International Conference on Business and Economics - Hellenic Open University

Vol 3, No 1 (2023)

Proceedings of the ICBE-HOU 2023

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Abstract

The EU Commission recently convinced the Court of Justice of the EU to reject a good number of transaction prices of Chinese imports to the UK, namely, of textiles and footwear items imported into the UK at the time the UK was an EU member, in favor of "fair" prices estimated via a statistical tool. Indeed, the UK was fined by the Court in 2022 and in early 2023paid the EU Commission close to 2.7 billion euro in lost customs duties. The paper looks into the tool's assumptions and mechanics and finds a number of deficiencies that ought to disqualify the particular tool from being used in the manner it was used in the trial against the UK.

JEL classifications: C20, F10, H87

Keywords: Import undervaluation, transaction value, statistical value, fair price estimation, customs duty losses

* The paper has benefited from suggestions made by an anonymous referee, and by comments made to an earlier version by participants in the International Conference on Business & Economics of the Hellenic Open University held in Athens (September 2023). The usual disclaimer applies.

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1. Introduction

The purpose of the paper is to review the statistical tool employed by the EU Commission in a recent court case against the United Kingdom of Great Britain and Northern Ireland (UK), namely, Case 213/19: *Commission v United Kingdom*, regarding (a) the values of a good number of Chinese textile and footwear items imported into the UK at a time the UK was an EU member, and (b) the associated EU customs duty (tariff) losses. According to the World Trade Organization (WTO) (1994), customs duties are routinely based on the transaction values of the imported items and, in cases where customs officers have reasons to doubt the truth or accuracy of the declared transaction value, the determination of the customs value (and, hence, of the associated duty) may be carried out in connection with some very specific steps (the tool or a variant of the tool discussed hereinafter is not one of them.) However, in 2022, the Court of Justice of the European Union accepted the use of statistical values and databases instead of transaction values, as a means to combat the undervaluation of goods imported in the European Union. In particular, the Court accepted the estimates of a statistical tool initially intended for risk-profiling purposes, as more appropriate than the transaction values of a respectable number of goods imported into the UK that were below a threshold calculated by the aforesaid tool.

The tool was developed by the EU's Joint Research Centre (Arsenis et al., 2015) for the identification of potentially undervalued goods, to help customs officers choose (prioritize) which shipment's items and values to check (before clearance) at the time the goods enter into the EU. Nevertheless, the Court treated the tool as something more than that, namely, as a means to price low-priced imports to avoid revenue losses; and based on the tool's assumptions and estimates, the withdrawing from the EU, UK was fined in 2022 and in 2023 paid to the EU Commission close to 2.7 billion euro for its past low-priced textiles and footwear imports from China. The Court decision marks a watershed in global trade and customs from a legal viewpoint (e.g., Schippers & de Wit, 2023). It also opens the way for the EU authorities to reject the transaction values of items imported in the other EU member states based on the tool's estimates, price a good number of imports higher than the declared transaction value, and claim additional amounts of customs duties (European Commission, 2023).

The economic implications across the EU are considerable: If the prices of imports are pushed by EU authorities upwards, then the consumer surplus across the EU will contract, and the inflow of cheap imports and competition will be disturbed. In addition, to the extent GDP = Consumption + Private investment + Government spending + Exports – Imports, if the prices of imports go up then the EU's GDP will go down. As the tool that was initially used for risk profiling purposes, and caused no harm, it was not scrutinized. If, however, the tool is going to be used in the manner described above, then it is imperative to take a first look at the way it works.

2. A brief description of tool

The tool estimates two things: (a) A *fair price*, **P**, for each good (i.e., for every 8-digit code good, say, for men's or boys' jackets and blazers) made in a particular country (e.g., China), imported anywhere in the EU for a period of 48 months. (b) A price, **Þ**, that corresponds to 50% of **P**. This **Þ** is called the *lowest acceptable price*and, as already mentioned, was initially intended to help customs officers choose (prioritize) which shipment's value to check at the time of its entry into the EU. Yet, following the Court's ruling, it has become more than that, as the Court:

- applied the **P** on all Chinese textile and footwear items imported into the UK with a price lower than the **Þ**); and
- based on the difference between **P** and the transaction-based import price, calculated the UK's customs duty losses owed to the EU, over several years.

However, the mechanics of the tool are intriguing. They are presented next.

Using monthly data taken from a database that is managed by Eurostat (called, COMEXT), which contains detailed statistics on international trade, the EU authorities:

Step 1. Run bivariate regressions that explain the aggregate monthly import values, **V**, of individual goods produced in a particular country, in terms of their respective quantities, **Q**, for each distinct EU member state, i, over 48 months:

$$\mathbf{V_i} = p^*\mathbf{Q_i} + e_i. \quad (1)$$

Step 2. Exclude observations associated with unusually high or low values (outliers).E.g., the three red observations provided in Figure 1.

Step 3. Re-run the regressions to estimate a multiyear price, $\hat{p}_i$, the so-called *cleaned average price* per kg of each good made in a particular non-EU country that is imported in a distinct EU member state, i.

Step 4. Select the $\hat{p}_i$s of the member states associated with a high or modest model fitness, R^2,and use them (only them) to calculate an arithmetic (non-weighted) average price, the so-called *fair price*, **P**, for the entire EU.

3. Sources of concern

Both the tool's assumptions, and the way the tool treats statistical values, raise a number of questions.

I. What if the Chinese imports were/are overvalued? It is possible that some or several Chinese producers overvalued or overvalue their productsin order to get larger export subsidies(e.g., Bartz, 2016). Export subsidies are, generally, practiced in China. The international literature recommends a number of tests/analyses to assess the level and origin of misevaluation (e.g., Finger et al. (1982),

Mehrotra & Gilles (2021), Ahene-Codjoe et al., (2022). These were not considered or carried out in the case under consideration.

II. In Step 1 and the other Steps, the tool runs monthly data, i.e., time-series observations, without any consideration of time trend, seasonal, cyclical aspects or of stationarity tests (see expression (1)), as if they are cross-sectional. The implications are crucial. For instance, if expression (1) were casted in terms of first differences (Δ) it would yield different results.

III. According to the tool's manual, regressions may run with just four observations, as per the first entry in the example provided by the tool's developers. (See Table 1,column 6, row 1.) This is scientifically objectionable.

Figure 1: Rendition of figure 1 in Arsenis et al. (2015)

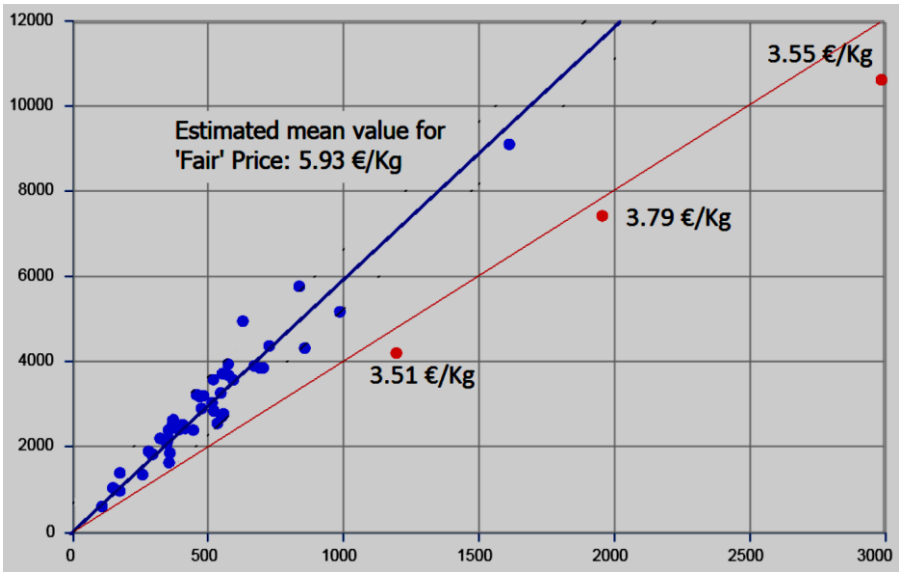


Table 1: The top part of the example provide in the tool's manual, in Figure 6 of in Arsenis et al. (2015)

All imports into the EU in December 2007-November 2010, all chapters, extracted in February 2011 (Fourteenth COMEXT downlo

Downloads (DLs)

Drag here column header for sorting: ▲ Estimated fair price

Product	Origin	Destination	Estimated fair price	Estimated fair price interval	Number of observations	Goodness of fit	Outliers detected
03062210	PH	DE	5.70	(4.66 ; 6.74)	4	0.98	0
03062210	CA	ES	7.14	(6.83 ; 7.45)	36	0.98	0
03062210	CA	GB	8.73	(8.37 ; 9.08)	32	0.98	4
03062210	ID	NL	9.27	(7.06 ; 11.47)	35	0.60	0
03062210	CA	IE	9.34	(8.71 ; 9.97)	17	0.99	1

IV. The bivariate approach employed is conditioned to yield straight lines. However, there is no good reason for the aggregate monthly **Q** and **V** combinations of non-hypothetical, actual, goods that reflect the diverse factors that enter people's supply and demand, to be placed along (or form) a straight line.

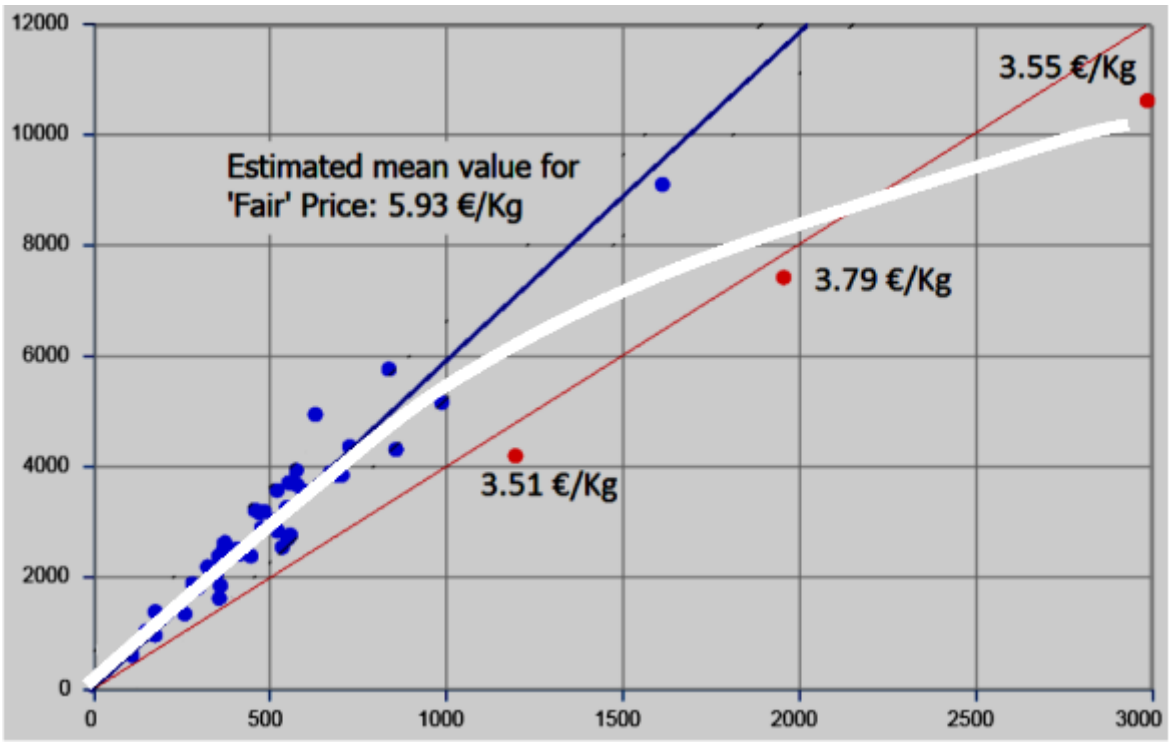
For instance, the **V-Q** relationship may very well be curved if discounts and economies of scale kick in as quantities increase (e.g., Oren et al. 1983; Dolan, 1987). Econometrically, this may be probed/tested by adding $\mathbf{Q^2}$as an explanatory variable. (See the examples supplied in Table 2, in which the tool's specification is supplemented with regressors such as $\mathbf{Q^2}$, time and its square ($\mathbf{t}$, $\mathbf{t^2}$), and seasonal dummies. In all cases the coefficients of $\mathbf{Q^2}$ and one or more time-related coefficients turn out to be statistically significant.) Additional explanatory variables are available or ought to be considered: the mode of shipment (e.g., by sea, air), terms of trade (e.g., CFR, CIF, FOB), brand andquality, differencesin the demand functions and market structuresacross the EU, etc.The omission of such factors from the econometric analysis violates a most basic regression assumption and probably yields a biased and inconsistent *fair price* result (e.g., Hastie et al., 2001; Gujarati & Porter, 2009). The inclusion of additional such factors (explanatory variables or regressors) would require a larger (a so-called, multivariate) kind of expression compared to expression (1). More importantly, a schedule that takes $\mathbf{Q^2}$ into account will probably come closer to the presumed outliers, and the latter no longer look like outliers. See the white-colored schedule in Figure 2.

V. Regarding the exclusion (the removal) of high or low-value observations or sets of observations: The deletion of observations from a dataset is controversial. To the extent observations (including outliers) stand for natural variations in the population, and do not arise due to data entry errors, data processing errors, measurement errors or poor data sampling, they should be left as they are in the dataset and not be removed. (E.g., Dodge, 2008; Wohlin et al., 2012; Borah et al., 2022). The three red-colored observations in Figure 1 correspond to relatively large quantities, so the presence of lower prices may be perfectly reasonable in the usual transaction of business. In this case, their exclusion makes the price (slope) steeper, thus contributing to a wrongly overestimated **P.** The same criticism applies to the removal of full sets of observations (country observations) in Step 4 on the grounds that they seem unfit in the (rather naïve) bivariate regression setting that the tool employs.

VI. In Step 4, the tool's developers turn to the R^2 statistic, which is not well defined in regressions without a constant term, like expression (1) (see Barten, 1987), and, hence, should not be used as a criterion. Indeed, most economistswould argue that the statistic that tells us whether a slope estimate is reliable or not is not the R^2statistic or the adjusted R^2, but the *p-value.*

VII. In Step 4, calculating the so-called *fair price*, **P**, as an unweighted average of $\hat{p}_i$s -as opposed to a weighted average in terms of **Q**- further removes the so-called*fair price* from cases associated with bulk purchasing -a practice widely used and accepted as fair in commerce- thus contributing to a wrongly overestimated, *unfair*, **P.**

Figure 2: A rendition of figure 1 in Arsenis et al. (2015) with an additional quadratic expression of value as a function of quantity (volume)



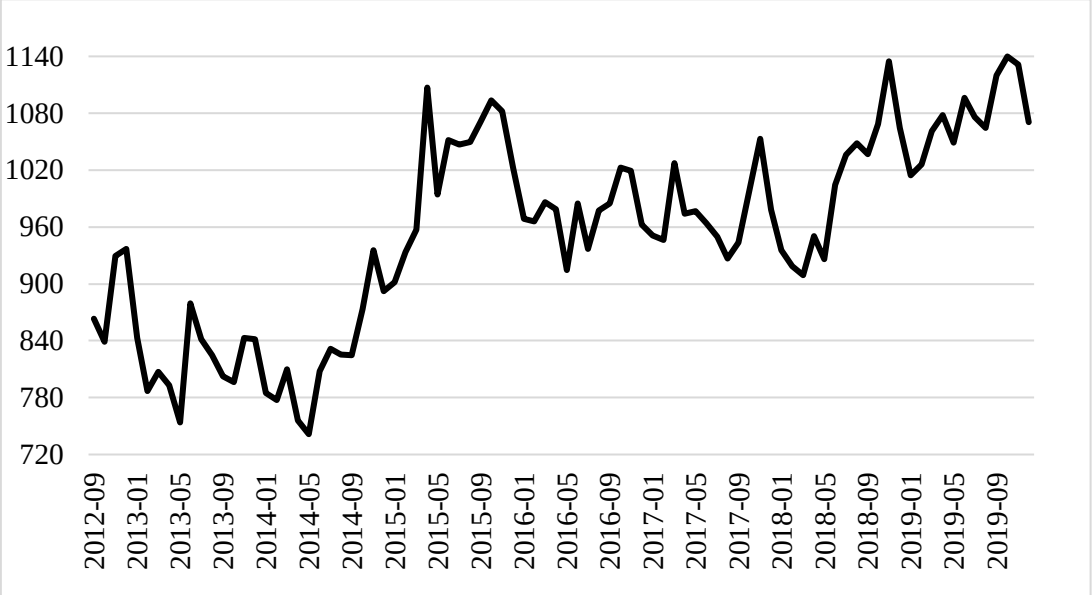
VIII. The tool estimates a so-called *fair price* of, say,a particular textile or footwear item from China, over a 48-month period. We note that the overall monthly EU price proxy (=V/Q) may be far from stable over time, due to trend, seasonal, cyclical patterns, and shocks (e.g., Table 2 and Figure 3).Is it fair to: compare (a) the individual prices observed in any country at a time that prices were low across the EU (UK included) to (b) an EU-wide average price estimated from data spanning the whole period (including times that prices were high across the EU), and mechanically charge a tax based onthe (b)-(a) difference or a variant of this difference? In April 2015 the average price of footwear across the EU was 50% higher than it was in May 2014, and in November 2018 it was 25% higher than it was in March 2018. (See Table 3.)If the tool operates with the assumption that the prices of imports do not vary significantly over time, and ignores long-term price trends, seasonal or cyclical patterns, and other temporary price variations over time, then the assumption is not supported by the facts.

Table 2: OLS regressions with robust standard errors and no constant, regarding the total values of the first five (codewise) eight-digit textile and footwear products imported to the EU-28 from China (in euro), Sep. 2012-Dec.2019 (88 monthly observations, quantities are in 100 kgs)

Product code (descending order)	Naïve bivariate model			Multivariate model that allows for non-linear pricing and time affects											
	Quan. ef.	Model fitness		Quantity effects		Timetrend effects		Seasonal effects						Model fitness	
	Q	R^2	adj R^2	Q	Q^2	t	t^2	Months #1 (reference 01)		Months#2 (reference 01)		Months#3 (reference 01)		R^2	adj R^2
# 61012010	486.09	0.7414	0.7384	468.19	-0.07	12009.65	-125.64	04, 06	-147503.50	07, 09-10	238722.50			0.9328	0.9279
# 61012090	1593.14	0.9601	0.9596	2018.60	-0.15	10424.52		02-06	-486775.30	11	-282258.30			0.9881	0.9874
# 61013010	972.33	0.8586	0.8570	779.96	-0.12	13832.21		03-06	-461739.40	07, 10	624191.20	08-09	1227241.00	0.9445	0.9405
# 61013090	1163.03	0.9095	0.9085	1036.14	-0.03	95775.45	-723.54	04-05	-1099470.00	07-10	3005084.00			0.9827	0.9814
# 61019020	747.35	0.7337	0.7306	978.54	-0.39	1906.59		02, 05-06	-136208.90	09-11	191212.10			0.8820	0.8749

Notes: All p-values are below 0.01.Alternative R^2s calculated with a constant are about 0.5392,0.8290, 0.6238,0.7055, 0.4686,respectively, in the naïve model, and 0.7773, 0.9245, 0.8430, 0.9098, 0.7044, respectively, in multivariate model. Source: Eurostat (DS-045409) as accessed in January 2023; own calculations.

Figure 3: The values of Chinese footwear imports into the EU-28 divided by the corresponding quantities (in euro per 100 kgs), Sep. 2012-Dec.2019



Source: Eurostat (DS-045409), as accessed in July 2023, own calculations.

4. Conclusions

The paper expresses concern regarding the overvaluation of Chinese exports due to export subsidies, and the lack of thorough testing to ascertain the level and origin of potential misevaluation. It also finds that the statistical tool employed by the EU Commission to identify low-priced imports suffers from a number of methodological deficiencies. It treats time-series data as cross-sectional, disregards time-series tests and aspects, relies on bivariate regressions with minimal observations, excludes crucial explanatory variables, removes legitimate observations that do not fit in the rather naïve bivariate regression setting selected by the EU authorities, and relies on a statistic that is not well-defined in the specific model (naïve bivariate regression) that the EU authorities selected.

Considering the above, the estimation of customs duty losses in the recent case of the *Commission v United Kingdom*, resolved in the Court of Justice of the EU, was not very scientific or well grounded. The authors are of the view that it would be best if the approach were abandoned in favor of a method that is free from the above shortcomings and in line with WTO practices. They also draw attention to the consumer surplus and GDP reductions that are likely to follow from import price increases if the EU Commission continues to price imports using the particular tool.

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