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Trade-related effects of Brexit. Implications for Central and Eastern Europe.

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Introduction

- Following the referendum on 23 June 2016, the UK voted to leave the EU.
- The United Kingdom left the European Union on 31 January 2020.
- However, trade negotiations between the EU-27 and UK are still in progress, thus, we do not know the final form of the UK-EU trade relations.
- The Brexit is likely to have significant economic implications for both UK and the EU economies. However, the scale of these effects remains unknown as they depend on the final form of Brexit.
- We evaluate the possible impact of Brexit using a CGE model and Brexit scenarios encompassing changes in tariffs and NTBs



Review of literature

- The literature mostly focuses on effects for the UK and EU as a whole.
- CGE models are commonly used (but also other models including structural gravity, macro models, etc).

Table 4 Brexit impact on trade, computable equilibrium models (CGE): short (2yr's), medium (5 yr's) to long-term (2030)

Authors/Year	Main scenarios	Main findings
<u>Ciuriak, D. et al.</u> , 2017	Hard: WTO rules Soft: EEA membership	Hard: loss of UK's total exports to ROW: 6.75% loss of UK's total imports to ROW: 7.53% Soft: loss of UK's total exports to ROW: 1.72÷6.63% loss of UK's total imports to ROW: 2.20÷7.34%
Kee, H.L. & Nicita, A. (2016)	Hard: EU MFN rules (2 yr's) Soft: <u>na</u>	Hard: loss of UK's goods exports: 2% Soft: <u>na</u>
PWC (2016)	Hard: WTO rules, (baseline: UK in EU) Soft: UK-EU FTA	Hard: loss of UK's overall trade: 2.1% GDP Soft: loss of UK's overall trade: 0.5% GDP
Booth, S. et al. (2015)	Hard: WTO rules Soft: UK-EU FTA	Hard: cost of TBs & NTBs: 2.79 % of GDP Soft: cost of NTBs: 1.03 % of GDP
CEPR (2013)	Hard: WTO rules Soft: UK-EU FTA	Hard: cost of TBs & NTBs: 1.77 % of GDP Soft: cost of NTBs: 1.24 % of GDP



Brexit Simulation for the EU

- Use the GTAP CGE model to evaluate Brexit implications for EU countries.
- Simulate an increase of tariffs and NTB's
 - Base the simulation on the 2014 level of tariffs
 - Estimate NTBs in merchandise and services trade, follow Fontagne, Guillin and Mitaritonna (2011) to estimate internal and external NTBs in EU merchandise and service trade using gravity framework.
 - Evaluate several simulation scenarios with varying depth of trade protection
 - Provide results for Poland, Czechia, Slovakia, Hungary, rest of the NMS, Ireland, France, the Netherlands, Germany and the rest of EU14.



UK-EU trade profile

	UK trade		EU countries trade	
	Merchandise			
Country	Share of imports	Share of exports	Share of imports	Share of exports
Poland	2.2	1.5	1.2	6.3
Czechia	1.2	0.9	1.0	4.6
Slovakia	0.5	0.3	0.6	3.8
Hungary	0.6	0.5	0.9	3.2
rNMS	1.1	1.3	2.1	3.4
Ireland	2.8	5.1	10.5	9.4
France	5.6	5.7	1.9	6.5
Netherlands	8.5	6.7	2.9	11.2
Germany	14.1	9.1	1.6	6.5
rEU14	17.6	16.1	3.4	6.4
Overall	54.1	47.1	2.4	6.7
	Services			
Country	Share of imports	Share of exports	Share of imports	Share of exports
Poland	1.4	0.8	7.6	5.3
Czechia	0.4	0.3	5.0	3.7
Slovakia	0.2	0.1	3.7	4.1
Hungary	0.4	0.2	4.7	3.6
rNMS	1.6	0.8	0.9	0.8
Ireland	4.2	4.8	8.7	5.0
France	8.1	5.9	8.8	7.1
Netherlands	3.8	6.0	9.7	4.0
Germany	5.9	6.8	7.4	4.4
rEU14	21.0	14.1	8.0	6.3
Overall	47.1	40.0	7.0	4.6

There is a significant difference in bilateral importance of the UK-EU to the importance of EU to the UK.

Source: UNComtrade trade database; OECD Trade in services by partner economy data (EBOPS 2010);

UK trade: EU country/region share in total UK trade; EU trade: UK share in total trade;



RCA of EU

- Poland has more sectors with RCAs than the remaining NMS, which is a natural consequence of larger size, less openness and more diversification than elsewhere.
- Poland is mainly positioned within the „traditional” production sectors: food and beverages, wood and paper, minerals, metals, but also: electronic equipment, construction, trade, accommodation and food service, land transport (part of transport nec), warehousing, communication, real estate, business and recreational services, human health and social work.

sector	RCAs of EU countries in trade to UK									
	POL	CZE	SVK	HUN	rNMS	IRL	FRA	NLD	DEU	rEU15
Agriculture	0.6	0.0	0.0	0.1	1.8	2.0	0.9	1.9	0.3	1.1
Fishing	0.3	0.1	0.0	0.0	3.5	1.9	0.3	1.2	0.1	1.8
Mining	0.0	0.1	0.0	0.0	0.1	0.6	0.1	2.0	0.2	1.8
Food	1.7	0.2	0.3	0.7	0.6	3.3	1.1	1.1	0.6	0.9
Bvrges & Tobacco	1.2	0.1	0.0	0.6	0.6	1.3	2.8	0.7	0.4	1.1
Textiles	0.7	0.6	0.4	0.5	1.6	0.5	0.8	1.1	0.7	1.5
Wearing apparel	0.5	0.5	0.0	0.1	3.6	0.4	1.4	0.8	0.6	1.4
Leather	0.4	0.7	0.1	0.1	0.2	0.2	1.9	1.1	0.6	1.3
Wood	3.6	0.5	1.4	0.6	7.6	1.0	0.4	0.2	0.6	1.3
Paper, Publishing	1.1	0.7	1.0	0.7	0.3	0.6	0.8	0.6	0.8	1.5
Fuels	0.4	0.0	0.0	0.0	0.9	0.8	0.7	2.4	0.1	1.4
Chemicals	0.6	0.5	0.3	0.8	0.6	1.5	1.1	1.3	0.9	0.9
Non-metalic minerals	1.4	1.2	1.0	1.6	1.5	1.2	1.3	0.5	0.9	1.1
Steel	0.5	1.6	0.4	0.1	0.8	0.5	0.9	0.9	0.7	1.5
Metals nec.	1.7	0.1	0.1	1.1	0.6	0.4	0.7	0.3	1.6	1.0
Metal products	1.1	1.2	1.7	0.4	1.0	0.6	0.6	0.4	1.0	1.5
Motor vehicles & parts	0.8	1.2	2.3	1.0	0.7	0.1	0.7	0.3	1.7	1.0
Transport Eq. n.e.c.	0.4	0.5	0.0	0.2	0.3	0.1	2.3	0.5	1.5	0.8
Electronic Eq.	1.7	3.5	2.8	3.3	0.3	1.0	0.4	2.8	0.7	0.3
Machinery and eq. nec	1.0	1.4	0.9	1.7	1.3	0.7	0.9	0.8	1.2	0.9
Mnfcs nec	0.8	2.1	0.1	0.3	0.3	0.6	3.1	0.4	0.7	1.0
Construction	2.1	0.3	0.7	0.4	0.7	0.1	1.6	2.1	1.6	0.7
Trade	1.1	0.9	0.9	1.0	1.1	0.5	1.6	0.7	0.5	1.2
Accommodation & Food	1.1	1.0	0.9	1.0	1.1	0.4	1.6	0.6	0.5	1.2
Transport nec	1.9	1.6	1.7	0.9	1.9	0.4	1.6	0.8	0.3	1.2
Water transport	0.4	0.0	0.1	0.1	2.0	0.2	1.6	1.0	0.3	1.3
Air transport	0.5	0.7	0.6	1.5	1.1	1.3	0.9	0.9	1.4	0.8
Warehousing and support	1.4	1.1	1.1	1.1	1.6	0.6	1.2	0.7	0.8	1.1
Communication	1.1	1.6	1.4	1.0	1.2	1.1	0.9	1.4	1.1	0.9
Financial services nec	0.5	0.3	0.5	0.4	0.4	1.4	0.3	0.2	1.0	1.3
Insurance	0.5	0.6	0.5	0.4	0.4	2.5	1.4	0.5	1.0	0.7
Real estate activities	1.5	3.8	1.9	0.8	0.7	0.8	1.5	1.0	0.7	1.0
Business services nec	1.1	0.9	1.0	1.0	0.7	1.5	0.6	1.5	1.3	0.8
Recreational and oth.	1.1	1.4	1.7	2.3	1.0	0.2	1.6	0.8	0.5	1.1
Public administration	0.8	0.5	0.7	0.7	0.7	0.4	1.0	1.0	1.3	1.0
Education	0.6	0.4	0.7	0.6	0.7	0.4	0.8	1.0	1.5	1.0
Human health, social work	1.1	0.9	1.0	1.2	1.1	0.5	1.8	0.6	0.6	1.1



Tariffs and NTBs

- The estimated NTBs are usually higher than tariffs.

	Applied Tariff	MFN Tariff	NTB Intra EU	NTB Extra EU
Agriculture	2.31	4.76	0.0	26.9
Fishing	1.78	3.19	20.5	43.5
Mining	0.00	0.00	6.1	11.7
Food	11.27	16.74	0.0	19.9
Beverages & Tobacco	5.62	7.98	0.0	31.2
Textiles	4.39	7.59	1.1	8.8
Wearing Apparel	6.33	11.37	0.0	15.3
Leather	7.74	9.25	0.0	13.8
Wood	1.54	2.01	1.0	10.7
Paper, Publishing	0.04	0.09	6.9	18.7
Fuels	1.43	1.77	19.2	27.1
Chemicals	3.13	4.45	7.7	19.0
Pharmaceuticals	0.31	0.57	0.0	13.8
Rubber & Plastics	3.33	4.71	8.2	16.3
Non-metallic minerals	3.16	4.10	6.5	12.7
Steel	0.30	0.63	33.8	47.8
Metals <i>nec</i>	1.03	1.90	32.1	44.9
Metal products	2.03	2.63	8.0	11.5
Electronics and <i>opticals</i>	0.86	1.12	8.1	14.3
Electrical equipment	1.77	2.39	8.5	11.1
Machinery and equipment <i>nec</i>	1.02	1.33	14.6	15.5
Motor vehicles and parts	3.94	7.30	0.0	11.4
Transport equipment <i>nec</i>	1.59	1.86	8.8	6.3
Manufactures <i>nec</i>	0.96	1.13	9.6	15.3

	Applied Tariff	MFN Tariff	NTB Intra EU	NTB Extra EU
Energy			0.4	7.5
Construction			29.0	37.1
Trade			32.9	39.0
Accommodation and Food			34.9	39.2
Transport <i>nec</i>			36.8	44.4
Water transport			9.7	10.6
Air transport			6.4	11.2
Warehousing and support			32.2	37.1
Communication			25.5	31.2
Financial services <i>nec</i>			46.2	55.0
Insurance			58.1	65.8
Real estate activities			28.5	33.6
Business services <i>nec</i>			21.8	26.7
Recreational and <i>oth.</i>			30.5	32.9
Public Administration			25.4	34.5
Education			15.0	22.2
Human health, social work			10.8	16.9

Tariffs are tariffs weighted averaged across all extra-EU partners for 2014. NTBs from gravity model estimations.



Simulations

- The GTAP model is a multi-regional computable general equilibrium model. It features CES production sectors, perfect competition, Armington-based international trade and non-homothetic preferences.
- GTAP database version 10
- NTBs are modelled as a fall in the iceberg trade costs.
- Aggregated database: 21 countries/regions and 40 sectors



Simulation scenarios

- We analyse five most likely to happen Brexit scenarios:
 - 3 Soft Brexit
 - Zero tariffs on manufactures, possible tariffs on agricultural goods
 - NTBs in services and potentially in agriculture
 - 2 Hard Brexit
 - MFN tariffs, NTBs in agriculture, manufacturing and services
 - Potential liberalization of UK MFN tariff.

Scenario	Agriculture & food	Manufacturing	Services
Soft Brexit A (full FTA + UK tariffs vs RoW stay intact including preferential agreements of EU)	Zero tariffs, Internal EU NTBs, + border costs 2.5% in UK-EU trade	Zero tariffs, Internal EU NTBs, + border costs 2.5% in UK-EU trade	25% of external EU NTBs, + border costs 2.5% in UK-EU trade
Soft Brexit B (full FTA + UK sets EU MFN tariff on RoW)	Zero tariffs with EU, MFN UK external tariffs. Internal EU NTBs, + border costs 2.5% in UK-EU trade	Zero tariffs with EU, MFN UK external tariffs. Internal EU NTBs, + border costs 2.5% in UK-EU trade	25% of external EU NTBs, + border costs 2.5% in UK-EU trade
Soft Brexit C (partial FTA excluding agriculture and limited FTA on services)	MFN tariffs, NTBs: 50% of external level, + border costs 2.5% in UK-EU trade	Zero tariffs. MFN external tariffs. Internal EU NTBs, + border costs 2.5% in UK-EU trade	50% of external EU NTBs , + border costs 2.5% in UK-EU trade
Hard Brexit A (with external merchandise trade liberalization)	EU: MFN tariffs, UK: 50% of the EU MFN across all partners, NTBs: 50% of external level, + border costs 2.5% in UK-EU trade	MFN tariffs, UK: 50% of the EU MFN NTBs: 25% of external level, + border costs 2.5% in UK-EU trade	100% of external EU NTBs, + border costs 2.5% in UK-EU trade
Hard Brexit B	MFN EU tariffs, NTBs: 75% of external level + border costs 2.5% in UK-EU trade	MFN EU tariffs, NTBs: 25% of external level, + border costs 2.5% in UK-EU trade	100% of external EU NTBs, + border costs 2.5% in UK-EU trade



Results: overall change in GDP

Table 1 Simulated changes in GDP

	SoftA	SoftB	SoftC	HardA	HardB	SoftA LR	HardB LR
Poland	-0.05	-0.05	-0.07	-0.11	-0.11	-0.15	-0.36
Czechia	-0.07	-0.07	-0.08	-0.15	-0.14	-0.23	-0.42
Slovakia	-0.04	-0.04	-0.05	-0.08	-0.08	-0.12	-0.21
Hungary	-0.07	-0.07	-0.09	-0.14	-0.14	-0.15	-0.30
Germany	-0.06	-0.06	-0.07	-0.12	-0.12	-0.12	-0.26
France	-0.05	-0.05	-0.07	-0.11	-0.11	-0.09	-0.20
Netherlands	-0.10	-0.09	-0.13	-0.22	-0.23	-0.30	-0.76
Ireland	-0.55	-0.55	-0.78	-1.29	-1.34	-2.40	-8.74
Rest of NMS	-0.06	-0.06	-0.08	-0.13	-0.14	-0.17	-0.36
Rest of EU-14	-0.07	-0.07	-0.09	-0.16	-0.16	-0.16	-0.36
UK	-0.49	-0.54	-0.73	-1.09	-1.25	-1.01	-2.14
Rest of Europe	0.01	0.00	0.00	0.02	0.02	0.05	0.08
Russia, Belarus, Ukraine	0.00	0.00	0.00	0.01	0.01	0.02	0.05
USA	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Rest of N. America	0.00	0.00	0.00	0.01	0.01	0.01	0.02
China	0.01	0.01	0.01	0.02	0.02	0.01	0.04
India	0.00	0.00	0.00	0.01	0.01	0.01	0.06
Rest of Asia	0.00	0.00	0.00	0.01	0.00	0.01	0.03
South America	0.00	0.00	0.00	0.01	0.01	0.01	0.03
MENA	0.00	0.00	0.00	0.00	0.00	0.03	0.03
ROW	0.00	0.00	0.00	0.01	0.01	0.14	-0.08

Source: own simulation



Simulated changes in investment

Table 1 Simulated changes in investment

	PL	CZ	SK	HU	DE	FR	NL	IR	rNMS	rEU14	UK
SoftA	0.0	0.0	0.1	0.0	-0.1	-0.1	-0.3	-1.7	0.0	-0.1	-3.5
SoftB	0.0	0.0	0.1	0.0	-0.1	-0.1	-0.2	-1.5	0.0	0.0	-3.9
SoftC	-0.1	0.0	0.1	0.0	-0.1	-0.2	-0.4	-2.6	0.0	-0.1	-4.4
HardA	-0.1	0.0	0.2	0.0	-0.3	-0.3	-0.7	-4.7	-0.1	-0.2	-8.2
HardB	-0.1	0.0	0.2	0.0	-0.3	-0.3	-0.8	-5.0	0.0	-0.2	-9.2
SoftA LR	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.3	-3.3	-0.2	-0.2	-1.2
HardB LR	-0.4	-0.4	-0.2	-0.3	-0.3	-0.2	-0.9	-13.2	-0.4	-0.4	-2.3

Source: own simulation investment change in percent of capital stock. For long-run scenarios – long run change in capital stock.

- Due to drop in investment as an immediate effect on increasing trade barriers, the capital stock falls leading to a magnification of the effects observed in the short term scenarios.
- In the Long Run:
- NMS lose 0.2% (SoftA LR) to 0.4% of GDP (HardB LR)
- UK loses 1.2% (SoftA LR) to 2.3% of GDP (HardB LR)



Simulated changes in welfare

Table 1 Simulated changes in welfare

	SoftA	SoftB	SoftC	HardA	HardB	SoftA LR	HardB LR
Poland	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.4
Czechia	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4
Slovakia	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2
Hungary	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
Germany	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
France	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
Netherlands	-0.1	-0.1	-0.2	-0.3	-0.3	-0.2	-0.7
Ireland	-0.6	-0.5	-0.9	-1.3	-1.5	-1.5	-5.4
Rest of NMS	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.3
Rest of EU-14	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.3
UK	-0.8	-0.9	-1.1	-1.9	-2.0	-1.0	-2.2
Rest of Europe	0.1	0.1	0.1	0.2	0.2	0.1	0.1
Rus., Bel., Ukr.	0.0	0.0	0.0	0.1	0.1	0.0	0.1
USA	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of N. America	0.0	0.0	0.0	0.0	0.0	0.0	0.0
China	0.0	0.0	0.0	0.1	0.1	0.0	0.1
India	0.0	0.0	0.0	0.1	0.1	0.0	0.1
Rest of Asia	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South America	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MENA	0.0	0.0	0.0	0.1	0.1	0.0	0.0
ROW	0.0	0.0	0.0	0.1	0.1	0.1	0.0

Source: equivalent variation as % of GDP

- Countries experience decrease in the TOT (red).
- Countries experience improvement in the TOT (green).
- Improvement in the TOT leads to milder negative welfare effects.



Brexit's effect on international trade

Table 1 Overall changes in international trade

	SoftA	SoftB	SoftC	HardA	HardB	SoftA LR	HardB LR
Exports							
Poland	-0.1	0.0	-0.1	-0.2	-0.3	-0.2	-0.5
Czechia	0.0	0.0	0.0	0.0	0.0	-0.2	-0.3
Slovakia	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Hungary	0.0	0.0	0.0	0.1	0.1	-0.1	-0.1
Germany	-0.1	-0.1	-0.1	-0.4	-0.4	-0.2	-0.6
France	-0.1	-0.1	-0.2	-0.4	-0.4	-0.2	-0.5
Netherlands	-0.2	-0.1	-0.4	-0.6	-0.7	-0.4	-1.2
Ireland	-0.2	-0.1	-1.1	-1.5	-1.8	-2.0	-8.8
Rest of NMS	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.3
Rest of EU-14	-0.1	0.0	-0.1	-0.3	-0.3	-0.2	-0.6
UK	-3.2	-4.1	-5.6	-9.0	-10.9	-2.8	-9.6
Imports							
Poland	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.5
Czechia	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.3
Slovakia	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Hungary	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
Germany	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.5
France	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4
Netherlands	-0.1	-0.1	-0.1	-0.3	-0.3	-0.4	-1.0
Ireland	-0.1	-0.1	-0.6	-0.8	-0.9	-2.3	-9.3
rNMS	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.3
rEU15	0.0	0.0	0.0	-0.2	-0.2	-0.2	-0.5
UK	0.2	-0.4	-1.8	-1.1	-3.1	-2.4	-9.6

Source: own simulation. Total trade (merchandise + services trade)



Changes in Exports/Imports

Table 1 Changes in bilateral exports

		Source									
	Destination	PL	CZ	SK	HU	DE	FR	NL	IR	rNMS	rEU14
Soft A	UK	-9.3	-9.7	-9.1	-9.7	-8.1	-8.4	-9.2	-8.8	-9.6	-8.7
	EU	0.5	0.4	0.4	0.4	0.6	0.7	0.7	1.1	0.4	0.6
	ROW	0.6	0.5	0.4	0.4	0.6	0.6	0.7	0.8	0.4	0.5
Soft B	UK	-8.3	-8.9	-8.1	-8.8	-7.2	-7.4	-7.7	-7.7	-8.1	-7.6
	EU	0.5	0.4	0.3	0.4	0.5	0.6	0.6	1.0	0.4	0.5
	ROW	0.5	0.4	0.3	0.3	0.5	0.5	0.5	0.7	0.3	0.4
Soft C	UK	-15.3	-10.5	-9.8	-12.4	-10.0	-12.4	-17.7	-19.8	-11.6	-12.5
	EU	0.9	0.5	0.4	0.5	0.7	1.0	1.5	1.9	0.5	0.8
	ROW	1.0	0.6	0.5	0.6	0.7	1.0	1.3	1.5	0.5	0.8
Hard A	UK	-27.2	-23.9	-23.3	-24.6	-23.1	-24.3	-28.8	-28.3	-25.7	-25.1
	EU	1.6	1.2	1.0	1.0	1.6	2.0	2.3	3.0	1.1	1.7
	ROW	1.5	1.2	0.8	1.0	1.4	1.7	2.0	2.3	0.9	1.4
Hard B	UK	-30.3	-25.8	-25.4	-26.6	-25.5	-26.7	-32.3	-31.5	-27.3	-27.3
	EU	1.8	1.2	1.1	1.1	1.7	2.1	2.6	3.2	1.1	1.8
	ROW	1.8	1.3	1.0	1.1	1.6	1.9	2.3	2.6	1.1	1.6
Soft A LR	UK	-9.0	-9.4	-8.7	-9.3	-7.8	-8.1	-9.1	-10.1	-9.2	-8.4
	EU	0.4	0.3	0.3	0.3	0.5	0.6	0.4	-1.2	0.3	0.5
	ROW	0.4	0.2	0.2	0.2	0.3	0.4	0.3	-1.5	0.2	0.3
Hard B LR	UK	-29.3	-24.6	-24.2	-25.4	-24.3	-25.5	-31.9	-35.7	-26.2	-26.2
	EU	1.5	1.0	1.0	0.9	1.5	1.8	1.8	-6.0	0.9	1.5
	ROW	1.2	0.7	0.6	0.6	1.1	1.2	1.3	-6.1	0.7	1.1

Source: own simulation. Total trade (merchandise + services trade)

Table 1 Changes in bilateral imports

		Destination									
	Source	PL	CZ	SK	HU	DE	FR	NL	IR	rNMS	rEU14
Soft A	UK	-7.2	-7.6	-7.8	-6.9	-7.7	-7.0	-6.6	-4.9	-6.9	-6.8
	EU	0.5	0.4	0.3	0.4	0.6	0.6	0.6	1.6	0.5	0.6
	ROW	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	0.6	-0.3	-0.1
Soft B	UK	-6.5	-6.7	-7.0	-6.1	-6.9	-6.2	-5.8	-4.2	-6.1	-6.1
	EU	0.4	0.4	0.3	0.4	0.6	0.5	0.6	1.5	0.4	0.6
	ROW	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	0.6	-0.2	-0.1
Soft C	UK	-10.6	-9.3	-9.0	-8.6	-9.3	-10.4	-11.1	-12.4	-9.7	-8.6
	EU	0.6	0.6	0.4	0.6	0.9	0.8	0.9	3.6	0.7	0.8
	ROW	-0.4	-0.5	-0.4	-0.4	-0.3	-0.3	-0.2	0.9	-0.3	-0.2
Hard A	UK	-23.4	-21.4	-21.7	-18.1	-20.3	-19.2	-20.6	-19.5	-21.1	-19.9
	EU	1.4	1.3	0.9	1.3	1.7	1.5	1.9	6.2	1.3	1.7
	ROW	-0.8	-0.9	-0.9	-0.9	-0.6	-0.7	-0.4	1.6	-0.7	-0.5
Hard B	UK	-25.5	-23.3	-23.4	-19.8	-22.0	-21.1	-22.3	-21.8	-22.9	-21.5
	EU	1.5	1.4	0.9	1.3	1.8	1.6	2.0	6.7	1.5	1.9
	ROW	-0.9	-1.0	-0.9	-0.9	-0.7	-0.7	-0.5	1.7	-0.7	-0.5
Soft A LR	UK	-9.9	-10.4	-10.4	-9.6	-10.1	-9.4	-8.9	-8.2	-9.5	-9.1
	EU	0.3	0.3	0.2	0.3	0.4	0.5	0.4	0.1	0.3	0.4
	ROW	-0.1	-0.1	-0.2	-0.1	0.1	0.1	0.0	-0.6	-0.1	0.1
Hard B LR	UK	-31.0	-29.3	-28.8	-25.7	-27.0	-26.3	-27.0	-30.8	-28.3	-26.4
	EU	1.1	1.0	0.6	1.0	1.3	1.4	1.3	-0.4	1.1	1.3
	ROW	-0.4	-0.4	-0.4	-0.4	0.0	0.0	-0.2	-4.3	-0.3	0.1

Source: own simulation. Total trade (merchandise + services trade)



Changes in output within sectors

Table 18 Overall changes in output – long run scenarios

	Soft Brexit A LR					Hard Brexit B LR				
	PL	CZ	SK	HU	rNMS	PL	CZ	SK	HU	rNMS
Agriculture	0.0	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.2	-0.1	0.0
Fishing	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.2
Mining	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.3	0.1	0.1
Food	-0.1	-0.1	-0.2	-0.1	-0.1	-1.2	-0.6	-0.8	-0.8	-0.2
Beverages & Tobacco	0.0	-0.1	-0.1	-0.1	0.0	0.2	-0.3	0.0	0.1	0.2
Textiles	0.0	-0.1	-0.1	0.0	-0.1	0.2	-0.6	-0.1	0.0	-0.3
Wearing Apparel	0.2	-0.5	0.3	-0.2	-0.6	0.7	-2.4	1.5	-1.3	-2.7
Leather	0.2	-0.6	0.2	0.2	0.3	0.4	-3.4	0.9	0.7	0.7
Wood	-0.4	-0.1	-0.2	-0.2	-0.4	-0.9	-0.3	-0.4	-0.5	-1.2
Paper, Publishing	-0.1	-0.1	-0.2	-0.1	0.0	-0.2	-0.4	-0.7	-0.3	-0.1
Fuels	-0.1	-0.1	0.0	0.0	-0.2	-0.4	-0.1	0.0	0.0	-0.4
Chemicals	0.2	0.2	0.4	0.2	0.2	0.6	1.0	1.5	0.9	0.7
Pharmaceuticals	0.5	0.4	0.6	0.3	0.3	1.7	1.6	1.8	1.1	1.2
Rubber & Plastics	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.4	0.0	-0.4	-0.1
Non-metallic minerals	-0.2	-0.2	-0.2	-0.2	-0.1	-0.6	-0.5	-0.5	-0.6	-0.3
Steel	0.1	0.0	0.1	0.1	0.1	0.3	-0.1	0.2	0.2	0.4
Metals nec	-0.4	-0.1	0.1	-0.2	0.0	-0.6	0.2	0.8	-0.2	0.4
Metal products	-0.1	-0.1	-0.3	0.0	-0.1	-0.1	-0.2	-0.7	-0.1	-0.3
Electronics and opticals	-0.6	-0.7	-0.5	-0.6	0.0	-0.9	-1.3	-1.0	-1.2	0.1
Electrical equipment	-0.4	-0.2	-0.1	-0.3	-0.1	-0.6	-0.4	-0.2	-0.5	-0.2
Machinery and equipment nec	0.0	-0.2	0.0	-0.2	0.1	0.1	-0.5	-0.1	-0.5	0.0
Motor vehicles and parts	0.2	0.2	0.2	0.2	0.2	0.8	0.8	0.5	1.0	1.0
Transport equipment nec	0.3	-0.1	0.3	-0.3	0.1	0.8	-0.2	0.3	-0.4	0.2
Manufactures nec	-0.3	-0.3	-0.3	-0.1	-0.2	-0.5	-0.6	-0.6	-0.2	-0.4

Table 18 Overall changes in output – long run scenarios

	Soft Brexit A LR					Hard Brexit B LR				
	PL	CZ	SK	HU	rNMS	PL	CZ	SK	HU	rNMS
Construction	-0.2	-0.2	-0.1	-0.1	-0.2	-0.4	-0.4	-0.2	-0.3	-0.3
Trade	-0.1	-0.2	-0.1	-0.1	-0.1	-0.3	-0.3	-0.2	-0.3	-0.3
Accommodation and Food	-0.2	-0.2	-0.1	-0.1	-0.2	-0.4	-0.3	-0.2	-0.3	-0.4
Transport nec	0.1	0.1	0.0	0.0	-0.1	0.3	0.2	0.1	0.0	-0.1
Water transport	0.1	-0.1	-0.1	-0.6	-0.3	0.4	-0.2	0.0	-0.8	-0.4
Air transport	-0.1	-0.2	-0.1	-0.1	-0.2	-0.4	-0.4	-0.3	-0.3	-0.4
Warehousing and support	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.3	-0.3
Communication	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.1	-0.2
Financial services nec	-0.1	0.0	0.1	0.0	0.0	-0.1	0.2	0.3	0.0	0.0
Insurance	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	-0.1	-0.2	0.0
Real estate activities	-0.1	-0.2	-0.1	-0.1	-0.2	-0.3	-0.4	-0.2	-0.2	-0.3
Business services nec	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2
Recreational and oth	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.4	-0.2	-0.2	-0.4
Public Administration	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	-0.3
Education	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.3
Human health, social work	-0.1	-0.2	-0.1	-0.1	-0.1	-0.2	-0.4	-0.1	-0.2	-0.3



Changes in real wages

Table 1 Changes in real wages

	PL	CZ	SK	HU	DE	FR	NL	IR	rNMS	rEU14	UK
Soft Brexit A											
Land	0.0	0.0	-0.1	0.0	0.0	0.2	0.0	-9.2	0.1	0.1	6.2
Unskilled labor	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.9	-0.1	-0.1	-1.0
Skilled labor	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.8	-0.1	-0.1	-0.8
Capital	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.5	-0.1	-0.1	-1.0
Natural Resources	0.7	0.8	0.5	0.6	0.9	0.8	0.3	-1.4	0.5	0.5	1.0
Hard Brexit B											
Land	-1.4	-0.9	-0.9	-0.5	-2.4	-1.8	-6.7	-63.9	0.0	-2.8	28.6
Unskilled labor	-0.2	-0.3	-0.1	-0.2	-0.2	-0.3	-0.6	-3.2	-0.2	-0.3	-3.2
Skilled labor	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.5	-3.1	-0.3	-0.3	-2.8
Capital	-0.3	-0.2	-0.1	-0.2	-0.2	-0.2	-0.4	-2.1	-0.2	-0.3	-3.3
Natural Resources	2.1	1.9	1.5	1.6	2.1	3.9	1.9	-5.9	1.3	1.9	4.3

Source: own simulation.

- Output changes in different sectors translate to changes in real wages of factors of production.
- In Hard Brexit, land rents visibly fall (effect of increasing trade barriers in agriculture).



Conclusions

- Our results show that in spite of the UK being one of the most important trading partners for many of the NMS, Poland in particular, the short run macroeconomic effects of Soft Brexit are very small.
- The short run Hard Brexit scenarios roughly double effects of the Soft Brexit scenarios.
- The reduction of EU27-UK trade flows will lead to drops in sectoral outputs, especially in some export-oriented sectors. These drops are generally moderate
- In the case of Poland the simulated falls in the output are mostly observed in manufactures nec (which covers *inter alia* manufacturing of furniture), the wood sector, electronic and optical equipment and manufactured food (which is the largest sector of manufacturing in Poland).