To use, or not to use (trade preferences) that is the question

Estimating the fixed cost thresholds

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Abstract:

One method of assessing the effectiveness of trade liberalisation, which has been largely ignored until some ten years ago, primarily due to lack of data, is examining the extent to which trade liberalised in theory actually enters foreign markets under the preferences that they are entitled to. Since then, work has been carried out often analysing the use of EU trade preferences by developing countries. In general, the studies conclude that trade preferences are fairly well used. This holds despite the fact that, frequently, tariffs are low thereby casting doubts on a commonly held view in the earlier literature that the preferential margin needs to be in the range of 3%-5% for preferences to be used. As a result, some recent research suggests that using preferences is associated with fixed costs rather than with variable costs. That is, unless the potential duty savings of using preferences are sufficiently large, preferences will not be used.

In order to properly assess these fixed costs, which may vary by exporting country, importing country and product, transaction level data, which is scarce to come by, is needed. We believe that this paper is the first of its kind to estimate these fixed cost thresholds based on transaction level data of EU exports (which has been obtained from Iceland's customs authorities). Using a regression kink model, we estimate the potential fixed cost thresholds to vary between about €20 and €260 for the full dataset. We also provide separate estimates for the sections of the Harmonised System and for the individual EU Member States. Finally, even when duty savings are low, the predicted preference utilisation rate of EU exports is fairly high, potentially pointing towards fixed costs at the firm-transaction level.

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1. Introduction

Trade has formed an important part of European Union (EU) commercial policy as well as of its foreign policy for a long period of time. Over time, the EU – a customs union itself – has progressed from having a series of primarily unilateral preference schemes and non-reciprocal bilateral free trade agreements (FTAs) to being involved in an ambitious agenda of reciprocal bilateral FTAs via successful multilateral negotiations on the way.

A significant literature has evolved analysing the impact of FTAs and preferential trading arrangements in general, often in terms of how much trade has been created or diverted as a result of the initiatives. However, one method of assessing the effectiveness of trade liberalisation that was largely ignored until some ten years ago, primarily due to lack of data, is examining the extent to which trade liberalised in theory actually enters foreign markets under the preferences that they are entitled to.

Since then work has been carried out often analysing the use of EU trade preferences by developing countries; see e.g. Bureau et al (2006), Candau and Jean (2005) Keck and Lendl (2012) and work by e.g. Nilsson (2011) and Nilsson and Dotter (2012), while Kawai and Wignaraja (2014) provide an overview of similar analyses in the Asian context. In addition, examining the Korea-ASEAN FTA, Hayakawa et al (2014) find that the preferential margin, rules of origin restrictiveness and the average export volume all contribute to determining the use of preferences, but that the latter is the most important determinant.

Nilsson (2016) examines the extent to which EU *exports* enter partner countries under the preferential access negotiated under its bilateral FTAs. He finds that, overall, the preference utilisation rate for EU exports is about 75% in 2013, albeit with significant variations depending on originating EU Member State (MS) and product group.

In general, the studies conclude that trade preferences are fairly well used. This holds despite the fact that, frequently, tariffs are low thereby casting doubts on a commonly held view in the earlier literature that the preferential margin needs to be in the range of 3%-5% for preferences to be used.[1] The work by Keck and Lendl (2012) and Nilsson and Dotter (2012) suggests that using preferences are associated with fixed costs rather than with variable costs. Hence, unless the potential value of preferences (i.e. the potential duty savings) of using preferences are sufficiently large, preferences will not be used.

In order to properly assess the fixed costs, which may vary by exporting country, importing country and product, transaction level data, which is scarce to come by, is needed. We believe that this paper is the first of its kind to estimate these fixed cost thresholds based on transaction level data of EU exports, which has been obtained from Iceland's customs authorities. A look at the data suggests that there is a range of fixed costs; we cannot observe a threshold of duty savings above which a jump in the preference utilisation occurs. Therefore, following the approach of Keck and Lendl (2012), we use a regression kink model

[1] See e.g. Francois et al (2005) who, for a group of developing countries, find that the margin should be higher than 4%.

with two knots in order to estimate the range of fixed costs. We find that fixed costs are between €20 and €260 in the full dataset. We also find considerable cross-country and cross-sectional variation when estimating the range for all countries and product sections separately. Finally, even when duty savings are low, the predicted preference utilisation rate of EU exports is around 70%, which potentially points towards fixed costs at the firm-transaction level.

The rest of the paper is structured as follows. Section 2 describes EU preference utilisation rates in Iceland by broad product categories, by EU Member States (MS) and by duty saving thresholds preferential margin. Section 3 empirically analyses the determinants behind the EU uptake of preferences, while Section 4 attempts to estimate the fixed costs associated with EU exports' use of preferences in Iceland. Section 5 summarises the findings of the paper and draws some conclusions.

2. Preference utilisation rates (PURs) by various metrics

PURs by MS and product groups

The data, which is for 2011, forms part of an overall data gathering exercise by EU delegations from relevant authorities in countries with which the EU has bilateral reciprocal trade agreements in place. Its most important feature is that it contains transaction level information on Iceland imports by (EU) country of origin and use of preferences.

Table 1 shows an overview of EU exports to Iceland by MS.[2] Germany is the largest exporter accounting for almost 50,000 transactions corresponding to about 20% of the close to 240,000 total number of transactions. The UK is the second most important MS in terms of number of exports transactions to Iceland followed by Denmark. At the other end of the spectrum, we find Luxembourg, Ireland, Malta and Cyprus displaying about, or less than, 100 transactions each.

On average, slightly more than 80% of all preference eligible transactions enter Iceland under preferences. One may note that Germany is slightly below this figure with 78% of the transactions being preferential, while the UK displays a significantly lower figure at 57%. In terms of customs value, Germany accounts for approximately 17% of the EU's total exports value, followed by Denmark with 16% and the UK and Sweden with 12% and 10%, respectively.

The average customs value per transaction is close to €1,400. Two of the main exporters, Germany and the UK, however display lower average customs values at some €1,100. Latvia and Estonia show the highest values – above €3,000 – followed by another two countries around the Baltic Sea, Finland and Lithuania, with average customs value of each transaction of more than €2,000. The average customs value is higher than the median customs value for each EU MS, ranging from 14 times higher in the case of Estonia to by and large double the value in the case of Romania and Cyprus. Hence, overall, this indicates that EU exports to

[2] Country codes are available in Annex Table B1.

Iceland are made up of relatively few large transactions and a great number of small transactions.

The preference utilisation rate (PUR) of EU exports of transaction *i* to country *c* (Iceland) is defined as the ratio of preferential exports of transaction *i* to country *c* over the value of preference eligible exports, i.e. products covered by the agreement and not facing zero MFN duties, as follows:

$$PUR_{ic} = \frac{Pref_{ic}}{Elig_{ic}}$$

Table 1: Characteristics of EU exports to Iceland by MS (€1000, € and %)

Origin	# of transactions	# of preferential transactions (%)	Customs value (€ 1,000)	Average customs value (€)	Median customs value (€)	PUR (%)
AT	2945	88.4	5504	1869	198	**97.9**
BE	5881	87.5	12251	2083	281	**96.8**
BG	1482	83.1	1225	826	293	**88.2**
CY	57	8.8	55	959	486	**27.2**
CZ	4419	86.1	3647	825	106	**95.1**
DE	48289	78.2	54869	1136	170	**91.7**
DK	31530	89.8	51379	1630	265	**95.9**
EE	950	95.4	2915	3069	216	**98.6**
ES	7646	88.6	7209	943	112	**95.2**
FI	2750	85.4	6265	2278	277	**97.5**
FR	13446	87.7	18426	1370	194	**94.6**
GB	37677	57.4	40254	1068	150	**83.2**
GR	936	78.0	546	583	75	**94.6**
HU	2329	85.6	3141	1349	266	**94.1**
IE	833	66.0	1707	2049	337	**90.7**
IT	16388	89.8	24871	1518	244	**96.3**
LT	3467	93.4	7656	2208	332	**93.8**
LU	102	82.4	186	1821	189	**90.2**
LV	1540	85.7	4856	3153	325	**69.6**
MT	89	85.4	102	1150	107	**96.0**
NL	12730	77.8	22197	1744	287	**90.5**
PL	12243	90.3	14806	1209	291	**95.0**
PT	5112	89.6	3827	749	161	**95.5**
RO	3026	89.3	2505	828	313	**93.4**
SE	17979	86.7	33363	1856	303	**94.1**
SI	1266	90.4	1188	939	251	**95.7**
SK	2172	85.6	3917	1803	203	**97.3**
Total	**237284**	**80.8**	**328866**	**1386**	**207**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

The last column of Table 1 shows that the total PUR is high at close to 93%. All EU MS display PURs above 90% except Bulgaria (88%), the UK (83%), Latvia (70%) and Cyprus (27%). The correlation coefficient between the PUR and average customs value of the transactions is 0.23, but it is negative between the PUR and the median customs value (-0.21) indicating that higher export values are positively correlated with the PUR (since the average customs value is higher than the median customs value of the transactions).

Table 2 shows the same data as above broken down by sections of the Harmonised System (HS). The largest number of transactions, close to 40,000, takes place in Textiles (Section 11), followed by Chemical products (Section 6), Miscellaneous manufactured products (Section 20) and Plastics and rubber (Section 7) at around 30,000 transactions. Together, these four sections account for 55% of EU exports to Iceland. About 80% of the number of transactions (Column 2) entered Iceland under preferences, ranging from 46% in the case of Instruments (Section 18) to 91% for Prepared foodstuffs (Section 4).[3]

Looking at the value of EU exports, we see notably that Textiles account for a lower share of the value of exports compared to the number of transactions, while the opposite holds true for Plastics and rubber. This is further reflected in the average customs value of the transactions, which reach €750 in case of the former and €1,800 in case of the latter. The average and median customs value is highest for Arms and ammunition (Section 19) and lowest for Instruments (Section 18). The PURs at section level are all above or around 90% except for Textiles (80%), Hides and skins (Section 8 (73%)) and Pearls, stones (Section 14 (65%)). There seems to be no clear relationship between the average and median customs values and the PUR.

The correlation coefficient between the PUR and the average and median customs value (0.54 and 0.35, respectively) at section level are higher compared to the correlation coefficient between the PUR and the average and median customs values of exports by originating MS. While this to some extent may reflect the underlying structure of exports, it also seems to suggest that there are differences in terms of complexities to use preferences by originating MS as compared to difficulties by sector.

[3] The data for 2011 does not contain any EU exports to Iceland in HS sections 1-3.

Table 2: Characteristics of EU exports to Iceland by HS section (€1000, € and %)

HS Section	# of transactions	# of preferential transactions (%)	Customs value (€ 1,000)	Average customs value (€)	Median customs value (€)	PUR (%)
4 Prepared foodstuffs	15602	91.2	41682	2672	711	97.5
5 Mineral products	11	81.8	5	465	419	89.7
6 Chemical products	31333	87.1	42572	1359	229	95.8
7 Plastics, rubber	27982	85.6	51398	1837	179	95.0
8 Hides, skins, leather	4045	54.5	2474	612	148	73.0
9 Wood, wood products	3510	89.7	6283	1790	193	93.7
10 Wood pulp products	10021	85.2	26666	2661	269	97.8
11 Textiles, textile articles	39888	71.5	30005	752	187	79.7
12 Footwear, headgear	5352	68.5	8150	1523	272	91.6
13 Art. of stone, plaster	9078	74.1	9760	1075	165	92.5
14 Pearls, stones, metals	2587	65.2	1848	714	147	64.8
15 Base metals etc.	12491	84.5	16417	1314	123	94.5
16 Machinery, mech. appl.	19170	76.5	35762	1866	341	92.5
17 Transp. equipment	25395	82.4	10231	403	109	83.1
18 Instruments	97	46.4	44	450	61	89.2
19 Arms, ammunition	249	77.9	1079	4335	960	93.6
20 Miscellaneous	30473	83.5	44489	1460	277	91.4
Total	**237284**	**80.8**	**328909**	**1386**	**207**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

Table 3 looks at the PURs by originating EU MS and sections of the HS and sheds some further light on some of the findings above. For example, the low PUR of Cyprus can be explained primarily by exports of Textiles and of Miscellaneous manufactures (in addition to exports in some of other sections which do not affect the overall PUR). The table also shows that Mineral products (Section 5) and Instruments (Section 18) have fewer exporting MS than the other sections. For example, only four MS (DE, DK, GB and NL) export Mineral products. While the overall use of preferences for exports in the section is high at close to 90%, it can be seen that DK, GB and NL make full use of the preferences for their exports and that the PUR for Germany stands at 0% (though this reflects only two transactions).

One may also note that the maximum PUR in each section but three is 100% (but the PUR is above 99% in these three sections) and that the minimum PUR is 0% in all sections but in Wood and wood products (Section 9 (22%)), Wood pulp products (Section 10 (55%)), Textiles (28%), Article of stones and plaster (Section 13 (24%)) and in Miscellaneous manufactures articles (26%), marked in bold in Table 3. Some of these outcomes are made up of a single or a handful of country/section combinations (e.g. Cyprus).

Table 3: PUR of EU exports to Iceland by MS and HS section (%)

Orig./ Sect.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Tot.
AT	100		88	99	92	99	99	95	97	81	88	90	99	84	100	100	99	**98**
BE	100		98	95	56	96	99	94	86	93	12	97	84	93		100	97	**97**
BG	50		99	35	89	100	84	83	96	97	100	100	98	99			96	**88**
CY				0	0			**28**	0				0				**26**	**27**
CZ	97		97	96	51	**22**	98	89	100	81	99	95	97	88		99	97	**95**
DE	98	0	92	94	72	97	97	84	89	89	45	93	91	80	87	93	90	**92**
DK	98	100	98	97	79	94	98	87	81	93	85	98	95	90	66	82	96	**96**
EE			95	100	96	100	100	97	100	90	100	100	8	94			97	**99**
ES	94		99	89	67	91	99	94	98	98	79	96	97	86		100	97	**95**
FI	100		100	99	70	89	100	85	97	91	100	97	99	96		98	97	**98**
FR	93		99	97	83	96	98	65	71	97	88	96	96	96	100	42	96	**95**
GB	97	100	95	89	52	84	95	57	54	76	34	82	75	72	26	99	71	**83**
GR	100		86	100	86		100	94	98	49	0	97	98	0			98	**95**
HU	91		100	99	100	83	98	99	99	97		89	95	87		100	75	**94**
IE	95		97	94	14		**55**	51	0	**24**	12	77	91	88			99	**91**
IT	94		98	98	91	100	97	97	98	99	93	96	97	96	0	86	93	**96**
LT	100		96	97	47	83	99	92	93	49	0	100	99	62			100	**94**
LU	0		0	90			100		0	96		100	84	91			81	**90**
LV	100		55	95	100	98	100	43	57	99	0	99	37	75			99	**70**
MT			15	100				82				0	0	51			100	**96**
NL	98	100	93	93	68	95	97	80	88	88	82	93	64	56	100	83	86	**90**
PL	95		97	99	78	96	96	89	81	95	18	93	97	94		0	94	**95**
PT	89		74	99	95	100	77	95	99	94	100	96	70	79		100	97	**95**
RO			18	84	87	91	100	89	99	74	100	98	99	66			97	**93**
SE	98		98	93	63	97	99	81	94	97	58	94	90	92	31	86	89	**94**
SI	100		99	98	100	64	100	68	0	92		98	100	97	100		92	**96**
SK	100		100	93			97	78	100	96	84	98	100	81			93	**97**
Total	**97**	**90**	**96**	**95**	**73**	**94**	**98**	**80**	**92**	**92**	**65**	**95**	**92**	**83**	**89**	**94**	**91**	**93**

Source: Own calculations based on data from Iceland's Customs Authorities.

To sum up our impressions of the data at country and section level, we note that the overall PURs are high, including for most countries and for most sections. The differences are greater by EU MS compared to sections of the HS. The average customs value varies between countries and is always higher than the median customs value, pointing to relatively many transactions at a relatively low value. Still, the PUR is high for exports from some MS in some sections while it is low for exports from other MS in the same sections.

PURs by duty saving thresholds and preferential margins

Preferences may be less than fully used due to a low preferential margin (the MFN duty minus the preferential duty) applicable to the transaction. Various cost aspects of complying with rules of origin (RoO) may also matter. For example, exporters may have to pay to get the origin certificates stamped (e.g. if issued by chambers of commerce) and to travel to another

location to get them. Similarly, the RoO requirements themselves may be stringent by e.g. restricting the use of imported intermediates. However, in the case of the EU this should be less of a problem since more than 85% of value added in EU gross exports is domestic.[4] Finally, in some cases unawareness of the existence of preferences may also play a role.

Nilsson (2016) shows that the PUR of EU MS' exports was closely related to the value of the trade flows, somewhat less to the (simple) preferential margin and somewhat more to the potential duty savings/potential value of preferences (the value of a trade flow times the preferential margin). He concludes that there are fixed costs rather than variable costs associated with using preferences and unless the gains are above a certain threshold, preferences will not be used. Keck and Lendle (2012) draw a similar conclusion.

In order to examine this further, Table 4 shows the PURs by preferential margin. It can be seen that even for preferential margins less than 2.5%, preferences are well used at above 80%. The PUR then increases to 95% for preferential margins between 2.5% and 5%, before it decreases to about 90% for margins between 5% and 10%. Interestingly, the PUR then drops to some 84% for transactions with a preferential margin between 10% and 15% (which is also reflected in a lower share of number of preferential transactions) before it increase again for the upper two thresholds.

Table 4: Transactions, value and preference utilisation by preferential margin thresholds (count, % and €)

Preferential Margin	# of transactions	# of preferential transactions (%)	Customs value (€ 1,000)	Customs value (% of)	PUR (%)
0<PM≤2.5	1319	66.8	2350	0.7	81.9
2.5<PM≤5.0	32421	82.8	93083	28.3	95.1
5.0<PM≤7.5	43400	83.3	28443	8.6	89.9
7.5<PM≤10.0	105990	82.1	134868	41.0	92.7
10.0<PM≤15.0	42727	70.5	38867	11.8	83.6
15.0<PM≤20.0	6685	91.8	16038	4.9	97.8
20.0<PM	4742	97.3	15216	4.6	99.4
Total	**237284**	**80.8**	**328866**	**100**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

Table 5 shows the distribution of EU MS exports by a set of duty saving thresholds (DSTs) in terms of number of transactions, number of preferential transactions, customs value and PURs. Overall, more than two-thirds of the transactions are eligible for duty savings of less than €50, but in terms of total export value they account for less than 8%. In fact, less than 3% of the transactions (transactions in the two highest duty saving thresholds) account for more than 40% of the export value. Preferences are fairly well used even at the lowest level of duty savings at some 75%-80%. The PUR then rises gradually with increased duty savings.

[4] The figure, which is for 2011, has been derived from the joint OECD-WTO initiative on trade in value added.

Table 5: Transactions, value and preference utilisation by duty savings thresholds (count, % and €)

Duty saving thresholds (€)	# of transactions	# of preferential transactions (%)	Customs value (€ 1,000)	PUR (%)
0 < DST ≤ 10	86904	75.4	4903	75.5
10 < DST ≤ 50	72541	78.8	20024	80.6
50 < DST ≤ 100	26131	84.2	19908	85.7
100 < DST ≤ 500	37543	89.6	89099	91.3
500 < DST ≤ 1,000	7752	94.0	57562	94.6
1,000 < DST ≤5,000	6088	96.4	111151	96.1
5,000 < DST	325	93.8	26218	94.8
Total	**237284**	**80.8**	**328866**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

In a next step, in Table 6, we examine what the PUR looks like by DST and HS section. The PUR tends to increase across the DSTs, but in the case of Textiles, we see that the PUR is lower in the highest DST. The same holds for Pearls and stones (in the highest DST these goods are exported). The last row shows that for DSTs above €5000, the total PUR is no longer increasing (from already high levels). Hence, it seems like impact of higher duty savings level off once you have reached a certain level.

In the lowest DSTs, five sections display PURs in the range of 40% - Hides, skins, leather (Section 8), Footwear, headgear (Section 12), Mineral products (Section 5), Arms, ammunition (Section 19) and Instruments (Section 18). The highest simple average PUR across the DSTs is found for Wood and Wood products, which reaches about 93.5% un-weighted (practically the same as the weighted figure in the last column).

Table 6: Preference utilisation by duty savings thresholds and HS section (%)

HS Section		Duty saving threshold (€)							
		0< DST ≤10	10< DST ≤50	50< DST ≤ 100	100< DST ≤ 500	500< DST≤ 1,000	1,000< DST ≤5,000	5,000< DST	Total
4	Prepared foodstuffs	71.8	86.3	94.6	96.7	98.4	99.3	98.9	97.5
5	Mineral products	45.6	89.2	100.0					89.7
6	Chemical products	82.0	87.2	91.7	96.4	96.0	98.5	100.0	95.8
7	Plastics, rubber	82.9	85.9	88.4	94.5	96.6	96.7	98.2	95.0
8	Hides, skins, leather	49.0	53.4	64.8	76.8	78.2	84.9		73.0
9	Wood, wood products	91.3	89.6	92.0	93.9	93.6	94.2	100.0	93.7
10	Wood pulp products	75.1	83.1	89.5	95.9	98.3	99.9	100.0	97.8
11	Textiles, textile articles	67.1	74.7	78.0	81.2	82.8	81.7	70.3	79.7
12	Footwear, headgear	46.7	61.4	72.4	83.9	92.2	98.9	100.0	91.6
13	Articles of stone, plaster	56.0	73.3	86.7	93.4	98.7	97.0	100.0	92.5
14	Pearls, stones & metals	68.0	64.1	63.9	66.0	83.6	40.4		64.8
15	Base metals etc.	83.8	83.4	86.4	90.8	95.6	99.6	100.0	94.5
16	Machinery, mech. appl.	63.7	76.4	85.5	92.5	96.8	96.4	89.3	92.5
17	Transp. equipment	82.8	80.4	81.6	85.3	78.7	83.2	100.0	83.1
18	Instruments	43.1	39.0	78.5	95.7	100.0			89.2
19	Arms, ammunition	43.3	67.0	73.0	96.5	100.0	93.1	100.0	93.6
20	Miscellaneous	82.3	80.9	86.1	88.5	92.2	93.9	98.5	91.4
Total		**75.5**	**80.6**	**85.7**	**91.3**	**94.6**	**96.1**	**94.8**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

Finally, Table 7 examines the DSTs by EU MS. It shows that also at MS level the PUR tends to increase with the DST. In addition, for many MS, the increase in the PUR seems to level out in the higher DSTs, or even in some cases to decrease in the thresholds where most duties are to be saved. There are a few exceptions, however. For example, Cyprus's low PUR of 11% in the second DST drops to about half of that – close to 5% – in the third DST. Estonia shows a similar pattern, albeit the difference being that its PUR drops from 96% in the first DST to 93% in the fourth DST, i.e. still close to full utilisation. A more extreme case is Latvia, the PUR of which seems to decrease with higher potential duty savings.

Table 7: Preference utilisation by duty savings thresholds and MS (%)

	Duty saving threshold (€)							
Origin	**0< DST ≤10**	**10< DST ≤50**	**50< DST ≤100**	**100< DST ≤500**	**500< DST ≤1,000**	**1,000< DST ≤5,000**	**5,000< DST**	**Total**
AT	85.2	88.1	95.3	97.5	99.4	97.9	100.0	97.9
BE	81.9	87.6	90.0	96.1	98.3	98.0	100.0	96.8
BG	84.5	86.4	84.6	85.0	88.6	89.8	100.0	88.2
CY	0.0	10.8	4.8	0.0	44.2	100.0		27.2
CZ	82.4	86.8	89.4	93.1	99.1	99.5	100.0	95.1
DE	75.7	76.6	83.3	90.6	95.8	95.7	100.0	91.7
DK	86.5	88.8	90.7	94.6	96.7	98.6	99.0	95.9
EE	96.2	94.6	94.2	93.0	100.0	100.0	100.0	98.6
ES	87.6	85.4	88.3	96.2	96.0	98.9	92.7	95.2
FI	61.0	87.2	94.2	95.2	98.0	100.0	100.0	97.5
FR	73.3	87.5	88.7	91.4	97.1	96.8	100.0	94.6
GB	55.5	57.4	64.9	79.4	86.9	93.9	89.6	83.2
GR	74.7	88.0	91.4	98.6	84.4	100.0	100.0	94.6
HU	77.8	88.1	89.2	94.2	100.0	93.0	100.0	94.1
IE	45.9	59.9	64.9	78.1	94.2	100.0	100.0	90.7
IT	71.5	91.1	93.8	94.3	97.8	98.8	100.0	96.3
LT	90.4	92.1	97.4	96.8	93.1	93.8	87.9	93.8
LU	84.8	78.1	59.3	90.7	86.1	100.0		90.2
LV	91.6	89.1	90.6	88.8	87.3	66.1	41.9	69.6
MT	90.0	80.7	53.2	98.0	100.0	100.0		96.0
NL	71.8	78.3	80.7	91.8	92.7	91.3	93.8	90.5
PL	87.4	86.9	94.4	94.4	92.4	98.9	100.0	95.0
PT	85.5	89.6	94.8	95.9	92.4	98.2	100.0	95.5
RO	80.0	91.3	91.7	90.5	95.4	100.0		93.4
SE	81.9	86.7	91.0	91.4	92.8	98.0	94.2	94.1
SI	86.5	92.6	94.5	97.9	94.8	83.0	100.0	95.7
SK	79.6	81.0	87.8	97.8	100.0	97.8	100.0	97.3
Total	**75.5**	**80.6**	**85.7**	**91.3**	**94.6**	**96.1**	**94.8**	**92.6**

Source: Own calculations based on data from Iceland's Customs Authorities.

Based on the above, one may conclude that the PUR increases with the DST but much less (if at all) in higher DSTs. Undoubtedly, while varying by HS Section and EU MS, the PUR seems to be related to the value of the transaction, the preferential margin it enjoys and the product of the two, that is the potential duty saving. The next section examines this in more detail.

3. Analysing determinants behind the uptake of preferences

In order to gain some further insights to what could be disentangled optically in the previous descriptive analysis, the purpose of this section is to quantitatively estimate the link between EU MS use of preferences in exports to Iceland on the one hand and potential duty savings

which are made up of the product of the value of a transaction and its preferential margin on the other.

Our main empirical model looks as follows:

$$\mathrm{PA}_i = \beta_0 + \beta_1 \log PREF\_ELIG\_EXP_i + \beta_2 MARG_i + \beta_3 (\log(PREF\_ELIG\_EXP * MARG))_i + \sum_m \gamma_m (\mathrm{HS}_m) + \sum_c \phi_c (\mathrm{O}_c) + \varepsilon_i$$

The dependent variable – preference applied (PA) – is an indicator taking a value of 1 if transaction *i* enters Iceland under preferences and a value of zero otherwise.[5] The variable *PREF_ELIG_EXP* denotes the log of the value of EU MS preference eligible export transaction *i* to Iceland in euros, while MARG is the preferential margin versus the MFN tariff in percent. The third variable – *PREF_ELIG_EXP*MARG* – is an interaction term between the log value of EU MS preferential export transaction and the preferential margin. HS denotes binary variables for the *m* sections of the Harmonised System and O binary variables for the *c* EU member countries and β_i, γ_m and ϕ_c are parameters to be estimated.[6]

Table 8 shows that values of the export flows matter as the coefficient of the variable log of preference eligible exports is positive and statistically significant at the 1% level, see column Main.[7] The same holds for the interaction between the two variables, the potential duty savings. The sign of the coefficient of the preferential margin is negative and also significant. However, this does not mean that a higher preferential *MARG* leads to a lower probability of using preferences. Recall that the marginal effect of the preferential margin is conditional on the value of the export transaction given by ($\beta_1 + \beta_3 (\log(PREF\_ELIG\_EXP)$). The lowest observed value of $\log(PREF\_ELIG\_EXP$ in our sample is 1.65, which implies that the impact of the preferential margin always is positive.

[5] Since the purpose of the empirical part of the paper is to analyse the determinants of the preference utilisation rate, one should note that, by construction, the only zeroes in the trade data refer to cases when exports of preference eligible goods take place, but preferences are not used and the PUR equals zero.

[6] Preferential margins have been calculated based on data from the Market Access Database and ITC's MacMap.

[7] Running an OLS regression yields close to identical results. Full regression results are available in Annex Table A1.

Table 8: Regression results of EU preference utilisation rates (PURs), logit

Dependent variable – PUR	Main	Potential duty savings
Log of preference eligible exports	0.0860***	
Preferential margin (absolute)	-0.0584***	
Log of preference eligible exports*pref. margin	0.0149***	
Potential duty savings, €		
<=10		0.087***
>10 and <=50		0.116***
>50 and <=100		0.170***
>100 and <=500		0.225***
>500 and <=1000		0.258***
>1000 and <=5000		0.281***
>5000		0.170***
Obs.	223,096	223,096

Source: Own calculations. *Note:* ***p<0.01, ** p<0.05, * p<0.10.

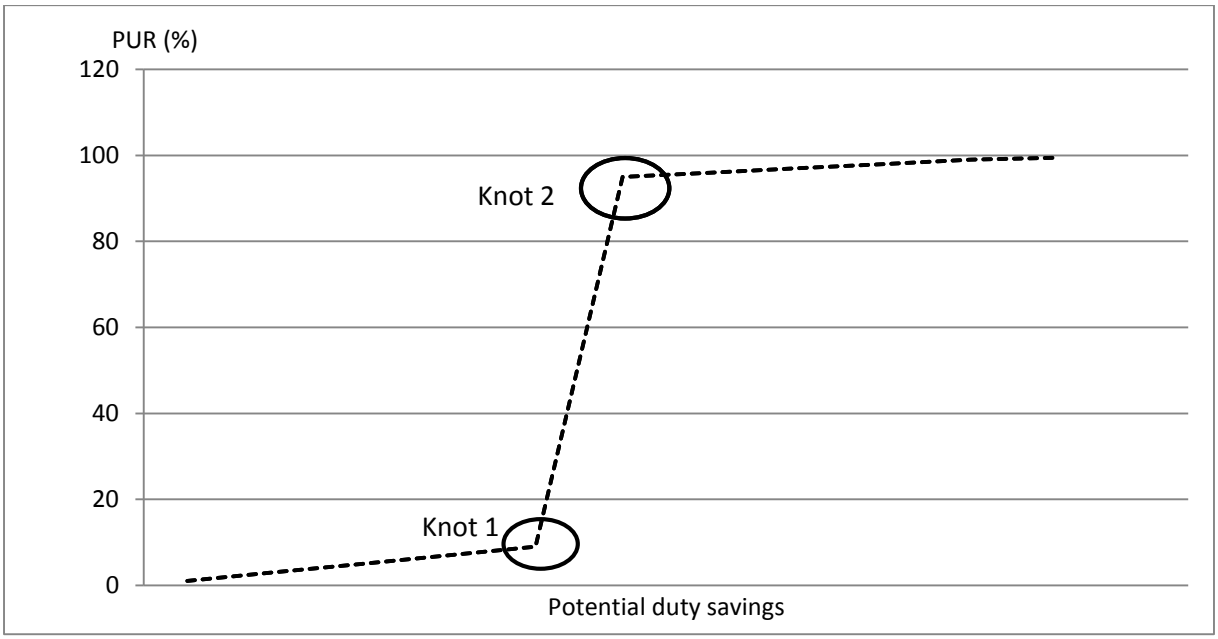
Column 2 displays the results when the PUR is regressed on categorical variables of the potential duty savings. The coefficient estimates show that there is an unambiguous increase in the impact on the preference utilisation rate except for duty savings above €5000 for which the coefficient decreases. This is likely to reflect that an increase in the duty savings does not affect the use of preferences anymore because preferences are already used to a great extent at this high level of savings.

4. Estimating the fixed cost thresholds

The finding that the use of preferences is related to the potential duty savings rather than the preferential margin of a transaction confirms the results of previous studies which find that the costs associated with using preferences are of fixed rather than variable nature. Keck and Lendle (2012) provide estimates of the fixed costs of preference utilisation for imports to Australia, Canada, Europe and the US. As data does not suggest that there is one exact threshold below which no utilisation is observed and above which preferences are fully utilised, we assume that fixed costs are distributed across a range of possible fixed costs between two thresholds or "knots" k_1 and k_2.

Below the first knot, k_1, the use of preferences should be low and not particularly affected by potential duty savings. Above k_1, preference utilization should increase with potential duty savings. The logic is that between the two thresholds, it is more likely that the value of the duty savings is higher than the fixed costs of using the preferences associated with the particular transaction and hence it is more likely that preferences are indeed used. Above the second knot, k_2, the use of preferences should be high and the effect of an increase in the duty savings on the PUR should be marginal or vanish, see Figure 1 below.

Figure 1: Potential duty savings and preference utilisation rates – an illustration



One drawback of the study by Keck and Lendle is that they do not have transaction level data available, which leads to what appears to be high estimates of the thresholds. Indeed, their estimates of k_2 range between USD 33,000 and USD 146,000. Although they re-estimate the fixed costs with what they call "pseudo transaction-level" data[8] for the EU and US, the upper thresholds around USD 1,500 they find are still high. In our data not even 3% of the transactions reach potential duty savings of above EUR 1,000. Furthermore, their estimates for k_1 are between USD 14 (EU) and USD 62 (US), indicating substantially higher fixed costs for US exporters than for EU exporters.

We improve upon that study in two aspects. First, we estimate k_1 and k_2 more precisely using transaction level data. Second, we also estimate the knots separately for each EU MS exporting to Iceland and for each HS section. It is likely that the knots differ across countries and sections as fixed costs of using preferences depend on factors varying at country and industry level, for example relating to RoO.

Because of the computational intensity of the estimation, we use a least squares (LS) technique to estimate the knots and different slope parameters. This can be justified by the fact that logit and OLS give qualitatively similar results and we are mainly interested in the signs and significance and the approximate values of the slope parameters.

We use a regression kink model similar to the one proposed by Hansen (2015), but assume two unknown knots instead of one. Defining a dummy variable indicating that duty savings (DS) of a transaction i are above knot j as $d_{ij}(k_j) = \{DS_i > k_j\}$, the regression equation then takes the following form:

[8] To generate this data, they only keep observations that occur in 6 months or less for each importer-exporter-product combination, arguing that these are close to transaction level data.

$$\mathrm{PA_i} = \beta_0 + \beta_1 \log(DS)_\mathrm{i} + \sum_{j=1}^{2}\left[\delta_j d_{ij}(k_j)(\log(DS_i) - \log(k_j))\right] + \sum_m \gamma_\mathrm{m}(\mathrm{HS_m}) + \sum_\mathrm{c} \phi_\mathrm{c}(\mathrm{O_c}) + \varepsilon_\mathrm{i}.$$

This model allows the effect of the duty savings on PA to change when the value of duty savings exceeds knot k_j. The slope coefficient is equal to β_1 for $DS < k_1$, $\beta_1 + \delta_1$ for $k_1 < DS < k_2$ and $\beta_1 + \delta_1 + \delta_2$ for $k_2 < DS$. Denote the vector of slope parameters to be estimated as $\theta = (\beta_0, \beta_1, \delta_1, \delta_2, \Sigma_m \gamma_m, \Sigma_c \varphi_c)$. By definition, the LS estimators $(\hat{\theta}, \hat{k}_1, \hat{k}_2)$ then jointly minimize the function of the sum of squared errors

$$S(q, k_1, k_2) = \sum \hat{e}_i^2.$$

Conditional on the knots, the regression equation is linear in θ and can therefore be estimated by OLS, yielding the sum of squared errors function

$$S(\hat{\theta}(k_1, k_2), k_1, k_2) = \sum (\hat{\varepsilon}_i\ (k_1, k_2))^2.$$

The estimates of the knots $\hat{k}_1, \hat{k}_2$ are defined as the values that minimize the sum of squared errors:

$$(\hat{k}_1, \hat{k}_2) = \arg\min S(k_1, k_2).$$

Using MatLab, we run an algorithm searching for the knots that minimize the same of squared errors, once for the full sample but also separately for each section and country. Due to the large number of observations and the necessity to search for the minimizing combination of two knots, which raises the size of the parameter space for the search by the power of two, the minimization procedure is computationally intensive. We therefore restrict the knots to hold integer values by conducting a discrete grid search with increments of 1.

The computational problems become even more severe when constructing the F-test for significance of the knots. Hansen (2015) proposes a bootstrap algorithm in order to calculate the p-values of the non-standard limiting distribution of the F-statistic. We follow his algorithm and apply it to our two-kink model to test the hypothesis that there exist two knots against the null hypothesis of zero knots.

To make the computation feasible, we take a 10% random subsample of our full dataset and discard all observations with duty savings below the 5th or above the 95th percentile of its distribution. These somewhat above 20,000 observations should be enough to produce asymptotically valid p-values.[9] We perform 1,000 bootstrap replications to approximate the distribution of the F-statistic under the null hypothesis.

Table 9 shows the estimated parameters for the full sample. The magnitudes of the slope coefficient in the different intervals are as expected. Before the first knot k_1, which is €19, the effect of the potential duty savings on preference utilization is small (0.010) but statistically

[9] The dataset used in Hansen (2015) contains 219 observations.

significant. A one percent increase in duty savings in this interval is expected to increase the PUR by one percentage point. Between the first and the second knot, which is €258, the sum of the slope coefficients ($\beta_1 + \delta_1$) is higher at close to 0.05 and statistically significant, indicating that a one percent increase in potential duty savings increases the probability of using preferences by five percentage points.

Above k_2, the sum of the slope coefficients ($\beta_1 + \delta_1 + \delta_2$) shrinks again to 0.08 and performing a Wald test to test the significance of ($\beta_1 + \delta_1 + \delta_2$) yields that this sum is not significantly different from zero. As expected, the estimate of the second knot at €258 is much lower than the one found by Keck and Lendle (2012), suggesting that estimating the knots with aggregated data might indeed result in too high values. The p-value of the F-statistic shows that we can reject the hypothesis that there are no knots.

Table 9: Kink regression results using absolute duty savings with two knots

	Full sample
k_1	19
k_2	258
F-test: 2 vs. 0 knots	46.47***
p-value	0.000
β_1	0.010***
	(0.002)
δ_1	0.039***
	(0.003)
δ_2	-0.037***
	(0.003)
Observations	237,284
HS section FE	Yes
Origin FE	Yes
R-squared	0.14

Note: The dependent variable is a variable taking the value of one if preferences are used, β_1 is the slope parameter for value of potential duty savings smaller than Knot 1, $\beta_1 + \delta_1$ make out the slope parameter between Knot 1 and Knot 2 and $\beta_1 + \delta_1 + \delta_2$ is the change in the slope parameter after Knot 2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure A1 (see Annex) illustrates the result of Table 9 graphically by plotting the preference utilisation predicted by the regression model against the log of the potential duty savings. The values given by the y-axis are to be interpreted as the probability of preferences being used given the specific value of potential duty savings. As indicated by the slope coefficients in Table 9, the effect of an increase in the duty savings is much stronger if the value of the potential duty savings is between some €20 and €260.

The figure also shows that even for very small duty savings, the probability of using preferences is around 70%, which is similar to what Keck and Lendle (2015) find for imports to the US. If fixed costs arise for each transaction, we should observe a preference utilisation

close to zero when almost no duty savings can be realized. We see the fact that this is not the case as likely evidence that fixed costs do not necessarily occur at the transaction level, but at firm-transaction level. For example, so called approved exporters do not face fixed costs for each transaction, but have instead incurred such costs in the process of becoming approved exporters.[10] The predicted preference utilisation probability of 70% for transactions with low duty savings seems to suggest that this is the case.

Annex Table A2 presents estimation results for each HS section in the dataset excluding sections 5 and 18, which have only few observations. The p-values show that the knots in all sections are significant, although there are 4 sections out of the 15 for which the estimations do not show the predicted patterns in the slope coefficients because either δ_1 is negative or δ_2 is positive.

These are sections 4 (Prepared foodstuffs), 9 (Wood etc.), 11 (Textiles) and 20 (Miscellaneous). Further, sections 12 (Footwear, headgear) and 15 (Base metals etc.) show the predicted patterns, but the values of the knots are adjacent to each other, suggesting that there is only one knot indicating the exact fixed costs of using preferences. The remaining sections all indicate varying ranges of fixed costs, which are lowest in section 13, ranging from €9 to €25, (Article of stone, plaster) and highest in section 14 (Pearls, stones, metals), ranging from €404 to €526. The latter high fixed costs are reflected in the relatively low PUR of 65% for section 14, c.f. Table 2.

Annex Table A3 shows the estimation results by EU MS. We drop Cyprus and Malta from the table as the number of observations for these two countries is below 100. Out of the remaining 25 member states, six do not follow the predicted pattern because δ_1 is smaller than zero: Bulgaria, Denmark, Estonia, Latvia, Netherlands and Poland. Further, the knots are not significant at the 10% level for Hungary, Portugal and Slovenia, leaving 16 member states with significant fixed costs thresholds. Latvia has already been standing out with a low PUR of 69.6% and a negative relationship between the PUR and the potential duty savings in Table 7. As we have seen that fixed costs differ considerably across product sections, the fixed costs variations (or absence thereof) indicated by the table could be due to different compositions of exports to Iceland across countries instead of different in country-specific fixed costs.

The non-conformity with the prediction in the case of Latvia could be explained by the large export value in section 11, which, as shown above, does not show the predicted patterns in the slope coefficients, and which accounts for 47% of Latvia's export value. Among Bulgarian exports, section 11 makes even up 70% of the value. For Estonia, exports consist to more than 50% of sections 11 and 20 and for Poland to almost 50%. Only in the case of the Netherlands and Denmark the fact that we could not find any fixed costs thresholds cannot be explained by high exports in sections where similarly no fixed costs could be identified. Their exports are rather diversified and their section shares are highly correlated with the aggregate section

[10] An approved exporter is an exporter who under certain conditions is allowed to make out proofs of origin, see http://ec.europa.eu/taxation_customs/customs/customs_duties/rules_origin/preferential/article_774_en.htm#approved_exporter.

shares. This can be seen in Annex Table A4, which shows the export value shares of each section by origin country and the correlation with the aggregate shares.

For exports from Austria, Belgium and Sweden, the knots are adjacent to each other and indicate fixed costs of using preferences of around €50. Exporters with a low range of fixed costs not exceeding a value of €40 are the Czech Republic, Finland, Greece, Italy and Romania. Spain, Ireland, Luxembourg have high fixed costs of at least around €60 and ranging up to €555. At a first glance, these differences cannot be explained by the differing export composition across countries. The section shares of Italy's exports for example have the highest correlation with the aggregate shares, but fixed costs are exceptionally low. Netherlands, Denmark and Poland on the other hand have also high correlations, but no evidence of fixed costs can be found.

Hence, also the country of origin seems to play a role for the existence and the range of the fixed costs of using preferences, although we find a higher number of similar fixed costs ranges between countries (e.g. AT, BE, SE) than between sections. When looking closer at the largest two exporters, Germany and the UK, the range of fixed costs starts at a similar value of around €20 and the upper knot is higher for the UK than for Germany (€306 vs €182). The fact that their fixed costs ranges are relatively close to the range in the full dataset suggests that they are the most "representative" countries with respect to the cost of preference utilisation.[11]

5. Summary and conclusions

This paper has provided an overview of the extent to which EU exports use preferences in Iceland using transaction level data. The overall use is about 90% in 2011, with certain variation between EU MS and sectors. In general, the paper shows that EU exports make relatively good use of preferences even when both the preferential margin and the potentially duty savings are low. The empirical analysis by and large confirms what the descriptive analysis shows.

To take the analysis a step further, we carried out estimations of potential fixed cost thresholds. We find the fixed costs to range between about €20 and €260 in the full dataset. This is considerably lower and due to the use of transaction level data more precise than what a similar study by Keck and Lendle (2012) found with more aggregate data. One of our findings shows that even when duty savings are low, the predicted preference utilisation rate is above 70%. We see this as evidence that fixed costs arise at the firm-transaction level and that transactions using preferences, although the savings realized are low, form part of a larger set of transaction firms are carrying out, most likely as so called approved exporters and hence less concerned with fixed costs per transaction.

We also estimate fixed cost thresholds separately by product section and EU member state. We find no statistical evidence of fixed costs in four out of 15 examined sections: 4 (Prepared

[11] In order to prove conclusively whether fixed costs vary more at section or at country level, estimations for each country-section combination would be necessary. However, this is a computationally intensive exercise and beyond the scope of this paper.

foodstuffs), 9 (Wood etc.), 11 (Textiles) and 20 (Miscellaneous). Across the remaining sections, fixed costs vary considerably between €9 to €25 (section 13) and €404 to €526 (section 14). When looking at the estimations by EU MS, we found no support of fixed costs in nine cases. This can be related to a high export share of sections 11 and 20, reflecting the results at section level, for four of them (Bulgaria, Estonia, Latvia and Poland), while for Denmark and Netherlands, the result seems more puzzling since it cannot be explained by the composition of exports.

Across the other countries, we find evidence of a strong variation of fixed costs that can only be partly attributed to different export compositions. However, the two largest exporters, Germany and the UK, have a similar range of fixed costs, which are relatively close to the range of fixed costs in the full dataset. We conclude that the estimations indicate that the fixed costs of using preferences vary across sections and to a somewhat weaker extent across countries.

Future work on this topic could advance our knowledge about preference utilisation further should suitable data with a firm identifier become available, including information of whether or not the firm is an approved exporter. This would then potentially allow for the determination of whether fixed costs vary at firm level and provide more precise estimates.

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ANNEX

Table A1: Full regression results of EU preference utilisation rates (PURs), logit

Dependent variable – PUR	Main	Potential duty savings
Log of preference eligible exports	0.0860***	
Preferential margin (absolute)	-0.0584***	
Log of preference eligible exports*pref. margin	0.0149***	
Potential value of preferences/duty savings, €		
<=10		0.087***
>10 and <=50		0.116***
>50 and <=100		0.170***
>100 and <=500		0.225***
>500 and <=1000		0.258***
>1000 and <=5000		0.281***
>5000		0.170***
HS Section dummy		
4 Prepared foodstuffs	0.816***	0.837***
5 Mineral products	0.589	0.685
6 Chemical products	0.786***	0.775***
7 Plastics, rubber	0.495***	0.480***
8 Hides, skins, leather	-1.233***	-1.227***
9 Wood, wood products	0.518***	0.522***
10 Wood pulp products	0.439***	0.406***
11 Textiles, textile articles	-0.571***	-0.569***
12 Footwear, headgear	-0.832***	-0.823***
13 Art. of stone, plaster	-0.351***	-0.325***
14 Pearls, stones, metals	-0.736***	-0.748***
15 Base metals etc.	0.364***	0.355***
16 Machinery, mech. appl.	-0.226***	-0.234***
17 Transp. equipment	0.394***	0.431***
18 Instruments	-1.566***	-1.621***
19 Arms, ammunition	-0.414**	-0.488***
20 Miscellaneous	-	-
Constant	1.085***	1.266***
Obs.	223,096	223,096

Source: Own calculations. *Note:* ***p<0.01, ** p<0.05, * p<0.10.

Table A2: Kink regression results using absolute duty savings with two knots by HS section

HS Section:	4	6	7	8	9	10	11	12
k_1	3	4	39	19	1	8	10	50
k_2	487	236	1023	447	20	152	1336	51
F-test	71.70	117.91	57.36	74.05	26.79	53.41	289.33	13.06
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014
b_1	0.056***	-0.009***	0.013***	-0.020***	0.184***	0.012***	0.095***	0.029***
	(0.0044)	(0.0035)	(0.0016)	(0.0075)	(0.0305)	(0.0037)	(0.0037)	(0.0071)
d_1	-0.019***	0.048***	0.037***	0.126***	-0.183***	0.048***	-0.067***	2.65***
	(0.0051)	(0.0044)	(0.0039)	(0.0149)	(0.0335)	(0.0067)	(0.0048)	(0.9744)
d_2	-0.032***	-0.035***	-0.047***	-0.131**	0.013	-0.039***	-0.181***	-2.62***
	(0.0055)	(0.0069)	(0.0193)	(0.0657)	(0.0101)	(0.0091)	(0.0265)	(0.9751)
Obs.	15,602	31,333	27,982	4,045	3,510	10,021	39,888	5,352
Origin FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.114	0.073	0.070	0.201	0.132	0.126	0.216	0.254

The dependent variable is a variable taking the value of one, if preferences were used, k1 and k2 are estimates of the knots, b_1 is the slope parameter for value of potential duty savings smaller than k1, and d_1 and d_2 are changes in the slope parameter. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A2: Kink regression results using absolute duty savings with two knots by HS section (continued)

HS Section:	13	14	15	16	17	19	20
k_1	9	404	28	8	45	4	10
k_2	25	526	29	151	330	282	21
F-test	197.91	22.63	100.31	245.90	35.31	21.32	97.72
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000
b_1	-0.057***	-0.007	-0.014***	-0.013**	-0.012***	-0.259***	0.021***
	(0.0072)	(0.0051)	(0.0031)	(0.0040)	(0.0018)	(0.0859)	(0.0036)
d_1	0.195***	1.244***	0.780**	0.097***	0.049***	0.408***	-0.082***
	(0.0183)	(0.2756)	(0.3318)	(0.0062)	(0.0086)	(0.0961)	(0.0113)
d_2	-0.087***	-1.6769***	-0.727**	-0.072***	-0.065**	-0.151**	0.093***
	(0.0178)	(0.3547)	(0.3334)	(0.0081)	(0.0278)	(0.0578)	(0.0101)
Obs.	9,078	2,587	12,491	19,170	25,395	249	30,473
Origin FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.157	0.222	0.057	0.215	0.069	0.312	0.172

The dependent variable is a variable taking the value of one, if preferences were used, k1 and k2 are estimates of the knots, b_1 is the slope parameter for value of potential duty savings smaller than k1, and d_1 and d_2 are changes in the slope parameter. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A3: Kink regression results using absolute duty savings with two knots by EU MS

Country:	AT	BE	BG	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HU
k_1	50	53	10	12	19	3	5	59	9	2	21	7	9
k_2	51	54	220	38	182	34	158	108	23	966	306	15	10
F-test	11.78	14.12	11.68	44.28	420.45	105.66	11.55	59.10	20.30	13.64	325.03	87.84	7.88
p-value	0.023	0.001	0.023	0.000	0.000	0.000	0.024	0	0	0.001	0.000	0.000	0.133
b_1	0.020***	0.017***	0.081***	-0.015***	-0.004**	0.038***	0.031**	-0.006**	0.006	-0.007	0.013***	-0.018	0.007
	-0.005	(0.0039)	(0.0233)	(0.0058)	(0.0018)	(0.0048)	(0.0151)	(0.0030)	(0.0109)	(0.0073)	(0.0023)	(0.0133)	(0.0112)
d_1	3.53***	2.94***	-0.098***	0.108***	0.081***	-0.049***	-0.047**	0.172***	0.121***	0.029***	0.089***	0.475***	0.690***
	-1.033	(0.3871)	(0.0307)	(0.0198)	(0.0042)	(0.0062)	(0.0189)	(0.0278)	(0.0288)	(0.0080)	(0.0051)	(0.0518)	(0.2469)
d_2	-3.54***	-2.940***	0.090**	-0.069***	-0.058***	0.038***	0.058***	-0.158***	-0.115***	-0.020	-0.079***	-0.428***	-0.682***
	-1.037	(0.8390)	(0.0384)	(0.0224)	(0.0075)	(0.0038)	(0.0184)	(0.0334)	(0.0256)	(0.0205)	(0.0109)	(0.0535)	(0.2437)
Obs.	2,945	5,881	1,482	4,419	48,289	31,530	950	7,646	2,750	13,446	37,677	936	2,329
Section FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.117	0.118	0.055	0.038	0.077	0.059	0.088	0.041	0.219	0.119	0.171	0.411	0.055

The dependent variable is a variable taking the value of one, if preferences were used, k1 and k2 are estimates of the knots, b_1 is the slope parameter for value of potential duty savings smaller than k1, and d_1 and d_2 are changes in the slope parameter. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A3: Kink regression results using absolute duty savings with two knots by EU MS (continued)

Country:	IE	IT	LT	LU	LV	NL	PL	PT	RO	SE	SI	SK
k_1	63	8	24	149	10	7	3	4	8	49	2	52
k_2	555	10	48	212	1237	515	80	114	14	50	42	102
F-test	39.80	59.45	22.29	13.15	57.19	17.02	92.27	5.47	18.78	12.54	8.18	44.63
p-value	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.288	0.000	0.017	0.121	0.000
b_1	-0.018*	-0.006	-0.019***	-0.068	0.006	0.057***	0.078***	0.018	-0.084***	0.012***	-0.022	-0.028***
	(0.0099)	(0.0040)	(0.0067)	(0.0428)	(0.0175)	(0.0057)	(0.0070)	(0.0124)	(0.0165)	(0.0023)	(0.0219)	(0.0074)
d_1	0.185***	0.197***	0.111***	1.50***	-0.025	-0.014*	-0.050***	0.019	0.443***	0.985**	0.065**	0.264***
	(0.0344)	(0.0400)	(0.0237)	(0.4800)	(0.0214)	(0.0075)	(0.0085)	(0.0148)	(0.0515)	(0.4133)	(0.0271)	(0.439)
d_2	-0.118	-0.164***	-0.096***	-1.46***	-0.272***	-0.051***	-0.026***	-0.029**	-0.365***	-0.976**	-0.049**	-0.238***
	(0.0813)	(0.0385)	(0.0225)	(0.5239)	(0.0411)	(0.0178)	(0.0064)	(0.0127)	(0.0436)	(0.4143)	(0.0193)	(0.0498)
Obs.	833	16,388	3,467	102	1,540	12,730	12,243	5,112	3,026	17,979	1,266	2,172
Section FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.231	0.045	0.081	0.282	0.145	0.092	0.080	0.029	0.025	0.077	0.124	0.087

The dependent variable is a variable taking the value of one, if preferences were used, k1 and k2 are estimates of the knots, b_1 is the slope parameter for value of potential duty savings smaller than k1, and d_1 and d_2 are changes in the slope parameter. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A4: Export composition by origin country (%) and correlation with total export composition

Orig. /Sect.	4	6	7	8	9	10	11	12	13	14	15	16	17	19	20	Corr with Total Export comp.
AT	6.6	9.4	11.4	0.8	1.2	3.6	12.4	1.1	4.3	0.5	5.1	19.4	10.1	0.1	13.8	0.840
BE	21.9	12.2	12.0	0.9	0.6	5.5	9.2	0.4	3.5	0.1	4.4	6.3	15.5	0.1	7.6	0.698
BG	0.2	2.4	0.6	0.4	0.3	0.2	69.5	3.2	2.2	0.5	0.5	0.7	0.9	0.0	18.2	0.608
CZ	1.1	2.6	13.2	0.5	0.3	1.7	5.3	0.6	7.0	0.2	13.6	10.6	29.7	0.4	13.1	0.548
DE	5.4	14.6	15.6	1.6	1.0	4.1	5.6	1.4	5.9	1.5	8.0	10.7	14.2	0.1	10.2	0.806
DK	8.6	16.8	12.0	1.9	3.1	5.4	18.1	1.4	2.7	2.7	4.9	3.0	2.2	0.1	17.1	0.878
EE	0.0	4.9	7.6	2.5	6.3	6.6	28.1	0.9	1.4	0.5	6.2	0.4	5.5	0.0	28.9	0.717
ES	7.9	4.5	12.3	2.1	0.8	1.5	15.8	4.2	5.3	0.5	5.4	7.1	25.2	0.0	7.5	0.735
FI	6.8	7.6	12.2	3.5	1.5	9.4	12.9	4.7	13.7	0.8	4.7	4.4	7.2	0.9	9.7	0.738
FR	6.0	18.7	10.7	1.0	1.1	5.3	11.1	1.4	4.3	0.8	6.8	7.6	19.2	0.0	6.0	0.827
GB	6.4	18.5	8.3	2.5	0.5	3.4	23.9	3.1	2.4	1.2	2.9	7.1	12.2	0.1	7.5	0.912
GR	2.0	3.7	18.6	2.8	0.0	21.9	37.9	1.1	0.2	0.4	4.4	2.6	0.5	0.0	3.8	0.588
HU	2.3	4.1	9.0	0.4	0.4	1.3	11.3	0.6	3.6	0.0	2.4	28.5	13.6	0.1	22.5	0.644
IE	6.2	21.0	12.1	1.4	0.0	1.3	13.9	0.8	0.7	1.3	1.7	28.8	2.6	0.0	7.9	0.675
IT	4.0	8.8	12.1	3.1	1.0	2.1	14.8	4.0	4.1	0.7	5.1	12.9	9.6	0.3	17.4	0.914
LT	0.8	0.7	5.0	0.3	4.3	3.1	46.7	1.7	0.5	0.0	0.7	5.2	0.5	0.0	30.3	0.670
LU	1.0	1.0	32.4	0.0	0.0	5.9	0.0	1.0	21.6	0.0	2.0	2.0	13.7	0.0	19.6	0.409
LV	0.3	12.1	17.0	0.5	8.4	0.5	41.2	2.1	1.0	0.1	3.6	0.4	1.0	0.0	11.9	0.742
NL	13.1	17.0	13.9	1.5	0.9	7.9	16.3	1.4	2.5	1.1	5.8	4.9	6.5	0.0	7.0	0.867
PL	5.3	7.2	11.5	0.9	3.6	3.9	20.6	0.8	3.4	0.1	1.9	10.4	5.9	0.0	24.6	0.853
PT	0.3	0.6	3.1	0.4	1.5	0.1	67.4	7.8	5.1	0.1	1.5	1.4	5.6	0.0	4.8	0.558
RO	0.0	0.2	1.5	1.2	5.5	0.4	55.2	5.4	5.8	0.1	1.2	2.9	4.6	0.0	16.1	0.600
SE	8.6	15.0	14.4	1.6	1.2	5.3	8.3	3.4	1.7	0.6	7.0	5.7	7.5	0.1	19.5	0.848
SI	1.2	1.1	10.4	0.1	0.9	0.7	10.1	0.1	2.5	0.0	2.4	38.5	7.4	0.0	24.3	0.502
SK	0.0	0.3	3.9	0.0	0.0	9.3	7.3	3.4	4.7	0.1	1.6	21.3	25.6	0.0	22.4	0.520
Total	6.6	13.2	11.8	1.7	1.5	4.2	16.8	2.3	3.8	1.1	5.3	8.1	10.7	0.1	12.8	1

Figure A1: Predicted probability of preference utilisation from kink regression

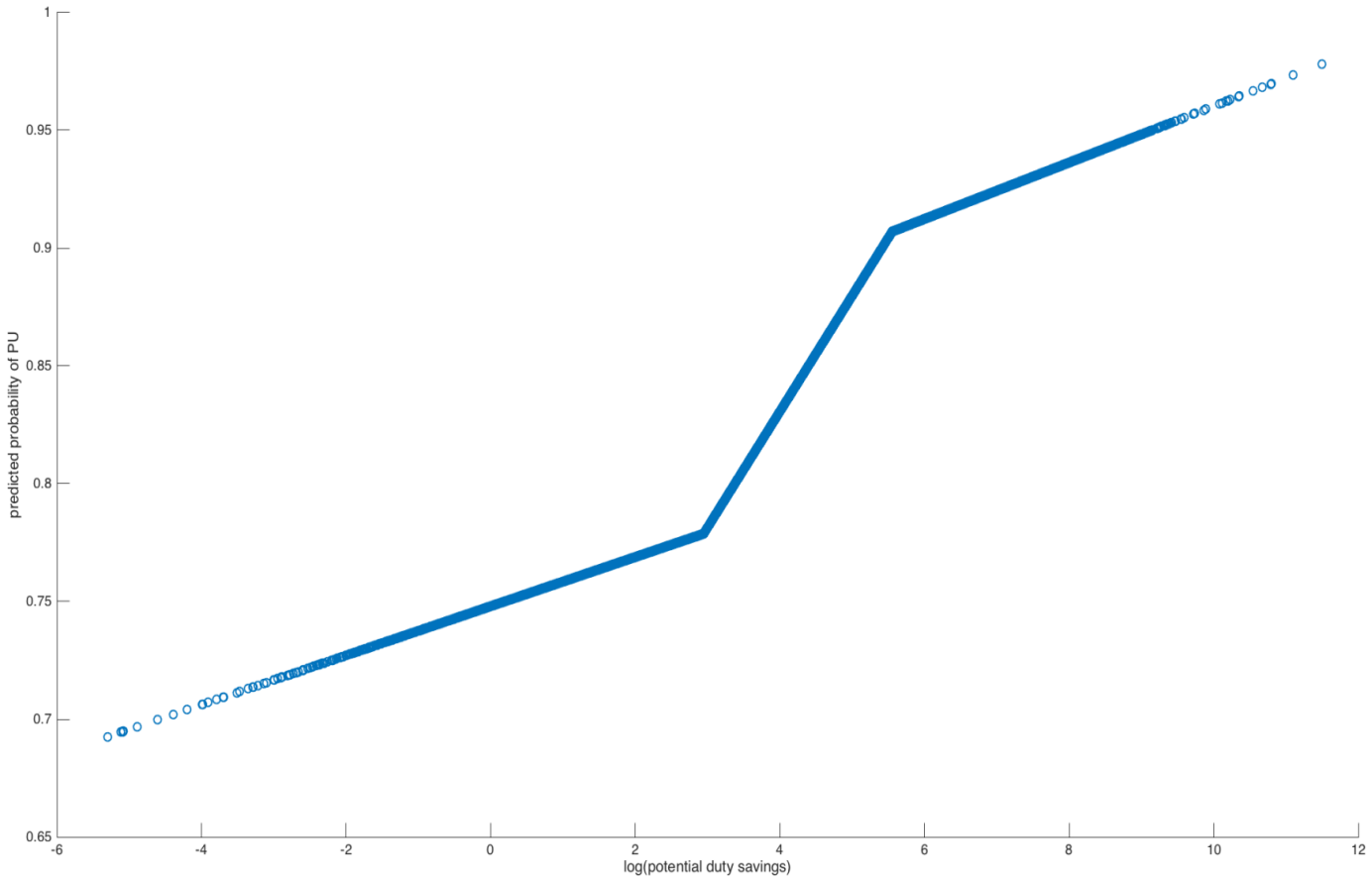

Table B1: List of country codes

Origin	Country name
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GB	Great Britain (UK)
GR	Greece
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia