Danmarks Statistik
MODELGRUPPEN

Arbejdspapir

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The Armington Elasticity: from a micro-level data

Resumé:

The paper presents substitution elasticities for Danish imports at the most detailed level of SITC-aggregation estimated using Feenstra (1994). The elasticities describe the substitution between foreign varieties, for example, the substitution between imports from Germany versus imports from UK. The sectoral estimates show much heterogeneity and range between -1.14 and -32.65 with overall mean -6.15 and median -4.45. The weighted averages of the sectoral estimates range between -3.82 and -6.83 using expenditure shares as weights, and between -2.58 and -5.82 using standard errors as weights. The point elasticity estimates are very close to an average estimate obtained from a bootstrapping procedure.

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Nøgleord: Imports, Armington elasticity, micro data

1. Introduction

The Armington elasticity of substitution between differentiated goods is one of the most empirically studied topic in international trade. Despite a large body of literature, there is no consensus on the magnitude that should be used, for example, in macroeconomic models. Orcutt (1950), Houtakker and Magee (1969) and Goldstein and Khan (1985) are some of the most sited early studies.

There has been an increasing research based on microeconomic data and the corresponding estimated elasticities tend to be larger than macro-data-based estimates, see Feenstra (1994), Broda and Weinstein (2006), Corbo and Osbat (2013) and Imbs and Mejean (2015). Imbs and Mejean (2015) show that the difference between macro and micro estimates is due to heterogeneity bias in aggregate data that pushes the macro estimate downward. Large price changes tend to occur in inelastic products, causing the aggregate price change to be associated with little response in quantities and resulting in low aggregate elasticity estimates.

This paper presents substitution elasticities for Danish imports estimated using the most detailed level of SITC aggregation. The paper uses the estimation technique proposed in the seminal work of Feenstra (1994). Feenstra supplements the demand equation for imports with a supply equation to account for the endogeneity of prices and applies the generalized method of moment estimator. In some instances, Feenstra's method generates elasticities that take on imaginary values that are outside the theoretically justified boundaries. For these groups we apply the grid search technique proposed by Broda and Weinstein (2006).

Previously, to the best of my knowledge, two studies have estimated elasticities of substitution for Danish imports at highly disaggregated level. Mohler and Seitz (2010) report a median elasticity of 3.42 using detailed data based on the Harmonized System and Corbo and Osbat (2013) using ISIC dataset report an average elasticity of 4 for Danish imports. The estimated elasticities in this paper range between -1.14 and -32.65 with overall mean -6.15 and median -4.45.

The next section briefly presents the theoretical model based on the workings of a Constant Elasticity of Substitution (CES) function. Section 3 presents Feenstra's (1994) Instrumental Variable (IV) procedure for estimating the Armington elasticity of substitution between varieties. Section 4 presents the dataset and the associated issues from using unit values as substitutes for price indices. Section 5 presents selected estimation results for the import-demand equations and a complete list of the estimated results is provided in the Appendix. Finally, section 6 concludes.

2. The model

The estimation strategy is based on Feenstra (1994). Feenstra uses the standard CES setting to derive demand equation for imports, the model implies the following import demand equation:[1]

$$x_{it}^k = \frac{1}{\beta_{it}^k}\left(\frac{P_{it}^k}{\boldsymbol{P}_t^k}\right)^{-\sigma^k} x_t^k, \quad (1)$$

Where x_{it}^k is the variety *i* of good *k* consumed at time *t*, as in Armington (1969) a variety $i = 1, \dots, N$ is distinguished by supplying country, i.e., there are as many varieties of *k* as there are trading partners. x_t^k is the total consumption of good *k* at time *t*, P_{it}^k is the price of x_{it}^k and P_t^k is the aggregate price for x_t^k. σ^k is the Armington elasticity of substitution assumed to be greater than unity and constant over all varieties.

Feenstra writes (1) in terms of expenditure shares, which helps to reduce measurement errors that arise from using unit values as substitutes for import prices (Kemp, 1962). Let $s_{it}^k \equiv \frac{P_{it}^k x_{it}^k}{\sum_i P_{it}^k x_{it}^k}$ denote the market share of country *i* in expenditures on good *k,* the demand equation can be written in terms of expenditure shares as:

$$\Delta lns_{it}^k = \emptyset_t^k + (1 - \sigma^k)\Delta lnP_{it}^k + \varepsilon_{it}^k \quad (2)$$

The intercept $\emptyset_t^k$ is time-varying and contains the variables that are common to all varieties. ε_{it}^k is the error term combining preference shocks and trade costs.

In order to estimate σ^k consistently, the error terms ε_{it}^k must be uncorrelated with the expenditure shares and prices. However, due to the simultaneous determination of import prices and quantities, it is likely that the error term can be correlated with Δlns_{it}^k and ΔlnP_{it}^k. To account for the simultaneity bias, Feenstra proposes using a supply function together with the demand function. The supply curve is specified as:

$$P_{it}^k = \exp(v_{it}^k)(x_{it}^k)^{\frac{\omega^k}{1-\omega^k}} \quad (3)$$

Where $\omega^k \geq 0$ is the inverse supply elasticity in sector *k*, assumed to be equal across all countries. v_{it}^k is the technology shock independently and identically distributed across countries and assumed to be independent of ε_{it}^k. Like the demand equation, the supply equation can also be re-written in terms of expenditure shares as:

$$\Delta lnP_{it}^k = \varphi_t^k + \omega^k \Delta lns_{it}^k + u_{it}^k \quad (4)$$

[1]The derivation of a demand function based on a CES utility function is well-known, see Feenstra (1994) and Broda and Weinstein (2004) for a detailed exposition.

Where φ_t^k is a time-varying intercept common across countries and $u_{it}^k \equiv \Delta v_{it}^k(1-\omega^k)$ is an error term that depends on supply shocks. Equation (2) and (4) can be consistently estimated by exploiting the panel structure of the data without a need for external variables. The technique is based on Leamer's (1981) time series estimation of a system of demand and supply equations without instruments. The CES structure implies that the substitution elasticity for a given good *k* is constant across importing countries, and if the supply elasticity is constant across supplying countries, a hyperbola of elasticity estimates can be obtained by using time series data for each country. By combining the elasticity estimates over all countries, multiple hyperbolas are obtained whose intersection defines the demand and supply elasticities.

3. Estimation technique

For estimation it is convenient to eliminate the time-varying random terms $\emptyset_t^k$ and φ_t^k from the demand and supply equations, we choose a reference country *r* and take differences in demand and supply relative to the reference country, to arrive at:

$$Y_{it}^k = \theta_1^k X_{1it}^k + \theta_2^k X_{2it}^k + e_{it}^k \qquad (5)$$

Where $Y_{it}^k = (\Delta lnP_{it}^k - \Delta lnP_{rt}^k)^2$, $X_{1it}^k = (\Delta lns_{it}^k - \Delta lns_{rt}^k)^2$, $X_{2it}^k = (\Delta lnP_{it}^k - \Delta lnP_{rt}^k)(\Delta lns_{it}^k - \Delta lns_{rt}^k)$, and $e_{it}^k = -(\varepsilon_{it}^k - \varepsilon_{rt}^k)(u_{it}^k - u_{rt}^k)/(1-\sigma^k)$

Endogeneity is an issue in equation (5), since the demand shocks ε_{it}^k and the technological shocks u_{it}^k are correlated with prices and expenditure shares, the shocks embedded in e_{it}^k are correlated with X_{1it}^k and X_{2it}^k.

Feenstra (1994) uses an instrumental-variable (IV) estimator where the instruments are dummy variables across the countries $i \neq r$.[2] Let $T_i^k \leq T^k$ be the total number of time periods country-*i* supplies good-*k*, then the total number of observations for good-*k* is $L^k \equiv \sum_{i \neq r}(T_i^k - 1)$, we subtract 1 so that the first differences in (5) can be calculated. We can now stack (5) over time and supplying countries and write:

$$Y^k = \theta^k X^k + e^k \qquad (5^*)$$

[2]Equivalently Weighted Least Square (WLS) can be used to obtain consistent estimates, cf Feenstra (1994). Provided ε_{it}^k and u_{it}^k are uncorrelated across countries, the time average of e_{it}^k is zero. The time averages of X_{1it}^k and X_{2it}^k, denoted $\bar{X}_{1i}^k$ and $\bar{X}_{2i}^k$, can be used as instruments to derive a consistent estimator. Since $cov_{it}(\bar{X}_{1i}^k, e_{it}^k) = cov_{it}(\bar{X}_{2i}^k, e_{it}^k) = 0$, the endogeneity issue is remedied, and identification is effectively obtained across countries. Take the time averages of the variables in (5) and write:

$$\bar{Y}_i^k = \theta_1^k \bar{X}_{1i}^k + \theta_2^k \bar{X}_{2i}^k + \bar{e}_i^k \qquad (5')$$

We can run weighted least square (WLS) on (5') and derive consistent estimates for θ_1^k and θ_2^k.

Where $Y^k$is an $Lx1$ vector with components Y_{it}^k, X^k is an $Lx2$ matrix with components (X_{1it}^k, X_{2it}^k), and e^k is $Lx1$ vector with components e_{it}^k. Let Z^k denote the instrument matrix for X^k. It contains dummy variables for each variety $i \neq r$, and takes the form:

$$Z^k \dots \begin{bmatrix} l_1^k & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & l_{N-1}^k \end{bmatrix}$$

Where l_i^k denote a $T_i^k x1$ vector of 1's for $i = 1, \dots, N-1, i \neq r$. Then the usual IV estimator will provide consistent estimates of θ^k. To obtain efficient estimates, we use a weighted IV estimator. That is the observations in (5*) are weighted by the variances of the residuals obtained from (5) using the first stage $\hat{\theta}$ estimates. Finally, we include a constant term in (5*) to control for measurement errors arising from the use of unit values as price indices.

Once a consistent and efficient θ_1^k and θ_2^k are estimated, the demand and supply price elasticities can be obtained by solving the quadratic equations:

$$\theta_1^k \equiv \frac{\omega^k}{1-\sigma^k} \text{ and } \theta_2^k \equiv \omega^k + \frac{1}{1-\sigma^k} \qquad (6)$$

If $\theta_1^k > 1$, irrespective of θ_2^k there will be two solutions to the demand elasticity, one that is greater than one and another less than one, we focus on the case $\sigma^k > 1$. If, however, θ_1^k is negative, we cannot get theory-consistent values for demand and supply elasticities in the range $\sigma^k > 1$ and $0 \leq \omega^k < 1$. Feenstra (1994) discards these sectors. We follow Broda and Weinstein (2006) and perform a grid search over the range of possible values, see also Imbs and Mejean (2015) for application. We conduct a grid search over the values of σ^k and ω^k in the range $\sigma^k > 1$ and $0 \leq \omega^k < 1$ looking for the minimum sum of squared Weighted Least Square residuals. We evaluate the weighted sum for values $\sigma^k \in (1, 80]$ with 5 percent increment and values $\omega^k \in (0.01, 0.99)$ with 0.01 increment. The resulting combination of σ^k and ω^k that minimizes the weighted sum of residuals is the optimal solution.

4. The data

The data is obtained from OECD's International Trade by Commodity Statistics database (ITCS). The database provides detailed annual data classified by SITC for 1989 to 2014. Imports and exports both in value and quantity are reported for Danish trade with approximately 230 partners. Trade values are reported in current USD and quantities are reported in various units of measurement such as area in square meters, electrical energy in thousands of kilowatt-hours, etc.

The calculation of unit values that are used as a proxy for prices is made difficult at least for two reasons: first, there is no simple way of converting different units of measurement into a single measure, and second, missing values and outliers are common at the highest level of disaggregation. The

proposed estimation technique (see above) uses growth rates of unit values, which has the advantage that, if a unit value changes level due to a change in the unit of measurement, the year-on-year growth rate in the unit value is only affected in the year(s) where the unit of measurement changes. Thus estimation is still possible if the year(s) with changes in the unit of measurement are excluded.

The Hidiroglou-Berthelot (1989) method is used for outlier detection and deletion in the unit values. We define an outlier as a unit value growth rate with a so-called suspicion value above the permitted threshold. First, suspicion values are calculated for growth rates outside the first and third quartile. The suspicion value is the distance of a given growth rate from the nearest quartile relative to the interquartile distance. Then, growth rates with a suspicion value above a threshold of 1.5 are replaced by zero.[3]

The use of disaggregated data presents additional problems. The identification strategy requires the availability of a reasonable number of trading partners supplying Danish imports consistently for a reasonable number of periods. However, the continued rise and fall of trading partners makes it difficult to calculate a time series of bilateral unit values at the most detailed level. Alternatively, we can choose to work with a higher aggregation level, but then we will be introducing heterogeneity bias. To avoid this bias, we use data at the most disaggregated level and impose a minimum of 15 countries supplying imports for at least half of the sample periods. Imbs and Mejean (2015) used a minimum of 20 trading partners for estimating demand equation for US imports, but needless to say US has more trading partners than Denmark. In addition, we also impose a restriction on the expenditure shares, i.e. the trading partner in question should at least supply 0.1 percent of the total Danish imports for that particular commodity. To construct the variables in equation (5) we also need to choose a reference country which is used to eliminate terms common to all varieties. We have used Germany for reference country as it supplies imports for most commodities in the sample periods considered.

The OECD's ITCS database contains 3131 groups at the most disaggregated SITC (revision 3) level, using our criterion we are able to estimate sectoral elasticities for 127 commodities.

5. Results

We present here commodity level elasticity of substitution estimates for imports using the method in Feenstra (1994). Table 1 presents elasticity estimates for food and live animals (SITC-0), beverages and tobacco (SITC-1) and raw materials (SITC-2). For SITC-0, the estimates range between -2.27 and -19.02, with mean -7.5 and median -5.26. There are only a handful of commodities in SITC-1 and SITC-2 and calculation of quartiles might be inappropriate.

[3] The choice of 1.5 is ad-hoc, Temere (2016) uses different suspicion values and shows that the result is not that sensetive.

Table 1. Elasticity of substitution estimates (1-σ^k) for SITC-0, SITC-1 and SITC-2

SITC-code	Elasticity of substitution	Standard error	Commodity descritpion
			SITC-0: food and live animal
09899	2,277	0,388	Other food preparations
02499	2,714	0,381	Other cheese
05671	4,051	1,231	Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid
04842	4,494	1,200	Sweet biscuits, waffles and wafers, gingerbread and the like
08195	5,019	1,534	Dog or cat food, put up for retail sale
04849	5,263	2,097	Other
03721	6,554	1,012	Crustaceans, prepared or preserved, n.e.s.
07111	7,755	1,192	Coffee, not roasted, not decaffeinated
09849	10,403	4,700	Other sauces and preparations therefor; mixed condiments and mixed seasonings
0344	14,956	7,001	Fish fillets, frozen
06229	19,021	7,188	Other
			SITC-1: beverages and tobaco
11249	1,76	0,049	Spirits and distilled alcoholic beverages, n.e.s.
11217	1,813	0,295	Wine of fresh grapes (other than sparkling wine); grape must with fermentation prevented or arrested by the addition of alcohol
			SITC-2: raw materials
2482	1,972	0,404	Wood of coniferous species, sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or finger-jointed, of a thickness exceeding 6 mm
29254	3,570	0,104	Other vegetable seeds
29269	4,294	0,987	Other live plants (including their roots), cuttings and slips; mushroom spawn
2485	6,941	2,152	Wood of non-coniferous species (including strips and friezes for parquet flooring, not assembled), continuously shaped (tongued, grooved, rebated, chamfered, V-jointed, beaded, moulded, rounded or the like) along any of its edges or faces, whether or not
29296	7,369	1,724	Mucilages and thickeners, whether or not modified, derived from vegetable products
2484	9,128	2,342	Wood of non-coniferous species, sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or finger-jointed, of a thickness exceeding 6 mm
29193	29	0,0	Guts, bladders and stomachs of animals (other than fish), whole and pieces thereof

Figure 1 presents the elasticity estimates for SITC-5 and similar figures for SITC-6, SITC-7 and SITC-8 are reported in the appendix. In general, the figures show a positive correlation between the numerical value of the elasticities and their standard errors, but there are also sectors with high elasticity and low standard error.

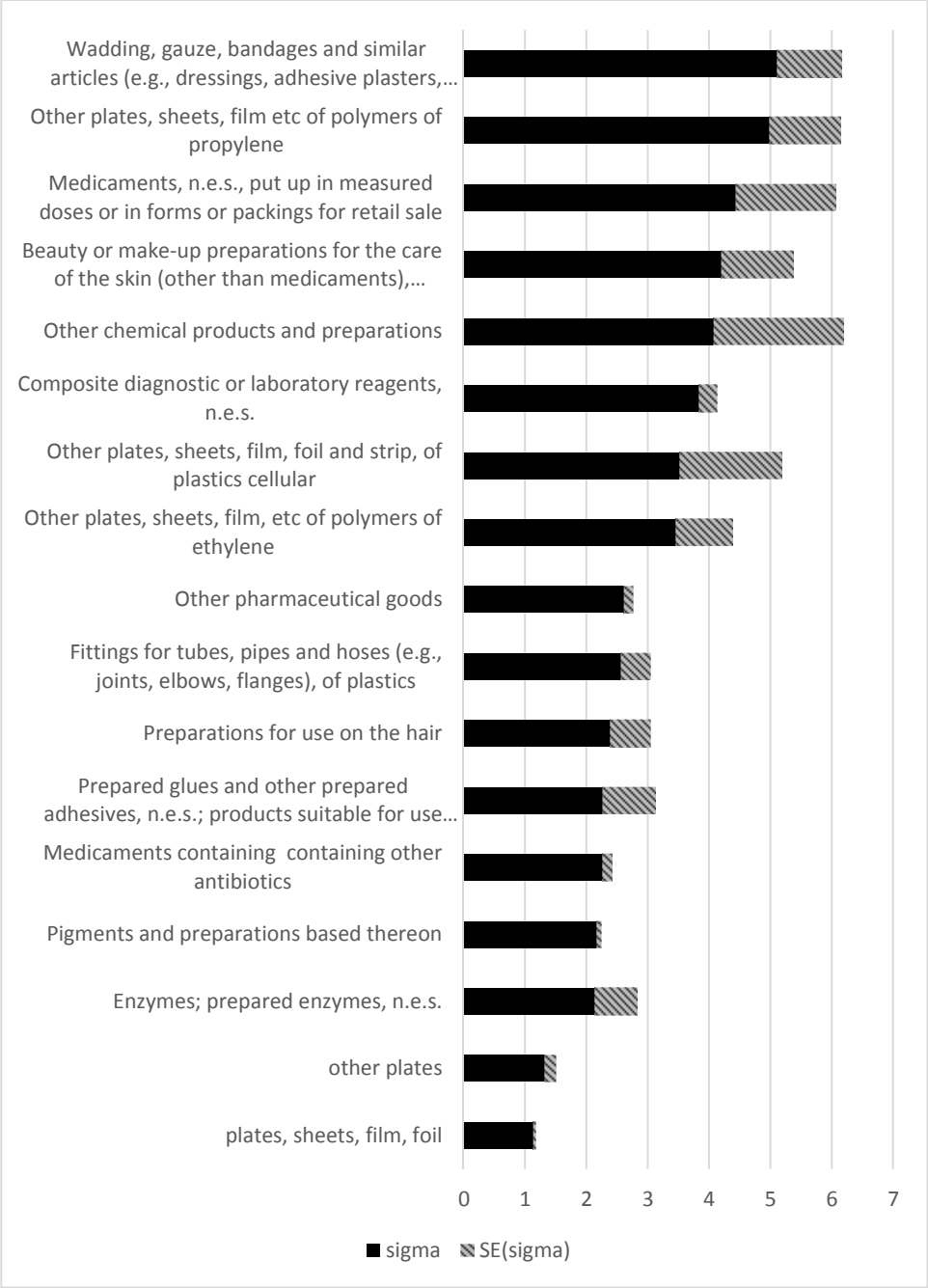

Figure 1. Elasticity of substitution estimates (1-σ^k), chemicals and related products (SITC-5)

Table 2 provides summary statistics for the estimated elasticities. For each group, the summary statistic is calculated with and without the sectors with $\theta_1^k < 0$, i.e. we check the sensitivity of the averages to the grid search technique proposed by Broda and Weinstein (2006). Including the sectors with a negative θ_1^k coefficient does not significantly affect the estimated average elasticities.

The micro level estimates in this paper are not significantly different from similar estimates in the literature. Feenstra (1994) estimates substitution

elasticities for eight goods that are in the range -2.29 and -42.9. Corbo and Osbat (2013) using the ISIC-classification report an average elasticity of -4 for Danish imports, which is close to the overall median of -4.45 in this paper. Broda and Weinstein (2006) using the same methodology for US imports by SITC report a mean of -4.9 and a median of -2.0. The -4.9 is within the range of mean estimates reported in table 2 below, but their median estimate is significantly lower than ours. Imbs and Mejean (2015) report a mean of -5.4 and a median of -3.9 using 56 ISIC sectors for US imports, which is close to our estimates.

Table 2. Summary statistic (no weights)

	Grid search	Mean	1st Quart.	Median	3rd. Quart	Min	Max	No. goods
SITC-0	yes	7,501	4,272	5,263	9,079	2,277	19,021	11
	no	*7,501*	*4,272*	*5,263*	*9,079*	*2,277*	*19,021*	*11*
SITC-1	yes	1,787						2
	no	*1,813*						*1*
SITC-2	yes	8,896		6,941				7
	no	*5,941*		*6,941*				*5*
SITC-5	yes	3,087	2,260	2,610	4,070	1,140	5,118	17
	no	*3,372*	*2,358*	*3,493*	*4,259*	*1,318*	*5,118*	*12*
SITC-6	yes	5,081	2,442	3,963	5,990	1,227	18,513	31
	no	*5,159*	*2,442*	*3,963*	*5,688*	*1,227*	*18,513*	*27*
SITC-7	yes	7,763	2,768	4,018	9,882	1,306	32,647	23
	no	*6,876*	*2,329*	*3,564*	*7,934*	*1,306*	*32,647*	*19*
SITC-8	yes	6,796	4,063	6,639	7,841	1,150	20,490	36
	no	*6,258*	*3,786*	*5,970*	*7,616*	*2,098*	*17,739*	*28*

The ultimate purpose is to obtain aggregate elasticities implied by the micro estimates. A first approximation is to use the unweighted means and medians as provided in table 1. However, this approach can be easily refuted as it assumes the same elasticity for all sectors. An alternative is to make weighted averages using the expenditure shares of each good as weights. One can also argue that the elasticity estimates should be weighted by the inverse of their standard errors, i.e. a sector with low standard error should be proportionally assigned a higher weight. Table 3 presents weighted average elasticities.

Table 3. Summary statistic, weighted averages

	expenditure shares as weights		standard errors as weights	
	agg. elasticity	agg. elasticity[(a)]	agg. Elasticity	agg. elasticity[(a)]
SITC-0	7,465	6,363	4,446	5,819
SITC-1	1,808	-	1,768	-
SITC-2	5,075	-	[(b)]3,770	-
SITC-5	3,696	3,824	2,037	2,581
SITC-6	6,277	4,372	2,942	3,079
SITC-7	14,544	6,832	[(b)]3,919	4,313
SITC-8	6,581	6,039	4,151	5,797

[(a)]Aggregate elasticities excluding sectors with the lowest two and the highest two elasticities.
[(b)]In calculating the aggregate elasticities, it was necessary to exclude the SITC sectors 29193 and 77831 as they have very low standard errors and hence very high weights.

There is no systematic difference between the unweighted and weighted macro elasticities. For both SITC-6 and SITC-7 the expenditure-weighted average exceeds the unweighted average. The weighted aggregate elasticity of 14.5 for SITC-7 is quite large, and falls significantly to 6.83 if we exclude the sectors with the highest and lowest three elasticities. In fact, the aggregate elasticity is inflated due to the large elasticity estimated for motor vehicle imports that constitute about 30 percent of the expenditure on all SITC-7 sectors chosen for estimation.

The last two columns in table 2 present average elasticities weighted by the inverse of the standard errors. In contrast to the expenditure-weighted aggregates, it lifts the standard-error-weighted aggregates if we exclude the highest and lowest three elasticities. This is because most of the sectors with a high elasticity are also the ones with a high standard error and consequently a low weight. Yet another approach is to use a weight that is a composite of the expenditure share and the inverse standard error. Macro elasticities calculated in this way should lie between the two macro elasticities reported in table 3.

6. Bootstrapping

Bootstrapping techniques are used to assign measures of accuracy to sample estimates. Bootstrapping is useful when it is difficult to get different samples from a given population. A bootstrapping technique considers a sample as a population and draws a number of bootstrap samples with replacement that has the same size as the original sample. For each bootstrap sample, parameters of interest are calculated and afterwards measures of central tendency and dispersion can be calculated using the bootstrap estimates.

Here, bootstrapping is used to evaluate the original IV-elasticity estimates presented above. For each commodity k, we draw with replacement 10000 bootstrap samples of equal size to the original sample for equation (5), which is estimated 10000 times for each commodity k using the IV estimator described above. We keep only the bootstrap estimates for which $\theta_1^k > 0$, i.e. theory consistent values exist for the demand and supply elasticities. The median bootstrap estimate of the demand elasticity is calculated for each commodity and compared to the original IV-estimate, cf. figures 2 to 4 below. Each figure covers a group of commodities, and the estimated elasticities of each group are shown twice on different scales. With the largest scale, all estimates including outliers are visible, while the smaller scale is better for illustrating the typical difference between the original IV-estimate and the bootstrap median. The bootstrap medians are typically close to the original IV-estimates. For commodities where the two estimates differ, the bootstrap median should provide a better proxy to the unobserved true elasticity.

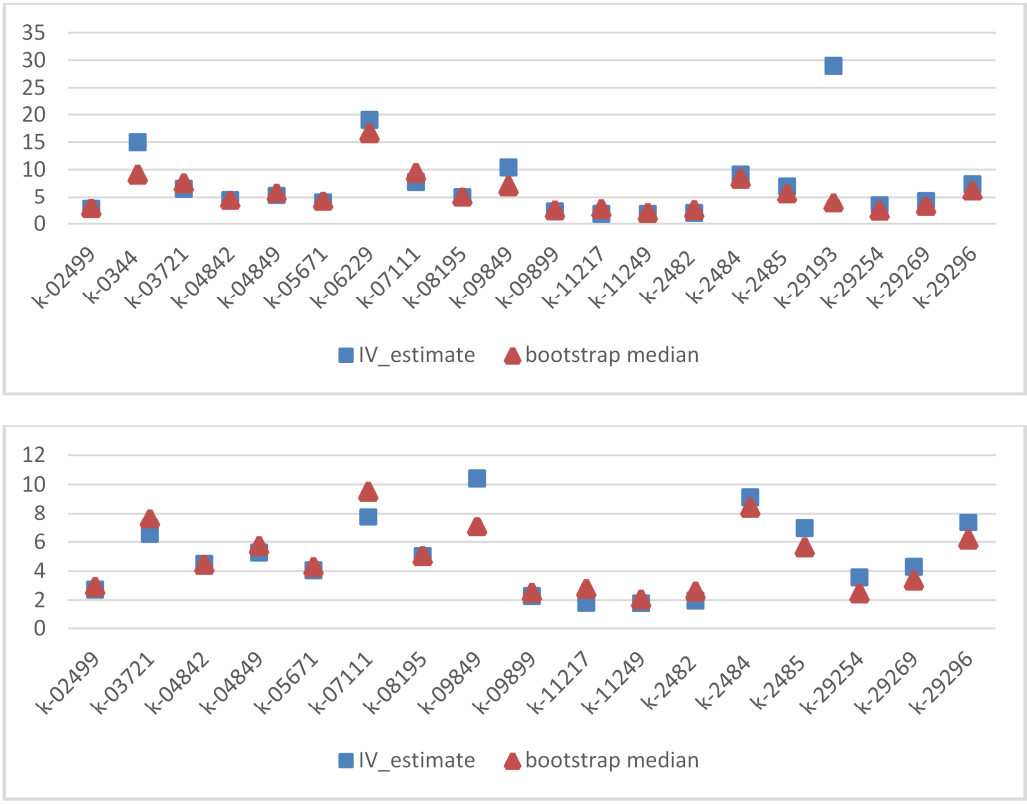

Figure 2. Elasticity of substitution estimates SITC-0,1&2 (upper panel: all estimates, lower: excluding commodities with high IV-estimates)

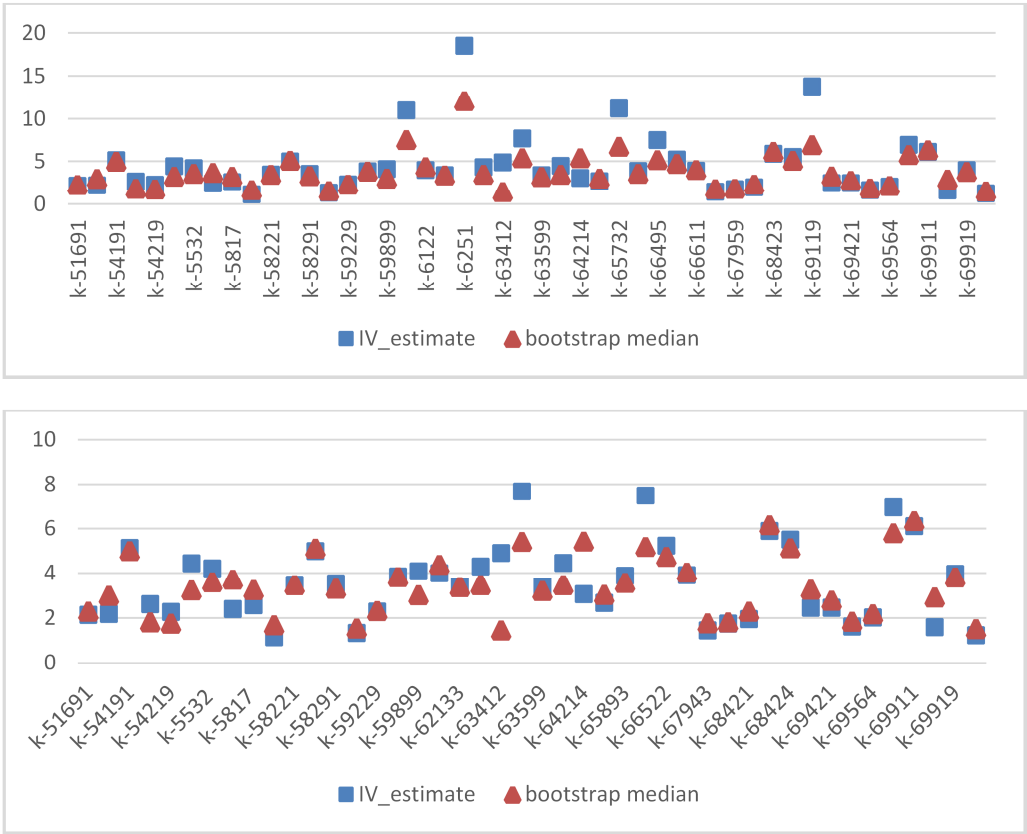

Figure 3. Elasticity of substitution estimates SITC-5&6 (upper panel: all estimates, lower: excluding commodities with high IV-estimates)

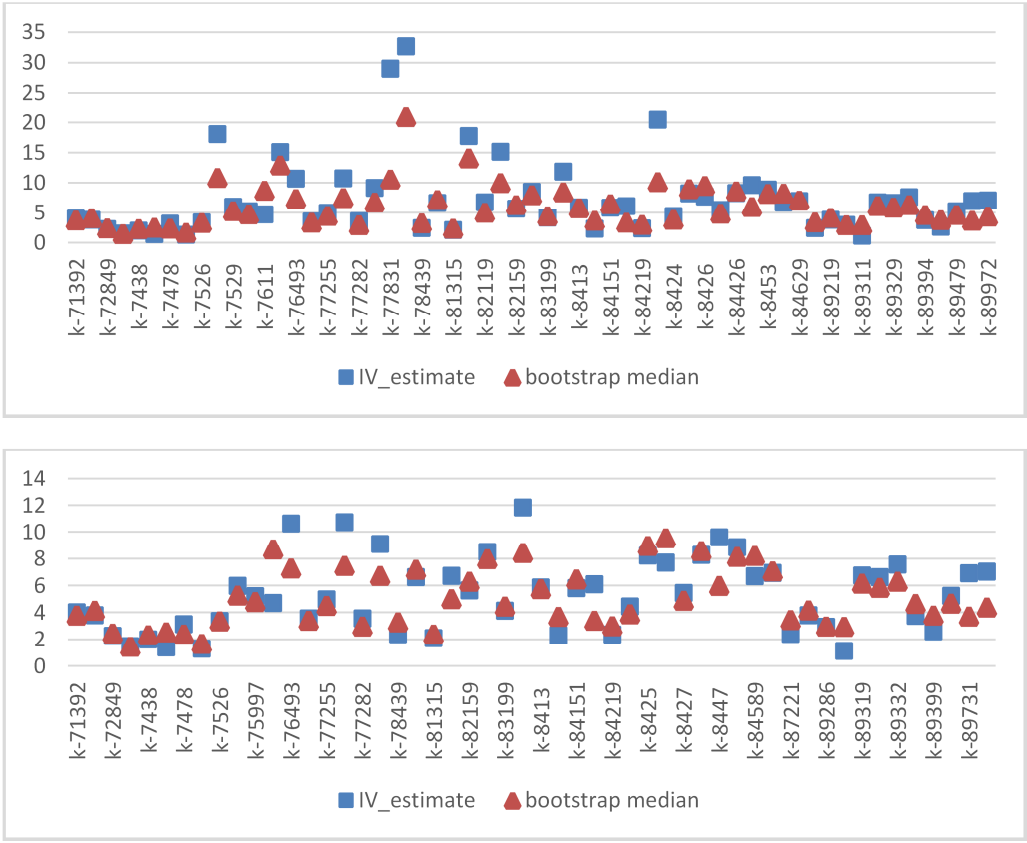

Figure 4. Elasticity of substitution estimates SITC-7&8 (upper panel: all estimates, lower: excluding commodities with high IV-estimates)

7. Conclusion

This paper has applied Feenstra's (1994) method for estimating elasticity of substitution for Danish imports at the most detailed level of SITC-aggregation. The detailed sector estimates have an overall mean of -6.15 and a median of -4.45, which is not significantly different from the -4, which Corbo and Osbat (2013) estimated for Danish imports using ISIC data. The sector estimates are also aggregated using expenditure shares and standard errors of the estimated coefficients as weights. These aggregates range between -3.82 and -6.83 using expenditure shares as weights and between -2.58 and -5.82 using standard errors as weights. Moreover, a bootstrapping procedure indicates that the original point elasticity estimates are close to the bootstrap average, with the exception of a handful of outliers. The bootstrapping procedure also describes the distribution of the elasticity estimates.

The results of the different weighting schemes and the bootstrap indicate that a median of -4.45 is a robust estimate of the order of magnitude for the micro elasticity in Danish imports. This elasticity describes the substitution between countries supplying the import. The elasticity in the import relation of ADAM is significantly smaller and describes the substitution between import and Danish production.

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Appendix

Figure A3. Elasticity of substitution estimates (1-σ^k) for manufactured goods classified chiefly by material (SITC-6)

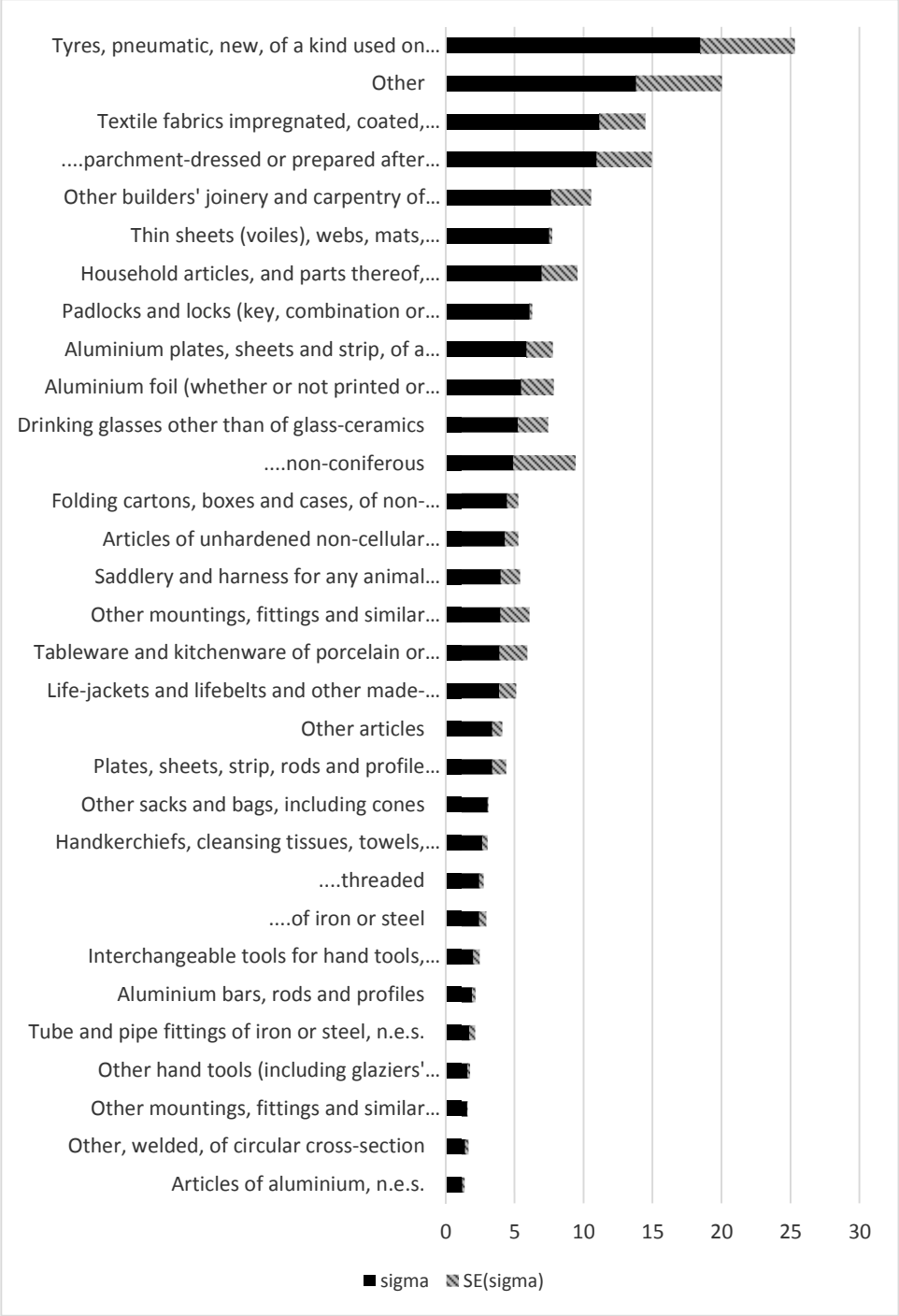

Figure A4. Elasticity of substitution estimates (1-σ^k) for machinery and transport equipment (SITC-7)

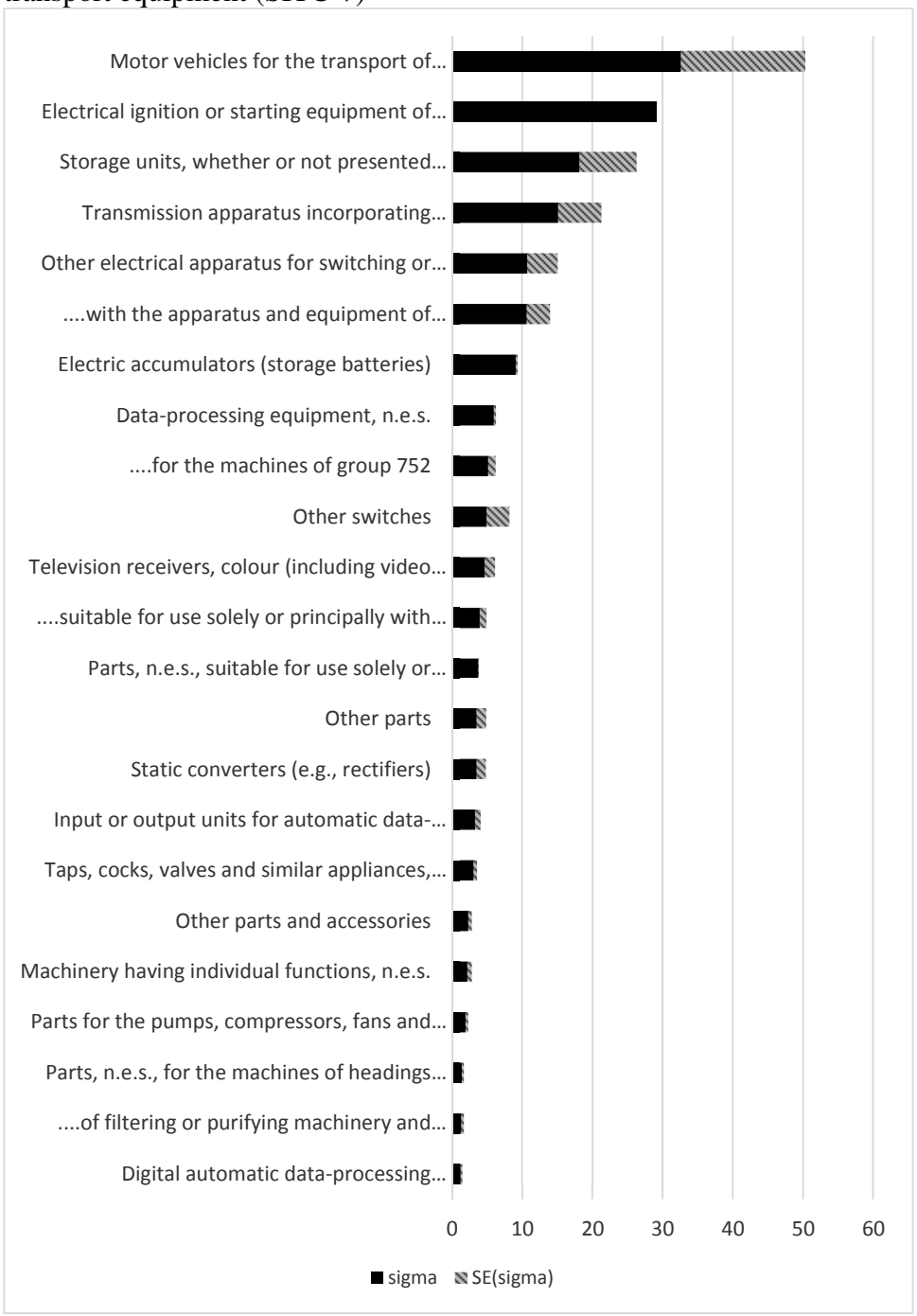

Figure A5. Elasticity of substitution estimates (1-σ^k) for miscellaneous manufactured articles (SITC-8)

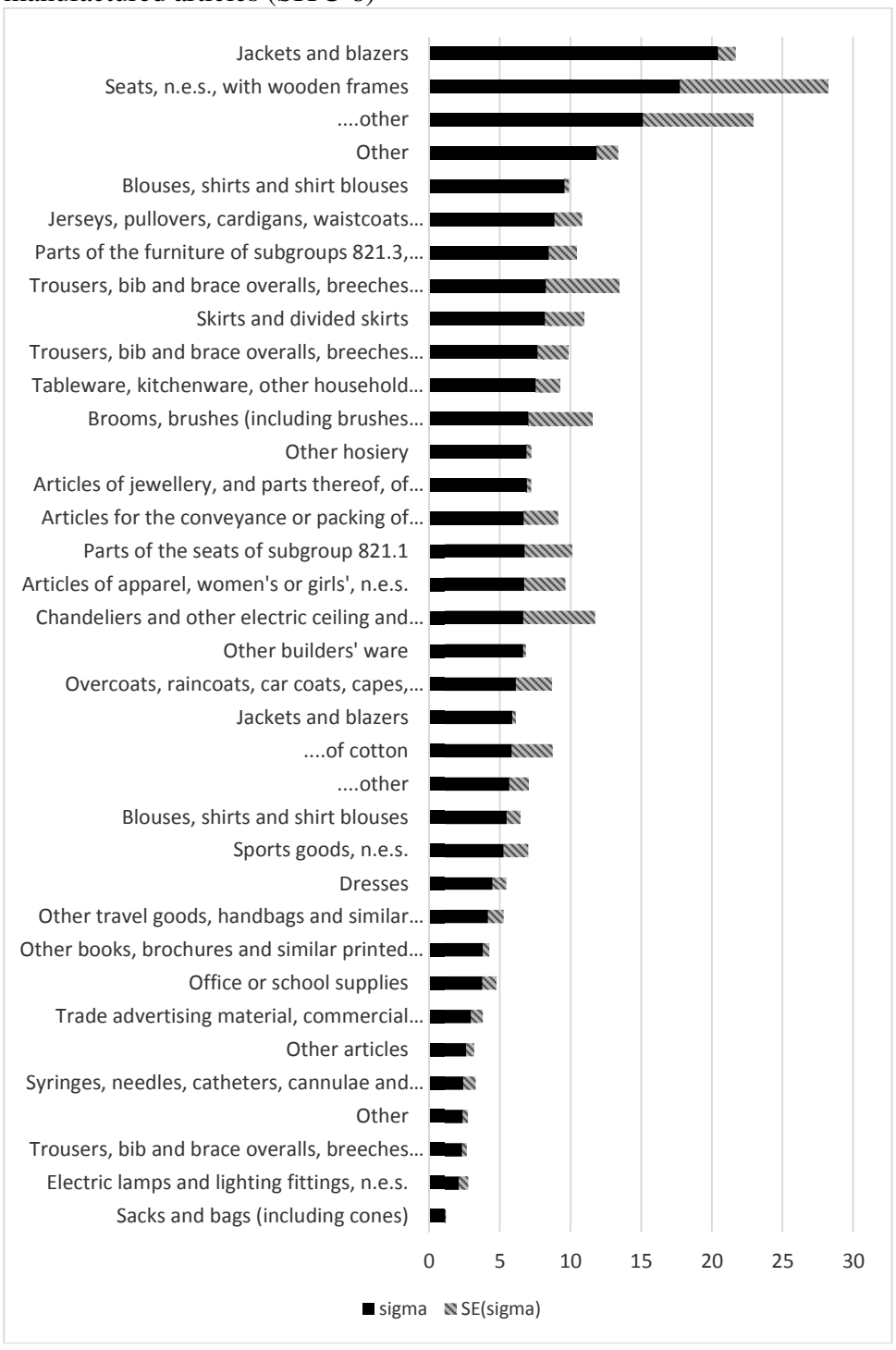

Table A1. The Armington elasticity of substitution

SITC-code	Elasticity of substitution	Standard error	Description
SITC-0: Food and live animal			
02499	2,714	0,381	Other cheese
0344	14,956	7,001	Fish fillets, frozen
03721	6,554	1,012	Crustaceans, prepared or preserved, n.e.s.
04842	4,494	1,200	Sweet biscuits, waffles and wafers, gingerbread and the like
04849	5,263	2,097	Other
05671	4,051	1,231	Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid
06229	19,021	7,188	Other
07111	7,755	1,192	Coffee, not roasted, not decaffeinated
08195	5,019	1,534	Dog or cat food, put up for retail sale
09849	10,403	4,700	Other sauces and preparations therefor; mixed condiments and mixed seasonings
09899	2,277	0,388	Other food preparations
SITC-1: Beverages and tobacco			
11217	1,813	0,295	Wine of fresh grapes (other than sparkling wine); grape must with fermentation prevented or arrested by the addition of alcohol
11249	1,760	0,049	Spirits and distilled alcoholic beverages, n.e.s.
SITC-2: Crude materials, inedible, except fuels			
2482	1,972	0,404	Wood of coniferous species, sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or finger-jointed, of a thickness exceeding 6 mm
2484	9,128	2,342	Wood of non-coniferous species, sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or finger-jointed, of a thickness exceeding 6 mm
2485	6,941	2,152	Wood of non-coniferous species (including strips and friezes for parquet flooring, not assembled), continuously shaped (tongued, grooved, rebated, chamfered, V-jointed, beaded, moulded, rounded or the like) along any of its edges or faces, whether or not
29193	29,000	0,000	Guts, bladders and stomachs of animals (other than fish), whole and pieces thereof
29254	3,570	0,104	Other vegetable seeds
29269	4,294	0,987	Other live plants (including their roots), cuttings and slips; mushroom spawn
29296	7,369	1,724	Mucilages and thickeners, whether or not modified, derived from vegetable products
SITC-5: Chemicals and related products			
51691	2,134	0,699	Enzymes; prepared enzymes, n.e.s.
53117	2,170	0,071	Pigments and preparations based thereon

54191	5,118	1,041	Wadding, gauze, bandages and similar articles (e.g., dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or put up in forms or packings for retail sale for medical, surgical, dental or veterinary purposes, n.e.s.
54199	2,610	0,143	Other pharmaceutical goods
54219	2,260	0,152	....containing other antibiotics, put up in measured doses or in forms or packings for retail sale
54293	4,436	1,627	Medicaments, n.e.s., put up in measured doses or in forms or packings for retail sale
5532	4,201	1,177	Beauty or make-up preparations for the care of the skin (other than medicaments), including sunscreen or suntan preparations; manicure or pedicure preparations
5533	2,387	0,658	Preparations for use on the hair
5817	2,564	0,481	Fittings for tubes, pipes and hoses (e.g., joints, elbows, flanges), of plastics
58211	1,140	0,038	....in rolls of a width not exceeding 20 cm
58221	3,462	0,919	....of polymers of ethylene
58222	4,977	1,161	....of polymers of propylene
58291	3,524	1,657	....cellular
58299	1,318	0,178	....other
59229	2,272	0,856	Prepared glues and other prepared adhesives, n.e.s.; products suitable for use as glues or adhesives, put up for retail sale as glues or adhesives, not exceeding a net weight of 1 kg
59869	3,840	0,292	Composite diagnostic or laboratory reagents, n.e.s.
59899	4,070	2,117	Other chemical products and preparations
SITC-6: Manufactured goods classified chiefly by material			
61142	10,969	3,931	....parchment-dressed or prepared after tanning
6122	3,983	1,406	Saddlery and harness for any animal (including traces, leads, knee-pads, muzzles, saddle-cloths, saddle-bags, dog coats and the like), of any material
62133	3,380	1,009	Plates, sheets, strip, rods and profile shapes, of unhardened vulcanized non-cellular rubber
6251	18,513	6,745	Tyres, pneumatic, new, of a kind used on motor cars (including station wagons and racing cars)
62999	4,296	0,978	Articles of unhardened non-cellular vulcanized rubber, n.e.s.
63412	4,888	4,494	....non-coniferous
63539	7,670	2,821	Other builders' joinery and carpentry of wood
63599	3,381	0,726	Other articles
64212	4,448	0,822	Folding cartons, boxes and cases, of non-corrugated paper or paperboard
64214	3,050	0,076	Other sacks and bags, including cones
64294	2,659	0,389	Handkerchiefs, cleansing tissues, towels, serviettes, tablecloths, bed sheets and other paper linen; paper garments and clothing accessories
65732	11,190	3,223	Textile fabrics impregnated, coated, covered or laminated with plastics, other than those of heading 657.93
65893	3,876	1,228	Life-jackets and lifebelts and other made-up articles, including dress patterns
66495	7,490	0,196	Thin sheets (voiles), webs, mats, mattresses, boards and similar non-woven products of glass
66522	5,219	2,186	Drinking glasses other than of glass-ceramics
66611	3,905	2,000	Tableware and kitchenware of porcelain or china
67943	1,438	0,256	Other, welded, of circular cross-section

67959	1,736	0,440	Tube and pipe fittings of iron or steel, n.e.s.
68421	1,937	0,249	Aluminium bars, rods and profiles
68423	5,881	1,842	Aluminium plates, sheets and strip, of a thickness exceeding 0.2 mm
68424	5,496	2,284	Aluminium foil (whether or not printed or backed with paper, paperboard, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0.2 mm
69119	13,798	6,194	Other
69311	2,440	0,537	....of iron or steel
69421	2,443	0,339	....threaded
69546	1,607	0,193	Other hand tools (including glaziers' diamonds); blowlamps
69564	2,009	0,483	Interchangeable tools for hand tools, whether or not power-operated, or for machine tools (e.g., for pressing, stamping, punching, tapping, threading, drilling, boring, broaching, milling, turning or screwdriving), including dies for drawing or extruding
69741	6,949	2,578	Household articles, and parts thereof, n.e.s., of iron or steel
69911	6,100	0,140	Padlocks and locks (key, combination or electrically operated), of base metal; clasps and frames with clasps, incorporating locks, of base metal; keys for any of the foregoing articles, of base metal
69916	1,580	0,038	Other mountings, fittings and similar articles suitable for buildings
69919	3,963	2,094	Other mountings, fittings and similar articles; base metal hat-racks, hat-pegs, brackets and similar fixtures; automatic door closers
69979	1,227	0,180	Articles of aluminium, n.e.s.
SITC-7: Machinary and transport equipment			
71392	4,018	0,975	....suitable for use solely or principally with compression-ignition internal combustion piston engines
7169	3,800	0,095	Parts, n.e.s., suitable for use solely or principally with the machines falling within group 716
72849	2,263	0,656	Machinery having individual functions, n.e.s.
72855	1,497	0,292	Parts, n.e.s., for the machines of headings 723.48, 727.21, 728.44, 728.46 and 728.49
7438	2,003	0,403	Parts for the pumps, compressors, fans and hoods of subgroups 743.1 and 743.4
74395	1,400	0,384	....of filtering or purifying machinery and apparatus
7478	3,142	0,483	Taps, cocks, valves and similar appliances, n.e.s.
7522	1,306	0,285	Digital automatic data-processing machines, containing in the same housing at least a central processing unit and an input and output unit, whether or not combined
7526	3,365	0,784	Input or output units for automatic data-processing machines, whether or not presented with the rest of a system and whether or not containing storage units in the same housing
7527	18,086	8,096	Storage units, whether or not presented with the rest of a system
7529	6,000	0,300	Data-processing equipment, n.e.s.
75997	5,215	1,044	....for the machines of group 752
7611	4,715	1,488	Television receivers, colour (including video monitors and video projectors), whether or not incorporating radio-broadcast receivers or sound- or video-recording or reproducing apparatus
76432	15,088	6,101	Transmission apparatus incorporating reception apparatus

76493	10,654	3,324	....with the apparatus and equipment of groups 761 and 762 and subgroups 764.3 and 764.8
77121	3,555	1,349	Static converters (e.g., rectifiers)
77255	4,987	3,234	Other switches
77259	10,741	4,281	Other electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits
77282	3,564	1,362	Other parts
77812	9,110	0,254	Electric accumulators (storage batteries)
77831	29,000	0,000	Electrical ignition or starting equipment of a kind used for spark- ignition or compression-ignition internal combustion engines (e.g., ignition magnetos, magnetodynamos, ignition coils, sparking-plugs and glow plugs, starter motors); generators (e.g., dy
7812	32,647	17,548	Motor vehicles for the transport of persons, n.e.s.
78439	2,395	0,506	Other parts and accessories
SITC-8: Miscellaneous manufactured articles			
81311	6,648	5,061	Chandeliers and other electric ceiling and wall lighting fittings (excluding those of a kind used for lighting public open spaces or thoroughfares)
81315	2,098	0,658	Electric lamps and lighting fittings, n.e.s.
82116	17,739	10,453	Seats, n.e.s., with wooden frames
82119	6,736	3,352	Parts of the seats of subgroup 821.1
82139	15,122	7,799	....other
82159	5,661	1,368	....other
8218	8,512	1,893	Parts of the furniture of subgroups 821.3, 821.5 and 821.7
83199	4,151	1,101	Other travel goods, handbags and similar containers
84119	11,850	1,494	Other
8413	5,860	0,261	Jackets and blazers
8414	2,329	0,325	Trousers, bib and brace overalls, breeches and shorts
84151	5,823	2,879	....of cotton
84211	6,116	2,547	Overcoats, raincoats, car coats, capes, cloaks and similar articles
84219	2,372	0,382	Other
8423	20,490	1,187	Jackets and blazers
8424	4,460	0,976	Dresses
8425	8,237	2,731	Skirts and divided skirts
8426	7,709	2,109	Trousers, bib and brace overalls, breeches and shorts
8427	5,473	0,979	Blouses, shirts and shirt blouses
84426	8,302	5,090	Trousers, bib and brace overalls, breeches and shorts
8447	9,610	0,241	Blouses, shirts and shirt blouses
8453	8,873	1,931	Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted
84589	6,703	2,911	Articles of apparel, women's or girls', n.e.s.
84629	6,940	0,288	Other hosiery
87221	2,408	0,883	Syringes, needles, catheters, cannulae and the like
89219	3,800	0,456	Other books, brochures and similar printed matter, not in single sheets
89286	2,950	0,845	Trade advertising material, commercial catalogues and the like
89311	1,150	0,036	Sacks and bags (including cones)
89319	6,747	2,368	Articles for the conveyance or packing of goods, n.e.s.; stoppers, lids, caps and other closures

89329	6,630	0,192	Other builders' ware
89332	7,584	1,667	Tableware, kitchenware, other household articles and toilet articles
89394	3,747	1,008	Office or school supplies
89399	2,615	0,568	Other articles
89479	5,247	1,741	Sports goods, n.e.s.
89731	6,930	0,233	Articles of jewellery, and parts thereof, of precious metal or of metal clad with precious metal (except watches and watch-cases)
89972	7,050	4,485	Brooms, brushes (including brushes constituting parts of machines, appliances or vehicles), hand-operated mechanical floor sweepers, not motorized, mops and feather dusters; prepared knots and tufts for broom or brush making; paint pads and rollers; squee