

## Brexit, trade and gross value-added (GVA)

A key question in the wake of the referendum to leave the European Union is what will be the impact on UK domestic output of reduced trade with the EU? A direct answer can be estimated using data on the domestic gross value-added (GVA) from exports collected by the OECD.<sup>1</sup>

Domestic GVA from exports is a good measure of how much the domestic economy benefits from trade. This measure subtracts the value of imported inputs, leaving us with just the economic activity that took place in the UK. Table 1 illustrates this with the example of a car destined for export which has been assembled in the UK using components imported from abroad. Gross trade is the sum of the value of the exported car *plus* its imported components. Domestic value-added is the value of the car *minus* the value of the imported components. This value-added accrues to UK households as wages and firms as profits.

In 2011 (the most recent year for which data are available), total UK GVA was \$2,286bn. The domestic GVA component of UK exports was \$563.1bn, so that 24.6 per cent of the UK's total GVA was related to exports. This is illustrated in the first column of table E3. Breaking down further by sector (column 1 of table 3), services exports account for 14 per cent of total UK GVA. FIRE and business service exports are the most important of the service sectors, accounting for 8 per cent of total UK GVA, while other service exports account for 6 per cent. Goods exports (manufacturing, mining and utilities) account for 11 per cent of the UK's total GVA.

Table 1. Gross trade vs value added, example

Total value of exported car (a)	£ 20,000
Value of imported components (b)	£ 10,000
Gross trade (a) + (b)	£ 30,000
Domestic gross value added (a) - (b)	£ 10,000

Table 2. Estimated reductions in bilateral exports with the EU (per cent)

	EEA		WTO	
	Optimistic	Pessimistic	Optimistic	Pessimistic
Goods	25	38	53	72
Services	19	40	43	72

Next, we try to project the potential impact on UK GVA of two key scenarios for the UK's future relationship with the European Union. We do this by combining the GVA data with estimates of the reductions in exports in goods and services to the EU from the academic literature on empirical gravity models (table 2).<sup>2</sup> We focus on two key scenarios for the UK's future relationship with the EU: EEA membership and a WTO status with no free trade agreement with the EU.

Table 3. Projected reductions in UK GVA from leaving the European Union (per cent)

	Share of UK total value-added	EU share of exports	Reduction in GVA			
			EEA		WTO	
			OPT	PESS	OPT	PESS
<b>Goods</b>	<b>11.0</b>	<b>49.1</b>	<b>1.4</b>	<b>2.0</b>	<b>2.8</b>	<b>3.8</b>
Manufacturing	9.4	46.2	1.1	1.7	2.3	3.1
Mining and Utilities	1.5	67.9	0.2	0.4	0.5	0.7
Agriculture	0.1	73.7	0.0	0.0	0.1	0.1
<b>Services</b>	<b>13.6</b>	<b>44.7</b>	<b>1.1</b>	<b>2.4</b>	<b>2.6</b>	<b>4.3</b>
Business sector services	12.3	43.5	1.0	2.1	2.3	3.8
FIRE and business services	7.9	42.8	0.6	1.3	1.4	2.2
Community services	1.2	56.6	0.1	0.3	0.3	0.5
Construction	0.1	50.1	0.0	0.0	0.0	0.0
<b>Total</b>	<b>24.6</b>	<b>46.8</b>	<b>2.5</b>	<b>4.4</b>	<b>5.4</b>	<b>8.2</b>
NiGEM GDP impact (Ebell and Warren, 2016)			1.5	2.1	2.7	3.7

Source: OECD Trade in Value-Added Dataset, October 2015, and own calculations. The decline in UK GVA from the 19 per cent decline in bilateral services exports under the optimistic EEA scenario leads to a 1.1 per cent decline in GVA. This is calculated as 13.5 per cent (share of UK GVA from services exports) times 44.7 per cent (share of value-added from exports to the EU) times 19 per cent (reduction in services exports) = 1.1 per cent.

## Brexit, trade and gross value-added (GVA) (continued)

Table 3 gives the projected reduction in GVA from the loss of access to EU export markets for the EEA and WTO cases. We find that the direct impact of export declines on GVA in the EEA scenario is expected to result in declines in UK GVA of between 2.5 per cent and 4.4 per cent relative to remaining in the EU. In the WTO scenario, the projected decline in UK GVA lies between 5.4 per cent and 8.2 per cent. These are long-run impacts, which would fully materialise after the UK has fully adjusted to its new status outside the EU.

The projected reductions in UK GVA are somewhat higher than the estimates of long-run declines in GDP relative to the baseline of remaining in the EU derived from NiGEM in Ebell and Warren (2016). The main reason is that using GVA data, we are able to account for the fact that trade is concentrated in higher value-added sectors such as financial intermediation and business services. This means that the GVA measure is capturing some of the impact on productivity, as we are accounting for the fact that higher productivity sectors, like financial intermediation, might be among the hardest hit by reductions in exports due to leaving the EU. Our NiGEM analysis in Ebell and Warren (2016), on the other hand, does not differentiate between high and low value-added sectors, and the core sectors do not include a productivity decline due to Brexit.

### NOTES

- 1 OECD Trade in Value-Added database, last updated October 2015.
- 2 Ebell and Warren (2016) provide more detail on the gravity estimates of reductions in EU trade under EEA and WTO scenarios.

### REFERENCES

- Ebell, M. and Warren, J. (2016), 'The long-term economic impact of leaving the EU', *National Institute Economic Review*, 236, pp. 121–38.
- OECD (2015), Trade in Value-Added database.

This box was prepared by Monique Ebell (m.ebell@niesr.ac.uk).