# Income Content of the World Coffee Exports

Contenido de la Renta de las exportaciones mundiales de café

Orlando Monteiro da Silva[1]

Carlos Antônio Moreira Leite[2]

## Abstract

Coffee is the most widely commercialized tropical product on the international market. The 2009/10 crop had an estimated value of $15.4 billion, with 93.4 million bags exported. According to the International Coffee Organization (ICO, 2011), the coffee sector employed around 26 million people in 56 producing countries and over 100 exporting countries. But how could coffee products beranked, in terms of income content, in relation to other commercialized products, and how have they evolved? To answer this question, we calculated the annual income content of 5,111 products exported by 167 countries from the period between 2000 and 2009, was calculated. We have used data from the COMTRADE (2011), and "sophistication" indicators proposed by Hausmann and Rodrik (2003) who classify different products according to their productivity, were used. An emphasis was put on five coffee products (whole grain, roasted, decaffeinated, caffeinated, and soluble), showing the evolution of the number of exporting countries and of the "sophistication" index (income content), whose temporal variation was decomposed by the effects of competitiveness and income per capita changes. The results showed that non-roasted, non-decaffeinated, whole grain coffee is still the most commercialized product, but with the lowest income content of all coffee products, occupying the twenty-fourth worst position in terms of income content in 2009. The roasted, decaffeinated coffee presented the greatest income growth in the period, placing itself in the 3,309th position in 2009. The decomposition of the index showed that

1   Department of Economics. Universidade Federal de Viçosa. Viçosa, MG. Brazil. E-mail: odasilva@ufv.br

2   Department of Rural Economics. Universidade Federal de Viçosa. Viçosa, MG. Brazil. E-mail:caml@ufv.br

for coffee products with the most processing, the greatest cause of export sophistication growth was the Revealed Comparative Advantage effect. Products with the least amount of processing presented a loss in relative market share, with the addition of values to the production chain occurring outside those countries producing the raw materials.

## Key Words:

Coffee, Exports, International markets, income level, Agriculture in International Trade

## JEL Clasification:

F14, F23, Q17

## Resumen

El café es el producto tropical más comercializado en el mercado internacional. La cosecha de 2009/10 fue estimada en 15,4 mil millones de dólares, con 93,4 millones de sacos exportados. Según la Organización Internacional del Café (ICO, 2011), el sector cafetero ha empleado alrededor de 26 millones de personas en 56 países productores y en más de 100 países exportadores. Sin embargo, ¿cómo los tipos de café podrían ser clasificados, en cuanto al ingreso, en relación a otros productos comercializados, y cómo han evolucionado? Para contestar a esta pregunta, se han calculado los ingresos anuales de 5.111 productos exportados por 167 países en el período comprendido entre 2000 y 2009. Los datos fueron obtenidos a través del COMTRADE (2011), y se han utilizado los indicadores de "sofisticación" propuestos por Hausmann y Rodrik (2003) que clasifican los diferentes productos en función de sus productividades. Se hizo especial hincapié en cinco tipos de café (grano entero, tostado, descafeinado, con cafeína y soluble), que muestra la evolución del número de países exportadores y del índice de "sofisticación" (relacionado a los ingresos), cuya variación temporal se ha descompuesto por los efectos de la competitividad y por los cambios en la renta per cápita. Los resultados mostraron que el café sin tostar, con cafeína y de grano entero sigue siendo el más comercializado, pero presenta el nivel más bajo de ingreso de todos los tipos de café, ocupando el vigésimo cuarto puesto de peor nivel de ingreso en 2009. El café tostado y descafeinado presentó el mayor crecimiento de ingresos en el período, ubicándose en el puesto 3309º en 2009. La descomposición del índice mostró que para los tipos de café con mayor procesamiento, la principal causa del crecimiento de la sofisticación de las exportaciones fue el efecto de la ventaja comparativa revelada. Los productos con menor cantidad de procesamiento presentaron una pérdida de cuota relativa de mercado, con el valor añadido a la cadena de producción llevado a cabo afuera de los países productores de materias primas.

## Palabras clave:

Café, Exportaciones, Mercados internacionales; Nivel de ingresos; agricultura y comercio internacional

## Introduction

According to the International Coffee Organization – ICO (2011), coffee is the most widely commercialized tropical product on the international market. The 2009/10 crop had an estimated value of $15.4 billion, with 93.4 million bags exported. It is also estimated that in 2010 the number of people employed in the coffee sector was around 26 millions, in 56 producing countries.

Coffee product exports make an important contribution to foreign exchange revenues for various countries. They also contribute to tax collection and Gross Domestic Product growth. Data from COMTRADE (UNCTAD, 2011) show that whole grain coffee is exported by more than 140 countries, while over 100 countries export coffees which need more processing (roasted and soluble).

Whole grain coffee is best known as green coffee beans, which is the coffee seed, obtained after removal of the bark and the mucilage and which goes through a drying process. This is how the product is most commercialized at the international markets, accounting for up to 90% of total value. Coffee seeds can also be decaffeinated when they are still green by soaking the green seeds in hot water or steaming them, then using a solvent to dissolve caffeine-containing oils (Dobelis, 1986). Also, with rare exceptions, all coffee is roasted before it is consumed. The degree of roast has an effect upon coffee flavor and body. Usually, lighter roasts have a more complex and therefore a stronger flavor of aromatic oils and acids - otherwise destroyed by longer roasting times – can be perceived. To obtain the instant or soluble coffee it is necessary first to obtain the beverage through the industrial process of roasting, grinding and extraction. When this is done, the water is removed through a drying process, and the dry soluble solids shaped either in powder or granulated, are obtained.

It is known that primary products have had their share on the international market reduced and that technologically intensive products have grown more than others among manufactured products. It is also believed that the technologically intensive products bring greater benefits to the exporting countries, by requiring greater allocation of human and physical capital, which involves faster transfer and diffusion of technology. Therefore, there is a growing interest in analyzing the technological structure of exports.

According to Lall *et al*. (2006), the greater the average income of the exporting country, the more sophisticated the product. The argument behind this ratio is based on the fact that products exported by rich countries have characteristics that allow producers to pay high salaries and still be competitive in world markets. Among these characteristics, the main one is technology, despite other factors of product competitiveness such as IT, marketing, logistics, infrastructure, and so on.

An analysis of the sophistication indicators can bring interesting information about the functioning of the coffee market, in which there are different exported products and for which the number of exporting countries is much greater than the number of producing countries. Thus, the present study has as its main objective to calculate and analyze the income (sophistication) content of the different exported products of coffee on the international market between the years of 2000 and 2009. For this, an income content, or "sophistication", that depends only on product export information and the exporting countries' per capita incomes, is used.

Besides this introduction, this paper presents, in section two, the calculation methods of the income content indices and their decomposition, and a description of the data utilized. Section three shows and discusses the main results found, whereas some conclusions are presented in section four.

## Methodology

A country's export basket encompasses a great number of different products. In spite of there being no information for the Research and Development content on each of these products, the literature presents some methods that allow for a measurement of each product's sophistication. One of these methods has been widely used in the recent literature (Hausman and Rodrik, 2003; Schott, 2007; Silva and Drumond, 2011), and calculate the Income Content Index of each product in the international market. According to Xu (2007), if a product is exported by only one country whose per capita income is $5,000, then the income content of this product is $5,000. If this same product is exported by more than one country, then its income content is equal to the weighted sum of the income levels of all countries that export it, with the weights corresponding to the product's share on each country's export basket.

For each i product, the sophistication index commonly called PRODY, can be calculated as:

$$PRODY_i = \sum_{c \in C} \sigma_{ic} * Y_c \qquad \textbf{(1)}$$

in which $\sigma_{ic} = VCR_{ic} / \sum_{d \in C} VCR_{id}$, with $VCR = \frac{X_{ic}}{X_c} / \frac{X_i}{X}$, $c = (1,2,3,...,M)$ and $Y_c =$ per capita gross domestic product (GDP) of each country. M is the number of countries, and the weights ($\sigma_{ci}$) normalize the Balassa's index of revealed comparative advantage (RCA) of country C, in relation to all other countries that export product.

In equation (1), $PRODY_i$ indicates the sophistication level of product $i$ and it is measured as a weighted average of the per capita GDP of all countries that export product $i$. In the weighting variable ($\sigma_{ci}$), ($\frac{X_{ic}}{X_c}$) corresponds to the share of product $i$ in the total value of exports of country C, reflecting the importance of this product in the total exports of that country. The $VCR_{ic} / \sum_{d \in C} VCR_{id}$ ratio makes the sum of weights equal to unit in such a way that the weights reflect the importance of product $i$ in the exports of country C, in relation to all countries that export that product.

Products with high PRODY values are those for which the countries with high incomes have a preponderant role in relation to the other commercial partners. The implicit assumption is that high salaries are present where the comparative advantages are determined by factors such as technology, public infrastructure, research centers, etc., instead of the labor costs.

However from one period to another, PRODY values can change. Either by changes in per capita GDPs of the countries (income), changes in revealed comparative advantages (competitiveness) or a mixture of both. Calling $P_i^t$ the PRODY value of product $i$ in period t, one can obtain a decomposition of that index from period t to period t+n as:

$$P_i^{t+n} - P_i^t = \sum_c \sigma_{ci}^{t+n} . Y_c^{t+n} - \sum_c \sigma_{ci}^t . Y_c^t \qquad \textbf{(2)}$$

$$P_i^{t+1} - P_i^t = \sum_c (\sigma_{ci}^{t+n} . Y_c^{t+n} - \sigma_{ci}^t . Y_c^t) \qquad \textbf{(3)}$$

$$P_i^{t+1} - P_i^t = \sum_c [(\sigma_{ci}^{t+n} - \sigma_{ci}^t) . Y_c^{t+1} + \sigma_{ci}^t . (Y_c^{t+n} - Y_c^t)] \qquad \textbf{(4)}$$

$$P_i^{t+1} - P_i^t = \sum_c (\sigma_{ci}^{t+n} - \sigma_{ci}^t) . Y_c^{t+1} + \sum_c \sigma_{ci}^t . (Y_c^{t+n} - Y_c^t) \qquad \textbf{(5)}$$

$$P_i^{t+1} - P_i^t = \sum_c (\sigma_{ci}^{t+n} - \sigma_{ci}^t ) . Y_c^t + \sum_c (\sigma_{ci}^{t+n} . Y_c^{t+n} + \sigma_{ci}^t . Y_c^t - \sigma_{ci}^{t+n} . Y_c^t - \sigma_{ci}^t . Y_c^{t+n}) \sum_c \sigma_{ci}^t . (Y_c^{t+n} - Y_c^t) \qquad \textbf{(6)}$$

The first component on the right side of the expression (6) represents the income effect and shows how the PRODY index changes when the revealed comparative advantages of the different products do not change, between period t and t+n. The third component represents the RCA effect and shows how the PRODY indicator changes when there are no changes in income of the countries between period t and t+n. The middle component shows a joint effect and considers the fact that the impact of changes of the VCR and GDP values of a given country depends on the changes of its trade structure.

The data used in this work are annual and refer to the period from year 2000 through 2009. Trade data are from the United Nations Commodity Trade Statistics (COMTRADE) and income data (GDP) from the World Bank (World Development Indicators). For calculation of PRODY indices, export data encompassed 5,111 different products from 167 countries and corresponded to the Harmonized System's 6 digit level classification of goods (HS6). Under this classification, the coffee products considered were: 090111 – Non-roasted, non-decaffeinated, whole grain coffee; 090112 –Non-roasted, decaffeinated, whole grain coffee; 090121 – Roasted, decaffeinated coffee; 090122 –Roasted, non-decaffeinated coffee; 210111 – Soluble coffee, even if decaffeinated (this classification includes other essences, extracts and coffee concentrated). It was not considered the products with classification: 090190 – other coffee products; and 293930 – caffeine. Also, the database utilized does not present any distinction between Robusta and Arabica coffee types.

# Results

Figure 1 shows the evolution of the number of countries that exported coffee products in the period between 2000 and 2009. With the exception of the year 2009, when there was a widespread fall by virtue of the international financial crisis, there is an increasing trend in the number of exporting countries. Most countries operate in the non-decaffeinated (whole grain and roasted) coffee market, but the greatest growth in the number of exporting countries occurred precisely within the decaffeinated, roasted coffee market, which grew from 82 countries in the year 2000 to 102 in 2009. It is interesting to note that among the 102 decaffeinated, roasted coffee exporting countries in the year 2009, only 56 were producing countries (ICO, 2011). The number of non-roasted, non-decaffeinated, whole grain coffee exporting countries was 132 in the year 2000, reached 144 in 1996, and fell to133 in 2009. The non-roasted, decaffeinated coffee product has the smallest number of exporting countries, varying from 77 in the year 2000 to 84 in 2009. In this same year, the number of exporting countries of the roasted, non-decaffeinated and of the soluble coffees was 124 and 106, respectively.

In the year 2009, the average per capita income of the non-roasted, non-decaffeinated, whole grain coffee exporting countries was $13,255.68, whereas for the roasted, decaffeinated exporting countries it was $18,990.20.

**Figure 1.** Evolution of the number of coffee product exporting countries. 2000-2009
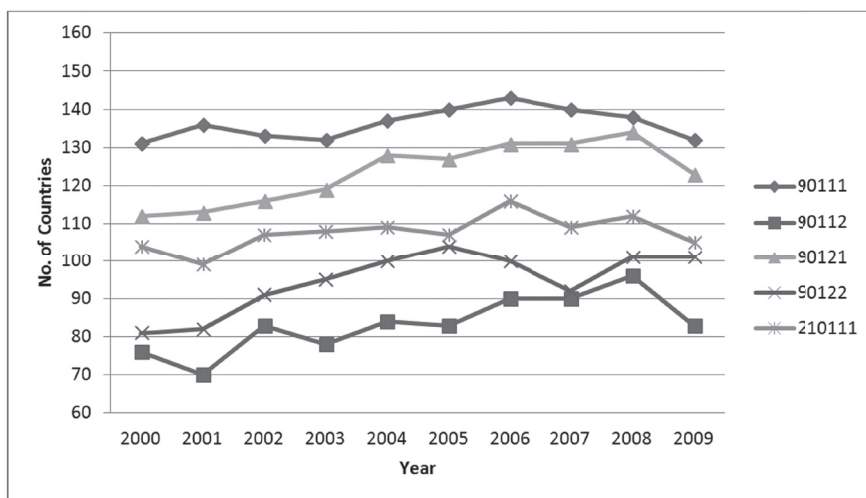


Table 1 shows the 25 countries with the greatest share in total export value, for coffee product with the smallest degree of processing (non-roasted, non-decaffeinated, whole grain coffee) and the one with the greatest degree of processing (soluble coffee), between

the years 2000 and 2009. The idea here was to highlight the relative importance that these products have as revenue generators for these countries and how that importance has changed over time. In the case of non-roasted, non-decaffeinated, whole grain coffee, all countries that appear on Table 1 are producers and with the exception of Brazil, are countries classified as low income countries. Also, with the exception of Honduras and East Timor, there was a fall in coffee shares in the total export revenue between 2000 and 2009. This is a natural trend by virtue of export diversification. But even so, that product still has a fundamental importance for some countries. Export revenue represented more than 30% of the total revenue for the first four countries on that table in 2009. For the following four countries, export revenue represented more than 10% of the total revenue in that year.

The numbers are rather different in the case of soluble coffee. The share of revenue from exports in the countries' total revenue is much smaller. See the cases of Ivory Coast (1.2%), Colombia (0.8%), Ecuador (0.5%) and Brazil (0.3%). Out of the 25 countries listed on Table 1, thirteen are non producing countries. Out of the 106 soluble coffee exporting countries that existed in year 2009, 65 (61%) were non producers. The share of revenue from exports grew in Ecuador, Nicaragua, Switzerland, Spain, France, Belgium and Great Britain. For the other countries on that table, the revenue fell between 2000 and 2009, while Togo, Malawi and Mali no longer appear as exporting countries.

Table 1. Countries with greater shares of coffee products in total exports. 2000 and 2009

| Country | 090111 | | Country | 210111 | |
|---|---|---|---|---|---|
| | 2000 | 2009 | | 2000 | 2009 |
| Burundi | .8530 | .7539 | Ivory Coast | .0120 | .0030 |
| Ethiopia | .6125 | .3400 | Colombia | .0080 | .0065 |
| Rwanda | .5837 | .3017 | Ecuador | .0053 | .0061 |
| Uganda | .5592 | .3921 | Brazil | .0029 | .0027 |
| Nicaragua | .1648 | .0886 | Nicaragua | .0020 | .0048 |
| Guatemala | .1468 | .0945 | Morocco | .0019 | .0013 |
| Tanzania | .1317 | .1098 | India | .0018 | .0009 |
| Kenya | .1144 | .0783 | Lithuania | .0017 | .0009 |
| El Salvador | .0999 | .0699 | Tanzania | 0016 | .0004 |
| Colombia | .0861 | .0512 | Togo | .0011 | --- |
| Honduras | .0857 | .1092 | Switzerland | .0007 | .0010 |
| Togo | .0707 | .0388 | Netherlands | .0007 | .0006 |
| East Timor | .0655 | .0743 | Malawi | .0007 | --- |

| | | | | | |
|---|---|---|---|---|---|
| P.N. Guinea | .0587 | .0362 | Italy | .0005 | .0001 |
| IvoryCoast | .0554 | .0205 | Germany | .0005 | .0004 |
| Laos | .0537 | .0211 | Spain | .0005 | .0011 |
| Djibouti | .0462 | .0150 | Greece | .0004 | .0007 |
| Costa Rica | .0419 | .0155 | Indonesia | .0004 | .0003 |
| Vietnam | .0414 | .0266 | Mali | .0004 | --- |
| Peru | .0409 | .0291 | Kenya | .0003 | .0001 |
| Cameroon | 0389 | .0242 | France | .0003 | .0003 |
| Brazil | .0312 | .0254 | Belgium | .0003 | .0004 |
| Congo | .0249 | .0059 | Great Britain | .0003 | .0004 |
| C. A.Republic | .0248 | .0033 | Australia | .0002 | .0002 |
| Madagascar | .0238 | .0033 | Israel | .0002 | .0001 |

Source: Research data

PRODY values (income contents) calculated for the five coffee products considered are presented in Table 2. Non-roasted, non-decaffeinated, whole grain coffee had the smallest income content. This was expected, considering the low degree of product processing ("sophistication") in relation to the others products. An income content corresponding to $562.15 in the year 2000 increased to $787.76 in 2009, with a nominal growth of 40% throughout the period. That product also was the one with the greatest relative decrease by the time of the international financial crisis. The non-roasted, non-decaffeinated and the soluble coffees presented very small decreases in the PRODY values, whereas the others were not affected by the crisis. The decrease in the number of exporting countries could explain this fact. The product with the greatest income content was the decaffeinated, roasted coffee. It presented a nominal growth of 192% throughout the period, and enlarged the difference in relation to the other products. The income content growth of soluble coffee achieved 114% in the period.

Table 2. Income contents calculated for the coffee products. US dollars. 2000-2009.

| Year | 090111 | 090112 | 090121 | 090122 | 210111 |
|---|---|---|---|---|---|
| 2000 | 562.15 | 1776.77 | 11015.89 | 6122.44 | 3824.87 |
| 2001 | 492.20 | 2181.13 | 7094.19 | 7149.77 | 3296.61 |
| 2002 | 546.09 | 974.60 | 8556.23 | 11968.61 | 4079.48 |
| 2003 | 472.77 | 1617.26 | 11808.80 | 13858.73 | 5726.10 |

| | | | | | |
|---|---|---|---|---|---|
| **2004** | 578.87 | 1664.04 | 10379.35 | 13560.43 | 6771.56 |
| **2005** | 575.92 | 1930.53 | 10385.02 | 16332.53 | 7808.67 |
| **2006** | 679.09 | 1740.52 | 8744.43 | 14455.73 | 7148.61 |
| **2007** | 741.75 | 1948.10 | 10374.11 | 14536.44 | 7228.79 |
| **2008** | 870.66 | 2264.83 | 11385.64 | 15573.28 | 8243.45 |
| **2009** | 787.76 | 2660.50 | 11103.98 | 17903.42 | 8202.14 |

**Source:** Authors' calculation

Table 3 presents the PRODY values of the coffee products calculated for the years 2000 and 2009, and those of the five products with the lowest and highest income contents.

In a universe of 5,111 different products, the group of five coffee products represented just 0.2% ($23.5 billion) of the total value of the international traded goods in 2009. According to the ICO, coffee continues to be the most widely traded product at the international level, after oil. In the group of coffee products, the non-roasted, non-decaffeinated, whole grain coffee still has the greatest share in the world market (0.14%).

Traditionally, coffee was exported as a green grain (The Global Coffee Trade, 2004), with the processing occurring in the importing countries. By lack of infrastructure and even processing technology, the producing exporting countries had a minimum share in the process of adding value to the production. The numbers of Table 1 show that this situation still prevails. Also, according to the order of classification (from the lowest to the highest) shown in Table 3, non-roasted, non-decaffeinated, whole grain coffee, which occupied the 29th position in the year 2000, fell to the 24th in 2009. The roasted, non-decaffeinated coffee, which occupied the best position of the group with an income content of $11,015.80 in 2000, also lost its position in 2009, falling from place nº 2,751 to 1,816. Among the coffee products, it was the one whose share increased the most throughout the period. The drop in position is justified if the export increase occurred in countries with smaller per capita income. The roasted, decaffeinated and soluble coffees increased their income content the most. The argument in this case is exactly the opposite of that in the previous case, stating that the growth of exports occurred in the countries with greater per capita GDPs.

It is interesting to note that products of greater "sophistication" tend to increase their market share as well as present more stable values over time. One can observe in Table 3 that there is a widespread change among lower income content products (more volatile), which are mostly agricultural or primary products. This change does not happen with those of higher income contents, which are those with greater capital and technological intensity.

**Table 3.** Income contents, classification and shares in the world exports of selected products. 2000 and 2009.

| Code | PRODY | Order Classif. | % of Exports | Code | PRODY | Order Classif. | % das Exports |
|---|---|---|---|---|---|---|---|
| | 2000 | | | | 2009 | | |
| Products with smaller values[1] | | | | | | | |
| 130120 | 234.8 | 1 | .000017 | 901041 | 333.4 | 1 | .000022 |
| 261590 | 317.0 | 2 | .000044 | 071390 | 360.4 | 2 | .000013 |
| 120792 | 327.6 | 3 | .000001 | 410611 | 387.6 | 3 | .000000 |
| 090700 | 350.2 | 4 | .000022 | 530490 | 391.1 | 4 | .000012 |
| 080131 | 369.6 | 5 | .000049 | 261590 | 452.9 | 5 | .000051 |
| Coffee Products | | | | | | | |
| 090111 | 562.1 | 29 | .001417 | 090111 | 787.7 | 24 | .001264 |
| 090112 | 1776.7 | 229 | .000062 | 090112 | 2260.5 | 252 | .000047 |
| 090121 | 11015.8 | 2751 | .000194 | 090121 | 11103.9 | 1816 | .000400 |
| 090122 | 6112.4 | 1434 | .000020 | 090122 | 17903.4 | 3309 | .000029 |
| 210111 | 3824.8 | 813 | .000248 | 210111 | 8202.1 | 1247 | .000301 |
| Products with greater values | | | | | | | |
| 560312 | 37107.7 | 5107 | .000159 | 721069 | 57204.2 | 5107 | .000167 |
| 721061 | 37668.4 | 5108 | .000102 | 590210 | 58547.6 | 5108 | .000104 |
| 741011 | 37856.1 | 5109 | .000143 | 721633 | 65787.6 | 5109 | .000149 |
| 721633 | 38788.1 | 5110 | .000272 | 730110 | 75498.3 | 5110 | .000257 |
| 730110 | 42458.9 | 5111 | .000076 | 590290 | 78029.6 | 5111 | .000098 |

Source: Authors calculation

3    130120 – Gum arabic; 261590 – Zirconium ores and their concentrates; 120792 – Other seeds and oleaginous fruits, even triturated; 090700 – Clove (fruits, flowers and peduncles; 080131 – Cashew nut, with peel; 560312 – False fabrics, even impregnated, coated, covered or stratified; 721061 – Flat laminated products, of iron or steel with no alloy, coated with aluminum-zinc alloys; 741011 – Sheets and stripes, thin, of refined copper ; 721633 – Iron or steel profiles with no alloy , in H; 730110 – Iron or steel poles/boards, even perforated or made from assembled elements; profiles obtained through hard welding.

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PRODY values also tend to increase over time with the growth of the world income per capita. Figure 2 compares the PRODY values of all products between the years 2000 and 2009, and highlights the position of coffee products. The correlation coefficient calculated between PRODY values of all 5,111 products between 2000 and 2009 was equal to .70, indicating general stability. The same correlation value for the five coffee products was equal to .69, showing no difference from the larger group of products. If the income contents of all products increased at the same ratio, they would be exactly over the line drawn on the chart. Therefore, values below the line indicate those products for which the income contents have grown above average and values above the line indicate those for which the income contents have grown below average. Four of the five coffee product values grew above average. Only the roasted, non-decaffeinated coffees grew below the average of all products. Also, the more to the right of the origin of the figure the points are, the greater the income contents. Non-roasted coffees appear very close to the origin, reflecting their low relative income content.

Figure 2. Change in the PRODY values between 2000 and 2009.
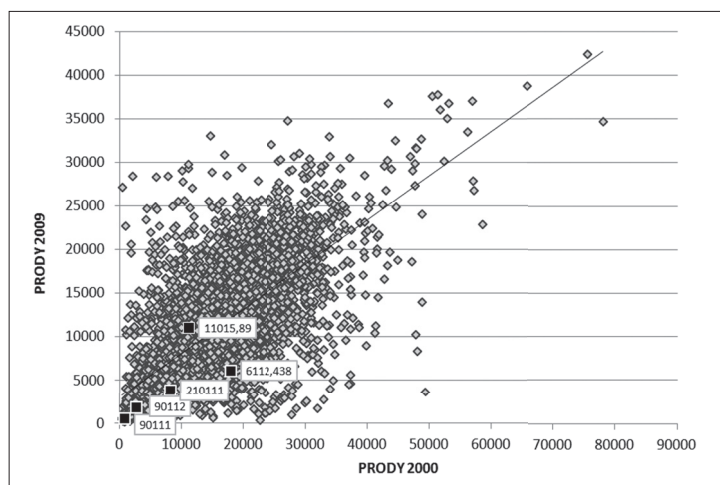


The decomposition of PRODY values, in terms of revealed comparative advantage (RCA) and income (GDP) effects between the years 2000 and 2009 is shown in Table 4. The total change in PRODY values between 2000 and 2009 shows that the greater growth has occurred in the income content of decaffeinated coffee (192.90%), followed by soluble coffee (114.44%). Non-decaffeinated, roasted coffee has shown the smallest variation rate (.80%). The least processed products (non-roasted, whole grain coffees) have basically depended on the growth of per capita income of the exporting countries, since the comparative advantage effect has been negative. The highly processed products (roasted and soluble coffees) have increased their "sophistication" by the relative increase

of their revealed comparative advantage. It is important to remember that the revealed comparative advantage compares the share of a country's total exports of a given product with that product's share of the world's total exports. The result found by the decomposition of PRODY values shows that the exporting countries of the most processed coffee products are in most cases the richer countries, and that they have had advantages in the exports of those products, to the detriment of the lower income producing countries.

**Table 4.** Decomposition of PRODY values between 2000 and 2009.

| Code | PRODY 2000 | PRODY 2009 | Rate Variation | Rank | VCR Effect | Joint Effect | GDP Effect |
|---|---|---|---|---|---|---|---|
| 090111 | 562.15 | 787.76 | 40.13% | 4º | -302.34 | -279.64 | 662.11 |
| 090112 | 1776.77 | 2660.50 | 49.47% | 3º | -10.58 | -18.22 | 78.28 |
| 090121 | 11015.89 | 11103.98 | 0.80% | 5º | .404 | .318 | .077 |
| 090122 | 6112.44 | 17903.42 | 192.90% | 1º | 103.39 | 46.41 | 43.10 |
| 210111 | 3824.87 | 8202.14 | 114.44% | 2º | 29.81 | 30.16 | 54.47 |

Source: The authors' calculation

## Conclusions

The objective of this study was to estimate the income content ("sophistication") from exports of the five main coffee products at the international markets and to analyze their trends, during the period from 2000 to 2009.

To do that we have chosen an indicator that considers only the variables per capita income and exports of each product. That indicator was obtained as a weighted average of each country's per capita income, with the weights being the Balassa's revealed comparative advantage indices of each country for that product. This measure classifies different exported products according to their income contents and allows one to follow their trends amongst other products.

The analysis has shown that the number of exporting countries of coffee products has continually grown. For 56 producing countries in year 2009, there were 133 exporting countries of non-roasted, non-decaffeinated coffee, 124 exporters of roasted, non-decaffeinated coffee and 106 of soluble coffee. It can be inferred that, in that supply chain, most of the values have been added outside of the producing countries.

In that same year, the share of products analyzed in the total value of world exports was 0.20%, with non-roasted, non-decaffeinated, whole grain coffee alone representing 0.14% of the total.

Revenue from the exports of coffee products has fallen in general, but for some countries it is still significant, representing more than 30% of the total revenue.

Among 5,111 products, non-roasted, non-decaffeinated, whole grain coffee fell from the 29th position in the year 2000 to the 24th position in 2009, with an income content equivalent to $787.76 for that year. For the exporting countries of the whole grain coffee, the decomposition of the income content growth showed that changes occurred basically due to the growth of per capita incomes. This per capita income growth, however, was not enough for those countries to switch exports to technologically more advanced coffee products with a loss in the product's revealed comparative advantage. Even with an abundant offer of raw materials, it seems to be lacking adequate infrastructure, technical and institutional capacity for industrial modernization at the producing countries. By contrast, for the most processed products and especially for roasted, decaffeinated coffee, a jump from the 1,434th to the 3,309th position (with an income content of $17,903.40), was due basically to the gain in terms of revealed comparative advantage.

A more detailed analysis on the trends of the income content indicators would allow one to map the countries' export changes and classify them according to their position on a global sophistication scale.

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