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“As Time Goes by”:
Econometric Estimation of the Prosecco Life Cycle

Laura Onofri [a] and Vasco Boatto [b]

Abstract

This paper presents an empirical model that estimates the Prosecco life cycle. We use OLS and 3SLS to estimate the life cycle of Prosecco (1) worldwide, (2) as a system of equations in selected countries and (3) as a system of equations in comparison with Cava and Champagne. Our results reveal that Prosecco is approaching maturity worldwide, different from Cava and Champagne, which have already achieved that phase. The Prosecco life cycle is in the growing phase in Germany, China and Japan, in the maturity phase in France, the United Kingdom and the U.S. and in the declining phase in Russia.

Keywords: product life cycle, Prosecco CDO, life cycle empirical specification, 3SLS, OLS

JeL Codes: L1, C2, C51, C54

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1. Introduction

Prosecco is an Italian sparkling or semi-sparkling white wine made from *Glera* grapes. This wine is primarily produced in the Veneto region, mainly in Treviso province[1]. Today, Prosecco is the largest-selling Italian wine in the world market: in 2017, over 205 million litres were sold. This figure corresponds to a market share of 40% in the wine sector, which represents nearly twice the amount of Champagne that was sold in the same year. The United States, the United Kingdom and Germany are the main foreign markets for exported Prosecco. However, emerging markets, such as China and Russia, might contribute to an increase in exports of this Italian product in the next years. Prosecco has overtaken Champagne in terms of sales volume but not in terms of value. In this perspective, France still surpasses Italy, and by far. In 2017, for instance, the average export price of Champagne was 25 euros per litre, and 112,287 litres were sold, resulting in a total turnover of 2,8 billion EUR. Prosecco's average export price in the same year was 3,92 euros per litres, with 205 million litres exported, which amounts to a total turnover of 804 million EUR (Nomisma Wine Monitor, 2018).

As Prosecco demand increases worldwide, several questions with theoretical and practical implications arise. In particular, it is important to understand the nature and the dynamics of such "booming" and success. In this respect, product life cycle (PLC) offers an interpretational and methodological framework. The product life cycle appears to be simply a time-dependent export model based on a biological analogy. Products, in fact, are created and introduced in markets. They achieve full maturity and eventually decline.

Prosecco represents a highly interesting application for the life cycle theory. Understanding which life cycle stage a product has attained is important to business strategy development and targeted, effective industrial policies.

This paper represents an exploratory attempt to shed light on the existence, the shape and the determinants of the product life cycle (PLC) for a sample of Prosecco exports during the period 2010-2016 worldwide and in selected markets (USA, Japan, France, Australia, United Kingdom, China and Russia). Given the lack of relevant literature on the subject, we proceed autonomously by selecting the relevant variables and the empirical method. The paper's novelty is twofold. First, to our knowledge, it is the first empirical application of the PLC theory to Prosecco. Second, it proposes an original estimation method of PLC dynamics.

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[1] For a thorough description of Prosecco and its market characteristics, see Pomarici (2016), Onofri et al. (2015) and Rossetto et al. (2011).

The paper is organized as follows. Section 2 presents the paper's motivation and frames the study within the mainstream literature. Sections 3 and 4 present the econometric method and empirical results, respectively. Section 5 discusses the econometric results from the perspective of industrial policy and strategy. Section 6 presents the study's conclusions.

1. Literature Review

In a seminal paper, Vernon (1966) theorized that each product is characterized by a life cycle. The idea is simple and suggests that a product develops over time in four main phases (i.e., introduction, growth/development, maturity, decline), which characterize and represent the product evolution.

The product life cycle (PLC) concept has found a wide variety of useful applications in practical business areas of product design, management, and marketing. Vernon's PLC concept has also been broadly applied in theoretical and empirical economic studies and has generated two main streams of research (Heffley, 2016).

Several authors have used Vernon's idea to develop theoretical and empirical models of international trade (see Jensen and Thurby, 1986 Grossman and Helpman, 1989, Segerstrom et al.,1990, Steffens, 2002, Ameri and Dutta, 2005, Aytac and Wu, 2011, 2013, Melser and Syed, 2013).

Another stream of research has focused on the attempt to systematically test an operational time-dependent sales model, whose key variables are time and the exported quantity of a selected product. In this stream of research, authors have (1) attempted to compute the cumulative distribution function of the PLC (Polli and Cook, 1969), (2) adopted time series and cross-sectional analysis (Cox, 1967, Brockhoff, 1967, de Kluyver, 1977, Bauer and Fisher, 2000) and (3) used panel data (Onofri and Scorcu, 2006).

The breadth of applications alone suggests the inherent appeal of the concept. However, similar to many "simple" concepts, PLC has important limitations. Heffley reports that certain researchers have used parsimonious empirical modelling and failed to find evidence, while others have concluded that the possibility of addressing the PLC empirically depends highly on which product is being considered. Other researchers suggest that, typically, "disturbances" occur in market trends such that an extension of the PLC model is required to include multiple determinants of unit sales, prices[2], or

[2] Several authors have focused on product price (instead of quantity) over time. In fact, unless firms operate in a perfectly competitive market in which the price is essentially given and determined by the market interaction of supply and demand, firms normally choose the price they charge for a product. The quantity sold represents a response to this price and a potentially large number of other factors: product quality, competitors' prices, consumer tastes, taxes, tariffs and other public policies. Consequently, the time paths of price and quantity sold for a particular good are typically not independent.

other measures of product performance. These additional factors include changes in demographic factors, the behaviour of competitors, domestic and foreign government policies, and many other variables that shape market outcomes. Failure to explicitly account for such factors can result in serious estimation errors and misinterpretations

of market patterns.

In our opinion, expanding and generalizing the PLC model would enhance its realism and versatility. However, it also might sacrifice the model's idiosyncrasy and capacity to target market patterns that reflect the product life cycle. Therefore, we follow the second stream of research and use a structural model that attempts to simultaneously estimate the sales dynamics in different markets. Exports occur in different markets simultaneously. Therefore, there are various Prosecco life cycles, which are simultaneously determined at each export destination. To the best of our knowledge, this part of the problem has not been addressed in the empirical PLC literature.

2. Method

This section describes the product life cycle theory and its main phases. It also presents the product life cycle econometric model and provides a short description of the analysed data set.

3.1. PLC phases

The product life cycle theory is an investigative tool that enables one to diagnose an asset's state of development. It also facilitates formulating appropriate industrial policies and strategies for each phase. In fact, as a product travels along its cycle, strategies regarding competition, pricing, distribution, promotion, and market information must be periodically evaluated and perhaps modified to support the market and sustainability. The four PLC phases are listed and explained in Table 1.

Table 1. PLC Phases

Introduction	This phase is preceded by the ideation phase, typically linked to the logic of scientific discovery and technological innovation. At this stage, the product is placed on the market in limited quantities by the supplying firm/firms because generally in this phase the market demand is rigid with respect to price variations. The price is typically high because it is necessary to amortize the costs of research, and therefore, only the most advanced countries can export the product. Alternatively, the price is low

	(limit pricing) to enable the company to make the product known, to create demand and to retain consumers.
Growth/Development	This phase is characterized by a situation in which the product acquires characteristics that enable it to be standardized. The production is organized on a larger scale, which entails an increase in the quantity supplied. The demand for the product increases and becomes more elastic. More firms are interested in entering the market and producing the good.
Maturity	This phase is characterized by a situation in which the product no longer undergoes innovations or undergoes marginal and no longer qualitative innovations. The level of job qualification decreases, and the elasticity of demand with respect to price is always higher. This phenomenon implies the possibility, if not the necessity, for the firm/firms to position itself/themselves in less elastic demand segments. In this phase, firms often relocate to regions in which the cost of production inputs is lower. It is the moment when profits are higher and companies can exploit the differentials between a higher price and a low cost per unit of the product. Eventually, the good becomes accessible to everyone.
Decline	This phase concludes the life cycle of the product, which is supplied and marketed in ever-smaller quantity relative to a gradually decreasing demand.
Revival Phase	The phase of decline can be followed by an eventual revival phase, which can prevent the exit of the producing company from the market and the end of production of the product.

3.2. Empirical Strategy

In accordance with the PLC concept, we assume there is a constructible relation between the time t and the sale y of a product. We choose a parsimonious version of the model since the essence of the (empirical) LC is to assess the "state of development" of a product. The Prosecco life cycle is therefore described by a (mathematical) relationship between the period of existence of the product

and total sales (worldwide and in selected markets). More variables would only obscure the idiosyncrasy of the analysis. Therefore, following Onofri and Scorcu (2006), we define a simple log-linear specification that describes the product life cycle in terms of the variations of the dependent variable (in our case the traded/exported quantity of the product) over time. It is possible to link these two variables in a functional form that describes the variations of the quantity of Prosecco traded worldwide as dependent on time variation. It is important to highlight that this model is not a "time-based" or a prediction model. In our framework, we study (empirically) the function (Q = f(T)) with mathematical analysis to identify the trait of the function (i.e., increasing, decreasing, stable) that represents the life cycle of the product.

The econometric operationalization of the intuition described above is expressed in the model described in function (1).

$$(1)\quad (Log)Exports_n=\beta_0+\beta_1 T1+\beta_2 T^2+\beta_2 T^3+\varepsilon$$

The function describes the classic "inverted bell" function, in which the independent variable is time (measured in years and/or months, depending on the available data). The quantity variable is represented by data on exports (in litres) to a specific country/worldwide. Exports to country n vary with time. After several checks and following this approach, the specification with the cubic term is always excluded because it is always inferior in terms of non-nested tests (the Akaike and Schwarz Information Criteria) to the model with the squared term. Therefore, we use the log-linear specification expressed in Equation (2).

$$(1)\quad (Log)Exports_n=\beta_0+\beta_1 T1+\beta_2 T^2+\varepsilon$$

Equation (1) represents the function of the Prosecco life cycle, whose empirical estimate enables one to measure its "curvature". Exports (in terms of volume in litres) of Prosecco to country n are a function of time (T, with a multiplicative variable T^2 that captures the non-linearities and curves of the function that represents the life cycle of the product). The model includes a constant and the error term. The variations of the exported quantity (in logs) are measured in terms of marginal effects, expressed by the total derivative of the export variable with respect to time variations ($\delta y/\delta T_1=\beta_1+2\beta_2 T$), which we estimate econometrically.

3.3. Data

The Prosecco life cycle is described by the total exports (worldwide and to selected countries) over time. More precisely, the dynamics of the Prosecco exported litres are 'explained' in terms of time, i.e., measured in months and/or years. The data on international exports are drawn from the Global Trade Atlas database, which records export volumes at national customs agencies. We gathered "pooled" data (on Prosecco Controlled Denomination of Origin[3] (CDO), Champagne and Cava total worldwide exports per month and year) and data on Prosecco CDO exports to selected international countries per month and year (for descriptive statistics, see Appendix).

The selected time period spans from 2011 to 2016[4] and is measured in months (72 months). On average, in the considered period, the total exported quantity is 9,670,087 litres, with a minimum 2,689,796, a maximum of 206,048,223 and a standard deviation equal to 6,689,97. Our panel contains observations on exported litres of Prosecco CDO for 72 months to 8 selected foreign countries (U.S., UK, Germany, France, Australia, Japan, China and Russia), for a panel with 576 observations.

4. Results

The section presents three applications and the related results of the econometric specification.

4.1. Prosecco Life Cycle Worldwide

The preliminary phase of the study involves testing the model on a small data set that contained the exports of Prosecco to all countries to which Prosecco is exported for the period between 2010 and

[3] Prosecco wine can be differentiated into Prosecco Controlled Denomination of Origin (CDO) and Prosecco Controlled and Guaranteed Denomination of Origin (CGDO), depending on the geographical area in which the grapes are cultivated (the Treviso, Asolo and Valdobbiadene areas for the second denomination or the broader Veneto and Friuli Venezia Giulia areas for the first denomination). It is worth noting that both CDO and CGDO wines come under the European DOP classification (Protected Designation of Origin) and therefore outside Italy are hypothetically of the same quality level. The reasons for the presence of two similar products on the market are to be found in a production regulation change that occurs a few years ago.

[4] The decision to collect data from 2010 is based on regulatory practices. In fact, the Prosecco Controlled Denomination of Origin (CDO) only started in 2010 according to a 2009 regulation. The regulation states the official "birth" of the product, e.g., its official introduction into the market. In our data set, the export data refer to Prosecco. In 2009, the strong demand for Prosecco wine resulted in a need to increase supply, which was attained with a new regulation that permitted the expansion of the Prosecco Area. In fact, the historical area of production, formerly the Prosecco CDO area, gained CGDO qualification, the most prestigious appellation among Italian Geographical Indications (GIs). Compared with a CDO, a CGDO has a stricter production protocol, and the quality of each batch is compulsorily checked by a tasting commission before being commercialized. At the same time, an extended Prosecco CDO Area that includes two regions and seven provinces was created, resulting in the rapid expansion of Glera plantings (today, CDO Prosecco is the most produced Italian wine GI4). Consequently, in the period 2010-2013, there was a 35% increase in Prosecco supply, with an equal increase in demand.

2016. The model is estimated using the OLS (ordinary least squared) and 3SLS (an estimation method) using the STATA 12 statistical program. Table 2 shows the preliminary results.

Table 2. Prosecco Life Cycle Worldwide

Variables	**Exports Worldwide**
T	5.26*
T^2	(-)0.012*
Constant	5542
R^2	0.90

*5% statistically significant.

The estimation of linear effect T is positive and relatively small. This estimate has a different magnitude depending on the destination of the export (see the following paragraph for further analysis regarding selected countries). The different magnitude of the estimated coefficients could imply variations of different entities in the export with respect to the variation of time, with spikes due to the novelty of the product, as for China. The estimate of the quadratic effect T^2 is negative and very close to zero (also in this case with different sizes depending on the individual applications). This outcome could mean that the total marginal effect is increasing but at increasingly smaller rates as time changes. The marginal variation of exports with respect to the variation of time is positive but "small". The measurement of the curvature is negative (T^2) and close to zero. The product is still growing but approaching the maturity phase worldwide.
The empirical results are based on a highly limited number of observations and must be interpreted "*cum grano salis*", i.e., with care. However, if we compare the econometric results with the descriptive statistical results provided in the Appendix, we can understand the methodological validity of the exercise, even at this preliminary stage. For instance, Figure 1 graphs the export trends worldwide and shows the same exports-time relationship in a non-parametric way. The graphs reveal an increasing trend of exports over time (with spikes, ups and downs) but do not model or measure the marginal effects.

4.2. Applications to Selected International Markets

Using monthly data (2010-2016 period) on Prosecco CDO exports to selected international markets, we tested the empirical specification to validate the model and capture at which stage of the life cycle Prosecco is found in those selected markets. We use the empirical specification in Equation (2) to

simultaneously estimate the Prosecco life cycle in international markets. We simultaneously estimate an eight-equations model. Each equation represents a selected market that is selected for a specific reason. The U.S., the United Kingdom and Germany are the three largest "traditional" importers of Prosecco. France is a large importer but also the producer of Champagne. Australia, Japan, China and Russia are the largest "new markets". The modelling structure implies simultaneity because Prosecco is traded simultaneously in the same considered period. For the sake of model parsimony, we exclude the constant in each line. This approach could generate heteroskedasticity. The application of the Overall System Heteroskedasticity Test after the 3SLS regressions in STATA excludes heteroskedasticity in the estimation of the simultaneous equations system. The model is synthesized in Equation (3).

Eq. (3)

$$1.(Log)ProseccoExports_{US}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$2.\ (Log)ProseccoExports_{UK}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$3.\ (Log)ProseccoExports_{Germany}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$4.\ (Log)ProseccoExports_{France}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$5.\ (Log)ProseccoExports_{Australia}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$6.\ (Log)ProseccoExports_{Japan}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$7.\ (Log)ProseccoExports_{China}=\beta_0+\beta_1 T+\beta_2 T^2$$
$$8.\ (Log)ProseccoExports_{Russia}=\beta_0+\beta_1 T+\beta_2 T^2$$

The model is estimated with a three-stage least-squared (3SLS) routine. Table 3 shows the results.

Table 3. Prosecco Life Cycle in Selected Markets

Variables	Estimated Coefficients							
	U.S.	UK	Germany	France	Australia	Japan	China	Russia
T	(-) 0.24**	(-)0.43**	0.15*	(-) 0.41**	(-)0.27**	0.90**	0.34**	(-) 0.02*
T^2	0.001**	0.002**	(-)3.85*	0.002**	0.001**	0.05*	0.02**	(-)0.16*
R^2	0.63	0.83	0.47	0.33	0.86	0.45	0.82	0.57

*5% statistically significant; **1% statistically significant.

For the U.S, France and the United Kingdom, the estimation of linear effect T is negative, and the estimated coefficient has a small magnitude. The estimate of the quadratic effect T^2 is positive but very "small" and close to zero. This outcome could mean that the total marginal effect is decreasing at very low rates. The product is in the "full" maturity phase.

The Germany, the estimation of linear effect T is positive and of small magnitude. The estimated coefficient of the quadratic effect T^2 is positive and different from zero. This outcome could imply that the product is still in the "growing" phase.

For Australia, the estimation of linear effect T is positive and "small. The estimate of the quadratic effect T^2 is negative and "small". This outcome could mean that the total marginal effect is increasing, at ever-lower rates. Export exceeds the development phase and enters the phase of maturity.
For Japan and China, the estimates of linear effect T are positive. The estimates of the quadratic effect T^2 are positive and "small". This outcome could mean that the total marginal effect is increasing, at ever-higher rates. Exports are in the development phase.

Finally, in the case of Russia, the estimation of linear effect T is negative, as is the estimate of the quadratic effect T^2. This outcome could mean that Prosecco is already in a declining phase in that market.

Table 4 summarizes the empirical findings.

Table 4. Prosecco Life Cycle (2016-2017)

U.S.	UK	Germany	France	Australia	Japan	China	Russia
Full maturity	Full maturity	Development	Full maturity	Between Development/ Maturity	Development	Development	Declining

4.3. Life Cycle of Prosecco, Champagne and Cava

To further validate the preliminary results presented in the previous section, we use the empirical model in Equation (2) to simultaneously estimate the Prosecco life cycle and the (partial) life cycle of Cava and Champagne for the same period in the same selected markets, as synthesized in Equation (3).

Eq. (3)

$$(Log)ProseccoExport_{worldwide}=\beta_0+\beta_1 T+\beta_2 T^2$$

$$(Log)ChampagneExport_{worldwide}=\beta_0+\beta_1 T+\beta_2 T^2$$

$$(Log)CavaExport_{worldwide}=\beta_0+\beta_1 T+\beta_2 T^2$$

The modelling structure implies simultaneity because the wines are traded simultaneously in the same considered period. The model is estimated with a three-stage least-squared (3SLS) routine. We first perform a preliminary exercise using aggregated data on exports worldwide. The results are reported in Table 4.

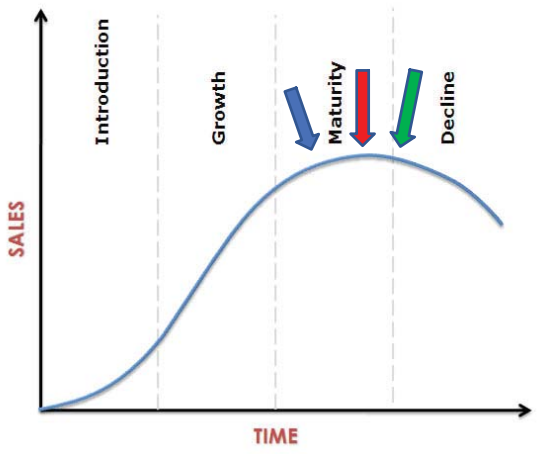
Table 4. Prosecco Life Cycle in Comparison to Champagne and Cava

Variables	Estimated Coefficients		
	Prosecco Exports Worldwide	**Champagne Exports Worldwide**	**Cava Exports Worldwide**
T	0.24*	0.00084	0.0009
T^2	(-)0.00012*	(-)4.13	(-)4.11*
R^2	0.89	0.75	0.66

*5% statistically significant.

As for the Prosecco life cycle, the marginal variation is positive and "very small". The measurement of the curvature is negative. The product approaches maturity (i.e., it passes from the development phase to the maturity stage). The situation is different for Cava and Champagne. Here, the marginal variation is positive and tends to zero. The measurement of the curvature is negative. The products enjoy full maturity. Figure 1 presents the results. In the figure, the green arrow indicates the position of Cava in the curve of the product life cycle for worldwide demand in the period 2010-2016. The blue arrow indicates the position of Prosecco and the red arrow that of Champagne.

Figure 1. Comparison of Prosecco, Cava and Champagne Life Cycles Worldwide



The comparison the Champagne and Cava life cycles is highly interesting. In the considered period, these wines are positioned in different parts of each product life cycle curve. Prosecco is in the first phase of maturity, Champagne in full maturity and Cava is entering the maturity phase.

5. Discussion

Our analysis intentionally neglects to include information on the impacts of the variables that structurally determine exports and, indirectly, determine the shape of the product life cycle function (e.g., prices, consumers preferences, demand shocks, regulatory interventions, import/export taxes and quota, technological changes and production technology, costs structure and many others).

The analysis, however, aims at providing suggestions regarding the type of strategy to be adopted once the life cycle stage has been diagnosed based on Vernon's theory.
In Australia and Germany, for instance, Prosecco is at the final stages of the development phase, approaching maturity. This phase is "delicate," since it is characterized by growth in sales, with a consequent increase in profits. In this phase, the most effective industrial policies and strategies continue to be communication and distribution. However, above all, these policies and strategies should be functional to create a precise product identity, which defends the products against competitors and clearly expresses the product characteristics. Let us consider two extreme examples. In Australia, consumers prefer not to spend more than 10 Australian dollars per bottle, although this tendency underwent a slight reversal in 2016, with an 8% increase in sales of wines that cost more than $ 10 per bottle[5]. The transition to the maturation phase, towards which Prosecco seems to be heading, could determine a period of sales stabilization due to the achievement of product acceptance by the majority of potential buyers in a country in which in 2016 each Australian, on average, drank 5 beers, a bottle of wine, three cocktails and half a litre of cider a week[6]. The most effective industrial strategies could aim to increase the price (if Australian consumers maintain the tendency to buy more expensive wines) with a mark-up on production costs that incorporates investments in quality, communication and "symbols", such as the identity of the "made in Italy" brand. For the bottle of wine drunk during the week to be Prosecco, it would be necessary to "educate" the consumer to purchase a quality product that incorporates and carries recognized and appreciated cultural and other values globally. In this way, the transition to the maturity phase and, above all, the maturity phase itself could last as long as possible. The alternative strategy (i.e., lowering the price to react to the pressure of domestic and New Zealand competitors) could bear fruit in the short term but does not

[5] https://www.wineaustralia.com/news/market-bulletin/issue-77.

[6] http://www.news.com.au/lifestyle/health/alcohol-rising-australians-drink-about-680-bottles-of-beer-a-year/news-story/9a73d22ba74c02ea576a78dc16e7c060.

represent an investment aimed at reaching and maintaining the maturity stage for the longest possible period. It could also result in a rapid decline if Prosecco were only perceived as an inexpensive cheap wine. In this case, any competitor could lower prices on the margin and gain a large market share, which is what presumably occurred in Russia (where the Prosecco life cycle is already in the declining phase). The producers' pricing strategy (i.e., low prices) has probably confused Russian consumers, who seek in Italian products the refined and expensive "*made in Italy*" cachet.

In the United Kingdom, France[7] and the United States, Prosecco is approaching the phase of full maturity. In this phase, the rate of sales growth tends to slow and the product enters a phase of "stability". This phase generally lasts longer than the previous two phases. Additionally, it is important to extend the duration of this phase to avoid that of decline, which may, however, be followed by a revival phase. At this stage, it is essential to try to find new ways to increase the consumption of the product (for example, by developing the market and expanding demand or seeking new niches and segments, such as "young people" or "sophisticated New York women") or enter a completely new market (for example, regions or states in a country in which the product has not yet been heavily marketed). An alternative strategy involves increasing the price, positioning the product in the less elastic segments of demand and therefore making it less reactive to price changes. This strategy could be characterized as a type of "upgrading" of the product. Prosecco is offered as a quality wine in its full maturity, and thus, the higher price implies the valorisation of the product itself (i.e., not necessarily that "cheap is good"). Equally valid is the "limit pricing" strategy aimed at entering new segments of demand, adopting a slightly lower price than that of the main competitor or dominant brand (incumbent) even if for a period this price policy might not guarantee profits. Another strategy aims at developing/modifying the product, focusing on innovation and development with respect to certain characteristics (e.g., aromatization, zero alcohol, packaging, bottle size) while focusing on quality or style. Therefore, this strategy aims to increase the functional performance of the product, its durability, reliability, performance and taste.
Finally, another strategy aimed at maintaining the product in the maturity phase is related to advertising and communication, that is, presenting the product in a convincing and differentiated way along the lines of the "*made in Italy*" emphasis, which is widely appreciated, particularly in the United States. Obviously, the appropriate strategy choice must follow careful industrial and contextual

[7] Prosecco is clearly more affordable than Champagne. Prosecco's average price is 3,92 € per litre, whereas Champagne's average price per litre is 25 €. Prosecco has much lower production standards and costs. However, the remarkable price difference is also due to industrial strategies and choices. The French want to skim the market and keep the price of their product high to remain in the high end of the wine market (the most prestigious position). In any case, the lower price is undoubtedly one of the factors that contributed to the great diffusion of Prosecco everywhere in the world… including France**.**

analysis of the characteristics of consumers and of the demand in the most important areas of reference for exports.

In China and Japan, the Prosecco life cycle is in the development phase. In this phase, generally, there is a rapid increase in sales, with a consequent increase in profits. The first consumers who start using the product appreciate the product, and other consumers follow their example, increasing the demand for the product, which can require an increase in distribution channels. Prices can vary downward (to attract consumers with stringent budget constraints) or upward to take advantage of the positive impacts of an increasing demand and to strive to position the product in more rigid segments (to attract consumers who have strong preferences for products marketed with emphasis on the “made in Italy” cachet).

The most suitable strategies for this phase differ from one to the next but are basically linked to the definition of communication and convincing advertising to capture and retain consumers or consumer niches of. In this regard, a notable initiative was that of the Consortium for the Protection of Prosecco Doc, which on the basis of an organic promotional campaign in Japan organized an exclusive event at the Sensi by Heinz Beck restaurant in central Tokyo[8]. Again, Prosecco was inextricably linked to the communication strategies "made in Italy" and "the Italian life style". The development/growth phase is relatively "easy" to manage but must be well organized, with strategies that aim to bring the product to a maturity phase that lasts as long as possible.

6. Concluding Remarks

In this paper, we have econometrically estimated the life cycle of Prosecco worldwide in selected countries and in comparison with Cava and Champagne. Our results reveal that Prosecco is approaching maturity worldwide, different from Cava and Champagne, which have already achieved that phase. Prosecco is in the growing phase in Germany, China and Japan, in the maturity phase in France, United Kingdom and U.S. and in the declining phase in Russia.

Our preliminary econometric analysis of the Prosecco life cycle indicates that the product has completed the development phase and is approaching that of maturity. Prosecco is a product characterized by its uniqueness in the sparkling wine market and appears to be following the life cycle of Champagne, which has maintained its position as a mature product for decades thanks to targeted industrial strategies.

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[8] http://www.ilsole24ore.com/art/food/2017-07-13/-prosecco-conquista-mercato-giapponese--090430.shtml?uuid=AEosidwB&refresh_ce=1.

Obviously, the economic factors that underlie the results must be scrutinized and the study extended with an analysis of the context in each selected market, which can, in factual terms, corroborate and strengthen the rigor of econometric analysis. The empirical modelling of PLC helps target the phase through parametric analysis. However, it does not capture the economic determinants that determine the phase. In addition, the empirical evidence presented in the paper only represents a preliminary result that might not hold in different contexts. To draw robust conclusions, further analysis based on larger data sets for other countries and including longer periods of time is required.

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APPENDIX. NON-PARAMETRIC TRENDS (Worldwide)

Y axes = Exported Litres; X axes = Time

Figure 1. Prosecco Annual Trends

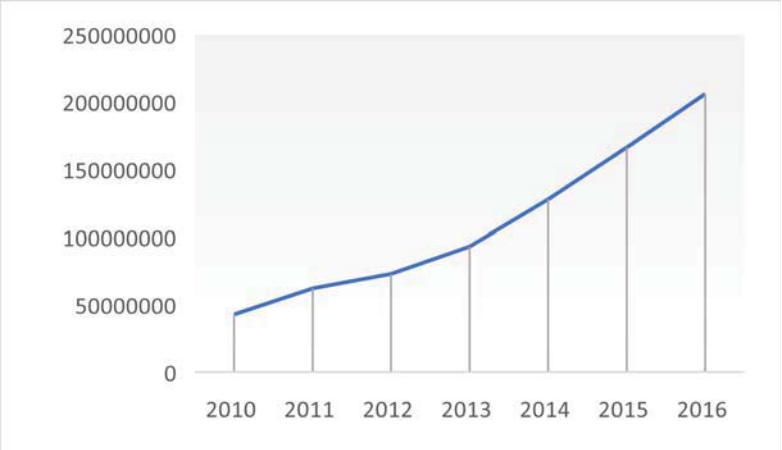

Figure 2. Champagne Annual Trend

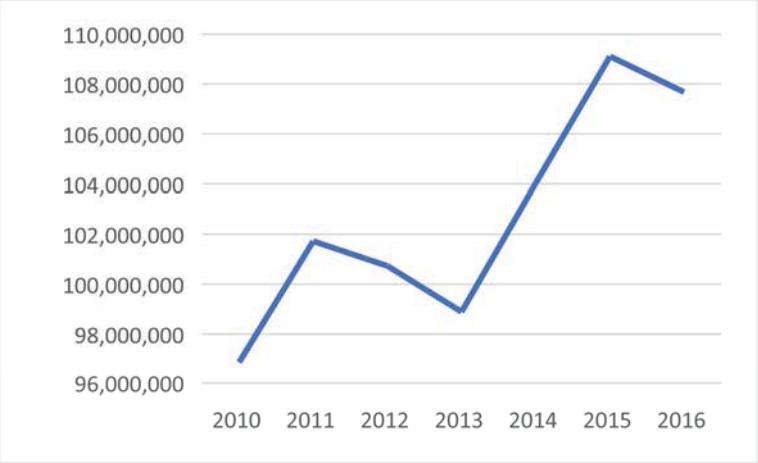

Figure 3. Cava Annual Trend

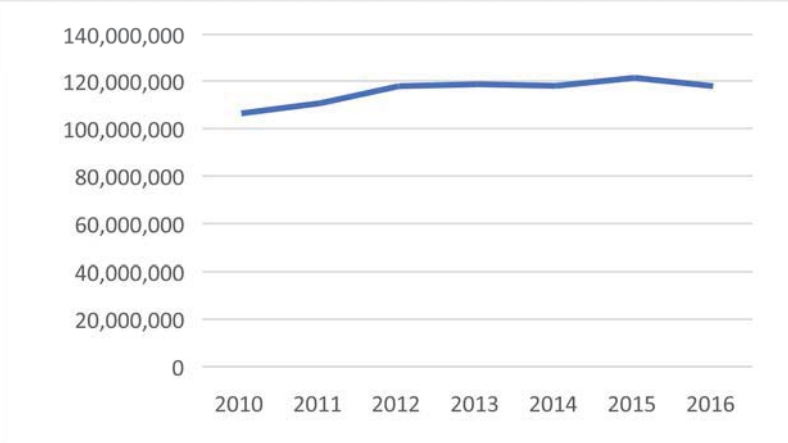

Figure 4. Prosecco Monthly Trend

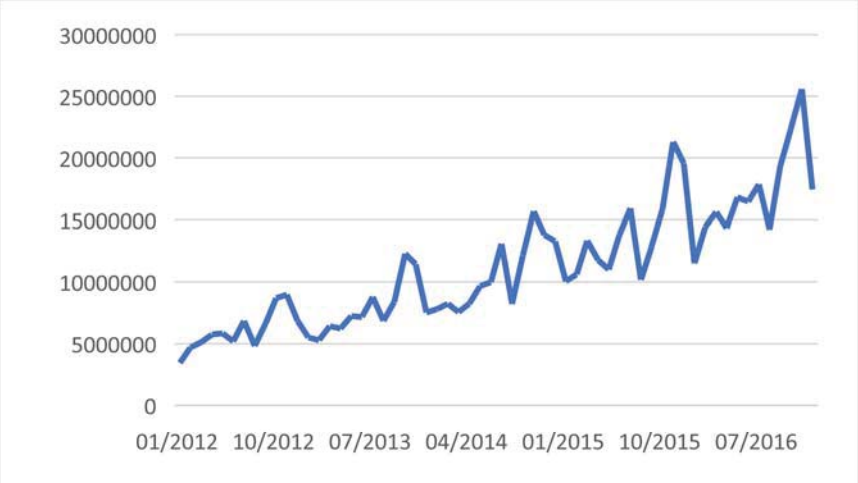

Figure 5. Champagne Monthly Trend

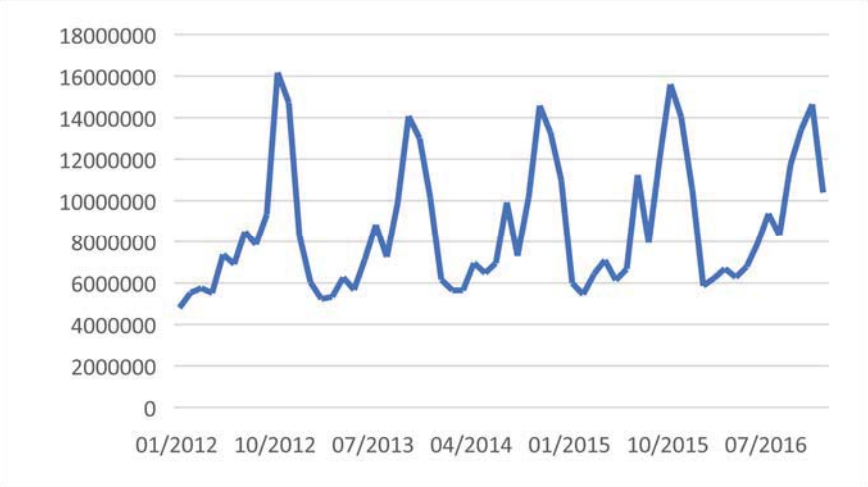

Figure 6. Cava Monthly Trend