The role of trade policies, multinationals, shipping modes and product differentiation in global value chains for bananas. The case of Cameroon.

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Abstract

The first part of the paper discusses changes which occurred in the world market for bananas in recent years. These changes include successive modifications of the EU import regime for bananas (the EU is the single largest importer of bananas, with 1/4 of the world market), innovations in sea shipment modes, increased concentration of the retail sector and the expansion of the demand in developed countries for environment-friendly and Fair Trade bananas. The implications of these changes for the distribution of the value among the actors at the different links of the global chain for bananas are discussed in details. The second part of the paper focuses on banana exports from Cameroon, a value chain representative of 'traditional' chains where large multinationals maintain a central role. First this chain is analyzed in detail, then a simple model representing its main characteristics is developed and expected effects of changes in key factors such as production and transportation technologies and fiscal and trade policies, derived.

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1. Introduction

Global value chains for bananas have been changing significantly over recent years. Several factors are responsible for these changes. First, several subsequent changes in the EU import regime for bananas (the EU is the single largest importer of bananas, with 1/4 of the world market) had significant trade creation and trade diversion effects, as well as implications for the distribution of market power along these chains. Second, innovation in sea shipment technologies induced a rapid growth in the use of refrigerated containers and, conversely, a decline of the share of bananas being transported using traditional reefers. Third, the continuous rapid concentration of the retail sector determined a parallel increase in its capacity to impose quality standards and acquisition prices upon its suppliers. Fourth, the increased demand for environment-friendly grown and Fair Trade bananas by more educated and higher income consumers in developed countries created opportunities for product differentiation. One of the consequences of these changes, possibly the most evident, has been the decline of the share of the international market held by the largest multinationals, with new trade operators appearing on the scene and a number of transactions occurring directly between retailers and small exporters and producer cooperatives.

The aim of the paper is twofold: first, to discuss these changes and their implications from a general point of view and then to analyze them with reference to a specific case study, the value chain of banana exports from Cameroon. The first part of the paper focuses on the main changes which occurred in the banana market in the past 10-15 years, and on how these changes brought an increased diversification of the value chains which characterize this important market. The second part, which is structured in two sections, focuses on the Cameroon banana industry, a value chain representative of 'traditional' chains where large multinationals maintain a central role and characterized, as a result, by a strong horizontal and vertical integration. Section three discusses in detail the structure of this specific value chain. A simple model representing the main features of the Cameroon banana industry in a stylized manner is developed in section four and is used to analyze the expected effects of changes in internal as well external drivers, such as production and transportation technologies and policy variables, on the distribution of the value among the different actors active along the chain.

2. Recent changes in global value chains for bananas

There are two main families of bananas: the fruit banana, or 'dessert' banana, essentially the Cavendish variety, which represents 70-75% of total banana production, and the 'plantain' banana, or 'cooking' banana, which is consumed cooked, as a vegetable. Dessert bananas – or, simply, bananas - are the most commonly eaten fruit in the world and more than 100 million tons (t) a year are produced in around 130 countries, mostly developing ones. Most bananas are consumed domestically. However, while international trade of plantain bananas is minimal, around 20 percent of the world production of dessert bananas is traded internationally.

The banana sector is a very dynamic industry. World production more than doubled since 1990, from around 47 million t, to 107 million t in 2013; bananas traded internationally show a similar growth, increasing from 9 million t in 1990 to 20 in 2013.

In 2013 the six main producers of bananas accounted for almost two thirds (62.4%) of global production; they were, in order of importance: India (27.6 million t), China (12.1), the Philippines (8.6), Brazil (6.9), Ecuador (6), and Indonesia (5.4). The largest net exporters of bananas and their ranking do not coincide with those based on production, as India and China, the two largest producers, are a marginal international trader and a net importer (504 thousand t in 2013), respectively. The largest net exporter in 2013 was Ecuador (5.5 million t, 27.7% of total world exports), followed by the Philippines (3.2, 17.2%), Guatemala (2.0, 16.3%), Costa Rica (1.9, 9.8%) and Colombia (1.6, 8.2%). In 2013 the top five exporting countries alone accounted for 79% of the world market.

Market concentration for imports is even higher than for exports. The EU, with 4.9 million t of bananas imported in 2013 (25% of the world market), is the largest importer, followed by the US with 4.3 million t (22% of the market). Other important net importers were the Russian Federation (1.3 million t), Japan (1 million t), Canada (557 thousand t) and China.

Banana trade flows show a clear pattern of regionalization. At least in part, this is the result of past and current EU import regimes for bananas. Virtually all exports from the group of African, Caribbean and Pacific[1] (ACP) countries are directed towards the EU, while Latin American countries export bananas to Europe, Russia, and North and South America. Virtually all US and Canada imports of bananas come from Central and South America and over 95% of the bananas

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[1] This is a group of 79 African, Caribbean and Pacific countries, all of them former colonies of an EU member state, which have been granted by the EU over the years preferential access to its market. The group includes all banana exporting African countries.

imported by the Russian Federation in 2013 come from Ecuador alone. The Asian market is largely characterized as a regional market separated from the rest of the world, with a very large share of imports satisfied by exporters from within the region itself. For example, in 2013 Japan, the largest importer of the region, imported 93 percent of its bananas from the Philippines.

2.1 Policies do matter. The implications of EU import regimes for bananas for quantities traded, trade flows, market power and the distribution of value along banana value chains.

Banana supply in the EU comes from three sources: domestic production (in 2013 614,000 t, 11.3%), imports from ACP countries (1.059 million t, 19.5%) and imports from third countries (3.767 million t, 69.2%). While in all other main importers imports are subject to minimal duties, the EU import regime for bananas has been always protecting domestic and ACP country producers from competition from Latin American imports, which used to occur at Most Favored Nation (MFN) conditions, with significant effects on volumes traded and trade flows.

The Common Market Organization (CMO) for bananas was introduced in 1993 as part of the creation of the single market. The import regime for bananas was based on a system of tariff rate quotas (TRQ), i.e. import quotas specific by groups of countries, with different import tariffs being imposed on in-quota imports and prohibitive tariffs charged on out-of-quota imports. The regime provided preferential treatment to imports from ACP countries and quotas were implemented using a system of import licenses distributed to importers based on historical traded volumes (Cogea 2005; Goodison 2007; Tangermann 2003).

In December 2006 the EU approved a reform of its domestic policies for bananas. The reform cancelled the CMO, which provided generous support to domestic producers through a 'deficiency payment' scheme, and 'decoupled' support, making banana production in Canary Islands (Spain), Guadeloupe and Martinique (France's 'overseas territories') - which, together, account for over 90% of EU domestic banana production - respond to market conditions. The expected impact of the reform of the EU domestic policy regime for bananas was, everything else held constant, a reduction in EU domestic banana production and - being the latter only 11% of banana supply in the EU market - a small increase in EU domestic price and imports (Anania 2008). In fact, banana production in the EU declined after the reform of the CMO, from an annual average of 740.4 thousand t in 2000-06 to 609.2 in 2007-2013 (-17.7%).

In recent years several changes in the EU import regime for bananas took place with significant (immediate and future) trade creation as well as trade diversion effects.

The EU import quotas regime for bananas was modified several times over the years, including in 1994, 1998 (when country allocations within the import quota for ACP exports were eliminated) and 2001 (when import licenses allocated based on historical volumes imported were replaced by a quota administration based on a 'first come, first served' system). The quotas were eliminated altogether in 2006 for MFN imports and in 2008 for imports from ACP countries. These changes significantly affected the structure of the banana market and the distribution of the value among the actors involved. The elimination of country allocations within the quota for ACP countries increased the power of traders holding the licenses and reduced the power of producers and exporters (license holders became free to shift from one ACP country to another as a source of the bananas they traded, and saw their quota rents increase). The elimination of quota licenses and the introduction of the 'first come, first served' system radically changed the distribution of quota rents and canceled the strong market power of (former) license holders, creating new opportunities for non-traditional traders. Finally, the elimination of the quotas canceled quota rents altogether[2] as well as residual rigidities of the EU import regime for bananas, allowing for even more opportunities for non-traditional trade links to develop. Changes in the administration system of the quota for ACP countries and, eventually, its elimination, favoured relatively new, more competitive, banana exporters among the countries in this group. It also changed the competitive environment within each country, making it possible for firms which were not integrated with multinationals and did not own quota licenses to export bananas to the EU without having to buy them, or, later, to compete with multinationals for in-quota exports. For example, in Cameroon this was the case of SPM, which significantly expanded its share of the country's total exports after the reform of the quota system in 2001 (Table 1).

With the Everything But Arms (EBA) initiative the EU granted duty-free and unlimited market access to all imports, except arms and ammunitions, originating in Least Developed Countries (LDC). Since 1 January 2006 EU banana imports from LDC enter the EU tariff-free and without any quantitative limitation. So far the EBA initiative has not generated significant results in terms of increased LDC banana exports to the EU. Analyses converge in judging the trade preference granted, albeit considerable, insufficient to enable LDC overcome other factors, linked to both costs of production and product quality, which make their banana exports to the EU not competitive.

On 1 January 2006 the EU introduced a 'tariff only' import regime for bananas, removing the TRQ for imports under MFN conditions (the TRQ was equal to 3,113,000 t, with imports within the

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[2] Estimates of quota rents vary widely (Anania 2006; Cogea 2005; FAO 2005). Anania (2006) estimated them to equal in 2002 94 US$/t for the MFN quota and 56 US$/t for the ACP one.

quota subject to a 75 €/t import tariff and out-of-quota imports subject to a 680 €/t prohibitive tariff), setting the MFN tariff at 176 €/t and expanding the duty-free quota reserved for imports from ACP countries from 750,000 to 775,000 t (out-of-quota exports became subject to the 176 €/t MFN tariff). The 'tariff only' import regime increased significantly access to the EU market for MFN bananas by introducing a tariff which implied a lower degree of market protection and by removing rigidities associated to quota licenses and eliminating quota rents. The introduction of the 'tariff only' import regime changed the competitiveness of ACP bananas on the EU market *vis a vis* MFN exporters. It had a large 'trade creation' effect. EU-27 imports from MFN countries expanded from a level in 2000-2005 very close to the 3,113,000 MFN quota to 3.6 million t in 2006, 3.9 in 2007 and over 4 million t in 2008; in 2009, 2010 and 2011 imports declined, also as a result of the changes which occurred in the import regime for ACP countries (see below), but nevertheless remained well above their levels before 2006 (Table 2). These figures seem to confirm the results of *ex ante* analyses which found that, contrary to the WTO ruling in the 2005 arbitration, the new import regime for bananas unilaterally introduced by the EU in 2006 was to expand market access for MFN banana exports (Anania 2006). Until 1 January 2006 ACP country exports outside the duty-free quota were subject to a preferential tariff of 360 €/t, while with the introduction of the 'tariff only' regime the tariff imposed on out-of-quota ACP exports became the now much lower MFN tariff, i.e. 176 €/t. As a result, under the new regime ACP country exports also expanded, from 765 thousand t in 2005 to 891 in 2006 and 845 in 2007.The fact that in 2006 and 2007 around 15 percent of ACP banana exports to the EU occurred subject to the MFN tariff implies that some of the ACP countries had developed a capacity to produce and market bananas competitively with MFN countries. ACP countries which experienced a rapid expansion of their banana exports to the EU following the changes in its import regime are the Dominican Republic, the largest ACP exporter of bananas in most recent years, with a 30.5% share in 2013, and, on a much smaller scale, Ghana, which emerged from being a marginal player until 2005 (0.6% of ACP exports to the EU) to exporting close to 50,000 t (4-5% of ACP exports) since 2010. The exploit by Ghana is largely due to the involvement in the banana sector in that country of Compagnie Fruitière, a multinational company partially owned by Dole. At the other end of the spectrum there are traditionally important ACP exporters which saw their capacity to compete on the EU market rapidly erode over the years, including Dominica (from 28,000 t exported in 1999 to 1,000 in 2013), Jamaica (exported 52,000 t in 1999, is not exporting bananas any more) and St Lucia (from 66,000 t in 1999 to 12,000 in 2013).

While the effects of the introduction of the 'tariff only' regime by the EU on volumes traded are those one would have expected, it is less so when the impact on prices is considered. We consider

the evolution of the price paid for the bananas exported to the EU between 2000 and 2011 in three countries: Ecuador, by far the largest exporter of bananas, and two much smaller exporters, but still among the top 10 world largest exporters of bananas: Cameroon, where the industry is totally controlled by a single multinational (this will be discussed in section 3); and the Dominican Republic, whose banana exports have been always involving non-traditional trade chains, with a significant role played by exporters and importers different from large multinationals. Prices paid for banana exports to the EU are represented by average unit values (AUVs) both at the EU border and at the country's own border; AUVs in US$ are considered for Ecuador and the Dominican Republic, while values in Euro are used for Cameroon. In the case of Ecuador changes in the price at the EU border do not seem to transmit to the price received at its border, and this is true both before and after the introduction by the EU of the 'tariff only' import regime (Figure 1). The large increases in the price recorded at the EU border between 2000 and 2005 (+68.3 % in five years) do not translate in increases in the AUV at the border of Ecuador, which remains almost constant (+10.5 %). The decline in the AUV at the EU border in 2006 (-6.3 %) is of an order of magnitude one would have expected because of the reduction in EU market protection, while the corresponding increase in the AUV at the border of Ecuador (+7.6 %) is probably somehow smaller than expected.[3] International price transmission in this case appears to be low. The increased difference between the two AUVs between 2000 and 2007 can have two very different explanations: an increase by the same order of magnitude of international transportation and transaction costs, or international traders capturing the benefits from the increased price paid at the EU border. There is no evidence of increased international transportation and transaction costs in the years considered. A similar pattern emerges when the prices of banana exports from Cameroon are considered. The AUV of bananas at the border of Cameroon remained constant through the implementation of the 'tariff only' regime and the first two years of the unrestricted duty-free export regime it was granted with the EPA. The reduction of the price at the EU border in 2006 and 2007 as a result of the increased market access given to MFN importers and the expansion of exports from ACP countries as a whole, did not translate in a decline in the price received by Cameroonian bananas at the country's border (Figure 2). While the price in euro paid for Cameroon bananas at the country's border shows a very limited variability between 1999 and 2009, the price recorded at the EU border shows a significantly higher variability (Figure 2), the difference between the two prices being highly correlated with the price at the EU border. Again, this pattern can have two explanations: it can either reflect fluctuations in international transportation and transaction

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[3] Very similar patterns emerge if prices in euro, instead of US$, are considered.

costs, or it can reflect the fact that the multinational firm handling Cameroon's exports was keeping the price paid to its suppliers relatively stable while 'absorbing' in its margins positive and negative fluctuations of the price at the EU border. Finally, a quite different pattern emerges when the analogous prices for bananas exported to the EU by the Dominican Republic are considered (Figure 3). In this case, contrary to what has been observed for Ecuador and Cameroon, the AUVs at the country's border and at the EU border appear to move together.

On 1 January 2008 the EU implemented the interim EPA it negotiated with ACP countries. The EPAs will progressively remove barriers to trade between the EU and several groupings of ACP countries in a bid to create free trade areas compliant with WTO rules. All agricultural exports from those ACP countries which have successfully concluded the negotiations are allowed duty-free and quota-free access to the EU. Bananas, along with sugar and rice, have been indicated as the agricultural commodities for which most of the export benefits of the EPA for ACP countries are to be gained. The EPA greatly increased the trade preferential margin enjoyed by ACP bananas on the EU market. As a result, ACP banana exports to the EU increased significantly: from 845 thousand t in 2007 to 921 in 2008, 961 in 2009, over 1 million t in 2010, 984,000 in 2011, 982,000 in 2012 and 1,059,000 t in 2013 (Table 2). ACP share of the EU market increased at the expenses of that of MFN countries, from 17.7% in 2007 (the lowest value since 1999, as a result of the introduction of the 'tariff only' import regime for MFN exporters), to 18.6% in 2008, 20.8% in 2009, 22.3% in 2010, 20.9% in 2011, 21.6% in 2012 and 21.9% in 2013 (Table 2). MFN exports to the EU in 2008-2013, i.e. after the implementation of the EPA, (on average 3.721 million t) remained slightly below the levels reached in 2006 and 2007 (on average 3.740 million t). The net effect for ACP countries as a whole of the two subsequent changes in the EU import regime – the introduction of the 'tariff only' import regime for MFN countries and the 'interim' EPA – appears to have been positive, i.e. the increased preference granted to ACP countries through the elimination of the quota seems to have been able to more than compensate the preference erosion which occurred with the implementation of the 'tariff only' regime for MFN banana exports. In fact, ACP banana exports to the EU in 2012-2013 (with both changes in the EU import regime for bananas in place) were 32% higher than those in 2004-2005 (before the changes). Analogously, considering longer periods to make the comparison, ACP average yearly exports increased from 765 thousand t in 2000-2005 to 868 in 2006-2007 and to 989 in 2008-2013. Thanks to the 'trade creation' effect of both policy changes, MFN exports also increased between 2004-2005 and 2012-2013, although by a smaller percentage (+13%) with respect to ACP exports. MFN share of EU imports, which remained always above 80% between 1999 and 2008, was below this threshold after then.

Again, while the observed impact of the EPA on volumes traded is what could have been expected, this is not the case for prices. If we consider the AUV of bananas exported from Ecuador to the EU at the two borders (Figure 1), we see that in 2008 the AUV at the EU border did not decline, but rather increased and remained relatively stable afterwards. On the contrary, the AUV at the border of Ecuador, which only slightly increased between 2000 and 2007, increased significantly for three years in a row (+22.7 % in 2008, +15.4% in 2009 and + 16.2% in 2010). These increases not being explained by a stiff reduction in international transportation and transaction costs, means they can be due to actors in the exporting country having been able to seize part of the margins previously held by actors in the international links of the chain. Also in the case of Cameroon the linkage between the prices at the two borders appears to change in most recent years, while, on the contrary, the AUVs at the country border and at the EU border for Dominican Republic exports appear to move together along the entire 2000-2011 period. What the different patterns observed for Ecuador, Cameroon and Dominican Republic and the structural change observed for Ecuador in more recent years seem to suggest is that the transmission of variations in the price paid at the EU border to the price at the exporter's border is higher the more limited the role of large multinationals in handling the country's exports.

In December 2009 Latin American exporters, the US and the EU reached an agreement to bring to an end the long-standing 'banana war' at the WTO, dating back to 1996. The agreement called for a progressive reduction of the EU MFN tariff on bananas from 176 to 114 €/t between the signing of the agreement and 2019, with an immediate 28 €/t tariff cut and subsequent cuts thereafter (Table 3). This agreement implies a significant progressive erosion of the tariff preference granted by the EU to bananas from ACP countries, from 176 €/t in 2009 to 114€/t in 2019, a reduction in 2019 by 62 €/t . The expected effects of the progressive reduction of the MFN tariff are two-fold: a trade creation effect, i.e. an increase of EU banana imports, and a trade diversion effect, i.e. a decline of ACP banana exports to the EU and an increase of MFN exports (with the increase in MFN exports being larger than the decline in ACP exports). Simulations of the expected effects of the implementation of this agreement suggest that the erosion of ACP preferences will be significant but will not be such that all benefits deriving from the EPA be wiped out, i.e. ACP banana exports to the EU are expected to remain in 2019 above those which would have occurred if neither the EPA or the WTO 2009 agreement were in place (Anania 2010a).

Finally, in 2010 the EU concluded an Association Agreement with six Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama) and Trade Agreements

with Colombia and Peru; a similar trade agreement has been reached with Ecuador in July 2014. From the perspective of the American countries, the provisions on bananas are considered among the key elements in these agreements. In the agreements reached in 2010 EU concessions on bananas are the same for all eight countries: the EU agreed to progressively reduce its import tariff on bananas originating in these countries to 75 €/t by 1 January 2020 (Table 3). In the absence of any agreement, the import tariff to be applied to their exports in 2020 would have been 114 €/t (the MFN tariff). This means that the new regimes introduce for these countries a preferential margin with respect to MFN banana exports which will increase progressively from 3 €/t in 2010[4] to 39 €/t from 2020 on (Anania 2010b) (Table 3). This implies an even larger preference erosion for ACP banana exports *vis a vis* those from these countries than *vis a vis* banana exports subject to MFN conditions. However, with the implementation of the agreement with Ecuador, only a very small portion of EU banana imports will occur at MFN conditions. The additional erosion of the preference for ACP banana exports will progressively increase from 8 €/t in 2013 to 39 €/t in 2020. A 'safeguard' clause ('stabilization clause' in the language of the agreements) will apply until 2020 to prevent larger than anticipated increases in EU banana imports (Anania 2010b). Due to this clause, most of the effects on banana trade of the progressive preferential reduction of the tariff applied by the EU on its imports from the countries involved are likely to unfold only after 2020, when it is due to expire.

Developments in the EU import regime for bananas did have a significant impact not only on trade volumes and trade flows, but also on the distribution of power in the banana market. Trade volumes expanded as a result of the progressive lowering of the protection of the EU market; trade flows have been affected in opposite directions by subsequent modifications of the relative profitability of MFN bananas vs. ACP bananas resulting from changes in the EU import regimes relevant for the two groups of countries; the market power of large multinationals and the large rents extracted by traders have been significantly reduced and eliminated, respectively, by the progressive relaxation and, eventually, the elimination of EU import quotas.

2.2 *The revolution in banana shipping: from dedicated reefers to refrigerated containers*

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[4] In the case of Colombia, Peru, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama the tariff reductions were actually implemented in 2013, after the ratification of the agreements by the parties involved. However, the tariffs applied were those originally foreseen in the agreements for the specific year. The agreement with Ecuador has not been ratified yet; in the case of Ecuador the preferential import tariff to be applied between 2014 and 2019 is 1€/t higher than the tariff applied on banana imports from the other countries, while from 2020 on it will also be equal to 75 €/t.

Traditionally bananas were shipped in dedicated reefer vessels, with the international transportation link of the chain being controlled by the large multinationals trading bananas, which either directly owned or chartered the reefers. Relatively recently, some of the largest operators in the world shipment industry, e.g. Maersk and MSC, introduced refrigerated containers. These can be loaded on the ship along with containers filled with goods different from bananas, while reefers are filled with bananas only, allowing the possibility to export small quantities of bananas using commercial lines. Refrigerated containers can hold bananas in good conditions for more than 30 days and significantly reduce post-harvest handling costs[5] and damages to the fruit. In fact, bananas can be stored in the refrigerated containers directly at the packing facility in the field, with no additional handling of the individual pallets until they arrive at the ripening facility in the importing country. In 2009 about 1/3 of the bananas traded internationally were shipped in refrigerated containers, a share which has been consistently increasing over the years (Arduino *et al.* 2013; Bright 2012; FAO 2014). Despite a growing banana world market, the number of reefers declined by 8% between 2000 and 2008 and by an additional 19% between 2008 and 2013 only (Agritrade, 2 July 2012; Arduino *et al.* 2013).

The introduction of refrigerated containers significantly affected the structure of the value chains for bananas by reducing barriers to entry in the trading link, making it possible for small and medium operators in producing and importing countries to export and import relatively small volumes of bananas without having to rely on space in conventional reefer vessels controlled or directly owned by large multinational firms.

2.3 *The changing role of multinationals and retail industry*

A large share of banana trade is concentrated in a very small number of multinational companies. 40% of world banana trade in 2013 was handled by four companies only: Chiquita (13%), Del Monte (12%), Dole (11%) and Fyffes[6] (6%) (FAO 2014). However, this share has been declining over time; the same four companies controlled 65% and 60% of world banana trade in 1980 and 2002, respectively: Chiquita 29% and 22%, Del Monte 15% and 20%, Dole 21% and 16%, and Fyffes a marginal share in 1980 and 4% in 2002 (FAO 2003). In recent years around 10% of world trade has been in the hands of a small number of newcomer "Russian companies" controlling the rapidly grown Russian market (Bananalink 2011).

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[5] According to Arduino *et al.* (2013) transport costs for bananas shipped by refrigerated containers are slightly higher than for those transported in traditional reefer vessels.
[6] In March 2014 Chiquita and Fyffes announced the intention to merge.

Chiquita, Del Monte and Dole are highly vertically integrated. Not only they handle exports and imports, but also produce bananas in their own plantations, have their own fleets of vessels to transport bananas around the globe and are active in the banana ripening sector in importing countries. However, over the years they gradually shifted from directly producing a significant share of the bananas they traded to purchasing bananas from large producers under multi-annual contracts, concentrating their attention on the shipping, ripening, international trading and marketing links of the chain.

The elimination of the EU import regime based on import quotas, administered based on import licenses allocated to traders on a historical basis, significantly reduced the capacity of multinational companies to prevent new actors from entering the market and to capture a large portion of their margins by imposing high prices for the quota licenses.

Large retailer chains are often indicated as able to dictate quality standards and to determine, by a large extent, their acquisition prices for bananas. Some of them also started buying bananas directly from independent exporters and producer cooperatives in producing countries, bypassing multinational firms altogether. This is the case, for example, for a significant share of organic and Fair Trade banana exports from the Dominican Republic.

Developments in the retail sector in importing countries, with the rapidly increasing concentration of the industry, an increasing volume of bananas being shipped in refrigerated containers, and the end of the EU import regime based on quota licenses, all have contributed to the progressive reduction of the capacity of multinational companies to exercise market power.

2.4 Undifferentiated vs. quality-differentiated bananas

For most consumers 'a banana is a banana', i.e. it is perceived as a largely undifferentiated good.[7] Bananas being perceived as an undifferentiated 'commodity' reduces the negotiating power of producers and exporters *vis a vis* traders and importers and, for the same reasons, increases that of retailers *vis a vis* their suppliers. Effective product differentiation makes sales expand, increases the value of the product at the end of the chain (the price paid by the final consumer) and creates necessary conditions to increase the share of the value captured by actors at the opposite end of the chain (producers and other actors in the country where bananas are produced). Producing organic, otherwise environment-friendly grown and Fair Trade bananas has been a major way to try to differentiate bananas with respect to undifferentiated ones in the eyes of more educated, higher

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[7] In certain markets bananas from Chiquita are identified by consumers as having relatively higher quality characteristics, which translates in a small price premium.

income consumers in developed country markets. Sales of organic, Fair Trade and dual certified - organic and Fair Trade - bananas (in 2013 34% of Fair Trade bananas were also certified organic) have been consistently increasing over time. One third of the bananas sold in the UK in 2011 were Fair Trade bananas. Fair Trade bananas amounted only to 373,000 t in 2013 (310,000 t in 2008, 332,000 t in 2012), i.e. around 3.5% of the bananas traded internationally; nevertheless, they are the second largest Fair Trade product in market value (the first one being cut flowers). In many developed countries bananas are the most important Fair Trade product sold on the market. This occurred because some large retailers decided to promote Fair Trade bananas to respond to growing consumer concerns about the exploitation of plantation workers and smallholder producers by large multinationals. In this respect, an important step was the decision in 2007 by Sainsbury's to convert to selling Fair Trade bananas only. While the fact that the often relatively small price premium paid for organic and environment-friendly bananas does actually translate in higher profits for producers is sometimes being questioned, there is little doubt about benefits accrued by producers in terms of increased exports. In the case of Fair Trade bananas, in addition to the price premium received by smallholders, benefits are also in terms of higher salaries and improved working conditions for plantation workers, and social services for both smallholder producers and plantation workers.

Fair Trade and organic banana production constitutes the most important single factor explaining the rapid increase in recent years of volumes exported and market shares of some of the relatively smaller banana exporters, such as the Dominican Republic (today the largest supplier of Fair Trade bananas, was a marginal exporter of bananas in 1990; it exported 355,000 t of bananas in 2013, most of them certified Fair Trade) and Peru (124,200 t exported in 2013). Other large exporters of Fair Trade bananas are Colombia and Ecuador .

2.5 Safety and quality standards

Private standards set by the retail industry are significantly more stringent than the legal ones put in place by importing countries. For large producers satisfying these standards is a problem in terms of the costs involved, not in terms of the ability of the firms to abide by the constraints on production practices and to meet required quality standards. On the contrary, for smallholder producers the standards to be satisfied constitute a barrier to entry they may, or may not, be able to comply with, depending on a series of factors, some related to the characteristics of the specific farm, others to the socio-economic and institutional environment (for example, effective technical assistance and access to inputs being provided by the domestic buyer of the bananas or by the cooperative the farm belongs to).

2.6 The increasing diversification of banana value chains

Value chains in the banana market can be differentiated along two, partially interrelated, dimensions: who manages the international trade link and the degree of product differentiation. As a result of the developments in the global banana market in recent years discussed above, three broad 'archetypes' of value chains can be identified:

- *'Traditional'* value chains, characterized by the central role played in international trading, ripening and marketing by a large multinational. Production occurs in large plantations, either directly owned by the multinational or under a multi-year contract with an independent firm, often with the direct involvement of the multinational in the management of production activities. The multinational also provides shipping and ripening services. In many markets the price paid by the retail sector is the result of bargaining between multinationals and retail chains, in a complex oligopoly/oligopsony setting. This value chain is characterized by a very high level of vertical integration/coordination. Once the price paid by the retail sector is set, the distribution of the value of the bananas traded is largely determined by the multinational. When production takes place in independent firms, the multinational uses its market power to set the price paid to its suppliers as low as possible under the constraint of making it profitable for them to stay in business. 'Traditional' value chains are still the predominant ones in the world banana market.

- *'Innovative'* value chains, characterized by the role played in the international trading link by an actor different from a traditional large multinational. This is often a relatively small operator, located in the exporting or in the importing country. If it is active in the exporting country, it is often a firm directly involved in large scale production, although the share of the bananas it trades which are produced in its own plantations tends to decline over time. It deals only with bananas produced within the country, mostly by large and medium size plantations; when this is not the case the supplier is a producer organization or a cooperative. Its counterpart in the importing country is also a relatively small operator, often with its own ripening facilities. If the trader is active in the importing country instead, it often uses its own ripening facilities, while it buys transportation services. It deals with bananas from different origins. In both cases bananas are more often shipped in refrigerated containers. Vertical coordination in this chain is more complicated than in a 'traditional' one, which makes relations along this chain more volatile. The distribution of value may or

may not be more equitable. While the 'traditional' chains still represent a large majority of the industry, 'innovative' value chains have been rapidly growing in importance.

- '*Product-differentiated*' value chains, characterized by the specific quality characteristics of the bananas - such as them being organic and/or Fair Trade - which makes them different from 'undifferentiated' bananas for a specific segment of consumers in developed countries. Production occurs in large plantations as well as in smallholdings grouped in cooperatives. The cooperative, or the producer association, provides small producers with technical assistance, inputs, sorting and packing services and takes care of the contractual arrangements with the buyer. Exports often occurs either directly, by large cooperatives or plantations, buying transportation services and selling to an importer, or buying also ripening services and trading directly with the retailers. Alternatively, bananas are sold to a local exporter taking care of all other activities along the chain. Also in this case international shipping more often occurs using refrigerated containers. For this value chains 'trust' among actors is a crucial factor, as informal relations are important. Multinationals are marginally involved in 'product-differentiated' value chains, as they consider conventional bananas their core business. The distribution of value among the actors in these value chains appears more equitable than in the other two. 'Product-differentiated' value chains constitute a small portion of the world banana market.

These three value chains being 'archetypes', other chains exist which are a mixture of their different characteristics.

3. The Cameroon banana sector

The interest in focusing on the Cameroon banana industry as a case study relies on the fact that it constitutes a showcase example of a 'traditional' value chain. In fact, in Cameroon the banana exports industry is characterized by the central role played by a single multinational, able to coordinate - and, to a large extent, control – the activities of the entire industry in the country. This makes it an example which can be used as a benchmark to analyse the functioning of chains which see a less pervasive presence of multinationals.

Cameroon is among the main exporters of bananas; in 2012 (the most recent year for which the volume of Cameroon banana exports is reported in the UN Comtrade database) with 231,800 t and a mere 1.5% of the world market, it was the seventh largest exporter.

All dessert bananas produced in Cameroon are meant to be exported. In fact, bananas sold in the domestic market are bananas which are unfit to be exported because of their low quality - mostly because of their size, shape or appearance; it is estimated that around 10-15% of bananas are rejected at the sorting controls taking place at the packing facilities and sold on the spot to local traders to be distributed in the domestic market. Dessert bananas are also produced in small plots for home consumption.

Production of dessert bananas in Cameroon is extremely concentrated; in the recent past four firms produced virtually all bananas exported from the country: the Societè des Plantations du Haut Penja (PHP), Cameroun Développement Corporation (CDC), BOH Plantations Limited (BPL) and the Groupe Société des Plantations de Mbanga (SPM), while production by smallholder producers is insignificant.

The PHP group is the largest operator with 57% of total Cameroon banana exports in 2014, 152,000 t, and a share which between 1993 and 2014 always remained above 40% (Table 1). The group includes two companies, PHP itself and SBM. PHP is entirely owned by the Compagnie Fruitière de Participation, a French-American company owned by the French Fabre family (60%) and by Dole (40%). PHP controls (51%) the SBM company, with Cameroon investors and the Italian firm Simba owning the remaining 13% and 36%, respectively.[8] Compagnie Fruitière has been present in Cameroon since the early 1980s; it is also a major player in the banana sector in other countries in the region, mainly Ivory Coast and Ghana. PHP main business is, by large, bananas, but it also exports from Cameroon flowers and pepper. All PHP bananas are GlobalGAP and ISO14001 certified,[9] while 800 out of the 3,300 ha it farms and four of its packing facilities are Fair Trade certified; PHP bananas also meet Tesco's 'Nature's Choice' quality standards, a private standard which is more restrictive than GlobalGAP in terms of the chemicals which can be used. PHP is strongly pushing for the introduction of an 'African' label for high quality bananas from the West Africa region (Cameroon, Ivory Coast and Ghana), an umbrella quality assurance certification to be used in conjunction with private firm labels. PHP pays its employees a salary which is significantly above the minimum they are entitled to. Compagnie Fruitière owns ripening facilities in several European countries and African Express Line (AEL), a sea shipping company operating a reefers fleet. PHP is in the process of expanding banana production by increasing its farmed land by almost 25%. PHP is currently providing, on a contractual basis, CDC and BPL, the only two other firms

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[8] From now on the PHP acronym will be used to refer to the group as a whole.
[9] ISO14001 is an international certification of the firm having in place an effective environmental management system.

producing bananas in the country at the moment, with technical assistance in the field. In addition, Compagnie Frutière handles, on a commission base, all BPL exports and part of those by CDC.

Cameroun Développement Corporation (CDC) accounts for around 40% of Cameroon banana exports. In 2013 and 2014 it exported more than 100,000 t, a volume larger than in the previous years but below those at the beginning of the past decade. CDC is a public firm owned by the Government of Cameroon. It is one of the largest firms in the country and the largest employer after the State. CDC operations are concentrated in agriculture, mostly in producing and exporting bananas, palm oil and rubber. CDC banana plantations cover close to 3,900 ha (16,000 ha are devoted to palm oil production, 24,000 to rubber). The Government has been trying to privatize CDC since 1998, a process which did not succeed so far and has left CDC management with a very uncertain medium term scenario, with negative effects on investment decisions, including those related to banana rotation plans and drainage management, and, as a result, on productivity (CDC yields are lower today than at the beginning of the past decade). A large portion of CDC plantations is characterized by relatively poor soil quality and high rainfall, which creates conditions favourable to the spread of black sigatoka.[10] CDC employs 6,500 people in its banana operations. Workers receive a salary which is above the minimum they are entitled to by law. From 1988 until 2011 CDC was active in close partnership with Del Monte Fresh Fruit, which was providing technical assistance in the area of production and was exporting most of CDC bananas at a fixed pre-determined FOB price out of the Douala port. When the agreement with Del Monte expired (Del Monte was not willing to renew it), CDC bought for few years technical assistance services from SPM; now it receives technical assistance from PHP. Bananas sold through Del Monte were labelled 'Del Monte Cameroun'. Some of CDC exports were also taking place under the label 'CDC banana'. CDC launched its own brand of high quality bananas ('Makossa') in 2010. CDC is currently still marketing 3,000,000 boxes of bananas (the equivalent of 54,400 t) per year via Del Monte (at a pre-fixed FOB price, set yearly) and the rest of the production, including the Makossa labelled high quality bananas, through Compagnie Fruitière (on a commission basis). The Makossa bananas are mostly sold in Southern France, where consumers started giving recognition to the label. All CDC bananas are certified GlobalGAP. CDC used for a limited period of time in the past refrigerated containers to ship its bananas, when it was offered by Maersk an economically very advantageous deal (motivated by the need by Maersk to fill and bring back to Europe a large number of containers which were left unused in countries along the South-West African coast).

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[10] Black sigatoka is a disease which is spreading globally and causes up to a 50% loss of fruit. It can be controlled only by frequent applications of fungicides, although the prompt removal of affected leaves and good drainage significantly help.

While CDC did not consider obtaining the Fair Trade certification for its bananas in the past - Del Monte never saw this as a strategy worth pursuing – it is considering it now. CDC is currently expanding the land devoted to banana production.

The Société des Plantations de Mbanga (SPM) group has been an important actor in the Cameroon banana industry, with close to 16% of country exports in 2007. Since then the group has been facing severe financial problems which significantly effected its activities (exports dropped from almost 40,000 t in 2008 to 28,800 t in 2010 and to 11,800 in 2013) and forced a stop of production and export activities altogether in January 2014 (Table 1). SPM plantations cover around 1,100 hectares. SPM is a private-public company, with the largest shareholders being French investors (49%) and the remaining shares being in the hands of the Government of Cameroon, Maersk and others. SPM used to export its bananas through Compagnie Fruitière.

BOH Plantations Limited (BPL) is a newcomer on the Cameroon banana industry scene. It started operations in 2008 and currently produces bananas on 300 ha (it has an option to expand production over 1,000 ha). It exported bananas for the first time in 2012. In 2014 it exported 12,000 t of bananas, 4.5% of total Cameroon exports. The sole owner, a Cameroonian entrepreneur, was not active in agriculture before (his main interests are in constructions and public works). BPL started operation receiving technical support by SPM, with very disappointing production and economic results. Since April 2013 it is technically supported by PHP and its yields increased significantly already after the first few months (from 21 t/ha to 40 t/ha). PHP helped also improve banana quality and reduce production costs. BPL sells its bananas through Campagnie Fruitière on a commission basis. BPL might in few years become a significant actor in the Cameroonian banana industry expanding its share of exports to around 10%.

As a result of the strong preferential tariff margin enjoyed on this market, virtually all Cameroon exports are shipped to the EU. Since 2000 this market alone has absorbed a share of Cameroon banana exports which remained between 97.4% and 100%. While Cameroon has been clearly benefitting from the EPA regime, it has not been able so far to take full advantage of the more favourable market access it has been granted, due to the increasing relative competitiveness of other ACP exporters. The main factors which could explain the decline in the relative competitiveness of Cameroon *vis a vis* emerging ACP banana exporters seem to be (i) higher production and domestic transaction and handling costs and (ii) the limited capacity of the industry in Cameroon to differentiate its bananas with respect to those of the competitors (as mentioned above, the success of the Dominican Republic is largely based on the fact that a large share of its banana exports are

organic, and a significant portion both organic and Fair Trade certified). However, production of organic bananas in Cameroon is made very difficult by environmental conditions and the need to control the black sigatoka disease.

Productivity has always been considered an issue in banana production in Cameroon. Reaching yields of 50-60 t/ha has often been indicated as an industry goal per se, regardless of production costs and product quality considerations. PHP did consistently show higher yields, while CDC and SPM have been lagging behind, partially as a result of under-investment, due to the uncertain medium term scenarios for CDC and the severe financial problems faced for SPM. The technical assistance now provided by PHP to CDC is expected to generate significant efficiency gains.

Recent developments in the industry, with the end of the close link between CDC and Del Monte and the recent cooperation agreement between CDC and PHP, strongly strengthened both the horizontal and vertical integration of the industry in Cameroon, with a strategic role played by PHP and Compagnie Fruitière. PHP is currently providing technical assistance to both the other firms in operation, is selling a significant portion of the bananas exported by CDC and the entire production of BOL and is handling the shipment (by reefers) of all banana exports from the country. While this assures an easier and more efficient vertical coordination – from production practices in the field all the way to the supermarket shelf – which is in everybody's interest, it also poses evident questions from the point of view of the distribution of the value of the bananas among the actors involved along the chain. While all actors currently share an interest in expanding production and exports, reducing production costs, improving product quality, increasing product differentiation/reputation at the retail level, reducing transaction and handling costs within the country, and maximizing support to the industry (coming from the national Government as well as from generous financial assistance provided by the EU), the interest of Compagnie Fruitiére is to maximize its own profits, which include those of AEL (its own reefers shipping company) and of its ripening operations, while making banana production by the other firms profitable enough for them to decide to remain in business. In its decision making it also takes into account the non-trivial spill-over effects of developments in the banana sector in Cameroon on the profitability of its banana operations in other countries, including Ivory Coast and Ghana (e.g. possible benefits from the introduction of an 'African' label for high quality bananas produced in the three countries, and implications for transportation costs, due to the fact that banana exports from the three countries are loaded on the same reefers, owned by AEL, stopping at different ports along the route).

All things considered, the overall positive development which took place in the banana sector in Cameroon over the years is to be attributed in a significant part to the role played by Compagnie Fruitière, which, by making its own interests also helped the growth and consolidation of the industry. Recent developments may bring in the future a stronger position of Cameroon in the world banana market, but this result will be highly dependent on the strategic decisions made by Compagnie Fruitière.

4. A model of the value chain of Cameroon banana exports

In this section a simple model is presented which includes, in a simplified manner, the main features of the value chain of banana exports from Cameroon discussed above. The model is used to derive the expected effects of changes in internal as well external drivers - such as changes in production technologies, transportation technologies, and fiscal and trade policies - on the distribution of the value among the different actors active along the chain.

The model includes four links - production, export and international transportation, import and ripening, and retailing - and is defined making the following simplifying assumptions, which take also into account the characteristics of the banana export sector in Cameroon described above:

(a)   bananas are an undifferentiated product;

(b)   there are two firms producing bananas in the exporting country considered, one (*M*) is owned by a multinational firm (MF), the other is an independent firm (*I*);

(c)   production costs are identical in the two firms and production occurs at an increasing marginal cost;

(d)   the multinational firm has full information on all elements of the market, while the independent firm has information only on firms' production and production costs, on the price paid by retailers in the importing country and on the price received by *M*;

(e)   MF handles only bananas produced in the specific country considered;

(f)   individual firms owned by MF are responsible for exporting, shipping, importing, ripening and selling to retailers the bananas produced by *M* and *I*, as no other provider of these services exists; these firms operate under increasing return to scale;

(g)   firm *I* receives a price given by the price paid by the retailers less the import tariff and the export, transportation, import and ripening charges by the firms owned by the multinational firm active at different links of the chain; because of the assumption made on the information firm *I* has access to, the same price has to be paid for the bananas produced

by *M* and *I* (otherwise firm *I* would be able to infer the costs incurred by the firms providing export and international transportation, and import and ripening services);

(h)   MF operates under the constraint that profits in each of the firms it owns remain non-negative;

(i)   the firm providing export and shipping services has its legal headquarter in a country were profits are not taxed, while they are in the countries where bananas are produced and where the firm providing import and ripening services is legally based. This assumption is meant to simplify the solution of the problem; MF will concentrate all its profits in only one of the firms it owns, and this restricts its decision variables to one, avoiding the complication of the existence of multiple optimal solutions;

(j)   there is only one import market, with the importing country imposing an import tariff; this is a specific tariff, i.e. a fixed sum per unit of bananas imported;

(k)   the export, shipping, import and ripening capacity of the firms involved in these activities is large enough not to be binding for the solution of the model;

(l)   the demand by the retail sector in the importing country for the bananas exported by the country considered is infinitely elastic at the given acquisition price, which is determined *ex ante* by the retailer (assumed to have no information on the value chain);

(m)   all actors maximize short term profits.

Based on these assumptions, the model can be described as follows:

Let *M* and *I* be the two firms producing bananas in the exporting country considered. They produce Q_M and Q_I units of bananas, respectively, with identical production costs $PC(Q_i)$, i= *M, I* ; with $\partial PC_i / \partial Q_i > 0$ and $\partial^2 PC_i / \partial Q_i^2 > 0$, $\forall Q_i > 0$.

All bananas produced are exported, hence country's total exports Q equal $Q_M + Q_I$.

If p_F is the price (net per unit revenue) received by both domestic firms producing bananas, their profits are given by:

$$\pi_i = [Q_i p_F - PC(Q_i)] (1 - \tau_{PROD}) , \quad i = M, I \tag{1}$$

where τ_{PROD} is the rate at which profits are taxed in the exporting country.

Firm MT provides export and international transportation services to *M* and *I* incurring costs $TC(Q)$, where $Q = Q_I + Q_M$, with $\partial TC / \partial Q > 0$, and an average cost which declines as Q

increases (i.e. with $TC(Q)/Q > \partial TC/\partial Q$, $\forall Q_i$). MT charges M and I c_{TR} per unit of bananas exported. Its profits (in the country where MT is legally based profits are not taxed) are given by:

$$\pi_{TR} = Q\, c_{TR} - TC(Q).$$
(2)

Firm MR is based in the importing country and provides both M and I with import and ripening services. It operates with costs $RC(Q)$, with $\partial RC/\partial Q > 0$ and $RC(Q)/Q$ decreasing as Q increases. MR charges M and I c_{RIP} per unit of bananas imported and ripened. Its profits are given by:

$$\pi_{RIP} = [\, Q\, c_{RIP} - RC(Q)\,]\,(1 - \tau_{IMP}).$$
(3)

where τ_{IMP} is the rate at which profits are taxed in the importing country, where MR is legally based.

Under the assumptions made regarding the information available to firm I, the following price linkage equation holds:

$$p_F = p_{RET} - c_{TR} - c_{RIP} - t,$$
(4)

where p_{RET} is the price paid by the retailers per unit of bananas and t is the per unit specific tariff imposed by the importing country.

In equilibrium firm I will maximize its profits by solving the problem:

$$\text{Max } \pi_I = [Q_I\, p_F - PC(Q_I)\,]\,(1 - \tau_{PROD}), \text{ with}$$
(5)

$$\text{FOC: } \partial \pi_I / \partial Q_I = [\, p_F - \partial PC_I / \partial Q_I\,]\,(1 - \tau_{PROD}) = 0, \quad \text{or}$$
(6)

$$[\, p_F - \partial PC_I / \partial Q_I\,] = 0,$$
(7)

$$p_{RET} - c_{TR} - c_{RIP} - t = \partial PC_I / \partial Q_I, \text{ and}$$
(8)

$$\text{SOC: } \partial^2 \pi_I / \partial Q_I^2 = -\partial^2 PC_I / \partial Q_I^2\,(1 - \tau_{PROD}) < 0.$$
(9)

MF will maximize its profits by making firm I obtain a profit, π^*_I, which equals the minimum profit which makes I find convenient to stay in business and produce bananas.

The assumptions made on how profits are taxed in the different countries and on the profits of MR being non-negative imply that MF will maximize its profits by maximizing, under a set of constraints, the profits made by MT. This reduces the dimension of the decision space for the

multinational firm to one, that of c_{TR}, the per unit charge by MT for the export and international transportation of bananas.

Because firm I is assumed to have full information on the volume produced by M and its production costs, as well as the price paid by the retailers, firm M will have to produce the same quantity of bananas produced by I (otherwise I will be able to infer the difference between c_{TR} and c_{RIP} - what it pays for the services rendered by MT and MR - and the costs these incur to provide them). Hence, $Q^*_M = Q^*_I$ and $\pi^*_M = \pi^*_I$. MF will choose the value of c_{TR} which maximize its profits

$$\pi_{MF} = \pi_M + \pi_{MT} + \pi_{MR} = [\, Q_M\, p_F\ -\ PC(Q_M)\,]\,(\,1\text{-}\,\tau_{PROD}\,)\ +\ [\, Q\, c_{TR} - TC(Q)\,]$$

$$+\ [\, Q\, c_{RIP} - RC(Q)\,]\,(\,1 - \tau_{IMP}\,) \tag{10}$$

subject to the following constraints:

$$p_F\ -\ \partial\, PC_I /\, \partial\, Q_I\ =\ (p_{RET}\ -\ c_{TR}\ -\ c_{RIP}\ -\ t)\ -\ \partial\, PC_I /\, \partial\, Q_I\ =\ 0\ ; \tag{11}$$

$$\pi_I\ =\ [Q_I\, p_F - PC(Q_I)\,]\,(\,1\text{-}\,\tau_{PROD}\,) = [Q_I\,(p_{RET}\ -\ c_{TR}\ -\ c_{RIP}\ -\ t)\ -\ PC(Q_I)\,]\,(\,1\text{-}\,\tau_{PROD}\,) = \pi^*_I\ ; \tag{12}$$

$$c_{RIP} = RC(Q)\,/\,Q\ ; \tag{13}$$

$$Q = 2\, Q_I\,. \tag{14}$$

Under the assumptions made, given π^*_I, Q^*_I will change only if either τ_{PROD} or production costs change. In fact, (11) and (12) imply

$$[\, Q_I\ \partial\, PC_I /\, \partial\, Q_I\ -\ PC(Q_I)\,]\,(\,1\text{-}\,\tau_{PROD}\,) = \pi^*_I\ . \tag{15}$$

Being $\partial\,\pi_I\,/\,\partial\, p_F > 0$ (under the assumptions made, profits monotonically increase as p_F increases), MF will determine the optimal value of c_{TR}, i.e. the value of c_{TR} which makes firm I maximize its profits (which will result equal to π^*_I) by producing a quantity equal to Q^*_I :

$$c^*_{TR} = p_{RET}\ -\ c_{RIP}\ -\ t\ -\ PC'(Q^*_I) \tag{16}$$

where $PC'(Q^*_I)$ is the value of $\partial\, PC_I /\, \partial\, Q_I$ when Q_I equals Q^*_I.

When t, p_{RET} or τ_{IMP} change, not only π^*_I, but also Q^*_I will not change. In fact, if t or p_{RET} change MF will maximize its profits by having MT change c_{TR} in the opposite direction by the same amount. If τ_{IMP} changes, nothing else will change. However, if it is τ_{PROD} that changes, then, in order to make firm I maintain its profits unmodified, the multinational firm will have to make firm's

I pre-tax profits increase by lowering c_{TR} ; as a consequence, p_F, which in equilibrium must equal $\partial PC_I / \partial Q_I$, and Q^*_I will both increase.[11] Hence, the impact of a change in the policy variables and acquisition price of the retailer on the profits of the independent firm producing bananas and the multinational firm can be described as follows:

$$\partial \pi^*_I / \partial t \ = \ \partial \pi^*_I / \partial \tau_{PROD} \ = \ \partial \pi^*_I / \partial \tau_{IMP} \ = \ \partial \pi^*_I / \partial p_{RET} \ = \ 0 \, , \tag{17}$$

$$\partial Q^*_I / \partial t \ = \ \partial Q^*_I / \partial \tau_{IMP} \ = \ \partial Q^*_I / \partial p_{RET} \ = \ 0 \, , \text{while} \tag{18}$$

$$\partial Q^*_I / \partial \tau_{PROD} \ > \ 0 \ . \tag{19}$$

$$\partial \pi^*_{MULTIN} / \partial t \ < 0 \, , \tag{20}$$

$$\partial \pi^*_{MULTIN} / \partial \tau_{PROD} < \ 0 \, , \tag{21}$$

$$\partial \pi^*_{MULTIN} / \partial \tau_{IMP} \ = 0 \, , \text{and} \tag{22}$$

$$\partial \pi^*_{MULTIN} / \partial p_{RET} \ > 0 \ . \tag{23}$$

If a technical change in the production of bananas occurs which lowers production costs, then the profits of firm I will not change while those of MF will expand. In fact, the benefits from the innovation will be entirely accrued by the multinational firm through an increase of c_{TR} by MT. In general, the change in c_{TR} will be such that π_I remains equal to π^*_I while Q^*_I changes (it can either increase or decrease, depending on how $PC(Q_I)$ is lowered by the innovation. However, Q^*_I may also not change. This is the case, for example, if the technical change is such that fixed costs remain unmodified while a downward parallel shift of $\partial PC_I / \partial Q_I$ occurs; in this case, in fact, MT will increase c_{TR} by an amount identical to the vertical shift in $\partial PC_I / \partial Q_I$, leaving not only π^*_I, but also Q^*_I unchanged. Even if its profits do not change, I still has an incentive to adopt the innovation in order not to be forced out of business when MT adjusts c_{TR}.

If the technical change occurs at levels along the chain different from production, then the multinational firm will set c_{TR} so as to leave p_F , and, as a result, Q^*_I and π^*_I, unchanged, capturing all the benefits from the cost-reducing innovation. If it takes place in the import and ripening link of the chain, MT will increase c_{TR} by the same amount of the reduction of the average cost incurred by MR calculated at the optimal total quantity produced by firms I and M before the innovation. If the cost-decreasing technical innovation is introduced in the export and international shipping link, then

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[11] The increase in c_{TR} will be such as to take into account the decline in c_{RIP} which will result from the increased production in both firms.

MT will simply leave c_{TR} unchanged and, again, no benefit is passed to firm *I* and all gains end up in increased profits by MF.

One question which may arise is: why does not MF find profitable to export only bananas produced by *M* ? The answer is in the assumptions made regarding production costs of bananas and costs incurred by MT and MR to provide export and transportation services and import and ripening services, respectively. Being *I* and *M* identical, $\partial PC_i / \partial Q_i > 0$ and $\partial^2 PC_i / \partial Q_i^2 > 0$, and RC(Q) / Q and TC(Q) / Q both decreasing as Q increases, MF will always find more profitable to handle bananas produced by both *I* and *M* , rather than by its own firm only.

These results are consistent with some of the peculiar developments observed for the Cameroon banana industry, in particular the relatively small variations over time in the volume of bananas exported and the virtually constant producer price received at the country's border over most of the years considered, despite the changes observed in the price paid for the same bananas at the EU border.

5. Conclusions

One of the goals of the paper was to discuss recent changes which occurred in the banana market over most recent years, the factors which induced them and their implications for the distribution of market power among the actors involved at different links of this important value chain. The evidence provided assigns a significant role to trade policy changes (the only relevant policies in this market being those of the EU), transportation technologies, consumer preferences and changes in the retail industry in reducing the market power of large multinationals and allowing the emergence of value chains alternative to the traditional ones.

The discussion of the structure and functioning of the banana exports industry in Cameroon, a relatively minor player on the world market, but still the seventh largest exporter of bananas, a rather extreme example characterized by the pervasive role played by a large multinational capable of controlling the entire industry while guaranteeing a strong and effective horizontal and vertical coordination, provides a reference benchmark for analyzing less clear-cut value chains. The simple model developed to represent, in a stylized matter, the functioning of such a value chain proved capable of reproducing some of the main elements characterizing actual developments observed for this specific case study.

While providing insights which hopefully help understand some of the relevant changes which have been occurring in this important market, the paper also raises several questions which remain to be

answered. Two of them emerge as particularly relevant. The first one is the need to disentangle the complex negotiations taking place between retailers and their suppliers of bananas, negotiations which develop in an oligopoly/oligopsony market framework. Understanding the distribution of market power between these two groups of actors, how they behave in this negotiation and what explains the actual outcome in terms of prices paid and received and volumes traded, is a necessary condition to then try to understand and model transmission mechanisms along the entire length of the chain, such as those explaining how changes in consumer preferences affect volumes traded and prices received by producers. The second area which needs additional research efforts is the need to extend the simple model presented in the paper by removing some of the assumptions made and, by doing so, making it able to represent a wider range of value chains. In this respect, three extensions of the model seem to be worth pursuing: removing the assumption of bananas being an undifferentiated product, allowing firms to produce different qualities of bananas (at different costs) and consumers to buy them (paying different prices); introducing alternative modes of shipping bananas internationally (at different costs), removing the assumption of a sole operator being supplying these services; and removing the assumption of an infinitely elastic demand for bananas (both undifferentiated and quality-differentiated ones) by the retail sector at exogenously determined prices, making prices paid and quantities of bananas traded endogenously determined.

Notwithstanding its limitation, we believe the discussion and the results provided in the paper may turn out valuable also outside the boundaries of the banana market, by helping identify and address potentially relevant factors explaining developments in other value chains in which large multinationals play an important role.

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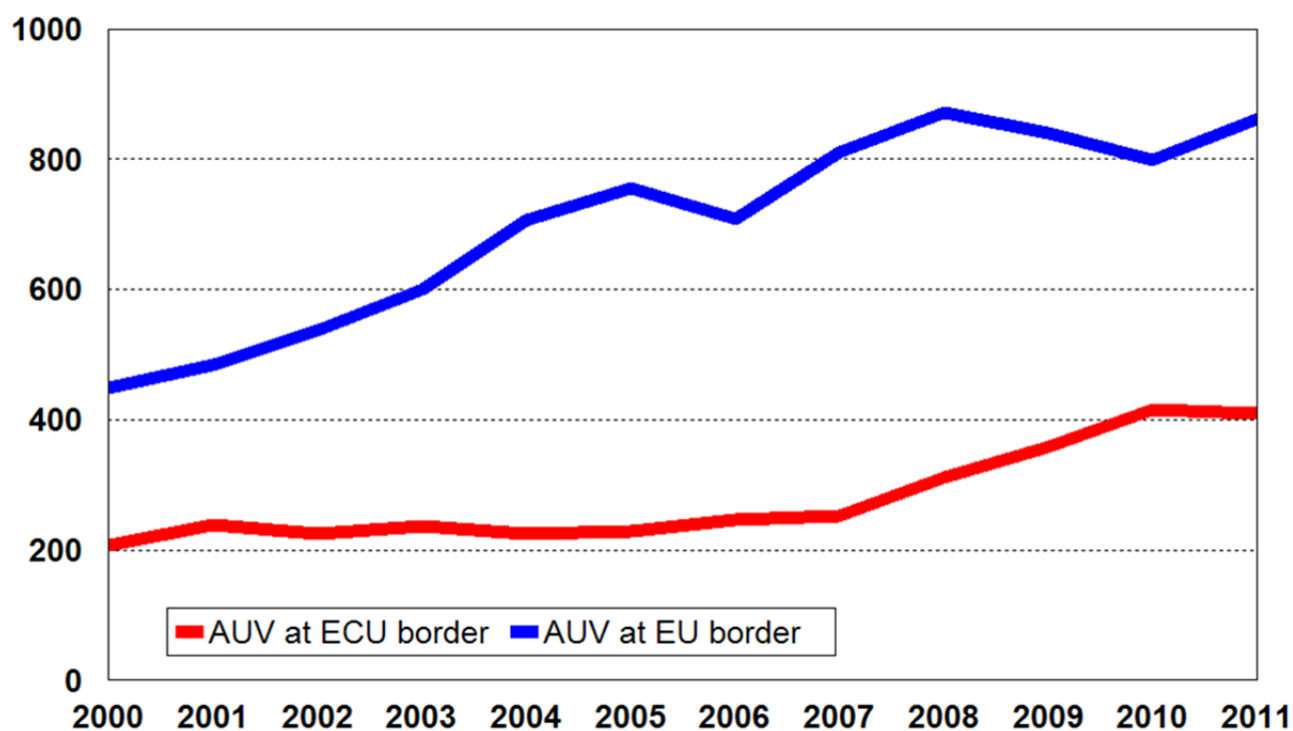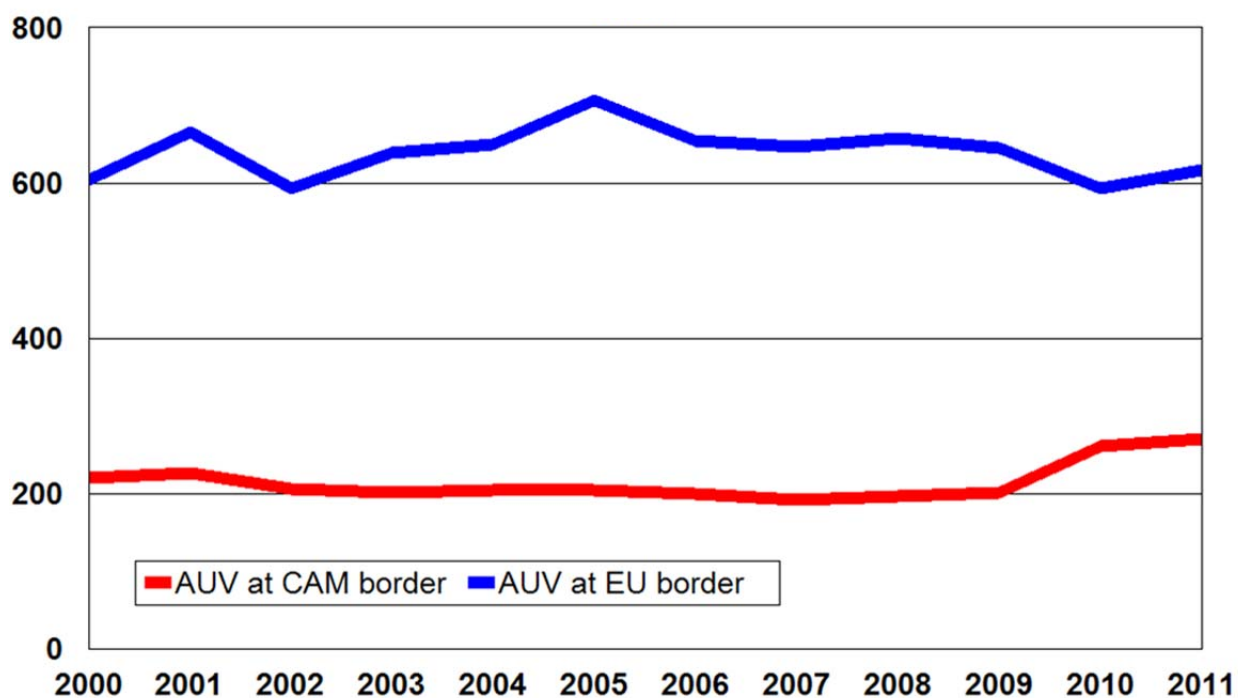**Figure 1 – Ecuador. Bananas: exports average unit value (AUV) at the Ecuador and the EU borders. (US$/t ; 2000-2011)**

Source: Comtrade.

Figure 2 – Cameroon. Bananas: exports average unit value (AUV) at the Cameroon and the EU borders. (€/t ; 2000-2011)
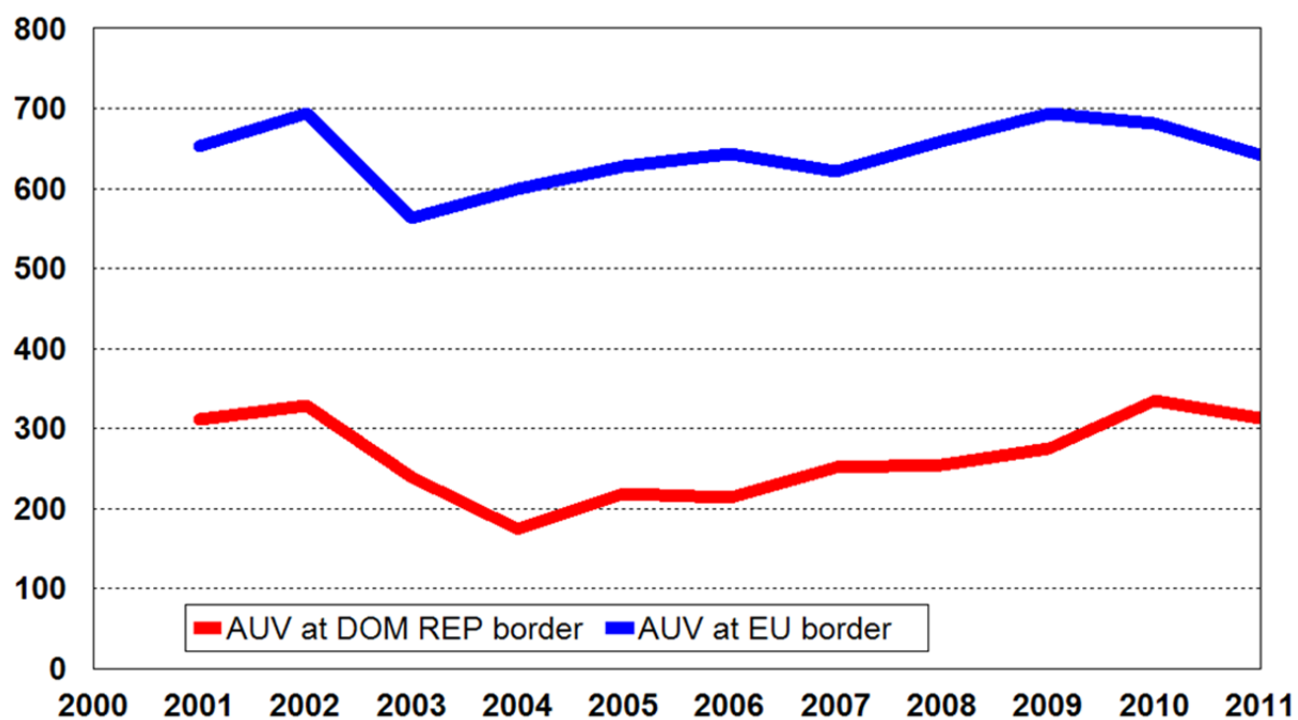
Figure 3 – Dominican Republic. Bananas: exports average unit value (AUV) at the Dominican Republic and the EU borders. (€/t ; 2000-2011)

Table 1 - Cameroon. Banana exports by firm, absolute values (t) and composition (%). (1993-2014)

	PHP[1]	CDC[2]	BPL	SPM[3]	Total	PHP[1]	CDC[2]	BPL	SPM[3]	Total
	(t)					(%)				
1993	121322	56278		4195	181795	66,7	31,0		2,3	100,0
1994	114733	68390		4243	187366	61,2	36,5		2,3	100,0
1995	113345	64595		3935	181875	62,3	35,5		2,2	100,0
1996	99619	86555		2676	188850	52,8	45,8		1,4	100,0
1997	92340	84212		178	176730	52,2	47,7		0,1	100,0
1998	104691	105313		4252	214256	48,9	49,2		2,0	100,0
1999	123542	102079		9521	235142	52,5	43,4		4,0	100,0
2000	114796	113057		10450	238303	48,2	47,4		4,4	100,0
2001	129949	111172		13285	254406	51,1	43,7		5,2	100,0
2002	119651	114417		24777	258845	46,2	44,2		9,6	100,0
2003	146048	121877		33751	301676	48,4	40,4		11,2	100,0
2004	115866	130385		31032	277283	41,8	47,0		11,2	100,0
2005	117290	111250		28974	257514	45,5	43,2		11,3	100,0
2006	118425	106939		31012	256376	46,2	41,7		12,1	100,0
2007	111481	84249		36597	232327	48,0	36,3		15,8	100,0
2008	129558	99444		39707	268709	48,2	37,0		14,8	100,0
2009	118802	99690		37017	255509	46,5	39,0		14,5	100,0
2010	111173	92842		28796	232811	47,8	39,9		12,4	100,0
2011	125386	98734		24903	249023	50,4	39,6		10,0	100,0
2012	121731	81311	4927	18192	226161	53,8	36,0	2,2	8,0	100,0
2013	129188	107416	6720	11755	255079	50,6	42,1	2,6	4,6	100,0
2014	152067	103459	11976	0	267502	56,8	38,7	4,5	0,0	100,0

Source: Assobacam.

(1): PHP+SBM+SPMP.

(2): CDC-Tiko+CDC-BEP+CDC-EPB+CDC-Ekona .

(3): SCBP before 1998.

Table 2 - EU-27 banana imports in volume by source; absolute values (t) and percentage composition. (1999-2013)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Imports (t)															
Cameroon	**162677**	**211970**	**225441**	**236502**	**298507**	**261244**	**252926**	**250859**	**221846**	**279564**	**249659**	**243021**	**237413**	**213868**	**249239**
Belize	55650	68558	51609	38709	73806	80292	74189	73207	62357	82149	79799	78817	72447	99288	96763
Cote d'Ivoire	202607	208251	226583	216742	210952	210776	183850	221668	189366	216953	229215	244323	224146	224944	252175
Dominica	28140	28373	18082	17802	10846	12401	13182	13591	7458	10489	36946	4218	4362	2268	1443
Dominican Republic	42334	59928	85930	97348	111954	101355	144743	176778	206389	170623	228179	303728	326902	294589	322658
Ghana	2909	3881	3656	3536	1238	2003	4331	22531	34278	46233	36763	52632	47418	50691	42612
Jamaica	51635	40963	42985	40600	41784	28660	11654	31866	18372	42	3	8			
St Lucia	65587	72566	34727	49313	32520	42874	28243	36733	30497	38579	33292	23173	6206	12145	12367
Suriname	39066	34282	28732	6557	12	19464	35271	45373	58799	65815	57617	70440	62914	83126	80956
Other ACP countries	39449	44370	32343	33809	23026	26276	16699	18548	15543	10709	9235	5626	2448	1416	872
Total ACP	690054	773143	750087	740919	804645	785345	765088	891155	844904	921156	960708	1025984	984256	982335	1059085
Total non-ACP	3320035	3224698	3129459	3205629	3323030	3284939	3219972	3559303	3921062	4041201	3663915	3567174	3729832	3558221	3767328
Total EU-27 imports	4010088	3997841	3879547	3946548	4127675	4070285	3985061	4450458	4765965	4962357	4624623	4593159	4714088	4540556	4826413
Composition of EU imports from ACP countries (%)															
Cameroon	**23,6**	**27,4**	**30,1**	**31,9**	**37,1**	**33,3**	**33,1**	**28,1**	**26,3**	**30,3**	**26,0**	**23,7**	**24,1**	**21,8**	**23,5**
Belize	8,1	8,9	6,9	5,2	9,2	10,2	9,7	8,2	7,4	8,9	8,3	7,7	7,4	10,1	9,1
Cote d'Ivoire	29,4	26,9	30,2	29,3	26,2	26,8	24,0	24,9	22,4	23,6	23,9	23,8	22,8	22,9	23,8
Dominica	4,1	3,7	2,4	2,4	1,3	1,6	1,7	1,5	0,9	1,1	3,8	0,4	0,4	0,2	0,1
Dominican Republic	6,1	7,8	11,5	13,1	13,9	12,9	18,9	19,8	24,4	18,5	23,8	29,6	33,2	30,0	30,5
Ghana	0,4	0,5	0,5	0,5	0,2	0,3	0,6	2,5	4,1	5,0	3,8	5,1	4,8	5,2	4,0
Jamaica	7,5	5,3	5,7	5,5	5,2	3,6	1,5	3,6	2,2	0,0	0,0	0,0	0,0	0,0	0,0
St Lucia	9,5	9,4	4,6	6,7	4,0	5,5	3,7	4,1	3,6	4,2	3,5	2,3	0,6	1,2	1,2
Suriname	5,7	4,4	3,8	0,9	0,0	2,5	4,6	5,1	7,0	7,1	6,0	6,9	6,4	8,5	7,6
Other ACP countries	5,7	5,7	4,3	4,6	2,9	3,3	2,2	2,1	1,8	1,2	1,0	0,5	0,2	0,1	0,1
Total ACP	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Composition EU imports (%)															
Cameroon	**4,1**	**5,3**	**5,8**	**6,0**	**7,2**	**6,4**	**6,3**	**5,6**	**4,7**	**5,6**	**5,4**	**5,3**	**5,0**	**4,7**	**5,2**
Total ACP	17,2	19,3	19,3	18,8	19,5	19,3	19,2	20,0	17,7	18,6	20,8	22,3	20,9	21,6	21,9
Total non-ACP	82,8	80,7	80,7	81,2	80,5	80,7	80,8	80,0	82,3	81,4	79,2	77,7	79,1	78,4	78,1
Total EU-27 imports	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: Comext; EU Commission, DG-AGRI.

Table 3 - EU import tariffs for bananas under different regimes; ACP countries preferential margin *vis a vis* MFN exporters and Andean and Central American signatory countries of trade agreements with the EU. (€/t)

	import tariff (€/t)			Preferential margin of ACP countries which concluded negotiations for an EPA *vis a vis* MFN countries	Preferential margin of ACP countries which concluded negotiations for an EPA *vis a vis* Central America and Andean countries*
	MFN (no DDA agricultural modalities by 31.12.2013)	ACP non-LDC (from 2008 ACP non-LDC which concluded negotiations for an EPA)	Trade Agreements between the EU and Central America and Andean countries*		
EU import regime in place in 2005	Quota of 3,313,000 t, in-quota exports subject to a tariff equal to 75 €/t; out-of-quota exports subject to a tariff equal to 680 €/t.	Quota of 750,000 t, duty free in-quota exports; out-of-quota exports subject to a tariff equal to 380 €/t.			
2006	176	Quota of 775,000 t, duty-free in-quota exports; out-of-quota exports subject to a tariff equal 176 €/t.			
2007**	176				
2008	176	0		176	176
2009	176	0		176	176
2010	148	0	145	148	145 (148)
2011	143	0	138	143	138 (143)
2012	136	0	131	136	131 (136)
2013	132	0	124	132	124 (132)
2014	132	0	117 (118)	132	117 (118)
2015	132	0	110 (111)	132	110 (111)
2016	127	0	103 (104)	127	103 (104)
2017	122	0	96 (97)	122	96 (97)
2018	117	0	89 (90)	117	89 (90)
2019	114	0	82 (83)	114	82 (83)
from 1.1.2020	114	0	75	114	75

*: Colombia, Ecuador and Peru; Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. Until December 31, 2019 the preferential tariff is subject to a "stabilization clause" based on country-specif trigger import volumes. Values for Ecuador in parenthesis.

**: In 2007 the provisions for bananas of the EBA initiative were fully implemented, providing ACP Least Developed Countries duty-free and quota-free access to the EU market.