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### **The opening :**

Within this issue, 32 articles were accepted as follow:

The first article entitled: **Areas of Benefiting From The Electronic Cloud in Accounting Information Systems / A Study in Some Selected Iraqi Companies**, for the researcher Zeyad Hashim ALSaqa ; the research discussed some concepts related to use of the electronic cloud in the work of AISs with a focus on concept of cloud accounting that dealt with the nature of accounting work in light of use of the electronic cloud and the expected effects resulting from that, and then identifying most important requirements for use of the electronic cloud in work of AISs.

The field study was carried out in a number of Iraqi companies to find out the extent of benefiting from the electronic cloud in the work of accounting information systems through the study sample, which included a group of employees in accounting work and information technologies. It was concluded that there are several areas through which cloud storage and computing are used. Cloud down to cloud accounting applications.

As for the second article which entitled: **COMPARATIVE ANALYSIS OF THE ECONOMIC PROFITABILITY OF THE EXPORT OF FRESH PINEAPPLE AND ITS JUICE PRODUCED IN BENIN REPUBLIC** for the researchers F. C. BIAOU et al; In their article, they focused on the rapid increase in pineapple production and its juice has been accompanied by an increase in its exports to various sub-regions. To assess the profitability of these exchanges, surveys were conducted among producers, processors and exporters of this commodity. In this study, the methodological approach includes the use and analysis through the Cost-Financial and Economic Benefit ratios nominal and effective protection coefficients and the ratio of comparative advantage. The results show that the export of fresh pineapple to hinterland countries is on the one hand, more profitable than that of pineapple juice because of the proliferation of sugar-sweetened beverages in the sub-region. On the other hand, it is more profitable than its export to Europe.

While the third article which entitled **Adjustment to International financial reporting standards for tenant in order to alleviate the impact of Cov-19** for the researcher Kadri Abdelkader; This research presents an outline of the accounting treatments of International financial reporting criteria and the methods that entities can fully fulfil and keep Conformity with the criteria. This research further intends to learn how to account for those privileges was given to tenants, as

such, an array of findings has been amounted, notably, the International Accounting criteria Board has made an alteration to International financial reporting criteria to facilitate it for tenants to account for Cov-19 related leasehold privileges. This research emphasizes only on the variations that will influence tenants as variations to be stemmed from International financial reporting criteria for landlords are insignificant.

The fourth article included a study entitled: **Attracting investments and achieving local development - international and national experiences** for the researcher BELADJINE Khaldia; this study aims to show how many countries in the world are working hard to promote investments offering many incentives and privileges and improving their economic, social and even political conditions, such as Malaysia and China, which have been able to attract enough projects through economic recovery programs as well as supporting growth and local development, that's what we had shown in this study through two axis, the first axis is about investments in general and the second, about investment experiences of international countries (Malaysia and China) and national experience (Algeria).

Concerning the fifth article entitled: **Cleaner production applications in the industrial company (Henkel case study during the period 2017-2021)** for the researcher Hamma aid Sana This study aims to identify the extent of commitment to cleaner production applications in Henkel company, by studying and analyzing a set of indicators for the company's cleaner production during the time period between 2017-2021, which are represented in: Reducing polluting emissions to the environment of all kinds, using renewable energies , and reducing the use of natural resources during the product life cycle, as the study found that the company adopts a targeted policy to reach cleaner production, especially in the field of reducing emissions, controlling the consumption of natural resources and energy, and promoting the use of renewable and clean energies.

The sixth article entitled: **Currency substitution monetary model in Algeria -An empirical analysis-** for the researcher Mohamed TERGOU; The article attempts to investigate the estimation of Equilibrium exchange rate in Algeria during period (1995-2020), using the Currency substitution Monetary Model, by applied the Bounds Test of ARDL co-integration model, The Unit Root Testing (ADF) conceded the integration of the variables at (0) order and (1), We estimate the selected model an ARDL(1,0,1,3) and it long-run; short-term relationships, The results shows the long-run relationships with Exchange rate is adjusted towards the equilibrium within four (4) years. In short-term there are Current and Future effect of monetary supply difference gap, and no effect by GDP gap on the exchange rate, also; the result shows the superiority of the monetary effect against the reel effect on the equilibrium exchange rate in Algeria.

While the seventh article entitled: **The blue economy's contribution to establishing sustainable development** for the researcher Asma Beleulmi; This research aims to define the basic concepts and aspects related to the blue economy, in addition to identifying its characteristics and principles on which it is based. As well as determining its importance in reaching sustainable development. Accordingly, the research has reached a set of results, the most important of which are: Maximizing the potential of the blue economy requires actively involving all countries to achieve the maximum benefit from it. In addition, failure to pay attention to the sustainability of the blue economy may lead the ecosystem to suffer irreparable damage, which may hinder the ability of future generations to maintain levels of Current living. This makes the blue economy a new development approach and a strategic alternative for oil and non-oil countries, as research confirms that a third of the global reserves of oil and gas lie in the seas.

Regarding the eighth article that entitled: **Evolution of food prices and its impact on food security in Algeria** for the researcher HALMOUCHE & MADI; This study aims to present the food security situation in Algeria through the World Food Security Index and identify the challenges that prevent the achievement of the goal of food security in Algeria..This study found concluded that the state of food security in Algeria is still in the process of development, and in order to enhance and support food security, a framework for appropriate policies must be put in place to maintain food security.

The ninth article entitled: **Impact of the Covid-19 Crisis: A Survey of Challenges and Respons in Chinese firms** for the researcher BELADJINE; This paper is dedicated to the covid-19 crises and its impact in entrepreneurship particularly on firm's activities, we investigate the impact of the COVID-19 pandemic on SME's, and their response during the recent economic crisis initiated by this pandemic, and we took the Chinese firms as example. Our purpose is to present and discuss cases related to the issued above and make it beneficial to researchers and students as well. The case study concluded by proving that innovation strategy to crisis management was the solution for many firms across the world including the Chinese firms.

The tenth article entitled: **Quality of Higher Education and Knowledge Economy (Comparative Study Using PANEL Data)** for the researchers BENOUNISSA & BENABOU, their study aims to project knowledge economy indicators on the higher education system in order to conduct a comparative study of a sample of 10 countries over a 15-years period using PANEL data. their founding are that both the percentage of students registered abroad and the framing rate have a negative impact on KEI, while patents, number of registered students and the gross registration rate in higher education have a positive effect on KEI. they also found that the best

sample for the study is the random impact sample, where the characteristics of each country are preserved and time is neglected.

The 11<sup>th</sup> article entitled: **Euro-Mediterranean Relations : the cooperation from conventional energy to renewable energy** for the researcher Sail said; The aim of this research is to discover the reality of Euro-Mediterranean cooperation in the field of fossil and renewable energies, and if the energy cooperation between the two parties in renewable energy has reached the same development and depth as cooperation in the field of fossil energy. To accomplish this study, he adopted a scientific methodology that focuses on the use of the descriptive and analytical approaches. He has reached the conclusion that, despite the Europe's awareness of the importance of the countries of the south and east of the Mediterranean in terms of the natural potential for the development of renewable energy, but cooperation in this field is still below the level of cooperation reached by the two parties in fossil energy.

The 12<sup>th</sup> article entitled: **The cooperation strategy between local government and water companies to achieve water sustainability Aarhus Municipality Case Study - Denmark** -for the researchers Amrouche & Nezali; This study aims to shed light on the Aarhus municipality in Denmark and its policy in water management, using smart solutions to maintain water sustainability and make the best use of it, in light of the increasing population and the daily exploitation of water. Therefore, the local government of Aarhus resort to make partnerships with either public or private companies in the field of water to achieve the goals and vision of the municipality, and to ensure pure and clean water in the best ways and lowest costs in pursuit of one of the sustainable development goals.

The 13<sup>th</sup> article entitled: **The effect of elements of the banking marketing mix on the mental image of the commercial banks: case study of Assalem Bank** for the researcher Routal Asma; The study aims at knowing the effect of the banking marketing mix on the image of the commercial banks through a field study on the customers of Assalem bank. She used the analytical descriptive method and relied on the questionnaire for data collection from the customers. As for the procession of data, she used SPSS. Her findings show that there are a statistically significant positive effect of the banking marketing mix on the formation of the image in Assalem bank from the perspective of the customers, a statistically significant positive effect of the traditional marketing mix on the formation of the image in Assalem bank from the perspective of the customers, a statistically significant positive effect of the enlarged marketing mix on the formation of the image in Assalem bank from the perspective of the customers, and a statistically significant positive effect of the dimensions of the image of Assalem bank from the perspective of the customers.

The 14<sup>th</sup> article entitled: **THE IMPACT OF OUTSOURCING ON THE COMPETITIVE PERFORMANCE OF INDUSTRIAL EXECUTING ESTABLISHMENTS - A CASE STUDY OF THE SOREMPEP COMPANY IN TLEMCEN** for the two researchers TARI & TERBECHE; The study aimed to know the impact of outsourcing on the competitive performance of the executing establishments, through a field study of the Metallurgical Industries Corporation (SOREMP) in Tlemcen. In collecting the data, they relied on a questionnaire distributed to 30 individuals responsible for the outsourcing activity of the organization under study. They used the SPSS program to analyze the results and reached a main result, which is the presence of a statistically significant effect of outsourcing on competitive performance. The study

recommended the necessity of increasing the interest of the facility in developing its relationship with project owners and introducing its services and operational capabilities.

The 15<sup>th</sup> article entitled: **The impact of worker's empowerment on the organizational development level by using the Confirmatory Factor Analysis (CFA) approach. A practical study on Almadar Aljadid Company Tripoli, Libya** for the researchers METARREF & al; The study aims to highlight the relationship between the dimensions of employee empowerment and the level of organizational development of the firm and the knowledge of the level of support for senior management in the latter. It also aims to clarify the importance of the dimensions of worker empowerment in the success of the organizational development process of the new Al Madar company in Tripoli, Libya. The study concludes, thanks to the use of the confirmatory factor analysis method (CFA) and the program (Amos-21) which analyze a questionnaire distributed to a sample of 260 employees of the new company Al Madar for communications of Tripoli, that the firm under scrutiny is fully aware of the impact of the dimensions of empowerment on career development, the empowerment policy making it, moreover, possible to go from a stagnant situation to a state more reactive to changes in all the domains. The study shows that the process of transferring authority from management to workers at the organizational level makes it possible to limit the heavy burden, in terms of information to be processed, imposed on managers.

The 16<sup>th</sup> article entitled: **The possibility of applying the import substitution policy on petrochemical products in Algeria** for the two researchers Tazi & youcefi; The study seeks to identify Algeria's ability to adopt an import substitution policy that would maintain its exchange reserves as well as avoid economic dependency. The approach used in the study is the analytical descriptive approach, where the phenomenon of import substitution has been described. The phenomenon has also been analyzed through a series of data and statistics to determine Algeria's ability to implement the policy of import substitution in petrochemical products. Concerning the study's findings, several findings had been reached: Algeria has enormous potential for fuel production but needs the sufficient absorptive capacity to cope with the production backlog of petrochemical derivatives. Through these results, they propose some recommendations, namely, to provide storage for the material produced and expand the refinery's scope at the national level.

The 17<sup>th</sup> article entitled: **The Problem of Evaluating the Performance of Human Resources and Training in Algerian Institutions – A Field Study in the Forest Governorate of Djelfa Governorate-** for the writer Hasbaia Rahma Majda; The study aimed to research the problem of evaluating human resources performance and training in Algerian institutions-a field study in the forest governorate in the state of Djelfa-and the study was adopted by the descriptive analytical approach, where corresponding questions were used as a tool to collect data on a sample of 29 employees belonging to the institution under study and they were interviewed from The researchers accepted and asked the questions that study the variables of the study on them, and the study reached many results, including: The performance evaluation system must stem from the institution's conviction and needs in order to be more effective in achieving the goals of the institution and providing services at the level required for society and building training programs on the basis The results of the evaluation of human resources performance and the involvement of all employees in building the training program plans and making its standards clear to all and giving everyone an opportunity to form.

The 18<sup>th</sup> article entitled: **The role of social media in the local touristic promotion in Algeria - Outlook study on a sample of social media users** -for the researchers BENIA & BELDJILALI ; This paper aims at studying the importance of social media in the touristic promotion in Algeria and, thus, lifting up this vital sector. To do this, they conducted an outlook study on a sample of Facebook users. To reach the study objectives, they designed a questionnaire and distributed it to the sample of the study that included 94 Facebook users. Moreover, they used SPSS for data procession. Findings show big importance and benefits for social media in promoting tourism. Finally, the study recommends the touristic agencies to shift towards promotion of their products on internet via social media.

The 19<sup>th</sup> article entitled: **Unveiling the Impact of COVID-19 on the Accounting and Auditing Profession in the light of Subsequent Events - Algeria as a case study-** for the researcher CHABLAOUI Brahim; This research aims to shed light on the effects of coronavirus pandemic on the financial statements through identifying the reflections of the events after the reporting period on the accounting and auditing profession. As long as the National Accounting Council has taken a number of actions relating to the COVID-19 pandemic, these procedures and measures include the updates on the financial reporting processes, disclosures in financial statements and the auditor's report. These latter, indeed, have given several benefits to ease the tasks of the external auditors and a better range of strategies for dealing with the financial statements that might be affected by the COVID-19. Additionally, the government seeks to make its local environment for external auditing compatible with the international audit environment.

The 20<sup>th</sup> article entitled: **Seasonal Consumption Cycle of Sheepmeat in The Tiaret Region, Algeria** for the researchers Azizi & al; they focused in this study on measuring the minor (infra-annual) cycle of consumption of sheepmeat to prevent household, or even producers' constraints. In this respect, a survey was conducted in the municipalities of Tiaret and Hamadia with 340 households in 2020. The data were introduced into the Keynesian psychological function of consumption along a microeconomic approach of the consumer in relation to the inner functioning of the market. The calculations have led to average expenditures allocated to sheepmeat of 13,195 DZD/inhabitant/year for Hamadia, and 13,579 DZD/inhabitants/year for Tiaret. The average quantities consumed were 13.37 kg/inhabitants/year (Hamadia) and 13.43 kg/inhabitants/year (Tiaret). More interesting, two types of infra-seasonal minor consumption cycles have alike been measured, each variable in the length of the phases and the amplitude of the fluctuations for a specified income, and for a particular expenditure. The infra-seasonal preferences explained the festive minor consumption cycle, and non-festive minor consumption cycle. The establishment of the model of infra-seasonal sensitivity facts allows to admit a principle of causality between climate, consumptions, and previous productions in the market, but to predict also the same future economic phenomena based on weather forecasts.

The 21<sup>st</sup> article entitled: **Business financing through the financial market: comparison between Algeria, Egypt, Morocco and Tunisia** for the researchers BEZTOUH & BOULAHOUAT ; by comparing Algeria and three countries (Egypt, Morocco and Tunisia), they aim to identify the differences in terms of the contribution of financial markets to business financing . The comparative analysis is based first on "non-quantitative" market criteria such as: microstructure, age, organization and method of listing, then on the basis of several quantitative criteria: through the

analysis of performance indicators for each market, namely the number of listed companies, market capitalization in value and as a percentage of GDP, stock market indices and traded values.

The 22<sup>nd</sup> article entitled: **The impact of performance assessment on employees performance a sample study of SONEGAS** for the researcher MEKSEM NADIA; her study intends to shed light on the appraisal of personnel in an Algerian company and its influence, with the adoption of techniques in its application and the identification of the elements determining its effectiveness, on the performance of employees. It focuses on the results of employees and their contributions to enhance both their own and the company's performance. The qualitative and quantitative study carried out within SONEGAS has shown that evaluation is an old practice and that employees career management is its main scope. The results of the study analyzed with Sphinx V5 and SPSS software demonstrated a liaison between professional categories and the results of the assessment as well as the willingness of each category to engage in this practice.

The 23<sup>rd</sup> article entitled: **The event as a heritage tool: case of the national pottery festival of Maâtkas (Tizi-Ouzou)** for the two researchers SMADI & HASSAINE; The article deals with the issue of enhancing territorial resources through the heritage approach through events. It aims to analyze the complex system of coordination of actors with a view to activating and valuing latent resources in order to constitute a specific asset. The article is based on a field survey conducted, using semi-directive interviews, with the actors involved in the Maâtkas pottery festival in the wilaya of Tizi-Ouzou. The main results of this research show that the event is a heritage tool generating socio-economic benefits in the appropriate territory. However, for the purposes of its sustainability, this action requires the permanent involvement and a consequent degree of intentionality of the different categories of actors constituting the territory. The institutionalization of the local pottery festival of Maâtkas as a national festival testifies to the quality of the coordination and the growing scale of this event.

The 24<sup>th</sup> article entitled: **Assessment of the firm's predispositions to establish a cooperative relationship with its distribution intermediaries. The case of the company "Les Moulins de la Soummam"**, wrote by CHEURFA Sadika; The main objective of this work is to focus on exploring the relational approach converted to the distribution channel in the particular context of the Algerian market, this is done by studying the predispositions of the company to establish a cooperative relationship with its distribution intermediaries. To do this, she undertook a case study of "Les Moulins de la Soummam", where she was able to mobilize several investigative techniques, a series of exploratory (non-directive) interviews and a semi-directional interview with the marketing manager. Based on the results obtained, she concluded that the company lacked the necessary conditions to establish a cooperative relationship with its distribution intermediaries.

The 25<sup>th</sup> article entitled: **The Quality of Financial Information Disclosed by Listed Companies- Case of Algeria** - for the two researchers CHIBOUB FELLAH & KAMELI; This study aims to analyze the quality of financial information disclosed by companies listed on the Algerian stock exchange, as measured by the practice of earnings management. This study is conducted on a sample of 04 companies listed on the Algerian stock exchange, observed over a period of 08 years from 2012 to 2019 (32 observations) using the Modified Jones Regression Model "MJRM" (1995). The results of the study show that listed companies disclosed good quality of financial information.

The 26<sup>th</sup> article entitled: **Study of the impact of foreign direct investment on growth of the Algerian economy (1990-2021)**. for the two researchers Chaalal & Ben bayer their paper studies the influence exerted by FDI inflows on the economic growth of Algeria, for the period from 1990 to 2021. For this purpose, the ARDL model was applied. Our results reveal the existence of a very weak significance, even a negative contribution between FDI and growth in the short and long term. The country's dependence on the energy sector, periods of political instability, economic problems have had and continue to have a negative impact on the contribution of FDI to the country's growth.

The 27<sup>th</sup> article entitled: **Analysis of the degree of digital transformation of HR processes in times of COVID. Case of French Organizations** for the two researcher ZOUAOUI /RACHEDI AKILA; her research aims to show that digital transformation (DT) is more topical than ever and is the subject of reflection in recent academic work. New procedures and processes have come to shake up the daily lives of companies which are now facing a whole new revolution called the "fourth industrial revolution". The objective of this paper is to take stock of the degree of digital transformation of HR processes within French Organizations during the COVID period. she has chosen an investigation methodology based essentially on a collection of quantitative data based on the report of a survey carried out by the firm Statistical processing by Excel of the data was carried out. The research results show that COVID has led to a forced acceleration of the digitalization of HR processes within the organizations surveyed.

28<sup>th</sup> article entitled: **The management of special waste at the level of the wilaya of Bejaia** for the two researchers SAHALI & DJENNANE; Special waste is the result of industry, to meet demand, supply continues to increase. they study the case of the wilaya of Bejaia and talk about this category of waste, the quantity generated each year and especially the means of processing this waste.

The 29<sup>th</sup> article entitled **Auditing bias in artificial intelligence in light of the framework of artificial intelligence auditing Institute of Internal Auditors (IIA) - Analytical Theoretical Study** for the researchers Hassan Rachid & Afram; The research aims to identify the concept of bias in artificial intelligence, and the framework of artificial intelligence auditing of the Institute of Internal Auditors (IIA), and to draw the attention of internal auditors to the importance of auditing artificial intelligence in order to reduce the risks related to the potential bias of algorithms. To achieve the objectives of the research, the researchers used the constructive approach in the study and analysis through the use of dissertations, theses, periodicals, books and Websites that deal with the subject of the study, especially with regard to the areas of: artificial intelligence and bias in algorithms and the role of internal audit in auditing bias in artificial intelligence in the light of the framework of artificial intelligence auditing. Institute of Internal Auditors (IIA)

The 30<sup>th</sup> article entitled: **The impact of affective destination image on tourist's satisfaction: The case of Tipaza city** for the two researchers Elfkaire & Bersali; This study aims to reveal the impact of affective destination image dimensions and the overall image on tourist's satisfaction. After developing a questionnaire and distributing it to a sample of 282 respondents who visited Tipaza during the summer of 2022, the results of the study showed that affective destination

image (i.e., Arousing, Relaxation, and pleasure) has a positive and significant influence on tourist's satisfaction. Furthermore, the results revealed that affective destination image (only pleasure) has a positive and significant influence on overall destination image. The study also found a positive effect of the overall destination image on tourist's satisfaction. Unexpectedly, the results did not reveal a significant effect of Excitement on the tourist's satisfaction. Recommendations are discussed in the end of this paper.

The 31<sup>st</sup> article entitled: **The role of the SCF financial accounting system in improving the effectiveness of fiscal auditing - a field study** for the two researchers Belkarcha & Ben gettib, This study aimed to demonstrate the importance of applying the financial accounting system in Algeria to the effectiveness of fiscal auditing in economic institutions. Through the spss program, the study concluded in its most important results that the financial accounting system is of great importance in the effectiveness of tax auditing in terms of providing quality information that helps the tax auditor to reduce fiscal risks and achieve fiscal security that every economic institution seeks, how much fiscal auditing in Algeria is practiced Accordingly, one of the most important recommendations is that the financial accounting system, which has not undergone any change since its issuance in 2007, must be modernized first, and secondly, a fiscal auditor independent of the external auditor should be appointed to take care of fiscal matters, by benefiting from international experiences in this field.

The 32<sup>nd</sup> article entitled: **The Role of Human Capital in Economic Growth: Evidence from a Sample of Countries over the Period 1990 – 2020** for the researchers Ramadan & Bougriba, This study aims to investigate the effect of human capital on economic growth, and to clarify its role in explaining differences in both cross-country income and international standard living levels. Within the framework of the canonical cross-country growth model, this study uses a broad set of explanatory variables in addition to human capital indicator, to estimate several growth regressions over the period 1990-2020. Logarithm of initial real per capita GDP and logarithm of initial human capital stock represent the state variables. Logarithm of averages of fixed investment, averages of population growth and regional dummies represent the control and environmental variables. Results indicate that human capital has a positive and significant effect on economic growth. Moreover, findings suggest that human capital is an important factor for accelerating the convergence of economic growth rates and income levels toward their positions in the steady-state..

**Editorial Committe**

## COMPARATIVE ANALYSIS OF THE ECONOMIC PROFITABILITY OF THE EXPORT OF FRESH PINEAPPLE AND ITS JUICE PRODUCED IN BENIN REPUBLIC

**F. C. BIAOU**<sup>1</sup> ♦, E. D. YAI<sup>2</sup>, V. J. MAMA<sup>3</sup> & D. H. ACCLASSATO<sup>4</sup>

<sup>1</sup> Faculté des Sciences Economiques et de Gestion/Université d'Abomey Calavi (FASEG/UAC). Email : [felchabiau@gmail.com](mailto:felchabiau@gmail.com) et

<sup>2</sup> Laboratoire d'Analyses et de Recherches sur les Dynamiques Economiques et Sociales (LARDES)/Université de Parakou. Email : [yaiemanuel2@gmail.com](mailto:yaiemanuel2@gmail.com), Bénin

<sup>3</sup> Institut des Recherches Agricoles du Bénin (INRAB) [mamvincent@yahoo.com](mailto:mamvincent@yahoo.com)

<sup>4</sup> Faculté des Sciences Economiques et de Gestion UAC Laboratoire de Recherche en finance et financement pour le développement durable (LARFFID) Email : [denacl\\_bj@yahoo.fr](mailto:denacl_bj@yahoo.fr)

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### Abstract:

In recent years, the rapid increase in pineapple production and its juice has been accompanied by an increase in its exports to various sub-regions. To assess the profitability of these exchanges, surveys were conducted among producers, processors and exporters of this commodity. In this study, the methodological approach includes the use and analysis through the Cost-Financial and Economic Benefit ratios nominal and effective protection coefficients and the ratio of comparative advantage. The results show that the export of fresh pineapple to hinterland countries is on the one hand, more profitable than that of pineapple juice because of the proliferation of sugar-sweetened beverages in the sub-region. On the other hand, it is more profitable than its export to Europe.

**Keywords :** Fresh pineapple; financial and economic; cost-benefit ratios; domestic resource costs; tradable and non-tradable factors.

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♦ Corresponding author.

## Introduction:

An efficient marketing system not only serves as a link between the producer and the consumer but actively and positively contributes to development by stimulating consumption (Harris, 1982 ; Timmer *et al.*, 1986). The economic efficiency of the marketing system measures the performance with which marketing functions are performed in order to take corrective measures. If the price system is functioning properly, it provides an incentive to increasingly satisfy consumer demand for type, quality and delivery time (Obi *et al.*, 2011). Thus, the production adapts to demand by responding to "price signals" by the marketing system. Harris (1982) argues that the marketing of agricultural products generates three main utilities : place utility, time utility, and form utility. In effect, it is a means to achieve the basic goals of society, which are economic growth, more equitable economic growth, more equitable distribution of income, nutritional well-being and food security (Timmer *et al.*, 1986).

An effective marketing system must be oriented to the consumers needs and generates a profit for all actors involved, namely the producer, transporter, trader, processor, etc. (Timmer. 1986). However, because of the dysfunctional nature of the trading system, traders are often characterized as speculators, leading to the perception that commercial activities are unnecessary. This dysfunctional is also reflected in developing countries where road infrastructures, means of transport and communication and standards are lacking (World Bank. 2012). According to Stiglitz and Greenwald (1989), the economic decay of the least developed countries is not only related to the lack of physical or human capital, but also to the inefficient functioning of their markets.

As foreign trade is an important determinant of long-term economic growth. the trade system can also be used to show that a country or region is competitive or not in the production and export of a good. Thus, economic policies that favor export growth, investment and trade liberalization are at the heart of the strategies recommended to developing countries (World Bank. 2008). The gains from trade liberalization come from comparative advantages, which can be in the form of natural resource endowments (Hecksher-Ohlin model) increases per capita income and growth through economies of scale and technological diffusion between countries.

The competitiveness of a country is based on the notion of comparative advantage. For this purpose, various indicators are classified into trade-based and technology-based indicators (Latruffe. 2010). The trade-based indicators focus on the real exchange rate (REER), purchasing power parity (PPP) and the Purchasing Power Parity (PPP). Revealed Comparative Advantage (RCA) and its derivatives such as Revealed Exportation Advantage (REA) the relative import advantage (RIA), relative trade advantage (RCA), the net export index (NEI), etc. and the strategic management-based indicators include cost indicators. profitability and productivity indicators. The cost measurement indicators focus on the ratio of cost to resources.

Indicators include the Cost of Internal Resources (CIR) ratio, the Cost of Social Resources, the Social Benefits Cost (SBC) and production costs. From an empirical point of view. Mulder et al (2004) examining the competitiveness of the agricultural and agri-food sector in the Mercosur and the EU during the period 1991-99 showed. based on the REERs. that the Mercosur countries have experienced a decline in competitiveness since 1998 (with the exception of Paraguay. where it has remained stable).

Gorton *et al.* (2000) using the CRI ratio for the main agricultural products in Bulgaria and the Czech Republic over the period 1994-96, show that wheat and barley are more competitive for both countries, both globally and in the EU. Gorton and Davidova (2001) review several studies analyzing the international competitiveness of agriculture in the CEEC countries (Bulgaria. Czech Republic. Hungary, Poland, Romania, Slovakia, Slovenia) between 1992 and 1998 based on the CRI ratio and farm-level data. They find that plant products are more competitive internationally than animal products and that in the field crop sector, wheat and sunflower are the most competitive. After examining the studies using the ratio for the same CEEC countries between 1989 and 1998. Bojnek (2003) also concludes that livestock production is less competitive internationally. The perpetuation of pineapple production essentially cultivated in the Atlantic department in the south of Benin Republic, depends on the efficiency of its marketing. According to Biaou *et al.*, (2016), nearly 80% of pineapple produced in Benin and more than 80% of the extracted juice, are exported to the sub-region.

The main objective of this paper aims to analyze the economic profitability of export of fresh pineapple and its juice to the sub-region. Specifically, it intends to show if the export of fresh pineapple to hinterland countries is more profitable than that is exported to Europe.

## **1. METHODOLOGICAL APPROACHES**

### **1.1 Methods of analysis**

Since market prices do not reflect the true economic value of goods because of distortions in their operation, the Policy Analysis Matrix (PAM) uses economic prices. to correct them, to show the discrepancies between the economic accounts and the financial accounts of agents and to analyze the impacts of government policies on prices and on the competitiveness (Pearson & Monke. 1989). Structurally. MAP is composed of two types of budgets : one budget evaluated at the market or financial price (financial budget) and the other at social opportunity costs or economic price (economic budget) where the values (prices. costs. profits) are those that would be observed in a situation of free trade or absence of distortions (table 1). For this purpose, all factors of the production system are divided into tradable and non-tradable factors.

I's translates the products and the j's, the destinations of the products. The parameters of these rows in table 1 are:

$A_{ij}$ , the gross financial revenue from the sale of good  $i$  ;

$B_{ij}$ , the financial costs of exchangeable factors for the production of good  $i$

$C_{ij}$ , the financial costs of non-tradable factors for the production of good  $i$

$D_{ij}$ , the financial profit of the sale of good  $i$  ;

$E_{ij}$ , the economic income from the sale of good  $i$  ;

$F_{ij}$ , the economic costs of tradable factors for the production of good  $i$  ;

$G_{ij}$ , the economic costs of non-tradable factors for the production of good  $i$  ;

$H_{ij}$ , the economic profit from the production of good  $i$ .

The divergences or convergences which are the differences by column of the elements of the first row and those of the second row are not used in this article. The indicators used to measure the profitability of pineapple and pineapple juice trade are the financial Benefit cost ratio (FBCR), economic benefit cost ratio (EBCR), domestic resource cost (DRC) and the coefficients of nominal product protection (CPNP) and coefficient of effective product protection (CEPC).

The  $FBCR_{ij}$  is a direct measure of producers' motivation to produce the good that reflects the competitiveness or efficiency of the production system. It is expressed as follows :

$$FBCR_{ij} = \frac{(B_{ij}+C_{ij})}{A_{ij}} \quad (1)$$

The  $EBCR_{ij}$  measures the magnitude of economic costs. It presents the social economic profitability of the activity and is calculated by :

$$EBCR_{ij} = \frac{(F_{ij}+G_{ij})}{E_{ij}} \quad (2)$$

Comparative advantage is assessed by the domestic resource cost ratio (DRC), which measures the efficiency of the best use of local resources ; that is the opportunity cost of producing one unit of the product using local resources. It is defined as the reference value of non-tradable factors used per unit of tradable factors.

$$DRC_{ij} = \frac{G_{ij}}{(E_{ij}-F_{ij})} \quad (3)$$

Thus. when the  $DRC_{ij}$  is between 0 and 1, the country has a comparative advantage in the production of the good based on the technology considered. In other words, the production activity is economically efficient and less costly in domestic resources. The system studied uses less internal resources than it generates value added. Such a system allows to earn foreign currency. But when the ratio is greater than the unit, it indicates otherwise that the system uses more internal resources (labor and capital) than it generates value added. When is equal to one, it reflects a case of indifference. In this case, the producer makes neither profit nor loss by producing locally or by importing the goods.

The nominal protection coefficient for products (NPCP) measures the ratio of the value of products at market price to their value at the reference price. When the NPCP is greater than one, it indicates that products are subsidized and when it is less than one, the products are taxed.

$$NPCP_{ij} = \frac{A_{ij}}{E_{ij}}$$

(4)

If  $q$  is the NPCP, the producer only receives  $NPCP_{ij} = q * E_{ij}$ , the system is therefore taxed by  $t = (1 - q) * 100$ .

The effective protection coefficient (EPC) is an aggregate measure of the rate of protection of the productive system that takes into account the effects of distortions on the product market and on the market for tradable inputs.

$$EPC_{ij} = \frac{A_{ij} - B_{ij}}{E_{ij} - F_{ij}}$$

(5)

An EPC less than one (1) means that the combination of transfers on products on the one hand, and on intermediate consumption (tradable goods) on the other results in the following :

- an effective distribution of income that is lower than it would be if the application, all other things being equal, of international prices;
- a value added distributed to agents that is less than what it represents economically for the community (Fabre, 1994).

The lower these coefficients are the better the country's advantages in producing the good or service.

## 1.2 Data collection methods

### 1.2.1. Research area

This research is conducted in the Atlantic Department which produces more than 98% of the pineapple in Benin. The population of this department, estimated at more than 800.000 inhabitants (INSAE, 2013), is distributed in eight (08) administrative units or communes. Five of them are the main producers of pineapples.

### 1.2.2. Sampling, data collection technique and tools

The primary data used in this paper were obtained from surveys of producers, traders and processors. Ten (10) producers were randomly selected from forty (40) villages selected and distributed in the five pineapple producing communes of the department. The commune and the village are the two strata considered in this work. The selected villages were distributed between communes in proportion to the number of pineapple-producing villages in the department and the villages to be surveyed in each commune are determined

according to the weight of the pineapple area of the village in the commune. Of the 400 targeted producers, 365 responded to our interview.

Similarly, based on the list of juice producers obtained from the National Association of Pineapple Processors in Benin (ANATRAB), 45 producers were randomly selected. We had discussions with the ANATRAB office about exporting the juice in the sub-region. Concerning the traders, where such a list is not available, they were counted in each of the market days they are opened. Appointments at home were made with some of them or outside the market. The itinerant retailers were also interviewed using a questionnaire. At the end, a total of 110 traders including 5 exporters of fresh pineapple were interviewed.

### **1.2.3. Data collected**

The data were collected from these different actors by individual interviews using a questionnaire. For fresh pineapple producers, data collected include the areas and quantities harvested and sold, the quantities of inputs used per ha, the sex ratio of the producers, his age, labor used per hectare and per cultivation operation, rental costs and the cost of renting land and labor, equipment and materials used, their costs and life span and the number of times these materials are used in the pineapple fields, etc. The questions addressed to traders, focused on modes of purchase (pre-financing, credit, or cash), product destinations, purchase and sale prices, harvesting costs, commercial charges (transport, packaging handling, and incidentals both at customs and during the traffic) loading and unloading, units of purchase and sale, level of education, age, secondary activities and difficulties encountered. At the processor level, data were collected include the equipment used, their acquisition cost, the places and the costs of purchase of the pineapple, their transport costs and those of the juice according to its destination, the quantities of pineapple processed, the quantities of juice marketed, the costs of road transport in addition to packaging charges, etc.

Secondary data is collected from institutions such as the Chamber of Agriculture, the Chamber of Commerce and Industry of Benin (CCIB), INSAE. Customs, etc. They focused on practices related to and import of agricultural products, especially pineapple and its derivatives, and pineapple and its derivatives, taxes, subsidies and other export charges.

In addition to mercurial data, 2015 average prices provided by the journal FRUITOP of France, one of the main beninese pineapple importer were used. As the mercurial data for fruit is not always available in the countries of the sub-region, data from ABC/SNV (2016) were used.

## **2. RESULTS AND DISCUSSION**

### **2.1. Main export areas for pineapple and pineapple juice**

Pineapple production in Benin, concentrated in the southern part of the country, has exceeded three hundred thousand tons since 2013. The volume exported to Europe represents less than 5% of this production (Biaou *et al.*, 2016). Police harassment does not allow for regular supply all the regions of the country. Thus, the area of its production is saturated, while the northwest and southwest regions of the country receive it accidentally (Adegbola & Arouna, 2008). Based on the national trends of production and the needs for

pineapple consumption, this southern part of the country is clearly unable to consume the rest of this production, which is then dumped in the sub-region. Thus, about 80% in of Benin's pineapple is exported to Nigeria and neighboring countries.

Juice is the main by-product which is also sold in the sub-region and is marketed mainly in the countries of the hinterland (Niger-Burkina) and Senegal (ABC/SNV, 2016). However, at more 6% of pineapple produced in Benin, is locally processed (Biaou *et al.*, 2016). According to most pineapple processors, more than 80% of their production are exported to the sub-region.

## **2.2. Cost-benefit ratios of pineapple and juice exports**

The financial and economic cost-benefit ratios (FCBR) are lower than unity everywhere, both for fresh pineapple and for juice. But the financial ratios are everywhere higher than the economic ratios (table 2).

The analysis of the financial cost-benefit ratios (FCBR) of fresh pineapple exports shows that they vary from one producer to another, depending on the type, depending on gender, level of education, living environment and the variety cultivated. These average ratios are statistically different only by the variety grown (at the 1% level), where they are respectively 0.5436 for smooth Cayenne and 0.8461 for sugar loaf. But the average FBCRs of the juice are not statistically different regardless of the subgroup considered.

The economic cost-benefit ratios (ECBRs) of exporting fresh pineapple also vary from one producer to another and also according to the regions of export. Their averages are only statistically different only in relation to the variety grown at the 1% threshold everywhere. Overall, these average ratios are higher with Europe (0.6222) than with the hinterland countries (0.1243) and Nigeria (0.1133). Thus, exporting fresh pineapple to Europe is 5.01 times more expensive economically than with the hinterland and 5.49 times more expensive than with Nigeria. It is to understand why informal sub-regional exports dominate formal exports to Europe, even though the quality of this pineapple is well appreciated there (Arouna (Arouna & Afomassè, 2005; Arinloyé, 2013).

## **2.3. Comparative advantages (CRI) of pineapple exports and juice.**

The coefficients of domestic resources are everywhere lower than unity, demonstrating that Benin has a comparative advantage over these countries in the production of pineapple and its juice. These domestic resource costs vary from one producer to another and are vary greatly from one exporting region to another. Examining this coefficient by pineapple export zone shows that it is very high for Europe and very low for the hinterland countries. The export of fresh pineapple to Europe costs on average 5.73 times more in domestic resources than exporting to hinterland countries and 4.19 times more than exporting to Nigeria (table 3). These high resource losses explain why pineapple produced in Benin is exported more to the subregion than to Europe. Indeed, these high CRI for Europe are essentially due to handling and freight costs, which constitute more than 57% of pineapple export costs.

Examination of these coefficients according to producer-related parameters shows that they are statistically different according to the varieties grown at the 1% threshold everywhere (Table 3). These ratios confirm the profitability of sub-regional pineapple juice exports. Overall, they have respective averages of 0.1023, 0.1288 and 0.3982 for Senegal, Nigeria and the hinterland. However, the export of fresh pineapple is more profitable to hinterland countries than the export of juice, which is more profitable when exporting to Senegal and to Nigeria. But the standard deviations of the CRI for juice show that these ratios vary greatly from one processor to another, proving strong variability in juice extraction yields. The latter depends on several factors, including the juiciness of the fruit, the mastery of extraction techniques, the production period, etc. The improvement of the juice extraction yield requires the use of efficient and adapted equipment and the production of high juice yield pineapple varieties.

#### **2.4. Nominal protection coefficients for fresh pineapple and juice**

The coefficient of nominal protection of products (CPNP) which is the quotient of the financial and economic turnover, shows that pineapple and juice producers are taxed. These coefficients indicate that pineapple producers receive only 6.57%, 9.38% and 3.73% of the economic turnover by exporting it to hinterland countries, Nigeria and Europe respectively, while juice producers receive 68.4%; 63.53% and 49.8% of the economic turnover by exporting respectively to hinterland countries, Nigeria and Senegal. Pineapple producers are more taxed when exporting to hinterland countries and Nigeria because of the various intermediaries that inflate the pineapple export channels for fresh pineapple. By exporting fresh pineapple to the countries, for example, it can be said that 93.59% of the economic turnover escape the producers and is transferred to other agents through market distortions and multiple intermediaries (table 4).

In relation to exports to Europe, these coefficients express the excessive costs of handling, transit and especially freight and other services that constitute more than 57% of the cost of this export. The problem of freight costs can only be solved by exporting by boat which is only possible by increasing production through production by expanding its cultivation in other regions of the country (Zou, Collines, Ouémé, Plateau, Mono and Couffo departments) where it is potentially possible and by significantly improving its productivity. In addition, the state can also review the handling and transit costs, which are still very high by reducing them to a quarter of their current respective values.

Since the juice producers are the exporters, these ratios also indicate that the differences in selling prices at the national levels and importing countries are small and the handling and transportation costs are low. In this way, they receive a higher share of the wealth generated than fresh pineapple producers.

#### **1.3 Effective protection coefficients (EPC) for pineapple and juice exports**

The effective protection coefficient (EPC) which is the ratio of the difference in turnover and costs of tradable factors at the market price to that same difference at the reference price, measures the effects of distortions in the product and tradable input markets simultaneously. They thus indicate an effective distribution of income to the disadvantage of producers or less value added than they would receive if they were linked to external

market prices. They are then taxed and it is the traders and other marketing services that benefited from the opportunity costs of exporting to these different countries or regions. For fresh pineapple, these coefficients of effective protection are statistically different by gender (at the 5% threshold) and by variety grown (at the 1% threshold). Thus, for example, through the export of pineapple to Europe, the value added on the exchangeable factors of producers effectively represent only 6.27% of the economic value added created on these tradable factors. The high cost of freight handling and export transit costs undermine the added value created by the factors of production such as fertilizers and pesticides and disadvantage producers which does not allow them to better benefit from the advantages from these exchanges. These export costs which vary according to the volume of exports must be reduced in order to increase prices to producers who are the ones who suffer the most from this distortion.

In relation to juice, these EPCs also vary according to the categories of juice producers and according to the importing countries. They show that juice producers receive 63.58%, 57.1% and 49.95% of the value added on tradable factors of juice by exporting it to hinterland countries, Nigeria and Senegal respectively. These coefficients, less than one, express a distribution that is unfavorable to producers/exporters of juice and show that the export of juice is taxed. These average coefficients are statistically different at the 10% for the hinterland and Nigeria depending on the technologies used and their values are 0.6358, 0.5710 and 0.4995 respectively for the hinterland countries, Nigeria and Senegal (table 5). However, it can be seen that the EPCs are higher than those for fresh pineapple exports. Thus, there is a distribution of income more in favor of juice producers than fresh pineapple producers.

Since juice producers are the exporters, the value added on tradable inputs is more concentrated in their hands. In addition, the costs of exporting juice are lower and weigh less on these added values which means that the values of these NPCCs and the FPCs are close. In this way, it could be concluded that these FPCs are due to the small difference in prices between the juice producing country and the importing countries. This small price difference is essentially a reflection of the strong competition from sweetened beverages in the subregion. The search for other more profitable juice sales markets is necessary. But this will only be possible through better organization of producers, harmonization of juice production techniques and production processes (ABC/SNV, 2016).

## **CONCLUSION**

The export of fresh pineapple and juice is profitable regardless the export zone. Fresh pineapple exported to hinterland countries is more profitable than that export to Europe. The latter costs 5.73 times in local resources and is discouraged by high freight and handling costs. Expanding the production area and strengthening the capacity of producers in using new production technologies will increase export volumes and reduce these costs. On the other hand, the export of juice to hinterland countries is less profitable than that of fresh pineapple. This faces strong competition from other sweetened beverages produced in the subregion. The increase in the percentage of pineapple processed into juice,

harmonization of juice production processes, the adoption of appropriate equipment and technologies with a high juice extraction rate and support from research to have juicier varieties will make it possible to have the necessary volumes of juice for the conquest of other African, Asian and European markets.

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**Table 1. Structure of the Policy Analysis Matrix (PAM)**

| Indicators                        | Revenu   | Factor costs |              | Profit   |
|-----------------------------------|----------|--------------|--------------|----------|
|                                   |          | Tradable     | Non tradable |          |
| Financial budget (market price)   | $A_{ij}$ | $B_{ij}$     | $C_{ij}$     | $D_{ij}$ |
| Economic budget (reference price) | $E_{ij}$ | $F_{ij}$     | $G_{ij}$     | $H_{ij}$ |
| Differences or convergences       | $I_{ij}$ | $J_{ij}$     | $K_{ij}$     | $L_{ij}$ |

**Source** Pearson & Monke (1989).

**Table 2. Average cost-benefit ratios (CBR) for fresh pineapple and pineapple juice exports by pineapple export region and producer pineapple export regions and producer parameters**

| Parameters      | Modalities     | Financial Cost-Benefit Ratios (RCBF) |               | Economic Cost-Benefit Ratios (ECBR) |               |               |                 |               |               |
|-----------------|----------------|--------------------------------------|---------------|-------------------------------------|---------------|---------------|-----------------|---------------|---------------|
|                 |                | Pineapple                            | Juice         | Fresh pineapple                     |               |               | Pineapple juice |               |               |
|                 |                |                                      |               | Hinterland                          | Nigeria       | Europe        | Hinterland      | Nigeria       | Europe        |
| Gender          | Men            | 0.811 (0.459)                        | 0.721 (0.166) | 0.124 (0.024)                       | 0.114 (0.034) | 0.622 (0.016) | 0.562 (0.146)   | 0.319 (0.097) | 0.304 (0.076) |
|                 | Women          | 0.63 (0.322)                         | 0.877 (0.392) | 0.120 (0.022)                       | 0.107 (0.031) | 0.618 (0.012) | 0.622 (0.257)   | 0.381 (0.245) | 0.358 (0.191) |
|                 | F de Fischer   | 2.45                                 | 2.409         | 0.554                               | 0.551         | 1.02          | 0.775           | 0.983         | 1.221         |
| Education level | No level       | 0.808 (0.394)                        |               | 0.126 (0.023)                       | 0.115 (0.033) | 0.623 (0.015) |                 |               |               |
|                 | Primary        | 0.831 (0.506)                        | 0.676 (0.133) | 0.126 (0.029)                       | 0.116 (0.040) | 0.623 (0.018) | 0.550 (0.158)   | 0.271 (0.124) | 0.267 (0.096) |
|                 | Secondary 1    | 0.803 (0.570)                        | 0.606 (0.103) | 0.121 (0.022)                       | 0.109 (0.031) | 0.621 (0.014) | 0.440 (0.101)   | 0.233 (0.076) | 0.238 (0.059) |
|                 | Secondary 2    | 0.727 (0.323)                        | 0.840 (0.251) | 0.116 (0.017)                       | 0.102 (0.024) | 0.616 (0.011) | 0.622 (0.166)   | 0.372 (0.133) | 0.345 (0.104) |
|                 | Superior       | 0.595 (0.230)                        | 0.882 (0.429) | 0.114 (0.014)                       | 0.099 (0.020) | 0.615 (0.010) | 0.628 (0.286)   | 0.391 (0.272) | 0.368 (0.211) |
|                 | F de Fischer   | 0.667                                | 0.822         | 1.589                               | 1.591         | 1.575         | 0.684           | 0.684         | 0.759         |
| Varieties       | Smooth Cayenne | 0.544 (0.331)                        |               | 0.113 (0.018)                       | 0.097 (0.025) | 0.616 (0.013) |                 |               |               |
|                 | Sugar loaf     | 0.846 (0.459)                        |               | 0.126 (0.025)                       | 0.116 (0.035) | 0.623 (0.016) |                 |               |               |
|                 | F de Fischer   | 22.012 ***                           |               | 14.92***                            | 14.93***      | 12.82***      |                 |               |               |
|                 | Non motorized  |                                      | 0.797 (0.327) |                                     |               |               | 0.560 (0.159)   | 0.328 (0.140) | 0.311 (0.110) |
|                 | Motorized      |                                      | 0.832 (0.340) |                                     |               |               | 0.626 (0.255)   | 0.378 (0.237) | 0.355 (0.184) |
|                 | F de Fischer   |                                      | 0.113         |                                     |               |               | 0.938           | 0.646         | 0.852         |
| Together        |                | 0.803 (0.455)                        | 0.818 (0.332) | 0.124 (0.024)                       | 0.113 (0.034) | 0.622 (0.016) | 0.600 (0.222)   | 0.358 (0.203) | 0.337 (0.159) |

( ) standard error; \*\*\* significantly at 1%..

**Source:** Data survey. 2013 and 2015.

**Table 3: Average comparative advantage (CRI) of fresh pineapple and pineapple juice exports to hinterland juice to hinterland countries. Nigeria. Senegal and Europe**

| Parameters      | Modalities    | Fresh pineapple  |                  |                  | Pineapple juice  |                  |                  |
|-----------------|---------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                 |               | Hinterland       | Nigeria          | Europe           | Hinterland       | Nigeria          | Senegal          |
| Gender          | Men           | 0.044<br>(0.026) | 0.061<br>(0.036) | 0.253<br>(0.028) | 0.39<br>(0.147)  | 0.101<br>(0.069) | 0.079<br>(0.055) |
|                 | Women         | 0.040<br>(0.024) | 0.054<br>(0.032) | 0.247<br>(0.024) | 0.403<br>(0.225) | 0.146<br>(0.122) | 0.116<br>(0.100) |
|                 | F de Fischer  | 0.53             | 0.531            | 0.678            | 0.049            | 1.934            | 1.986            |
| Education level | No level      | 0.046<br>(0.025) | 0.063<br>(0.035) | 0.254<br>(0.027) |                  |                  |                  |
|                 | Primary       | 0.046<br>(0.031) | 0.064<br>(0.042) | 0.255<br>(0.033) | 0.421<br>(0.191) | 0.126<br>(0.128) | 0.100<br>(0.102) |
|                 | Secondary 1   | 0.041<br>(0.024) | 0.056<br>(0.032) | 0.250<br>(0.025) | 0.276<br>(0.067) | 0.053<br>(0.025) | 0.042<br>(0.020) |
|                 | Secondary 2   | 0.035<br>(0.019) | 0.049<br>(0.025) | 0.243<br>(0.020) | 0.453<br>(0.177) | 0.138<br>(0.105) | 0.107<br>(0.080) |
|                 | Superior      | 0.033<br>(0.015) | 0.045<br>(0.021) | 0.240<br>(0.017) | 0.375<br>(0.237) | 0.132<br>(0.122) | 0.107<br>(0.103) |
|                 | F de Fischer  | 1.594            | 1.594            | 1.59             | 0.752            | 0.608            | 0.577            |
|                 | Varieties     | Smooth C         | 0.032<br>(0.019) | 0.044<br>(0.026) | 0.240<br>(0.021) |                  |                  |
|                 | Sugar loaf    | 0.046<br>(0.027) | 0.063<br>(0.036) | 0.255<br>(0.028) |                  |                  |                  |
|                 | F de Fischer  | 15.073***        | 15.056***        | 14.239***        |                  |                  |                  |
| Technologies    | Non motorized |                  |                  |                  | 0.392<br>(0.167) | 0.113<br>(0.103) | 0.086<br>(0.074) |
|                 | Motorized     |                  |                  |                  | 0.403<br>(0.218) | 0.139<br>(0.110) | 0.113<br>(0.094) |
|                 | F de Fischer  |                  |                  |                  | 0.032            | 0.643            | 1.033            |
| Together        |               | 0.044<br>(0.026) | 0.061<br>(0.036) | 0.061<br>(0.036) | 0.398<br>(0.197) | 0.129<br>(0.107) | 0.102<br>(0.087) |

\*\*\* Significantly at 1%;

Source: Survey data. 2013.

**Table 4. Nominal product protection coefficients (NPPC) for fresh pineapple and juice exports to hinterland countries. Nigeria. Senegal and Europe.**

| Parameters      | Modalities    | Fresh pineapple  |                  |                  | Pineapple juice   |                  |                  |
|-----------------|---------------|------------------|------------------|------------------|-------------------|------------------|------------------|
|                 |               | Hinterland       | Nigeria          | Europe           | Hinterland        | Nigeria          | Senegal          |
| Gender          | Men           | 0.065<br>(0.022) | 0.092<br>(0.031) | 0.037<br>(0.012) | 0.686<br>(0.115)  | 0.656<br>(0.110) | 0.514<br>(0.086) |
|                 | Women         | 0.075<br>(0.036) | 0.106<br>(0.051) | 0.043<br>(0.021) | 0.651<br>(0.130)  | 0.623<br>(0.124) | 0.488<br>(0.098) |
|                 | F de Fischer  | 2.625            | 2.626            | 2.631            | 0.827             | 0.827            | 0.827            |
| Education level | No level      | 0.066<br>(0.018) | 0.093<br>(0.025) | 0.037<br>(0.010) |                   |                  |                  |
|                 | Primary       | 0.067<br>(0.034) | 0.095<br>(0.047) | 0.038<br>(0.019) | 0.713<br>(0.099)  | 0.683<br>(0.094) | 0.683<br>(0.094) |
|                 | Secondary 1   | 0.066<br>(0.018) | 0.093<br>(0.025) | 0.037<br>(0.010) | 0.610<br>(0.117)  | 0.584<br>(0.112) | 0.457<br>(0.088) |
|                 | Secondary 2   | 0.060<br>(0.024) | 0.084<br>(0.034) | 0.034<br>(0.014) | 0.681<br>(0.170)  | 0.651<br>(0.163) | 0.510<br>(0.128) |
|                 | Superior      | 0.062<br>(0.113) | 0.088<br>(0.016) | 0.036<br>(0.006) | 0.6485<br>(0.093) | 0.621<br>(0.089) | 0.486<br>(0.070) |
|                 | F de Fischer  | 0.518            | 0.516            | 0.517            | 0.518             | 0.518            | 0.518            |
| Varieties       | Smooth C      | 0.076<br>(0.024) | 0.107<br>(0.034) | 0.043<br>(0.014) |                   |                  |                  |
|                 | Sugar loaf    | 0.064<br>(0.022) | 0.091<br>(0.032) | 0.036<br>(0.013) |                   |                  |                  |
|                 | F de Fischer  | 12.541***        | 12.52***         | 12.571**<br>*    |                   |                  |                  |
| Technologies    | Non motorized |                  |                  |                  | 0.635<br>(0.085)  | 0.607<br>(0.081) | 0.476<br>(0.064) |
|                 | Motorized     |                  |                  |                  | 0.684<br>(0.143)  | 0.654<br>(0.137) | 0.513<br>(0.107) |
|                 | F de Fischer  |                  |                  |                  | 1.691             | 1.116            | 1.161            |
| Together        |               | 0.066<br>(0.023) | 0.093<br>(0.323) | 0.037<br>(0.013) | 0.664<br>(0.124)  | 0.635<br>(0.119) | 0.498<br>(0.093) |

\*\*\* Significantly at 1%;

Source: Survey data. 2013.

**Table 5. Average effective protection coefficients (EPC) by importing country for pineapple and its of pineapple and its juice and some producer-related parameters.**

| Parameters      | Modalities    | Fresh pineapple  |                  |                  | Pineapple juice  |                  |                  |
|-----------------|---------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                 |               | Hinterland       | Nigeria          | Europe           | Hinterland       | Nigeria          | Senegal          |
| Gender          | Men           | 0.060<br>(0.024) | 0.083<br>(0.033) | 0.062<br>(0.025) | 0.665<br>(0.182) | 0.581<br>(0.147) | 0.456<br>(0.103) |
|                 | Women         | 0.073<br>(0.039) | 0.101<br>(0.054) | 0.075<br>(0.040) | 0.618<br>(0.280) | 0.565<br>(0.302) | 0.526<br>(0.586) |
|                 | F de Fischer  | 4.342**          | 4.338**          | 4.16**           | 0.377            | 0.041            | 0.234            |
| Education level | No level      | 0.061<br>(0.020) | 0.084<br>(0.027) | 0.063<br>(0.020) |                  |                  |                  |
|                 | Primary       | 0.062<br>(0.036) | 0.086<br>(0.049) | 0.064<br>(0.037) | 0.726<br>(0.116) | 0.649<br>(0.103) | 0.521<br>(0.08)  |
|                 | Secondary 1   | 0.059<br>(0.019) | 0.081<br>(0.026) | 0.061<br>(0.019) | 0.595<br>(0.124) | 0.537<br>(0.107) | 0.428<br>(0.078) |
|                 | Secondary 2   | 0.057<br>(0.025) | 0.078<br>(0.035) | 0.058<br>(0.026) | 0.639<br>(0.278) | 0.553<br>(0.238) | 0.430<br>(0.175) |
|                 | Superior      | 0.060<br>(0.013) | 0.083<br>(0.017) | 0.062<br>(0.013) | 0.618<br>(0.275) | 0.572<br>(0.317) | 0.562<br>(0.683) |
|                 | F de Fischer  | 0.35             | 0.351            | 0.353            | 0.203            | 0.13             | 0.185            |
| Varieties       | Smooth C      | 0.072<br>(0.025) | 0.099<br>(0.034) | 0.075<br>(0.026) |                  |                  |                  |
|                 | Sugar loaf    | 0.059<br>(0.024) | 0.081<br>(0.033) | 0.061<br>(0.025) |                  |                  |                  |
|                 | F de Fischer  | 14.485***        | 14.46***         | 14.299***        |                  |                  |                  |
| Technologies    | Non motorized |                  |                  |                  | 0.558<br>(0.217) | 0.494<br>(0.193) | 0.393<br>(0.147) |
|                 | Motorized     |                  |                  |                  | 0.688<br>(0.255) | 0.622<br>(0.278) | 0.570<br>(0.582) |
|                 | F de Fischer  |                  |                  |                  | 3.149*           | 2.88*            | 1.585            |
| Together        |               | 0.061<br>(0.025) | 0.083<br>(0.034) | 0.063<br>(0.026) | 0.636<br>(0.246) | 0.571<br>(0.253) | 0.500<br>(0.465) |

( ) Error standard ; \*\*\* ; \*\* et \* respectively significantly at 1%. 5% et 10%.

Source: Survey data. 2013