A CGE analysis of Boris Johnson's Brexit including Melitz, multinationals and unemployment effects

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1. Motivation

Although there are already several analyses of Brexit very few of them combine:

- *Trade and Multinationals's effects*
- *Several manufactures running á la Melitz (2003)*
- *Unemployment, using a wage curve à la Blanchflower and Oswald (1994a; 1994b, 2005)*
- *A steady state simulation à la Francois et al. (2013).*
- *Boris Johnson's Brexit proposal & other scenarios*
- *Focus on Spain, while presenting results for UK, Rest of the EU, US and ROW.*

2. Methodology

Our CGE approach…

- **We combine Melitz (2003) in manufactures**
- **with multinationals (&FDI) in services**
- **in all regions of the model**
- **This extends our previous work: Olekseyuk (2016) & Latorre and Yonezawa (2018) & Latorre et al. (2018)**

Our CGE approach… (Cont.)

The FDI story

- *"(…) The great strength of our theory of international trade is its general-equilibrium approach. If one is to integrate the multinational into the theory of international trade, one needs to turn to a general-equilibrium framework."* (Markusen, 2002, p. 77)

- FDI runs in imperfect competition à la Krugman (1980)

- Multiregional setting + imperfect competition had not been attained till Latorre and Yonezawa (2018) and Latorre et al. (2018)

The FDI story (Cont.)

Services sectors have 3 ≠ types of varieties:

Domestic firms
Multinational firms coming from ≠ countries
Imported varieties coming from ≠ countries

Producing locally

The cost structure of domestic firms ≠ of multinational firms

- Domestic firms use local production factors + intermediates
- Multinationals also use local production factors + intermediates BUT,

+ specialized foreign inputs

↑ Barriers to FDI ↑ costs of multinationals, which affect their entry and profitability.

Our CGE approach… (Cont.)

The Melitz story

- Extends the full Melitz specification of Balistreri et al. (2011) in *JIE*
- Pareto distribution with parameters as in Balistreri et al. (2011)
- We model Melitz in <u>several manufacturing sectors</u>

  Others have CGEs with Melitz in only one sector: Dixon et al., 2016; Akgul et al., 2016; Oyamada et al., 2015
- The model <u>includes firm exit and entry</u>:

  Contrary to the approach of Petri and Plumer, (2016) and Petri et al. (2012)
- We can report <u>productivity & consumption varieties impact</u>, for which there are less Brexit results

Our CGE approach… (Cont.)

The model incorporates many simultaneous features of the real economies:

- multiple sectors, regions and factors of production
- trade imbalances
- intermediates with demand structures reflecting IO data
- sector-specific tariffs & Non-Tariff Barriers (NTBs) to trade and FDI
- multinationals operating in services sectors
- and a competitive selection of heterogeneous manufacturing firms (following Melitz, 2003)

Rare in the mainstream analysis (NQTMs) in international economics (e.g., Costinot et al., 2012; Costinot and Rodríguez-Clare, 2014; Melitz and Yeaple, 2015)

Our CGE approach… (Cont.)

- **Costinot and Rodríguez-Clare (2014) analyze *some* of these features. However, for some of them they do it *only in an Armington framework* of perfect competition.**

- **Balistreri and Tarr (2017) note that in this literature Melitz models do not yet incorporate *all the realistic data and features* of the previous slide.**

- ***Most Brexit studies have an Armington Structure* (e.g., Dhingra et al., 2017; Aichele and Felbermayr, 2015; Ottaviano et al., 2014, Ciuriak et al., 2015) *and homogeneous NTBs* (e.g., Dhingra et al., 2017; Ottaviano et al., 2014)**

3. Data

5 x 4 x 22 model of the world economy:

- **5 regions (UK-REU-Spain-US-ROW) x 4 factors of production (labor-land-natural resources-capital) x 22 sectors**

- **Main source**: **GTAP10 Data Base** (2019), **best database (The Economist, 2015), Forward calibration to 2020**

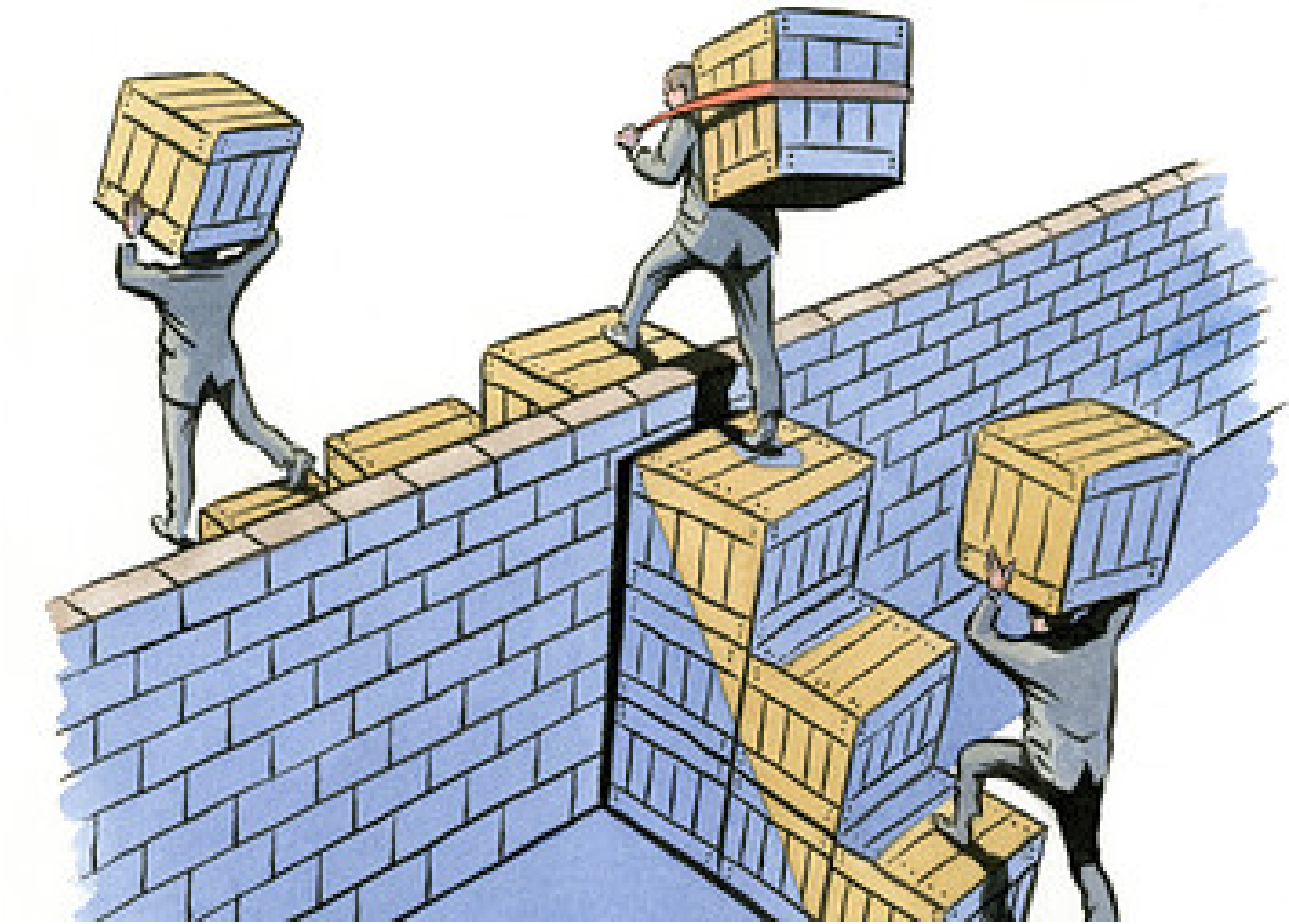
- **NTBs:**
- **Dhingra et al. (2016) For trade Ecorys (2009)**
- **For FDI Jafary and Tarr (2014)**

- **For the Sales of MNEs: Eurostat (2019), Spanish Ministry of Industry, Trade and Tourism and BEA (2020)**

Projections to 2020 Using IIASA (2019) scenarios

4. Scenarios

Brexit means increasing barriers to trade and FDI



- **“Hard” Brexit scenario:** MFN tariffs & highest NTBs to trade and FDI

- **Customs Union Scenario:** zero tariffs between the two parties and common external tariffs, but increases in high non-tariff barriers to trade and FDI.

- **Boris Johnson's Brexit Scenario:** based on the "revised policy statement" (Gov UK, 2019): Tariffs would be zero but NTBs would emerge.

- **“Soft” Brexit Scenario:** The relationship with the lowest possible barriers to trade and FDI.

- **Boris Johnson's Brexit combined with an ambitious or modest agreement with the United States:**
  - signed by the UK alone
  - or simultaneously by the rest of the EU (including Spain, of course) on similar terms.

5. Results

Macroeconomic results

	GDP	Private consumption	Aggregate exports	Aggregate imports
	Reference model			
Spain	-0.47	-0.80	-0.83	-0.92
European Union	-0.45	-0.77	-2.13	-2.33
United Kingdom	-2.57	-3.37	-11.29	-9.36
Rest of the world	0.02	0.03	0.26	0.28
United States	0.01	0.02	0.08	0.06
	Steady state: Capital stock reductions' framework			
Spain	-1.49	-2.08	-1.67	-1.78
European Union	-1.30	-1.88	-2.83	-2.99
United Kingdom	-5.11	-6.17	-13.55	-11.10
Rest of the world	0.00	0.01	0.05	-0.03
United States	0.01	0.01	0.02	-0.03

Impact on Spanish Economy

	GDP	Private consumption	Wages	Employment	Aggregate exports	Aggregate imports
	Hard Brexit					
Total	**-0.64**	**-1.08**	**-0.55**	**-0.36**	**-1.31**	**-1.42**
Tariffs	-0.11	-0.19	-0.17	-0.08	-0.52	-0.54
NTBs	-0.31	-0.52	-0.38	-0.20	-0.94	-0.97
FDI	-0.25	-0.43	-0.04	-0.11	-0.06	-0.14
	Customs Union					
Total	**-0.52**	**-0.87**	**-0.38**	**-0.28**	**-0.92**	**-1.02**
Tariffs	-0.02	-0.03	-0.04	-0.01	-0.12	-0.12
NTBs	-0.27	-0.45	-0.31	-0.17	-0.82	-0.84
FDI	-0.25	-0.43	-0.04	-0.11	-0.06	-0.14
	Johnson's Brexit					
Total	**-0.47**	**-0.80**	**-0.33**	**-0.26**	**-0.83**	**-0.92**
NTBs	-0.25	-0.42	-0.30	-0.16	-0.77	-0.80
FDI	-0.23	-0.39	-0.04	-0.10	-0.05	-0.13
	Soft Brexit					
Total	**-0.32**	**-0.54**	**-0.23**	**-0.17**	**-0.56**	**-0.63**
BNAs	-0.17	-0.28	-0.20	-0.11	-0.53	-0.55
IED	-0.16	-0.26	-0.03	-0.06	-0.03	-0.08
	Johnson's Brexit & Ambitious agreement between the US and EU&UK block					
Total	**0.03**	**0.04**	**0.09**	**-0.04**	**0.18**	**0.08**
Tariffs	-0.43	-0.73	-0.30	-0.23	-0.66	-0.74
NTBs	-0.10	-0.17	0.05	-0.10	-0.17	-0.22
FDI	-0.40	-0.67	-0.32	-0.24	-0.74	-0.90
	Johnson's Brexit & Modest agreement between the US and EU&UK block					
Total	**-0.27**	**-0.46**	**-0.18**	**-0.17**	**-0.37**	**-0.45**
Tariffs	-0.43	-0.73	-0.30	-0.23	-0.66	-0.74
NTBs	-0.35	-0.59	-0.20	-0.20	-0.60	-0.68
FDI	-0.44	-0.74	-0.33	-0.25	-0.79	-0.91

Microeconomic results

Spanish exports

	Brexit				Johnson+Agreement with the US	
	Soft	Johnson's	Customs Union	Hard	Ambitious	Modest
	Total	Total	Total	Total	Total	Total
Agriculture	-2.35	-3.43	-4.39	-5.25	-3.78	-3.60
Other primary	-0.12	-0.06	0.00	0.24	8.62	1.47
Food	-2.22	-3.03	-4.12	-4.48	4.78	-0.19
Textiles	-0.57	-0.87	-0.86	-1.78	0.68	0.30
Wood and Paper	-0.06	-0.17	-0.05	-0.05	0.06	0.01
Chemicals	-0.30	-0.47	-0.40	-0.69	1.07	0.29
Metals	-0.48	-0.72	-0.56	-1.02	-0.36	-0.45
Motor vehicles	-0.97	-1.49	-1.63	-3.37	-1.21	-1.46
Other transport	-0.91	-1.32	-1.31	-1.77	-2.08	-1.63
Electronics	-0.35	-0.56	-0.44	-0.56	-0.76	-0.55
Other machinery	0.13	0.17	0.22	0.17	-0.02	0.23
Other manufactures	-0.45	-0.69	-0.50	-0.92	0.30	0.29
Construction	0.30	0.37	0.74	0.99	-0.47	0.10
Water transport	-0.31	-0.52	-0.51	-0.48	0.16	-0.19
Air transport	0.50	1.95	2.33	2.50	2.30	2.14
Communications	0.13	0.20	0.26	0.35	0.80	0.55
Finance	-0.58	-1.01	-1.05	-0.92	-1.00	-0.98
Insurance	-0.22	-0.41	-0.39	-0.21	1.88	0.55
Business services	-0.14	-0.32	-0.30	-0.10	-0.72	-0.42
Hotels+Restaurants	-0.20	-0.45	-0.33	-0.12	-0.03	-0.25
Personal services	-0.07	-0.24	-0.19	0.08	-0.52	-0.28
Other services	-0.02	-0.16	-0.11	0.22	-0.47	-0.22
All Manufatures	-0.65	-0.96	-1.05	-1.65	0.59	-0.27
All Services	-0.05	-0.08	-0.01	0.23	-0.22	-0.08
Total	**-0.56**	**-0.83**	**-0.92**	**-1.31**	**0.18**	**-0.37**

Spanish production

	Brexit				Johnson+Agreement with the US	
	Soft	Johnson's	Customs Union	Hard	Ambitious	Modest
	Total	Total	Total	Total	Total	Total
Agriculture	-0.88	-1.31	-1.68	-1.98	-2.07	-1.62
Other primary	0.26	0.32	0.37	0.60	0.44	0.28
Food	-0.45	-0.69	-0.91	-1.02	0.78	-0.20
Textiles	-0.26	-0.41	-0.39	-0.68	0.34	0.15
Wood and Paper	-0.11	-0.20	-0.20	-0.19	0.04	-0.07
Chemicals	0.04	0.02	0.03	0.21	0.07	0.02
Metals	0.02	0.01	0.05	0.07	-0.04	0.02
Motor vehicles	-0.47	-0.77	-0.84	-1.97	-0.67	-0.83
Other transport	-0.06	-0.10	-0.06	-0.01	-1.30	-0.67
Electronics	0.14	0.17	0.21	0.41	-0.37	-0.03
Other machinery	0.07	0.08	0.11	0.19	-0.11	0.04
Other manufactures	-0.05	-0.09	-0.06	-0.02	0.11	0.14
Construction	-0.04	-0.06	-0.05	-0.06	0.00	-0.03
Water transport	-0.36	-0.55	-0.57	-0.67	0.18	-0.23
Air transport	0.05	0.76	0.96	0.98	1.32	1.02
Communications	-0.26	-0.39	-0.42	-0.53	-0.04	-0.24
Finance	-0.26	-0.38	-0.39	-0.51	-0.01	-0.21
Insurance	-0.42	-0.63	-0.69	-0.82	0.14	-0.31
Business services	-0.27	-0.41	-0.44	-0.51	-0.11	-0.28
Hotels+Restaurants	-0.47	-0.70	-0.76	-0.93	0.03	-0.41
Personal services	-0.36	-0.55	-0.60	-0.70	-0.06	-0.34
Other services	-0.32	-0.48	-0.52	-0.63	-0.01	-0.29
All Manufatures	-0.12	-0.20	-0.23	-0.29	0.08	-0.09
All Services	-0.32	-0.47	-0.51	-0.61	-0.01	-0.28
Total	**-0.25**	**-0.39**	**-0.43**	**-0.52**	**-0.02**	**-0.24**

Conclusions

- The negative impact of Brexit on the Spanish economy is limited.
- The higher the barriers between the EU and the UK, the greater the negative impact: The most damaging would be the hard Brexit> Customs Union> Johnson's Brexit > soft Brexit.
- It is important to try to negotiate a future relationship that brings about the lowest possible barriers. But the big market for Spanish trade and FDI is the European one, even in the absence of the United Kingdom.
- Non-tariff barriers (NTBs) to trade are the main focus of post-Brexit contractionary trends. This is a result in line with most of the Brexit studies.

- However, the impact of FDI barriers is very important in the Spanish economy as well.
- The effect of multinationals in Spain after Brexit is greater than in the United Kingdom itself (Latorre et al., 2019a; Latorre et al., 2019d).
- An ambitious EU treaty (including Spain and the UK) with the US would offset the negative effects of the Brexit on the Spanish economy, and if it were modest, would soften them considerably.
- If Brexit were to trigger sharp falls in investment in the economy (domestic or FDI) that ended up reducing the stock of capital in the Spanish and European economy, it would become a serious obstacle to economic growth and welfare.
- The damage would, of course, be much greater in the UK itself, as happens with all Brexit impacts.

Thank you!

References

Dhingra, S., Huang, H., Ottaviano, G., Pessoa, J.P., Sampson, T., y Van Reenen, J. (2017) "The costs and benefits of leaving the EU: Trade effects", Economic Policy, vol. 32, pp. 651-705.

Fernández-Pacheco, C.T., López, J.L. & Latorre, M.C. (2018a) "Multinationals' effects: A nearly unexplored aspect of Brexit", Journal of International Trade Law and Policy, 17, 2-18.

Fernández-Pacheco, C.T., López, J.L. & Latorre, M.C. (2018b) "The effect on foreign multinationals: an under-explored aspect of Brexit", LSE Blog on Brexit, https://blogs.lse.ac.uk/brexit/2018/10/22/the-effect-on-foreign-multinationals-an-under-explored-aspect-of-brexit/

Latorre, M. C. and Yonezawa, H. (2018) "Stopped TTIP? Its potential impact on the world and the role of neglected FDI", Economic Modelling, vol. 71, pp. 99-120, available at: https://www.sciencedirect.com/science/article/pii/S0264999317306119

Latorre, M. C., Olekseyuk, Z., Yonezawa, H. and Robinson, S. (2019) "Brexit: Everyone loses, but Britain loses the most", Peterson Institute for International Economics working paper 19-5, March. https://piie.com/publications/working-papers/brexit-everyone-loses-britain-loses-most

Latorre, M. C., Olekseyuk, Z., Yonezawa, H. and Robinson, S. (2019) "Making sense of Brexit losses: A review of macroeconomic studies" forthcoming in Economic Modelling.

Latorre, M. C., Yonezawa, H. and Zhou, J. (2018a) "A general equilibrium analysis of FDI growth in Chinese services sectors", China Economic Review, vol. 47, pp. 172-188, available at: https://www.sciencedirect.com/science/article/pii/S1043951X17301219

Latorre, M. C., Yonezawa, H. y Olekseyuk, Z. (2019a) "Trade and Foreign Direct Investment-related impacts of Brexit", World Economy, vol. 43, pp. 2-32, libre acceso en: https://onlinelibrary.wiley.com/doi/full/10.1111/twec.12859.

Latorre, M. C., Olekseyuk, Z., and Yonezawa, H. (2018c) "Can Brexit be overturned with other trade and FDI agreements?", paper presented at the 21th GTAP Conference on Global Economic Analysis.

Mann, M. (2017) “Exploratory estimates of US Internation Services by Modes of Supply”, Commitee on statistics and statistical policy – WPTGS, Available at: https://www.bea.gov/system/files/papers/WP2017-6.pdf

Ortiz, G. y Latorre M.C. (2019a) “A Computable General Equilibrium Analysis of Brexit: Barriers to Trade and Immigration Restrictions”, World Economy, Vol. 43, pp. 705-728.

Ortiz, G. y Latorre M.C. (2019b) “The economic impact of potential migration policies in the UK after Brexit”, Contemporary Social Science, vol. 14, pp. 208-225.

Price Water House Coopers. 2016. Leaving the EU: Implications for the UK economy (March).

Rueda-Cantuche, J. M., R Kerner, L Cernat and V Ritola (2016) “Trade in services by GATS modes of supply: Statistical concepts and first EU estimates”, DG Trade Chief Economist Note No. 3/2016, November.

Steen, W. Cernat,L., Maurer, A. Liberatore, A. and D'Andrea, B. (2018) "Towards a global data set on trade in services by sector and mode of supply – a progress report", Paper presented at the 21st Annual Conference on Global Economic Analysis, Cartagena, Colombia.