Ministry of Economic Development
Department for Enterprise and Internationalization
Directorate-General for the Fight against Counterfeiting
Italian Patent and Trademark Office (DGLC-UIBM)

Counterfeiting in figures:
ESTIMATED VALUE OF SEIZED GOODS
NEW METHODOLOGY
Rome, June 2013

Abstract

www.uibm.gov.it/iperico

Nexen
BUSINESS CONSULTANTS

Iperico

Integrated database on anti-counterfeiting activities

Counterfeiting in figures:

ESTIMATED VALUE OF SEIZED GOODS - NEW METHODOLOGY

The former methodology

The work is a dossier explaining the IPERICO new methodology used to estimate the value of seized goods. The previous procedure (in IPERICO reports 2011 and 2012) has suffered from some limitations, also related to the reduced depth of historical data. Consequently an update to improve reliability has been proposed.

Until 2013, the methodology consisted of calculating the average unit value by the product category, elaborated by the Ministry of Economic Development and hereinafter referred to as "*decmise*", on the basis of data provided by "*Agenzia delle Dogane*" (Customs Agency) and evaluating all the seized goods, thanks to this average value. In particular the procedure consisted of the following main steps:

1. Selection: identify the group of seizures used to estimate the value of the goods seized in a year;

2. Calculation: calculate the average value of the item in different categories (decmise) selected on the basis of seizures;

3. Expansion: assign the worth of all seizures by the average value of the corresponding category.

Customs (Agenzia delle Dogane) provide an estimate of the market value of the seized goods, based on:

      a) the "quality" of counterfeiting;

      b) the value that the goods would have had if they had been sold on the market.

That methodology was based on some assumptions:

1. the estimates of the value provided by "Agenzia delle Dogane" are a representative subset of the average value of the goods seized by polices in the various categories;

2. the average value of the goods in the categories does not change significantly between seizures made by the various police;

3. the average value of the goods in the categories is stable over the years;

4. the types of goods seized in each product category is stable over the years.

The assumption 1) can be considered valid, because of the experience of the "Agenzia delle Dogane" in evaluating seized goods and in consideration of the high number of seizures made by this Agency. The information on the value are of acceptable quality and, most importantly, this quality improves from year to year. The assumption 2) can be considered valid too.

Based on available historical data in IPERICO (from 2008), it is possible to verify the hypothesis of stability of the value and composition of the product categories from year to year, as required by hypothesis 3) and 4). These assumptions cannot be considered valid at this stage.

For this main reason, therefore, it is useful to revisit the estimation methodology.

The new methodology

A crucial aspect in average value estimation is that there are seizures with very small or very large values for the same item in almost all categories.

The abnormal data (outliers) may affect the average value enormously and consequently make the estimation procedure less accurate: a typical countermeasure, in these cases, is to eliminate outliers, after defining a rule for their identification.

However, the elimination of the outliers may result in a loss of information: it is therefore necessary to identify the "extreme" values .

The anomaly of the estimated values of a seizure may depend on the presence of "extraordinary" goods in that seizure, or an error in the estimation of value of certain goods by Italian Customs. We can reasonably suppose, however, that anomalies are due to "extraordinary" seizures, that should not be considered in the definition of the average value of the goods within a single category *decmise*.

A seizure may be considered anomalous (outlier) in relation to the unit value of his goods, regardless of the quantity of goods seized.

To cancel this inconvenience it is possible to proceed by ordering the seizure of goods of the same category in ascending order of unit value. If the unit values are very small, the evaluation is substantially correct. It is not surprising that counterfeit goods have very low market value: it is also typical of many well-known goods on the market and therefore it is assumed that these products can be evaluated quite accurately. In contrast, a small percentage of the seizures have unit value (UV) very high. In this case it is likely that the UV, if extreme, depends on one of the two factors of abnormality considered.

By eliminating the seizures with the highest unit value, the result is a decrease in the average unit value. This decrease is more pronounced when the extreme values are distant from the rest of the distribution, and vice versa. When a distribution has no extreme values, the proposed correction has a negligible impact.

The extreme values are not used to calculate the average unit value, but are used anyway to value the goods of the seizures to which they are attributed. In this sense, these values are not ignored completely: they are just not taken into account in the selection process.

The unit values for *decmise* often change over the years, even in a non-negligible mode.

Changes in the value of the goods seized over the years can be explained by:

- Changes in the type and quantity of goods seized;

- Changes in the value of the goods seized even if the category or item are identical;

- Different assessment procedures of the value of the goods seized.

This variability may influence the calculation of the average value and the result would be an estimation procedure that is too sensitive.

The average value is assessed using a "sliding window" of 3 years, starting with the current year and considering the preceding two years. Within this period, after removing outliers using the procedure described, we proceed calculating the average unit value. A three-year period is a reasonable period of time, and data are of good quality.

To estimate the value for 2013, for example, 2013, 2012 and 2011 will be used as reference years.

Two important results are:

- The calculation of the average unit value on a wider sample, and therefore a more robust estimate of the average unit value.

- The greater stability of the estimated value from year to year.

Summing up the new methodology:

1. **Selection**: estimate the value of the goods of one year, using the current year and the two previous years. The estimation is performed separately for each *decmise* category. The seizures are aggregated by category and three year period. After being sorted in descending order according to the value, the 5% of seizures with the higher unit value are deleted.

2. **Calculation**: obtain the average unit value for each category (without outliers).

3. **Expansion**: expand to all seizures without estimated enhancement the average unit value of the corresponding category. For those already valued by Customs in origin, we use the original value.

4. **Alignment**: in this start-up phase, it is necessary to take the same values as estimated in 2011 (then based on 2009-2010-2011) also for all years prior to 2011. Since 2012, instead, the estimate is obtained with a three-year sliding window system, so the 2012 value is estimated using the years 2010-2011-2012.

2008-2011: NEW METHODOLOGY

*The estimated value for decmise for years **2008-2011** is calculated using the procedure described on the years 2009-2010-2011*

DECMISE CATHEGORY	Average Unit Value (€)
clothing	8.786
clothing accessories	20.810
other goods	1.949
electrical equipment	25.932
computer equipment	23.336
shoes	21.537
CDs, DVDs, cassettes	3.019
toys	4.059
glasses	35.168
watches and jewelry	40.183
perfumes and cosmetics	32.453

2012: NEW METHODOLOGY

*The estimated value for decmise for the year **2012** is calculated using the procedure described on the years 2010-2011-2012*

DECMISE CATHEGORY	Average Unit Value (€)
clothing	7.592
clothing accessories	17.142
other goods	3.690
electrical equipment	34.701
computer equipment	15.507
shoes	15.809
CDs, DVDs, cassettes	3.110
toys	6.160
glasses	23.997
watches and jewelry	21.601
perfumes and cosmetics	16.329

2008-2011: ESTIMATED VALUE OLD METHODOLOGY

Customs Agency and Guardia di Finanza Data, related to Counterfeiting without Foods beverages Tobacco and Medical Products

DECMISE CATHEGORY	2008	2009	2010	2011	Total
clothing	124,755,283	134,406,134	134,700,501	65,539,715	**459,401,632**
clothing accessories	158,867,590	576,842,393	95,714,009	175,379,282	**1,006,803,274**
other goods	17,522,757	10,238,558	44,812,920	38,875,530	**111,449,764**
electrical equipment	21,636,050	15,907,749	9,053,976	44,425,802	**91,023,577**
computer equipment	160,314	172,242	387,742	591,417	**1,311,715**
shoes	128,400,490	96,208,909	41,971,369	31,226,151	**297,806,919**
CDs, DVDs, cassettes	866,520	908,390	4,150,335	634,850	**6,560,094**
toys	2,146,548	16,153,548	14,896,696	7,141,915	**40,338,706**
glasses	9,991,098	5,034,577	3,908,179	27,377,067	**46,310,921**
watches and jewelry	4,105,433	3,292,331	13,676,680	8,997,423	**30,071,867**
perfumes and cosmetics	12,595,206	23,809,661	59,133,329	19,417,659	**114,955,855**
AMOUNT (€)	**481,047,288**	**882,974,492**	**422,405,735**	**419,606,809**	**2,206,034,324**

2008-2012: ESTIMATED VALUE NEW METHODOLOGY						
Customs Agency and Guardia di Finanza Data , related to Counterfeiting, without Foods, Beverages, Tobacco and Medical Products						
DECMISECATHEGORY	2008	2009	2010	2011	2012	Total
clothing	103,902,793	112,054,222	112,299,636	54,640,377	39,682,949	**422,579,976**
clothing accessories	169,548,959	623,949,388	103,530,354	189,701,376	108,399,761	**1,195,129,838**
other goods	20,642,121	11,949,114	52,299,815	45,370,465	85,849,989	**216,111,505**
electrical equipment	41,122,469	31,065,477	17,681,075	86,757,011	161,244,475	**337,870,507**
computer equipment	2,075,192	1,898,021	4,272,717	6,517,107	3,467,688	**18,230,724**
shoes	116,456,331	89,233,829	38,928,474	28,962,277	17,238,430	**290,819,341**
CDs, DVDs, cassettes	855,512	879,384	4,017,807	614,578	29,038,458	**35,405,738**
toys	5,920,709	45,801,093	42,237,467	20,249,886	43,239,697	**157,448,853**
glasses	46,929,046	24,589,275	19,087,858	133,711,790	51,555,280	**275,873,249**
watches and jewelry	17,596,299	13,122,594	54,512,603	35,861,987	31,163,671	**152,257,154**
perfumes and cosmetics	21,488,664	40,621,631	100,887,293	33,128,442	8,454,937	**204,580,967**
AMOUNT (€)	**546,538,095**	**995,164,030**	**549,755,098**	**635,515,294**	**579,335,335**	**3,306,307,852**