COVID-19 LOCKDOWN AND WINE CONSUMPTION FREQUENCY IN PORTUGAL AND SPAIN

João Rebelo, Raúl Compés, Samuel Faria,
Tânia Gonçalves, Vicente Pinilla
and Katrin Simón-Elorz

Covid-19 Lockdown and Wine Consumption Frequency in Portugal and Spain

João Rebelo*, Raúl Compés[+], Samuel Faria**, Tânia Gonçalves*, Vicente Pinilla[++] and Katrin Simón-Elorz***

Abstract:

This study aims to analyse how psychological factors related to the Covid-19 lockdown affected the frequency of wine consumption among Portuguese and Spanish consumers. To achieve this goal, we used data collected from an online survey in Europe comprising 4489 observations from Portuguese and Spanish samples. Using an ordered probit model, we analysed the wine consumption frequency as a function of a set of explanatory variables related to psychological factors and also sociodemographic variables, motivation-related variables and consumption characterisation. The results allow us to conclude that for Spanish respondents the fear of isolation was a decisive factor in increasing the probability of a higher frequency of wine consumption. Meanwhile, in Portugal, the fear of an economic crisis was the psychological factor leading to a higher consumption frequency. In both countries, psychological factors influenced the frequency of wine consumption during the lockdown due to Covid-19. However, the impact of the Covid-19 crisis has been felt differently in Spain and Portugal. Differences can be observed in both psychological and behavioural attitudes that have influenced the frequency of wine consumption and could also indicate significant cultural differences.

Keywords: Covid-19; consumer behaviour; lockdown; psychological factors; wine consumption

JEL: C2, D12, L66

1. Introduction

Since the Second World War global wine consumption has increased remarkably. This trend has been driven by increasing globalisation, the emergence of new producing countries and regions, greater openness and expansion of international trade, and a growing standardisation of the typology, habits and attitudes of consumers (Anderson & Pinilla, 2018). However, in the traditional producing countries of Southern Europe, namely France, Italy, Portugal and Spain, consumption has decreased notably, while that of other alcoholic beverages, particularly beer, has increased. In general, in Western countries, there has been some convergence in the consumption patterns of alcoholic beverages. There is abundant literature explaining these trends and analysing the determinants of alcoholic beverage consumption (Fogarty, 2010; Holmes & Anderson 2017; Anderson et al, 2018).

However, the behaviour of alcoholic beverage consumers can also be affected by unexpected shocks, such as economic or financial crises (Bor et al., 2013; Garbinti et al., 2020), wildfires (Thach & Eyler, 2017), earthquakes (Forbes and Wilson, 2018) and threats or terrorist attacks (Gergaud et al., 2018).

The Covid-19 pandemic and the subsequent lockdown, the resulting containment and associated public and individual control measures is an entirely new and unknown phenomenon in modern economic and social history, with disruptive psychological and behavioural effects. Specifically, Covid-19 has generated extreme fear and anxiety. It has disrupted routines and people have developed "disproportional cognitive, affective, or behavioural responses to the objects and situations that they associate with the Covid-19 pandemic and severe deteriorations may occur in the physiological and psychological functionalities" (Arpaci et al., 2020, p: 2).

At the microeconomic level, the behaviour of wine consumers has usually been analysed using variables related to both subjective and objective wine attributes, consumer motivations, together with sociodemographic characteristics (e.g. Charters & Pettigrew, 2008; Gonçalves et al., 2020; Ribeiro et al., 2020). Observations of the determinants of wine consumption frequency during the Covid-19 lockdown suggest that variables related to psychological behaviour should be added to the hedonic demand function as explanatory variables (taste, health or relaxation).

In this context, this study aims to analyse how psychological factors related to the Covid-19 lockdown crisis have affected the wine consumption frequency of Iberian consumers. Consumer behaviour is heterogeneous, not only between social classes but also between countries (Bor et al., 2013; Garbinti et al., 2020). Therefore, one research question in this study is whether the impact of the lockdown (Covid-19) has been homogeneous between countries.

The impact of Covid-19 was probably felt differently in Spain and Portugal. Compared to Spain, Portugal had a lower mortality rate and a less restrictive lockdown, which was certainly manifested in the psychological and behavioural attitudes concerning the frequency of wine consumption.

For this purpose, based on samples collected for Spain and Portugal, we have estimated an ordered probit model using a stepwise approach, to determine consumer behaviour (consumption frequency). To do this we used significant psychological variables and control variables related to the sociodemographic characteristics of respondents as well as wine-related variables, such as the reasons for drinking wine and purchasing and drinking habits.

The paper is organised as follows. After the Introduction, Section 2 presents our theoretical approach and the hypothesis that we wish to test. Section 3 includes the survey, sample, and data collection. Section 4 describes the methodological approach, including the econometric framework and the variables used in the study. Section 5 presents the estimation results and is structured into two parts. First, we analyse the set of results for Spain and Portugal as a whole; second, we analyse the data from both countries separately to identify possible national determinants, which could be associated with cultural or social factors, in the event of significant differences. The final remarks are presented in Section 6.

2. Material and methods
2.1. Theoretical approach and hypothesis

COVID-19 has caused a global health crisis unprecedented in our time. The WHO (World Health Organization) recognised it as a pandemic on 11 March 2020. From that moment, many countries around the world rushed to decree a general State of Emergency to confine the population and restrict numerous non-essential activities. The Spanish government declared the state of alarm on 14 March 2020, and, after several extensions, it remained in force until 21 June. Portugal meanwhile declared the state of alarm on 18 March and it lasted until 2 May. Since the end of the state of national emergency, local lockdowns have been imposed in some municipalities or districts because of the emergence of serious outbreaks of the infection in a second wave during the summer months.

This situation has forced millions of citizens to stay in their homes for weeks and has caused the closure, at least temporarily, of many workplaces. Confinement reduces social contacts and limits both work-related and personal activities. This has essential cognitive, affective and behavioural consequences (Arpaci et al., 2020). Isolation generates feelings of loneliness; the evolution of the crisis causes negative thoughts and behaviours that are

inexorably modified. Fear of contagion and anxiety about the future, among other factors, have a negative psychological impact on many citizens (Atalan, 2020; Brodeur et al., 2020; Chaix et al., 2020; Sibley et al., 2020; Van Hoof, 2020).

Being a catastrophe, this lockdown constitutes an extraordinary economic and natural social experiment for many social sciences, since it allows us to study the changes that occur in the lives of the people affected. A particularly exciting aspect is their behaviour as consumers, especially of products that are controversial due to the consequences of their excessive consumption. The most representative case is that of beverages with an addictive alcoholic component (Bentzen et al., 1999), particularly dangerous in the case of young people (Gil & Molina, 2009). Additionally, the interest in studying these kinds of products is more significant due to the limitations imposed during confinement, and even afterwards, on the HORECA channel (on-trade and off-trade), whose establishments have been closed for weeks. This channel is highly important for virtually all alcoholic beverages since it represents an important part of their sales. The HORECA channel represents around 30% of the total volume of wine sales (31% in Portugal (2017) and 29% in Spain (2018)) due to the habit of eating out and tourism. In terms of added value, they represent between 59% in Portugal (2017) and 66% in Spain (2018). Therefore, the closure of catering establishments has had a significant impact on wine sales in this channel (ICEX, 2019 and Interprofesional del Vino en España, 2020). For consumers, it represents a moment of social consumption.

Within these drinks, wine deserves special attention since its consumption has a specific cultural dimension given that it is closely linked to gastronomy, although in recent decades its hedonic function has become increasingly important (Platania et al., 2016). Diet frameworks, such as the "Mediterranean alcohol drinking pattern" consider the wine consumption patterns identified as being healthy (Bazal et al., 2019; Gunay & Baker, 2011). However, this does not mean that situations of abuse do not occur (Goldsmith & d'Hauteville, 1998).

In general, consumption is conditioned by psychological and cultural factors (McGuire, 1976; Callwood, 2013). Its pattern responds to motivations, perceptions, learning, beliefs and attitudes of consumers as well as customs and social guidelines. Often, the two types of factors are linked (Silva et al., 2017).

In the case of wine, a positive association has been found between its consumption and psychological factors such as sensory gratification (Marques & Guia, 2018), social bonding (Dunbar et al. 2017), pleasant experience (Peele, 1999), the creation of a positive or relaxed mood and the ability to cope with difficulties and to adapt (Sayette, 1993; Cooper, 1994; Stritzke, et al., 1996; Foster et al., 2014). In the same way, Baum-Baicker (1985) identified five

areas of psychological benefits derived from the moderate consumption of alcoholic beverages: (a) reduction of stress; (b) improved mood; (c) higher cognitive performance; (d) reduction of clinical symptoms and the incidence of depression (Gea et al., 2013); and (e) better functioning in the elderly. These results are explained by the fact that alcohol releases dopamine and serotonin, neurotransmitters associated with the experience of pleasure (Lovinger, 1997; Banerjee, 2014).

With this background, the first hypotheses that this study will test is the impact of psychological variables on the consumption frequency during the lockdown (Covid-19). In other words, whether the foreseeable increase in feelings of anguish, anxiety and worry during confinement caused changes in consumption patterns, in particular its frequency, since this can be an indicator of increased moments of discomfort. Frequency is, together with intensity, one of the two parameters that define the demand and consumption patterns of any good. In the case of alcoholic beverages, they cannot be treated as substitutes for one another, since each has different psychological and cultural implications (Heckley et al.; 2017), and they all have significant but different consequences on health (Attard et al., 2019). Frequency is especially relevant for its ability to create habits that influence purchasing and consumption decisions in the medium and long term (Ji & Wood, 2007). Our hypothesis is:

H1: Psychological variables influenced the consumption frequency during the lockdown

Cultural factors have a significant national component, although interdependencies between countries are increasing. Thus, for example, research on the effects of the 2008 crisis on the consumption of some substances, including alcoholic beverages, (Dom et al., 2016) revealed significant differences between countries of the European Union. However, Leifman (2001) and Smith & Mitry (2007) found, at least in Europe, a relative cultural convergence between European countries regarding wine consumption patterns. Cultural patterns are related to consumption occasions in which the same consumer adopts different behaviours. For example, Hall & Lockshin (2000) established three models of consumption (consumption at parties, at work meals, and private consumption); the first two were eliminated during the lockdown.

In the case of the COVID-19 crisis, all countries have been affected, although not with the same intensity. Similarly, the quality of the public management of the crisis has not been the same either and this also affects the psychological state of the citizens. A particularly interesting case is that of Spain and Portugal, neighbouring countries of Iberia and culturally very close, although with differences in certain social behaviours and the evolution and

incidence of the COVID-19 pandemic. Compared to Spain, Portugal had a lower mortality rate and a less restrictive lockdown (OECD, 2020). Our second hypothesis to test will be:

H2: The impact of Covid-19 on wine consumption was not homogeneous in Portugal and Spain with differences both in psychological and behavioural attitudes and in the frequency of consumption.

2.2. The survey, sample, and data collection

The survey was based on previous research (e.g., Bruwer & Buller, 2013; Martinez-Carrasco et al., 2006; Thach & Olsen, 2015) and on the methodology used by the European Social Survey (https://www.europeansocialsurvey.org). To assess attitudes, beliefs and behavioural patterns, the survey was designed by a group of researchers from the board of the European Association of Wine Economists (EuAWE) -https://www.euawe.com/about-us/ - and from the INSEEC-School of Business and Economics of University of Bordeaux. Subsequently, the survey was pre-tested by conducting an online survey in European countries, namely France, Italy, Portugal and Spain between 17 April and 10 May 2020, through the SurveyMonkey platform and using the exponential discriminatory snowball sampling technique[1]. This method allows the urgency in the data collection process to be addressed. However, one possible limitation is that it can generate sample bias, failing to cover all socio-demographic layers of the target population, which tends to reduce as sample size increases (Taherdoost, 2016). The main goal of the study was taken into consideration and was inherent in the design of the survey, both in the content of questions as well as in the respective scales. Thus, the survey includes four groups of questions related to purchasing and consumption patterns, the consumption situation, Likert scales to assess feelings and emotions during the lockdown and sociodemographic information[2].

The preliminary results from the European study, released on 30 April, indicate that, in general, the frequency of wine consumption increased during the lockdown period for more

---

[1]Given that the population aged 18 years and older in Spain and Portugal is the universe of interest of this study, and since the populations of this age group are respectively 36.011.970 in Spain (according to the Instituto Nacional de Estadística, www.ine.es, consulted on 3 December 2020) and 3.353.602 in Portugal (according to the PORDATA – www.pordata.pt, consulted on 3 December 2020), and since we have 2549 and 1940 respondents in each country respectively, we can build a 99% confidence interval, with an error margin of 2.60%, to ensure that the responses are representative of the population). The responses were anonymous, and to avoid restrictive answers to possible sensitive questions (such as in the case of age and income), the methodology of the European Social Survey was used.

[2] The survey in Spanish and Portuguese is available in the supplementary material.

than 35% of respondents. However, the expense of alcoholic beverages decreased, with the average price of wine being lower when compared to normal conditions. The frequency of wine consumption from personal cellars increased as did consumption in a non-social context and especially drinking alone. When analysing the determinants of the increased drinking frequency, the anxiety generated by the Covid-19 crisis played a relevant role, with respondents in all countries expressing a powerful fear about the economic consequences of the crisis, as various factors of precariousness may arise or may be intensified.

For a better understanding of consumer behaviour in this time of crisis, we need to conduct additional research on how psychological factors affect the consumption of alcoholic beverages, particularly wine. Therefore, the goal of this research is to study how psychological variables influenced consumption frequency during the lockdown period in the Iberian market, given a set of control variables related to consumption motivations, consumption behaviour, and socioeconomic characteristics. The sample comprises 1940 respondents in Portugal and 2549 in Spain, resulting in 4489 valid responses (collected from 17 April to 10 May 2020). Table S1 (Supplementary Material) provides the socioeconomic characteristics of the respondents and the wine and Covid-19 related variables in both countries, as well as the results of the different means tests.

The majority of respondents are male (61.9% in Portugal and 59.6% in Spain), living in urban areas (50.1% and 62.3%, respectively), and employed in the services sector. In Portugal, unemployment is more prevalent, with 13.4% of respondents unemployed compared to 4.4% in Spain[3]. In the Portuguese sample, 30.9% are in the 41-50 age group, followed by 22% in the 51-60 age group. In Spain, 28.7% and 28.6% of the respondents belong to the 41-50 and 51-60 age categories, respectively. More than half of the sample in Portugal claim to be "coping on present income" (54.3%), while in Spain, the majority of respondents claim to be "living comfortably" (64.6%). Concerning the wine-related variables, the Portuguese show a higher degree of consumption with online interactions, with 34.5% (22.5% in Spain) having a wine app on their smartphones, 20.5% (12.5% in Spain) gaining improved wine knowledge through online content during the lockdown and 54.0% (40.3% in Spain) receiving online offers from winemakers to buy their wine online. In both countries, and during the lockdown, personal cellars were the second most important place for wine purchase after supermarkets, followed by the online channel. Regarding the motivations for wine consumption, accompanying food

---

[3] In this variable the sample values are different from those of the population, since unemployment in Portugal is lower than in Spain. This is because the sample is not stratified and runs the risk of not adequately reflecting all social layers, which represents a limitation.

and wine tasting are the most common reasons for drinking wine, followed by socialising with friends. 73.8% of the Portuguese respondents stated that during the lockdown they organised digital gatherings to have a drink with family or friends almost daily, 12.5% at least once a week, 12.9% rarely, and less than 1% did not organise a digital gathering. On the other hand, 48% of the Spanish respondents organised such meetings daily, 12.6% at least once a week, 35.6% rarely and 2.5% never. With respect to the psychological variables related to the Covid-19 crisis, in both countries, the respondents feared the virus and the economic crisis as a consequence of the pandemic. Nevertheless, they also agreed that this period provided an opportunity for positive initiatives. However, the fear of isolation is more prevalent in Spain, possibly due to the more widespread adverse effects of Covid-19 in that country.[4]

Figure 1 displays the observed values of wine consumption frequency during the lockdown by country. In both countries, almost half of the sample reports a lower frequency of consumption when compared to normal circumstances, before Covid-19, this being more prevalent in Portugal. Less than 20% claim that they consumed wine as usual and more than 30% said that they consumed wine more frequently than usual.

Please insert Figure 1 about here

2.3. Methodological approach
2.4.   Model

The measure of wine consumption frequency is a categorical, ordinal variable. Therefore, the appropriate econometric model to represent the causal relationship, as opposed to a relationship that simply captures statistical associations, is the ordered probit model. This model identifies statistically significant relationships between explanatory variables and a dependent variable, accounting for unequal differences between the categories in this variable (McKelvey & Zavoina, 1975, 2003 and Wooldridge, 2002).

The ordered probit model, proposed by McElvey & Zavoina (1975), is built around a latent regression, specified as follows:

$$y_i^* = \beta' x_i + \varepsilon_i, i = 1, \dots N, \qquad (1)$$

where i is the observation, y^* is the unobserved Nx1 dependent variable, β' is the vector of the Kx1 estimated parameters or unknown marginal utilities, x is the of NxK covarites that

---

[4] The comparison between the two samples proved to be statistically different in most variables, except for gender, lock proc online frequency, fear of isolation, opportunity for initiatives, students, taste, romance and sleep motives, supermarket, wine store, online and drive-in points of sale.

are assumed to be independent of ε, and ε (Nx1) is the error term including unobservable factors and assumed to be normally distributed across observations (with zero mean and unit variance). The probabilities underlying this model are:

$$Prob[y = 0] = \Phi(-\beta'x), \qquad (2)$$

$$Prob[y = 1] = \Phi(\mu_1 - \beta'x) - \Phi(-\beta'x), \qquad (3)$$

$$Prob[y = 2] = \Phi(\mu_2 - \beta'x) - \Phi(\mu_1 - \beta'x), \qquad (4)$$

$$...$$

$$Prob[y = J] = 1 - \Phi(\mu_{J-1} - \beta'x). \qquad (5)$$

where $\Phi(\bullet)$ denotes the cumulative distribution function, and μ_j the unknown thresholds parameters between which the categorical responses are estimated. Given the continuity assumption, and to preserve positive signs, probabilities require $\mu_j > \mu_{j-1}$. Also, including a constant term will require $\mu_0 = 0$.

The likelihood function for the estimation of the model parameters is based on the implied probabilities. The parameters estimated have no behavioural meaning, but the partial effects are particularly meaningful and given by:

$$\frac{\partial Prob[y = j|x]}{\partial x} = [\varphi(\mu_{j-1} - \beta'x) - \varphi(\mu_j - \beta'x)]\beta. \qquad (6)$$

where $\varphi(\bullet)$ is the density function.

The marginal effect for a dummy variable (D) would be obtained by a difference of probabilities, rather than a derivative, as follows:

$$\Delta_j(D) = [\Phi(\mu_j - \beta'x + \gamma) - \Phi(\mu_{j-1} - \beta'x + \gamma)]$$
$$- [\Phi(\mu_j - \beta'x) - \Phi(\mu_{j-1} - \beta'x)]. \qquad (7)$$

where γ is the coefficient of D.

Given the empirical specification of the model used in this study and to solve the research questions, we adopted the following process. First, in this type of model endogeneity is not a common issue since decisions regarding the consumption frequency of wine, beer and spirits can be simultaneous and interdependent. This can give rise to endogeneity with at least one of the explanatory variables (frequency of consumption of beer and spirits) which is determined simultaneously with the explained variables and correlated with the error term (Woldridge, 2002). Therefore, we have addressed the issue by including as instrumental variables the probability of consumption of spirits and beer in the lockdown period, and the frequency of

consumption in the pre-Covid period[5]. After assessing potential endogeneity in the explanatory variables, econometric practices recommend a stepwise regression approach when using a considerable number of explanatory variables. This process has the advantage of selecting only the statistically significant variables, eliminating non-significant outcomes, thus improving the statistical quality and the reading of the model. We performed a backward selection for the complete ordered probit regressions, with the decision level being significant at 10%.

To assess potential structural differences between countries, we estimated the ordered probit regression model for both countries (jointly) and the regression re-run by adding the set of explanatory variables multiplied by a country factor (dummy variable). We also performed a likelihood ratio test with the nested and global model. This allowed us to identify structural (partial regression estimated parameters) differences between the country data. Therefore, we proceeded to estimate the ordered probit model, following a stepwise approach for Portugal and Spain separately. In the sequence of this procedure, the model estimated is described in equation 8, where a set of explanatory variables, including related psychological factors and consumer characteristics affect the probability of changes in consumption frequency.

$$Prob[y = \text{"Lockwine"} = J)] = 1 - \Phi\big(\mu_{J-1} - (\beta_1 Fearcrisis + \beta_2 Isolation +$$
$$\beta_3 Age + \beta_4 D_{Employed} + \beta_5 D_{Motivtaste} + \beta_6 D_{Motivhealth} + \beta_7 D_{Motivrelax} + \beta_8 D_{Lockonline} +$$
$$\beta_9 Normwine + \beta_{10} Lockspirits)\big). \qquad (8)$$

2.5. Variables

Table 1 includes the list of statistically significant variables used in the final econometric models. The dependent or explained variable is the frequency of wine consumption during the lockdown. Therefore, the "Lockwine" variable is ordinal, with three categories, evaluating potential changes, when compared to the pre-lockdown period (i.e., normal consumption): i) less frequent; ii) as usual; iii) more frequent.

Please insert Table 1 about here

We expect a series of factors to affect wine consumption frequency during the lockdown period. First, we are interested in the effects of psychological factors on wine consumption, which are included to analyse how consumers perceive the emerging crisis, the insecurity, and changes to daily life. Crises affect consumer behaviours. Crises spread poverty (Dobrovolskij

---

[5] The probability of spirits and beer was, respectively, estimated through an ordered probit model (with the dependent variable being the lockdown period consumption frequency and the explanatory variable the frequency of consumption in the pre-Covid period, i.e. consumption in normal situations, during the last year, 2019, before covid). Only the statistically significant variables remain in the analysis.

and Stukas, 2013), increase stress (Mucci et al., 2016) and alter the well-being of populations (Van Hal, 2015). All crises change eating habits (Di Renzo et al., 2020). There is evidence that in the immediate aftermath of a crisis, consumers purchase higher levels of utilitarian products, but there is no evidence of increased consumption of hedonic products (Forbes, 2017). In the case of COVID-19, Bracale and Vaccaro (2020) found an increase in Italians´ consumption of some types of food linked with their symbolic value and a tendency to carry on at home certain external socialization habits. Therefore, different responses can be expected depending on the value consumers give to a product, and wine is a good example. Thus, Likert scales measure the "fear of crisis", i.e., the expectations of future economic consequences of the Covid-19 crisis. Additionally, the lockdown fostered a sense of social isolation, which is expected to influence consumer behaviour. To account for this potential effect, the variable "isolation" was included.

Second, a group of control variables, including sociodemographic variables, consumption motivation variables, and consumption characterisation was used. The first subgroup includes the age and professional situation of the respondent. In order to better understand the results, a comparison between the survey sample results and the population of the countries should be made, as similarities and differences occur due to the sampling technique employed and the results should be read according to the sample. For example, it is worth mentioning that in both Portugal and Spain, the most populated age group is the 40-49 years segment (18.8% and 19.0% of the adult population) which is also the most represented age group in this sample (29.6% of the respondents). Additionally, it is noteworthy that in our sample, the unemployment rate is 8.3% (4.35% of Spanish respondents and 13.4% of Portuguese respondents), while the national unemployment rate in Spain is 14.1% and in Portugal, it is 6.5%. Moreover, the occupation of the respondents also diverges from that of the national populations. In Portugal and Spain, agricultural workers account for 5.7% and 4.0% of the workforce, while in our sample this rate is higher (19.3% and 15.6% of the respondents). The second subgroup, the reason-related variables, comprises a set of variables to assess the three main possible motivations for consuming wine: taste, as wine consumers may favour the taste of wine when compared to other substitute beverages; relaxation and stress relief, to assess the influence on the consumption of wine; and health, which has been a major concern during Covid-19 pandemic (Agrawal et al., 2008; Barrena and Sánchez, 2009; Castriota, 2020; Chang et al., 2016; Helble and Sato, 2011; Ji et al.,,2011; Moran and Saliba, 2012; Rhum and Black, 2002; Thach and Chang, 2015 and 2016) . The final subgroup of variables included in this study is that of consumption characterisation. The habit of consuming alcoholic beverages (wine, beer or

spirits) is included to assess how pre-lockdown consumption habits influenced changes in the consumption frequency during the lockdown period. A dummy variable for "online" buying is also included, to assess whether the lockdown has changed the use of the purchase channel. With specialised wine stores, wineries, cellars and other traditional channels closed, the online channel may have facilitated product availability, thus influencing wine consumption behaviour.

3. Results

Table 2 includes the final estimation results for Spain and Portugal. The results of the estimations suggest that there are similarities and disparities between Spain and Portugal. It should be noted that the variables that are statistically significant for both countries (Age, Motiv_taste, Motiv_relax and Lockonline) have the same direction effect, which allows us to conclude that the changes in consumption patterns are determined by similar factors. This appears to be in line with the analysis presented in Section 2. However, there are some disparities in the key factors influencing changes in consumption behaviour.

Please insert Table 2 about here

Given the nature of the estimated model, the ordered probit coefficient results do not provide meaningful interpretations, apart from the significance and direction (sign) of the effects. Thus, we estimated the ordered probit marginal effects to show how wine consumption frequency probabilities change with a variation in the explanatory variables. Table 3 reports the results for the countries analysed, highlighting both differences and similarities between these two markets.

The analysis of the marginal effects allows us to corroborate the argument that the impacts of the determinants of wine consumption changes have similarities for both countries. It is noticeable that the direction of the marginal effects remains the same for both countries across all variables, for all outcomes.

Please insert Table 3 about here

The psychological factors included in this study, "feeling of isolation" and the "fear of a crisis" display different results in terms of significance. These results are different for each country, although both variables show the significance of the sample as a whole. The feeling of

12

isolation, which is significant for Spain and the global sample, show that the higher this feeling, the higher the probability of increased frequency of wine consumption. A consumer with a greater sense of isolation is more likely to have increased the frequency of wine consumption during the lockdown. The different lengths of the lockdown in Spain (100 days) and Portugal (45 days) can explain this feeling.

Additionally, for Portugal and the whole sample, we can observe that the fear of a crisis displays the same effect. i.e., higher concerns about a crisis result in the higher probability to have increased consumption frequency. The results of the psychological factors show that insecurity, uncertainty and the threat to regular daily life had a positive impact on the probability of a higher frequency of wine consumption during the lockdown, which coincides with the interpretations of the frequency of consumption during the lockdown. Consumers have responded emotionally to the threat of Covid-19, which is linked to changes in consumption patterns. The high level of threat and uncertainty is positively linked to a higher frequency of wine consumption.

The sociodemographic variables considered in this study are age and the consumer's professional situation. The age of consumers is significant in both countries, and the marginal effects allow us to conclude that older consumers tended to be less likely to increase their frequency of wine consumption during the lockdown. Meanwhile, the probability that younger consumers maintained or increased their frequency of consumption during this period was higher.

The marginal effects of employment show that, on average, employed people are more likely than the unemployed to say that their wine frequency stayed constant during the lockdown or increased with the lockdown (in Portugal) and less likely to say their wine consumption decreased. For Portugal, it is possible to conclude that being employed improved the probability of increasing the frequency of consumption.

The control variables included in the estimation, i.e., the motivations and the consumption characteristics, display exciting results. The motivations for consuming wine are related to the consumers' loyalty to a product. We can observe that consumers driven by "taste" are more likely to increase the frequency of consumption which highlights the differentiation of wine when compared to other substitute beverages. "Health" concerns, however, tended to reduce the frequency of consumption in Portugal, i.e., health concerns decrease the probability of a consumer to change to a higher frequency. This is especially interesting in the Covid-19 context, where we would expect health concerns to change consumer behaviour and patterns. In Portugal, this result is consequential in the same way as the variable Fear COVID Crisis.

The "relaxation" variable as a motivation has the expected result. For both countries, it shows that the higher a consumer values relaxation as a reason to drink wine, the more likely they are to increase the frequency of consumption. This result may have two interpretations. Wine is a good that generates a feeling of relaxation among consumers and the lockdown experience with social distancing, isolation and feelings of uncertainty drove consumers to increase the search for relaxing factors, such as drinking wine.

For the consumption characterisation variables, it is noteworthy that the "online channels" were indeed crucial for the demand for wine. Consumers who opted to buy wine online are more likely to have increased their frequency of consumption (those who do not opt to buy online have a higher probability to have reduced the frequency of consumption). The "previous consumption" behaviour effects are as expected, even though the significance is only found for Spain and the global sample. Thus, the higher frequency of spirit consumption (Spain and the whole sample) is linked to lower probabilities of positive changes in the frequency of wine consumption during the lockdown. Wine consumption habits in the pre-COVID period also display the expected outcomes (for Spain and the whole sample). A consumer who has a daily consumption habit is less likely to have experienced an increase in consumption frequency during lockdown but, inversely, consumers with a lower frequency of consumption (less than once a month) are more likely to have increased their frequency of wine consumption. This behaviour indicates that wine is a product that has attracted non-consumers and lower frequency consumers during the lockdown. This result is in line with the previous analysis of the frequency of consumption which found that the frequency of consumption increased for 34.5% of the respondents, whereas the majority of consumers had not increased their frequency, since they were already regular/daily consumers.

4.   Discussion

Covid-19 is a very recent phenomenon and we need to analyse its effects in different fields. We know very little about its impacts on alcohol consumption, specifically wine, indicating the need for research on the topic. This study aims to contribute to providing a better understanding of the behaviour of wine consumers during the lockdown, with a focus on the effects of psychological and cultural factors on wine consumption frequency.

The psychological effects of the lockdown on people's consumption behaviour is set to become a growing topic of research. The comparison with the consequences of other natural disasters is useful, but we must also bear in mind that the lockdown has very different characteristics, such as the absence of supply problems and a different perception of its impact

on the risk of human lives, since it is not an instantaneous phenomenon but rather one that is prolonged over a long period of time and without the violence characterising other shocks.

In any case, the severity of the impact on lifestyle of disasters such as 9/11, tsunamis or earthquakes is expected to be greater than a period of lockdown. The former imply an extreme risk to life, while in the case of Covid, the effects are related more to feelings or isolation during the lockdown.

Using data from Portugal and Spain, we have estimated an ordered probit model to investigate how wine consumption frequency was influenced by psychological factors and whether there are differences between these two countries. The econometric results and the marginal effects show that the psychological factors have affected the frequency of wine consumption, thus verifying our first hypothesis. However, these psychological factors have had a distinct impact in both countries. The fear of isolation increased wine consumption frequency for the Spanish sample and, in Portugal, the same effect was found as a result of the fear of a crisis. The feeling for consumers is similar. The different lockdown lengths of the two countries and the situation of fear related to the number of people infected reflect the same final result; anxiety and disruption in people's routines increase their wine consumption frequency. Thus, our second hypothesis has also been verified.

The impact of Covid-19 was probably felt differently in Portugal and Spain (lower mortality rates and different restrictive lockdown measures) which is certainly reflected in the different results for wine consumption frequency.

Age is a determining variable that should be included in future research as it requires further explanation. Two paths can explain the negative relationship between age and the increase of wine frequency consumption. First, older people did not increase their frequency of wine consumption as it was already high. But it is necessary to include the absolute variable of the quantity of consumed wine. And second, it constituted an opportunity to identify new possibilities to increase the wine frequency consumption of younger people.

Employment is decisive for the Portuguese people and the whole sample. This result must be related to consumers' incomes and the probability to increase the consumption frequency.

The variables that motivate wine consumption are related to hedonic demand functions such as taste or relaxation. The Iberian lifestyle forms part of the Mediterranean alcohol drinking pattern, and the relevance of health concerns must also be related to lifestyle or the Covid-related fear. This question remains open for future research.

However, one of the most interesting results of this study is related to the use of online media to buy wine. The growth of this channel is here to stay and wineries are developing

different apps to sell wine by different consumer profiles. One remaining uncertainty is whether the amount sold in this channel exceeds other sale channels or not and whether the average sales price increases or not between the different vendors.

This result highlights the fact that the impact of the lockdown on consumer behaviour is not homogeneous between countries, so it is not possible to generalise the results of one market to other markets. As an example, it should be noted that 52.9% of Portuguese consumers have reduced the frequency of their wine consumption. This indicator in Spain is 44.7%. However, if we observe the impact of consumers who have increased the frequency of wine consumption, the situation is reversed. In Spain, 36% of consumers have increased the frequency of wine consumption, while in Portugal this percentage is 32.6%. Despite this, many similarities have been found between the two countries.

Our results can be compared with those of other studies on the impact on wine consumption of other natural disasters or of the same lockdown.

The impacts produced on consumption can vary depending on the kind of disaster. Thus, Foster (2017) reflects on consumption patterns after the 2011 Christchurch earthquake disaster. In this study, the immediate decrease in wine consumption (both red and white) represents around 27% in volume and 22% in value terms.The analysis of the extent of recovery of consumption over a longer period of time (4 weeks), reveals an increase of 10% in volume and and increase of between 6.6% and 10.8% in terms of value. These ratios indicate that short-term recoveries do not offset the post-disaster decline. However, it is necessary to point out that the situation derived from other natural disasters (earthquakes, tsunami, 9/S and others), implied a instantaneous greater vital risk as well as supply problems that have not occurred in the case of Covid-19.

Braccale and Vacaro (2020) provide an analysis about food consumption in Italy during the Covid-19 emergency. The situation is different depending on the type of drink considered. Thus, it is observed how the consumption of alcoholic beverages (beer and wine) has increased. The greatest increase in wine consumption occurred in Italian wine from controlled designation of origin (6.6%), Beer (4.1%) and Italian wine from protected geographical indications (2.3%).

Our study has, however, some limitations. The sampling method, the snowball sampling technique, can produce biased results, since the survey sample may be different from the population of interest, namely wine consumers. This may lead to differences between the sociodemographic characteristics of the sample and the population of the countries (and therefore also the population of interest), which can be reflected in the results and their

interpretation. As a consequence, our results should be taken with caution as they may not accurately reflect the behaviour of the population of interest.

Future research could complete these results as follows. First, by making a comparison with cross-country differences considered in this article. This could be further expanded with more data. In particular, a comparison with consumption behaviour after the lockdown period would be interesting. Second, future research could go further in terms of the explanatory variables, considering the differences in the price of wine before and during the lockdown. Third, we could exploit different sampling techniques. And, finally, the debate on whether wineries should formulate new strategies in the face of the increase in online shopping should be studied.

Another interesting question is the study of the recovery of wine consumption after lockdown and if there have been changes in wine consumers' profiles or in the purchasing channels, especially as a result of increased online shopping.

References

Agrawal A, Dick DM, Bucholz KK, Madden PAF, Cooper ML, Sher KJ, Heath AC, 2008. Drinking Expectancies and Motives: A Genetic Study of Young Adult Women. Addiction 103: 194–204.

Anderson K, Meloni G, Swinnen J, 2018. Global Alcohol Markets: Evolving Consumption Patterns, Regulations and Industrial Organizations. Annu Rev Resour Economics 10: 105-132.

Anderson K, Pinilla V, 2018. Wine Globalization. A New Comparative History. Cambridge University Press, New York.

Arpaci I, Karataş K, Baloğlu M, 2020. The development and initial tests for the psychometric properties of the COVID-19 Phobia Scale (C19P-S). Pers. Individ. Differ., 164, 110108. Advance online publication. https://doi.org/10.1016/j.paid.2020.110108

Atalan A, 2020. Is the lockdown important to prevent the COVID-19 pandemic? Effects on psychology, environment and economy-perspective. Annals of Medicine and Surgery 56: 38-42.

Attard R, Dingli P, Doggen CJ, Cassar K, Farrugia R, Wettinger SB, 2019. The impact of frequency, pattern, intensity, and type of alcohol consumption, and its combined effect with smoking on inflammation, lipid profile, and the risk of myocardial infarction. Journal of Public Health: 1-14.

Banerjee N, 2014. Neurotransmitters in alcoholism: A review of neurobiological and genetic studies. Indian journal of human genetics, 20 (1), 20.

Barrena R, Sanchez M, 2009. Connecting product attributes with emotional benefits: analysis of a Mediterranean product across consumer age segments. British Food Journal 111: 120-37.

Baum-Baicker C, 1985. The psychological benefits of moderate alcohol consumption: a review of the literature. Drug and alcohol dependence, 15 (4): 305-322.

Bazal P, Gea A, Martínez-González MA, Salas-Salvadó J, Asensio EM, Muñoz-Bravo C, Pintó X, 2019. Mediterranean alcohol-drinking pattern, low to moderate alcohol intake and risk of atrial fibrillation in the PREDIMED study. Nutrition, Metabolism and Cardiovascular Diseases, 29 (7): 676-683.

Bentzen J, Eriksson T, Smith V, 1999. Rational addiction and alcohol consumption: evidence from the Nordic countries. Journal of Consumer Policy 22 (3): 257-279.

Bor J, Basu S, Coutts A, McKee M, Stuckler D, 2013. Alcohol Use During the Great Recession of 2008–2009. Alcohol Alcohol, 48 (3): 343–348.

Braccale, R. & Vaccaro, C. 2020. Changes in food choce following restrictive measures due to Covid-19. *Nutr Metab Cardiovasc Dis* 30 (9): 1423-1426.Brodeur A, Clark AE, Fleche S, Powdthavee N, 2020. Assessing the impact of the coronavirus lockdown on unhappiness, loneliness, and boredom using Google Trends. arXiv preprint arXiv:2004.12129.

Bruwer J, Buller C, 2013. Product involvement, brand loyalty, and country-of-origin brand preferences of Japanese wine consumers. Journal of Wine Research 24(1): 38-58.

Callwood K, 2013. Psychological factors that influence consumer buying behavior. Journal of Business 15 (2): 39-48.

Castriota S, 2020. Wine Economics. MIT Press, Cambridge (Ma.)

Chaix B, Delamon G, Guillemasse A, Brouard B, Bibault JE, 2020. Psychological Distress during the COVID-19 pandemic in France: a national assessment of at-risk populations. medRxiv.

Chang K, Liz MW, Janeen O, 2016. Wine and health perceptions: Exploring the impact of gender, age and ethnicity on consumer perceptions of wine and health. Wine Economics and Policy 5, 2: 105-113

Charters S, Pettigrew S, 2008. Why Do People Drink Wine? A Consumer-Focused Exploration. J Food Prod Mark 14(3): 13–32. https://doi.org/10.1080/10454440801985894

Cooper ML, 1994. Motivations for alcohol use among adolescents: Development and validation of a four-factor model. Psychological assessment 6 (2): 117.

Di Renzo, L, Gualtieri, P, Pivari, F, Soldati, L, Attinà, A, Cinelli, G, Leggeri, C, Caparello, G, Barrea, L, Scerbo, F, Esposito, E, De Lorenzo, A, 2020. Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey. Journal of Translational Medicine, 18: 229.

Dobrovolskij, V, Stukas, R, 2013. The impact of economic crisis on nutrition habits - Comparison of eating habits in 2013 and 2007 in Lithuania. European Journal of Public Health, 23, Issue suppl_1, https://doi.org/10.1093/eurpub/ckt124.101

Dom G, Samochowiec J, Evans-Lacko S, Wahlbeck K, Van Hal G, McDaid D, 2016. The impact of the 2008 economic crisis on substance use patterns in the countries of the European Union. International Journal of Environmental Research and Public Health 13 (1): 122.

Dunbar RIM, Launay J, Wlodarski R, Robertson C, Pearce E, Carney J, MacCarron P, 2017. Functional benefits of (modest) alcohol consumption. Adaptive Human Behavior and Physiology 3 (2): 118-133.

Fogarty J, 2010. The Demand for Beer, Wine and Spirits: A Survey of the Literature. Econ Surv 24 (3): 428-478.

Forbes SL, Wilson MM, 2018. Resilience and response of wine supply chains to disaster: the Christchurch earthquake sequence. Int Rev Retail Distrib Consum Res 28 (5): 472-489.

Forbes, S, 2017. Post-disaster consumption : analysis from the 2011, Christchurch earthquake. *Int. Rev. Retail. Distrib. Consum. Res.,* 27(1): 28-42.

Foster DW, Neighbors C, Prokhorov A, 2014. Drinking motives as moderators of the effect of ambivalence on drinking and alcohol-related problems. Addictive behaviors 39 (1): 133-139.

Garbinti B, Lamarche P, Lecanu C, Savignac F, 2020. Wealth effect on consumption during the sovereign debt crisis: households' heterogeneity in the euro area. European Central Bank, Working Paper Series No 2357.

Gea A, Beunza JJ, Estruch R, Sánchez-Villegas A, Salas-Salvadó J, Buil-Cosiales P, Arós F, 2013. Alcohol intake, wine consumption and the development of depression: the PREDIMED study. BMC medicine 11(1): 192.

Gergaud O, Livat F, Song H, 2018. Terrorism and wine tourism: The case of museum attendance. J Wine Econ 13 (4): 375-383.

Gil AI, Molina JA, 2009. Alcohol demand among young people in Spain: an addictive QUAIDS. Empirical Economics 36 (3): 515-530.

Goldsmith RE, d'Hauteville F, 1998. Heavy wine consumption: empirical and theoretical perspectives. British Food Journal 100 (4): 184-190.

Gonçalves T, Pinto LMC, Lourenço-Gomes L, 2020. Attribute non-attendance in wine choice: Contrasts between stated and inferred approaches. Econ Anal Policy 66: 262–275.

Greene W, 2003. Econometric Analysis. Macmillan, New York.

Gunay GN, Baker MJ, 2011. The factors influencing consumers' behaviour on wine consumption in the Turkish wine market. EuroMed Journal of Business 6 (3): 324-341.

Hall J, Lockshin L, 2000. Using means-end chains for analysing occasions-not buyers. Australasian Marketing Journal 8 (1): 45-54.

Heckley G, Jarl J, Gerdtham UG, 2017. Frequency and intensity of alcohol consumption: new evidence from Sweden. The European Journal of Health Economics 18 (4): 495-517.

Helble M, Sato A, 2011. Booms and booze: on the relationship between macroeconomic conditions and alcohol consumption. LSE Research Online http://eprints.lse.ac.uk/40030/

Holmes A, Anderson K 2017. Convergence in National Alcohol Consumption Patterns: New Global Indicators, J Wine Econ, 12 (2): 117–148.

ICEX, 2019. El mercado del vino en Portugal. ICEX España Exportación e Inversiones, E.P.E., M.P.

Instituto Nacional de Estadística, www.ine.es, consulted on 3 December 2020.

Interprofesional del Vino de España. 2020. Radiografía de canales de consumo de vino en España. *Estudio para la Interprofesional del Vino de España. Observatorio español del mercado del vino. https://www.interprofesionaldelvino.es/publicaciones-estudios/radiograf%C3%ADa-sobre-el-consumo-de-vino/*

Ji MF, Wood W, 2007. Purchase and consumption habits: Not necessarily what you intend. Journal of Consumer Psychology 17 (4): 261-276.

Leifman H 2001. Homogenisation in alcohol consumption in the European Union. Nordic Studies on Alcohol and Drugs 18(1_suppl): 15-30.

Li J, Jia J, Taylor D, Bruwer J, Li E, 2011. The wine drinking behaviour of young adults: An exploratory study in China. British Food Journal 113(10): 1305-1317.

Lovinger DM 1997. Serotonin's role in alcohol's effects on the brain. Alcohol health and research world 21 (2): 114.

Martinez-Carrasco L, Brugarolas M, Gomis FJ, Africa MP, 2006. Influences of purchase place and consumption frequency over quality wine preferences. Food Quality and Preference 17(5): 315-327.

McGuire WJ 1976. Some internal psychological factors influencing consumer choice. Journal of Consumer research 2 (4): 302-319.

McKelvey W, Zavoina T, 1975. A Statistical Model for Analysis of Ordinal Level Dependent Variables. J Math Sociol Summer 1975: 103–120.

Moran C, Saliba AJ, 2012. Reasons for drinking wine and other beverages: comparison across motives in older adults International Journal of International Wine Research 4: 25-32

Mucci, N, Giorgi, G, Roncaioli, M, Perez, JF, Arcangeli, G., 2016. The correlation between stress and economic crisis: a systematic review. Neuropsychiatric disease and treatment, 12: 983.

OECD (2020). The territorial impact of COVID-19: Managing the crisis across levels of government. Tackling coronavirus (COVID-19) Contributing to a global effort (oecd.org/coronavirus).

Peele S, Grant M (eds). 1999. Alcohol and pleasure: A health perspective. Psychology Press.

Peixeira C, Bernardo AT, 2018. Gender, knowledge and motivation for wine purchasing. International Journal of Wine Business Research 30 (4):481-492.

Platania M, Platania S, Santisi G 2016. Entertainment marketing, experiential consumption and consumer behavior: the determinant of choice of wine in the store. Wine Economics and Policy 5 (2): 87-95.

PORDATA – www.pordata.pt, consulted on 3 December 2020.

Ribeiro T, Corsi A, Lockshin L, Louviere J, Loose SM, 2020. Analysis of consumer preferences for information and expert opinion using a discrete choice experiment. Port Econ J 19: 67–80. https://doi.org/10.1007/s10258-019-00154-3.

Ruhm CJ, Black, WE (2002). Does Drinking Really Decrease in Bad Times? Journal of Health Economics 21, 4: 659–678.

Sayette MA, 1993. An appraisal-disruption model of alcohol's effects on stress responses in social drinkers. Psychological bulletin 114 (3): 459.

Sibley CG, Greaves LM, Satherley N, Wilson MS, Overall NC, Lee CH, Houkamau CA, 2020. Effects of the COVID-19 pandemic and nationwide lockdown on trust, attitudes toward government, and well-being. American Psychologist 75 (5): 1-13.

Silva AP, Jager G, Van Zyl H, Voss HP, Pintado M, Hogg T, De Graaf C, 2017. Cheers, proost, saúde: cultural, contextual and psychological factors of wine and beer consumption in Portugal and in the Netherlands. Critical reviews in food science and nutrition 57 (7): 1340-1349.

Smith DE, Mitry DJ, 2007. Cultural convergence: consumer behavioral changes in the European wine market. Journal of Wine Research 18 (2): 107-112.

Stritzke WG, Lang AR, Patrick CJ, 1996. Beyond stress and arousal: A reconceptualization of alcohol–emotion relations with reference to psychophysiological methods. Psychological bulleti, 120 (3): 376.

Tach L, Olsen J, 2015. Profiling the high-frequency wine consumer by price segmentation in the US market. Wine Economics and Policy, 4: 53-59

Taherdoost, H. (2006). Sampling methods in research methodology; how to choose a sampling technique for research. *International Journal of Academic Research in Management, 5*(2), 18-27.

Thach L, Chang K, 2016. Wine Generations: a new survey looks at consumer wine preferences. Vineyard Winery Management 42 (1): 124-128

Thach L, Eyler R, 2017. Up in smoke: Will wildfires leave lasting economic scars on California's vital wine country? Aust NZ Grapegrow Winemak 647: 84-85

Thach L., Chang K, 2015. Survey of American Wine Consumer Preferences. WineBusiness.com. Retrieved from http://www.winebusiness.com/news/?go=getArticle&dataid=160722

Van Hal, G, 2015. The true cost of the economic crisis on psychological well-being: a review. Psychology research and behavior management, 8: 17-25.

Van Hoof E 2020. Lockdown is the world's biggest psychological experiment-and we will pay the price. World Economic Forum (Vol. 9).

Wooldridge JM (2002). Econometric Analysis of Cross Section and Panel Data. The MIT Press, USA.

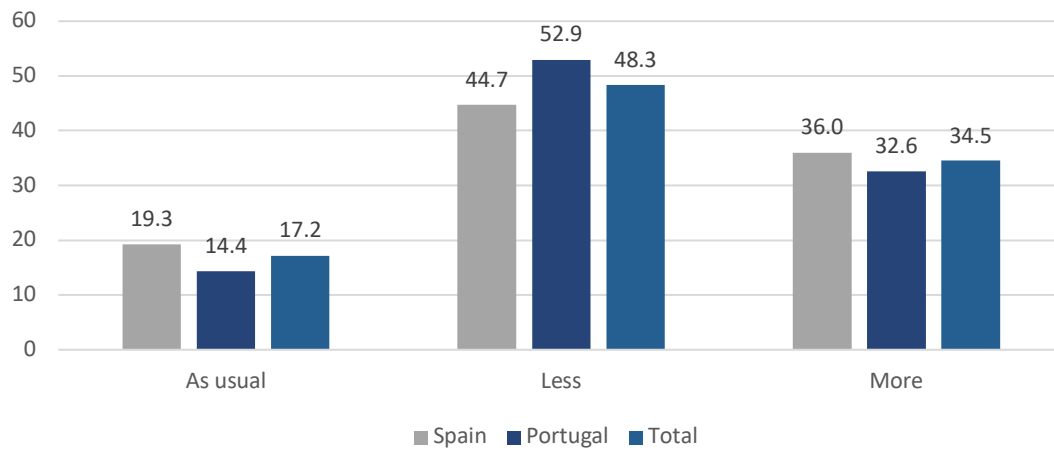***Figure 1. Wine consumption frequency during the lockdown, in %***

Table 1. List of variables used in the econometric models

Variable name	Description	Typology
Dependent variable		
Lockwine	Frequency of wine consumption during the lockdown	Ordinal variable (1- less frequent; 2- as usual; 3- more frequent)
Psychological Covid-19 related variables		
Fear_crisis	The measure of the level of fear with Covid-19 crisis (economic consequences)	Likert scale (1- Strongly disagree; 2- disagree; 3- neither agree nor disagree; 4- agree; 5- strongly agree)
Isolation	The measure of the sense of isolation	QCAL scale (5-point Likert scale) unified by a factor analysis which grouped 3 items into one factor.
Sociodemographic variables		
Age	Age group	Categorical variable (1- From 18 to 29; 2- From 30 to 40; 3- From 41 to 50; 4- From 51 to 60; 5- From 61 to 70; 6- 71 and above)
Employed	Professional situation	Dummy variable (0- unemployed; 1- employed/student/retired)
Motivations of wine consumption variables		
Motiv_taste	Enjoying the taste as a factor of wine consumption	Dummy variable (0- not relevant; 1- relevant)
Motiv_health	Health issues as a driver of wine consumption	Dummy (0- not relevant; 1-relevant)
Motiv_relax	Wine consumption as a factor of relaxation and stress relief	Dummy variable (0- not relevant; 1- relevant)
Consumption characterisation variables		
Lockonline	Use of online channel during the lockdown to buy wine	Dummy variable (0- not used; 1- used)
Normwine	The measure of consumption frequency in the period pre-Covid	Likert scale (1-never; 2-less than once a month; 3- at least once a month; 4-at least once a week; 5- daily)
Lockspirits	The measure of consumption frequency of spirits during the lockdown	Estimated probability of consumption

Table 2. Ordered probit estimation results

	Explanatory Variable	Spain	Portugal
Psychological Covid-19 related variables	Isolation	0.0410 * (0.0247)	-
	Fear_crisis	-	0.07604* (0.0428)
Sociodemographic variables	Age	-0.0878 *** (0.0201)	-0.06218 *** (0.0220)
	Employment	-	0.2091 ** (0.8316)
Motivations of wine consumption variables	Motiv_taste	0.2148 *** (0.0534)	0.1305 *** (0.0614)
	Motiv_health	-	-0.3038 ** (0.1338)
	Motiv_relax	0.4423 *** (0.0599)	0.5099 *** (0.0621)
Consumption characterisation variables	Lock_online	0.1886 *** (0.0683)	0.2178 *** (0.0350)
	Normal wine cons	-0.1220 *** (0.0260)	-
	Lock_spirits	-2.8422 *** (-0.7966)	-
	Observations	2549	1940
	Log-likelihood	-2585.1393	-1769.3800
	LR Chi2(7)	158.02***	271.16***
	Pseudo R^2	0.0297	0.0712

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. '-'denotes excluded variables from the stepwise approach—standard deviations in parenthesis.

Table 3. Average Marginal Effects

Explanatory Variable	Wine consumption frequency (outcome)	Spain	Portugal	Global (for comparison)
Psychological Covid-19 related variables				
Isolation	Less	-0.0155 *	n.s.	-0.0132*
	As usual	0.0009	n.s.	0.0010*
	More	0.0147 *	n.s.	0.01221*
Fear_crisis	Less	n.s.	-0.0273*	-0.0225**
	As usual	n.s.	0.0027*	0.0017**
	More	n.s.	0.246*	0.0206**
Sociodemographic variables				
Age	Less	0.0333***	0.0223***	0.0289***
	As usual	-0.0018 ***	-0.0022***	-0.0022***
	More	-0.0315***	-0.0201***	-0.0270***
Employment	Less	n.s.	-0.0751***	-0.0821***
	As usual	n.s.	0.0075**	0.0062***
	More	n.s.	0.0670**	0.0759***
Motivations to wine consumption variables				
Motiv_taste	Less	-0.0814***	-0.0469**	-0.0784***
	As usual	0.0045***	0.0047**	0.0059***
	More	0.0769***	0.0422**	0.0725***
Motiv_health	Less	n.s.	0.1092**	0.0583**
	As usual	n.s.	-0.0109**	-0.0044**
	More	n.s.	-0.0983**	-0.0540**
Motiv_relax	Less	-0.1676***	-0.1092***	-0.1717***
	As usual	0.0092***	0.0109***	0.0132***
	More	0.1585***	0.1650***	0.1605***
Consumption characterization variables				
Lock_online	Less	-0.0715***	-0.0782***	-0.1015***
	As usual	0.0039**	0.0078***	0.0076***
	More	0.0675***	0.0704***	0.0940***
Lock_spirits	Less	0.7899***	n.s.	n.s.
	As usual	-0.0433**	n.s.	n.s.
	More	-0.7466***	n.s.	n.s.
Normal wine cons	Less	0.0460***	n.s.	0.0327***
	As usual	-0.0025***	n.s.	-0.0025***
	More	-0.0435***	n.s.	-0.0302***

***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

SUPPLEMANTARY MATERIAL : Table A1. Descriptive statistics

Socio-economic characteristics	Portugal (n=1940)		Spain (n=2549)	
	No.	%	No.	%
Gender (male)	1200	61.9	1518	59.6
Residence				
Urban	972	50.1	1588	62.3
Sub-urban	481	24.8	481	18.9
Rural	487	25.1	480	18.8
Dedication sector				
Services	1043	53.8	1461	57.3
Industry	201	10.7	346	13.6
Agriculture	298	15.7	334	13.1
Unemployed	260	13.4	111	4.4
Retired	88	4.5	213	8.4
Student	77	4.0	82	3.2
Age				
18-29	216	11.1	185	7.3
20-40	370	19.1	422	16.6
41-50	599	30.9	728	28.7
51-60	444	22.9	728	28.6
61-70	225	11.6	393	15.4
>70	86	4.4	81	3.6
Income				
Living comfortably	531	27.4	1647	64.6
Coping on present income	1054	54.3	564	22.1
Finding it difficult	201	10.4	100	3.9
Finding it very difficult	31	1.6	26	1.0
I prefer not to answer	123	6.3	212	8.3
Children in the household (mean)	1.7		1.6	
Adults in the household (mean)	3.4		3.2	
Wine related variables	No.	%	No.	%
Online offers received	1048	54.0	1027	40.3
Has a wine app	670	34.5	573	22.5
Improved wine knowledge	398	20.5	319	12.5
Wine purchase place during the lockdown				
Supermarket	1079	55.6	1376	54.0
Cellar	504	26.0	538	21.1
Winery	297	15.3	263	10.3

	No.	%	No.	%
Online	266	13.7	374	14.7
Wine store	169	8.7	219	8.6
Grocery	116	6.0	247	9.7
Drive-thru	8	0.4	12	0.5
Motivations for wine consumption				
Food	1477	76.1	1556	61.0
Taste	1321	68.1	1764	69.2
Friendly	840	43.3	774	30.4
Relax	591	30.5	532	20.9
Challenge	298	15.4	472	18.5
Romance	176	9.1	242	9.5
Health	94	4.8	186	7.3
Helps to sleep	70	3.6	81	3.2
Lockdown digital drink				
Daily	1432	73.8	1224	48.0
At least once a week	243	12.5	321	12.6
Rarely	251	12.9	907	35.6
I did not	14	0.7	97	2.5
Lock Proc online (yes)	329	17.0	489	19.2
Psychological Covid-19 related variables	No.	%	No.	%
Fear of virus (1=strongly disagree, 5=strongly agree)	3.5		3.6	
Fear of crisis (1=strongly disagree, 5=strongly agree)	4.4		4.4	
Opportunity for initiatives (1=strongly disagree, 5=strongly agree)	3.8		3.7	
Refocus on me (1=strongly disagree, 5=strongly agree)	3.2		3.2	
Isolation (mean)	-0.08		-0.12	

Note: Difference of means tests - t-test – Adults (t(4487) = 4.20, p = 0.000); Children (t(4487) = 3.7, p = 0.000); Isolation (t(4487) = -1.6, p = 0.108); Wilcoxon Mann-Whitney test – age (U = 2229881.5, p = 0.000), Income (U = 1647621.5, p = 0.000); Lockdown digital drink (U = 1749448.0, p = 0.000); Fear virus (U = 2299307.5, p = 0.000); Fear crisis (U = 2323773.0, p = 0.000); Refocus (U = 2357308.5, p = 0.005); Opportunity (U = 2413789.5, p = 0.151); Pearson Chi-Square – gender ($\chi2(1,N = 4489) = 2.45$, p = 0.118); wine app ($\chi2(1,N = 4489) = 79.9$, p = 0.000); online offers received ($\chi2(1,N = 4489) = 83.5$, p = 0.000); Improved wine knowledge ($\chi2(1,N = 4489) = 52.5$, p = 0.000); Urban ($\chi2(1,N = 4489) = 66.9$, p = 0.000); Sub-urban ($\chi2(1,N = 4489) = 22.9$, p = 0.000); Rural ($\chi2(1,N = 4489) = 25.6$, p = 0.000); Agriculture ($\chi2(1,N = 4489) = 4.64$, p = 0.031); Industry ($\chi2(1,N = 4489) = 10.6$, p = 0.001); Services ($\chi2(1,N = 4489) = 5.6$, p = 0.018); Unemployed ($\chi2(1,N = 4489) = 118.9$, p = 0.000); Student ($\chi2(1,N = 4489) = 1.8$, p = 0.177); Retired ($\chi2(1,N = 4489) = 25.7$, p = 0.000); Taste ($\chi2(1,N = 4489) = 0.6$, p = 0.426); Relax ($\chi2(1,N = 4489) = 54.0$, p = 0.000); Friendly ($\chi2(1,N = 4489) = 80.0$, p = 0.000); Food ($\chi2(1,N = 4489) = 114.5$, p = 0.000); Romance ($\chi2(1,N = 4489) = 0.2$, p = 0.630); Health ($\chi2(1,N = 4489) = 11.3$, p = 0.001); Helps to sleep ($\chi2(1,N = 4489) = 0.6$, p = 0.428); Challenge ($\chi2(1,N = 4489) = 7.7$, p = 0.005); Supermarket ($\chi2(1,N = 4489) = 1.2$, p = 0.275); Grocery ($\chi2(1,N = 4489) = 20.4$, p = 0.000); Cellar ($\chi2(1,N = 4489) = 14.7$, p = 0.000); Wine store ($\chi2(1,N = 4489) = 0.02$, p = 0.888); Online ($\chi2(1,N = 4489) = 0.8$, p = 0.362); Winery ($\chi2(1,N = 4489) = 25.1$, p = 0.000); Drive ($\chi2(1,N = 4489) = 0.09$, p = 0.771); Lock Proc online ($\chi2(1,N = 4489) = 3.7$, p = 0.056).