

THE DOURO REGION: WINE AND TOURISM

João REBELO¹, José CALDAS¹ and Alexandre GUEDES²

¹Department of Economia, Sociologia e Gestão, Universidade de Trás-os-Montes e Alto Douro, Quinta de Prados, Vila Real – Portugal.

²Turismo do Porto e Norte de Portugal, Viana do Castelo – Portugal

*Corresponding author: Rebelo. Email: jrebelo@utad.pt

Abstract

The Demarcated Douro Region (DDR) dates from 1756, when it was recognized as one of the first demarcated regions in the world. The DDR economic activities fit the *terroir* model and are based on wine and tourism. Both activities have witnessed deep and structural changes along the last three decades, with influence in the current socio-economic performance of the region. The objective of this paper is to present the recent evolution of the DDR wine *filiere* and tourism. The Port wine continues to be the star product of DDR, with almost 90% being exported. However, along the last decade the still wines evolved from being almost unknown to a position of a national and international recognition in market niches. The tourism in Douro region is connected to the wine *filiere* and tends to be structured under two dominant influences: the river and the *terroir*.

Keywords: *Wine region, world heritage, wine and tourism*

1. INTRODUCTION

Both the wine and tourism industries have a strong regional and a rural basis and, sometimes, share locations, customers, suppliers and interconnected networks (Nunes and Loureiro, 2012). The growth of one sector may have positive impacts on the other. This convergence or overlap developed a hybrid wine-tourism industry, i.e., an industry which is emerging endogenously from the specific sectors of viticulture/wine making and tourism. The development of wine tourism has provided considerable economic growth regional opportunities. This phenomenon (Hall et al, 2000) has been recognized both in the old world wine and new world wine producing countries. Additionally, the classification of a site as a world heritage enhances this it as a tourist destination, with a positive impact on the local development as it happens in other sites with the same nomination (Cuccia et al., 2013 and Arezki et al., 2009).

Archeological records sign the presence of vineyards in Douro region since the Roman times. The emergence of the present Demarcated Douro Region (DDR) dates from 1756, when it was recognized as one of the first demarcated regions in the world, with a legislative framework similar to that currently applied in the most famous traditional wine regions. Viticulture is the economic base of the DDR covering an area of 45,000 ha, almost 18% of the total area of the region. In 2001, located in deep valleys and steep slopes along the Douro River and its tributaries, 24.600 ha of the DDR (Alto Douro Wine Region – ADWR) were included by UNESCO in the list of the World Heritage sites, as a cultural and evolving landscape, illustrating an example of a traditional European wine region and reflecting the evolution of the human activity over the time. The main economic activities of DDR are wine and tourism (Andresen and Rebelo, 2013). Both activities have witnessed deep and structural changes along the last three decades, with influence on the present socio-economic performance of the region.

The objective of this paper is to analyze the recent evolution of the: (a) Douro wine *filiere*, taking special attention to the DDR wine cluster and to the structure of the vines and the production and marketing of wines; (b) tourism phenomenon, particularly looking at the region as a tourist destination, examining the behavior of the supply and demand. To achieve this goal the paper includes a brief analysis of the Douro wine cluster, a discussion of the Douro wine *filiere* and tourism, concluding with some final remarks.

2. DOURO WINE FILIERE

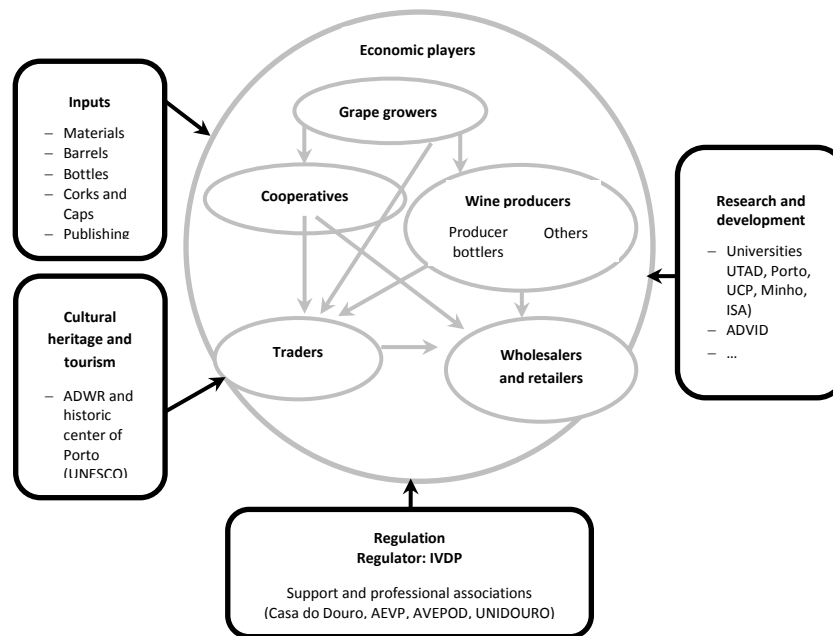
a) The DDR wine cluster

Rebelo and Caldas (2013), taking into account the local, regional and international background of the wine industry, analyzed the DDR structure and behavior using a cluster approach (Figure 1).

The authors (p.35) concluded that the DDR is a typical *terroir* model¹ and fits the *organized cluster*, as happens in other European wine regions (e.g. Bordeaux). This conclusion is based on the analysis of the following structural

¹ *Terroir* is defined as a clearly identified and homogeneous territory endowed with a strong identity which is characterized by the whole of natural and cultural resources (Rastoin and Vissac-Charles, 1999), generally backed up by a certificate of guaranteed origin label (Ditter, 2005).

variables: (a) Number of critical actors low and the firm size dominated by micro and SMEs. (b) There is some innovation (R&D), albeit not continuously, classified between low and high, that can be fostered through an increase in the level of trust. (c) The levels of skill and technology are medium-high. (d) There are some links between the players of the cluster, but the knowledge transfer circuits can be improved and more extensive. (e) There is some cooperation between the players, some of it resulting from informal and formal networks among the economic players and other sustained and imposed by the regulatory entity; there is a strong competition between economic players, especially at the phase of distribution of the added value created along the chain. (f) During the last decades the still *Appellation d'Origine Controlée* (AOC) wines suffered important changes and the exports are considered medium-high.



Source: Rebelo and Caldas (2013)

Figure 1: DDR wine cluster

Taking into account the diagnosis, and in order to improve the performance of the DDR wine cluster, additional policy measures are required, namely : (a) to increase the size of firms and the number of critical actors, in order to allow producers to make heavy investments that enables them to react outside pressures; (b) to introduce and spread a real culture of continuous innovations in the different phases of the wine-chain, anticipating or provoking changes in world market demand; (c) to amplify the cooperation and the network between the different cluster players for a generalized and better diffusion of knowledge and skills.

b) Vines and wines

The wine is the economic base of the DDR, a region where the *terroir* characteristics are present, as clearly expressed by UNESCO, when classified this region as a world heritage site according to the following: *Criterion (iii) - The Alto Douro Region has been producing wine for nearly two thousand years and its landscape has been molded by human activities; Criterion (iv) - The components of the Alto Douro landscape are representative of the full range of activities associated with winemaking - terraces, quintas (wine-producing farm complexes), villages, chapels, and roads; Criterion (v) - The cultural landscape of the Alto Douro is an outstanding example of a traditional European wine-producing region, reflecting the evolution of this human activity over time.*

According to the Centre for the Research, Study and Advancement of Mountain Viticulture (CERVIM), the DDR is the largest and most heterogeneous wine mountain region in the world, characterized by valleys strongly embedded by steep high slopes along the river Douro and its tributaries, dominated by shale and cold winters, hot summers and low rainfall. We are in the presence of hillside vineyard, being more than 40% of the vines installed in plots with a slope higher than 40% (Quatenaire Portugal / UCP, 2007), which makes mechanization very difficult and requiring manual labor, consequently, leading to high production costs.

During the last thirty years an intense process of Douro vineyard conversion was carried out by grape growers with strong public support (Magalhães et al., 2013), renovating 21,940 ha, almost 49%, of the DDR under vine. This dynamic starts in 1980s with the stimulus given by the Integrated Rural Development Project of Trás-os-Montes (PDRITM) financed by the World Bank, resulting in the planting of 2,500 ha of new vineyards and the reconversion of 300 ha. This program introduced two new land terracing systems – wide *patamares* (terraces supported by earth

banks) and vertical planting. Financed by funds from the European Union, the investments on reconversion of vineyards continued in the subsequent decades (4,400 ha in the 1990s and 14,740 ha in the last decade).

Table 1 presents the evolution of the land organization systems of vineyards², between 2001 and 2012, in the ADWR area classified by UNESCO. In 2012, 55% (5,875 ha) of the vineyards are on *patamares*, with a rise of approximately 2,500 ha from 2001. This ascending curve was also noted in vertical planting (more 363 ha), although on a much lower scale. The class that experienced the greatest contraction (1,900 ha) was vineyards on post-*phylloxera socalcos*. However, in 2012, two new typologies for land organisation were registered: *socalcos* with *patamares* and *socalcos* with vertical planting, respectively with 514 ha and 26 ha. The new forms of land organisation seek to reconcile heritage conservation with mechanised crop operations using new technologies (Magalhães et al., 2013)

Table 1: Evolution of the land organisation systems of vineyards between 2001 and 2012

Vineyard organisation system		2001		2012		Variation		
		(ha)	%	(ha)	%	(ha)	%	% Total Area
<i>Socalcos</i>	pre- <i>phylloxera socalcos</i>	215	1%	200	1%	-15	-7	0%
	post- <i>phylloxera socalcos</i>	4,659	19%	2,762	11%	-1,898	-41	8%
	<i>socalcos</i> with <i>patamares</i>	0	0%	514	2%	514		-2%
	<i>socalcos</i> with vertical planting	0	0%	26	0%	26		0%
<i>Total socalcos</i>		4,875	20%	3,502	14%	-1,373	-28	6%
<i>Patamares</i>		3,297	13%	5,785	24%	2,488	75	10%
Vertical planting		509	2%	871	4%	363	71	1%
No land organisation		608	2%	412	2%	-196	-32	1%
Total vineyards		9,288	38%	10,570	43%	1,282	14	5%
Other uses		15,312	62%	14,030	57%	-1,282	-8	5%
Total		24,600	100%	24,600	100%			

Source: Magalhães et al. (2013: A1-23).

Similarly to the oldest wine regions of Europe, the property structure in DDR is skewed (Table 2), with 45,189 ha of vineyards distributed amongst 34,139 grape-growers, an average farm size of 1.32 ha. Compared with 2006 (Quatenaire Portugal/UCP, 2007), the total area of vineyards remain relatively unchanged but the number of viticulturists decreased by 14%, a trend that will continue in the near future, since we are in the presence of an aging population (Rebelo et al., 2013).

Roughly 35% of the DDR area is owned by just 640 grape-growers. The average farm size for this group is around 27.70 ha, an increase of 41% compared with 2006. Most of these farms belong to bottler-wine-producers and traders of Port wine. In contrast, small and medium size grape-growers are mostly members of wine cooperatives (Rebelo et al., 2010).

Table 2: Number of Grape Growers and Farm Size in the DDR, in 2012

Area (Hectares)	Number of viticulturists	Viticulturists %	Hectares	Size %
Until 0.5	19,747	57.80	3,734	8.20
0.5 – 2.0	9,819	28.80	9,885	21.90
2.0 – 5.0	2,985	8.70	9,311	20.60
5.0 – 8,0	708	2,10	4,370	9.70
8 – 10.0	240	0.70	2,132	4.70
More than 10	640	1.90	15,757	34.90
Total	34,139	100.00	45,189	100.00

Source: IVDP (www.ivdp.pt)

Two categories of wines are produced: Porto wine and still wines. Table 3 includes the wine production in most recent years. The DDR annual average production is 1,468,954 hl (an average of 32.51 hl/ha), around 23% of the Portuguese wine production³. Port wine represents 53% of the DDR production and 12% of the domestic production.

² For the remaining DDR area this information was not available. The assessment of the classified site requires a detailed analysis of the landscape evolution, including plantation systems (Andresen and Rebelo, 2013).

³ According to IVV (www.ivv.pt), the total domestic vineyard area is 237,786 ha, representing the DDR 19%.

Table 3: DDR production: 2005-2012

	Port wine (hl)*	Still wines (hl)	DDR Production (hl)	Port wine/ DDR production (%)	Port wine/ Portuguese production (%)	DDR production/ Portuguese production (%)
2005	845,169	873,604	1,718,773	49.17	11.63	23.65
2006	867,107	850,766	1,717,873	50.48	11.50	22.78
2007	877,405	562,786	1,440,191	60.92	14.45	23.71
2008	871,864	502,047	1,373,911	63.46	15.33	24.15
2009	773,718	552,657	1,326,375	58.33	13.19	22.61
2010	771,777	870,483	1,642,260	46.99	10.80	22.98
2011	590,436	729,736	1,320,172	44.72	10.50	23.48
2012	674,768	537,398	1,337,280	55.66	10.70	19.21
Total	6,272,154	5,479,477	11,751,631	53.37	12.19	22.85

Source: Authors' computations from data collected in Instituto de Vinho do Douro e Porto - IVDP (www.ivdp.pt) and Instituto da Vinha e do Vinho - IVV (www.ivv.min-agricultura.pt)

Port wine and still wines have different market positions. The Port wine has a story of more than two centuries of being exported, albeit cyclical movements. Recent data (Table 4) shows that Port wine is witnessing a negative phase, expressed by a 12% sales decrease in volume and 11% in value, between 2005 and 2012. The domestic demand remained relatively stable, around 13-14%, in quantity and 15-16% in value. Unquestionably, it is a globalized product, sold around the world, although the main market is the EU followed by USA and Canada (www.ivdp.pt).

Table 4: Sales of Port wine: 2005 - 2012

	2005	2006	2007	2008	2009	2010	2011	2012
Domestic market								
– Volume (hl)	129,330	130,860	128,430	125,100	110,160	120,906	106,607	110,339
– Value (10 ³ euro)	63,029	64,224	61,704	59,578	51,874	55,327	50,321	52,104
– Euro/litre	4.87	4.91	4.80	4.76	4.71	4.58	4.72	4.72
Exportations								
– Volume (hl)	807,750	785,250	814,050	767,070	725,940	741,604	718,624	715,273
– Value (10 ³ euro)	341,930	331,685	342,550	316,222	300,266	315,474	305,592	308,282
– Euro/litre	4.23	4.22	4.21	4.12	4.14	4.25	4.25	4.31
Total								
– Volume (hl)	937,080	916,110	942,480	892,170	836,100	862,511	825,230	825,612
– Value (10 ³ euro)	404,959	395,909	404,254	375,800	352,100	370,801	355,912	360,386
– Euro/litre	4.32	4.32	4.29	4.21	4.21	4.30	4.31	4.37

Source: IVDP (www.ivdp.pt)

Regarding still wines, only a part of the total production is sold as AOC wines (Table 5). Between 2005 and 2012 the share of AOC in still wines increased, reaching a maximum (71%) in 2008. In 2012, the exports of AOC wines represented around 40.7%, in volume, and 41% in value, with an average price per liter of 3.89 euro in the domestic market and 3.95 euro in external markets, averaging 3.91 euro. Comparing with 2005, these prices increase 73%, 16% and 60%, respectively. In the same period the domestic market decreased 41% and the exports increased 89%, showing that the Douro wine firms are searching for new external markets.

Table 5: Sales of DDR's AOC wines

	2005	2006	2007	2008	2009	2010	2011	2012
Domestic market								
– Volume (hl)	230,481	268,956	308,520	279,369	222,453	142,400	136,317	136,283
– Value (10 ³ euro)	51,866	62,374	70,070	70,645	66,156	56,113	52,076	52,953
– Euro/liter	2.25	2.32	2.27	2.53	2.97	3.94	3.82	3.89
Exportations								
– Volume (hl)	49,545	58,140	69,822	74,646	77,202	71,162	85,571	93,396
– Value (10 ³ euro)	16,853	20,717	25,243	26,977	27,680	29,087	34,000	36,878
– Euro/liter	3.40	3.56	3.61	3.61	3.59	4.09	3.97	3.95
Total								
– Volume (hl)	280,026	327,096	378,342	354,015	299,655	213,562	221,888	229,680
– Value (10 ³ euro)	68,719	83,091	95,313	97,622	93,836	85,200	86,076	89,831
– Euro/liter	2.45	2.54	2.52	2.76	3.13	3.99	3.88	3.91
Sales of still wines/Production of year	0.32	0.38	0.67	0.71	0.54	0.25	0.30	0.43

Source: IVDP (www.ivdp.pt)

It is important to highlight that is only with Portugal's entry into the European Union (1986) that the grape-growers started to develop their own labels and bottle their wines rather than selling the grapes to Port wine shippers, as they did for nearly two centuries. These new start-ups produced predominately red still wines. While these new brands found heavy demand in Portugal, their entrance in the international markets became quite difficult, since Douro wine region was not known at all, and therefore did not represent a category to be included in the wine lists and shelves (Rebelo and Muhr, 2012).

The market strategy followed by these new wine producers has been based on differentiation for niche markets, where production is made through marketing events, press releases and interactions with wine experts (such as media, trade and gastronomy) in the target markets. One of the consequences of this entrepreneurial behavior is the emergence, in the last decade, of Douro still wines which, from being unknown, have achieved, within a decade, a high national and international recognition (Rebelo and Muhr, 2012). For instance (Caldas and Rebelo, 2013), in 2010, the rater Robert Parker ranks 26 Portuguese wines (23 red and 3 white wines) above 90, of which 23 (21 red and 2 white wines) are from Douro region. In the same year, Wine Spectator awards scores above 90 points to 27 wines, all red and from Douro. Cellartracks⁴ rates 23 wines above 90 points, all red and 22 from Douro.

3. TOURISM

Since the registration of ADWR as world heritage the tourism in the Douro has enjoyed strong political and institutional support by the Portuguese government (Andresen and Rebelo, 2013), highlighting the importance of the region as touristic destination. The unique characteristics of the region were emphasized by the National Geographic Society that, in 2010, ranked the Douro in 7th place, among 133 sites/destinations, in the category of *Best Rated Places*, taking into account its environmental and ecological quality, social and cultural integrity, level of preservation of the historical buildings and archeological sites and the tendency to remain so.

The tourism in the Douro region tends to be structured under two dominant influences, the river (Douro) and the *terroir*. Relatively to the Douro River, its navigability started in 1994, showing nowadays a remarkable economic vitality (table 6). In 2013, 35 companies were operating with 86 regular boats and 11 hotel boats with a total occupancy of 6,124 passengers. The water-born sector, however, holds two subsectors that exhibit divergent behaviors, the hotel boats (cruising ships) showing an occupancy rate of roughly 76 %, and the regular boats a rate lower than 50%, between 2010 and 2013.

Table 6: River tourism supply indicators: 2010 - 2013

Supply	2010	2011	2012	2013
Companies operating regular boats	-	32	34	35
Number of regular boats	51	54	66	86
Number of hotel boats	7	8	8	11
Total boats occupancy	4,810	5,519	5,874	6,124
Hotel boats occupancy rate	76.45%	75.19%	76.75%	76.75%
Regular boats occupancy rate	52.20%	45.24%	42.01%	42.01%

Source: IPTM (2013)

Overall the water-born sector has been growing consistently (Table 7), with an average growth rate of 21 % between 2007 and 2013, having carried in the last year a total of 545,630 passengers. From these 39,352 (7.2 %) traveled in hotel boats, 150,034 (27.5 %) in 1-day cruises, 5,969 (1.1%) in recreation boats and 350,275 (64.2%) in small trip cruises in the same reservoir.

Table 7: Number of passengers per type of boat/trip: 2007 – 2013

Demand	2007	2008	2009	2010	2011	2012	2013	Average Var. 2007/2013
Hotel boats (BH)	17,724	20,982	19,711	22,017	26,454	28,089	39,352	15.08%
Cruises – 1 day (C)	148,016	144,187	159,198	173,143	153,033	135,688	150,034	0.70%
Recreation boats (R)	6,820	4,842	6,457	6,160	5,724	5,632	5,969	-0.50%
Cruises in the same reservoir (CMA)	-	-	-	-	-	243,419	350,275	43.90%
Total (BH+C+R+CMA)	172,560	170,011	185,366	201,320	185,211	412,831	545,630	27.20%

Source: Source: IPTM (2013)

⁴ Is a website (<http://cellartracks.com>) in which consumers express their opinion and ascribe their scores.

On the demand side there are sharp differences on the type of users, according to the category of boat/trip. Roughly 97% of the hotel boat (cruise ships) market is concentrated within an international frame in opposition to 1 day cruises which depend most entirely on the domestic market, around 94% of its total demand (IPTM, 2013). The hotel boat market is mainly centered on international big cruising companies (e.g. Croisieurope and Viking). Most of the tourists come from European countries, almost 77% of total demand (France, 22%; United Kingdom, 15%, Germany, 14% and others 26%), and of the United States of America which generates around 22 % (IPTM, 2013). The touristic activities within the *terroir* are well embedded in the cultural environment of this region which is clearly based on the wine *filiere*. During the 1990s, the evolution of the traditional *quinta* (wine producing properties) to satisfy the new agro-tourism demand is an important landmark that shows the linkage between wine and tourism. Altogether, there are presently 25 *quintas* that fulfill tourism requirements (Rebelo et al, 2013).

Moreover, in 2012, the lodging sector combines 36 hotels, fulfilling a capacity of 2,303 beds (Table 8), with a considerably higher number of rural tourism units (101), although with a smaller number of beds (552).which is equivalent to a ratio of 5 beds per unit versus 64 beds per hotel. On average, between 2010 and 2012 the hotel establishments were responsible for a guest room income of almost 8 million euro.

Table 8: Hotel establishments and rural tourism units: 2010 – 2012

Supply	2010	2011	2012	Ratio Beds/Units
Number of hotel establishments	34	39	36	
Number of beds in hotel establishments	2,280	2,466	2,303	64
Number of rural tourism units (TER)	-	-	101	
Number of beds in rural tourism units	-	-	552	5
Guest room income - hotel establishments	8,334,000€	8,466,806€	7,098,000€	

Source: INE/ERTD (2012)

Despite the classification of ADWR in 2001 as world heritage, the number of hotels and beds did not increase, meaning that the results achieved are below what was anticipated after its UNESCO nomination. The number hotels/beds in 2001 were 34/2,276 and in 2012 36/2,303 (INE, 2001-2012).

Relatively to the demand of hotels, the overnights and number of guests (table 9) show a decrease, between 2001 and 2012, of -1.6% and -1.1%, on average, respectively. The average stay has remained on the threshold of 1.5 nights and the net occupancy rate of 28% in 2001 and 23.7% in 2012, suggesting that the Douro hotel tourism still has a long way to run in order to achieve reasonable economic results.

Table 9: Tourism demand trends – hotel establishments: 2001 – 2012

Demand	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Mean 2001/2023
Overnights at hotels (1)	233,464	234,877	221,220	233,255	224,428	221,081	228,181	217,074	215,248	223,416	220,116	192,463	-1.6%
Number of guests in hotels (2)	145,402	154,874	146,851	153,721	151,607	151,181	157,655	140,879	129,787	136,567	142,488	125,414	-1.1%
Nights spent	1.61	1.52	1.51	1.50	1.50	1.50	1.40	1.54	1.66	1.60	1.50	1.50	1.53
Net occupancy rate	28.00%	27.80%	25.60%	27.50%	26.50%	26.10%	26.60%	25.00%	25.60%	26.70%	25.40%	23.70%	26,21%

Source: INE (2002-2013)

In opposition to boat hotels, the hotel demand is essentially concentrated in the domestic market, which represents on average, between 2001 and 2012, 78.55 % of total demand (INE, 2001-2012) with the remaining mainly dispersed by 6 European countries (United Kingdom, Spain, France, Germany, Netherlands and Italy).

Summing up from the demand side we can conclude that ADWR is not a massive touristic site, and will not be even in a near future. But it is expected that a significant increase will occur essentially in the boat hotel segment.

4. CONCLUSION

The Douro region is a typical *terroir* model that fits an organized cluster, similar to other famous traditional wine regions, whose main economic activities are wine and tourism. During the last 30 years DDR witnessed an intense process of vineyard conversion, 21,940 ha, almost 50% of the area under vine. Two categories of wines are produced, Porto and still wines. The former has a history of more than two centuries of being exported (86% of the total sales), although, in the last decade, have witnessed a negative trend. Regarding still wines, their entrance in the market is recent. Only after Portugal joined the European Union the grape-growers started to vinify and bottle their wines. In 2012, the exports of AOC wine represented 40.7% in volume and 41% in value. Moreover in the last decade the Douro wines evolved from being almost unknown to a position of a national and international recognition in market niches. This evolution was led by high qualified start-ups, with a market strategy based on quality in which the *terroir* Douro region is a key competitive component.

The tourism in Douro region is connected to the wine *filiere* and tends to be structured under two dominant influences: the river and the *terroir*. The first comprises a wide array of nautical tourism activities, where the hotel boat subsector seems to excel, maintaining a level of sustainable growth based on its distribution system which is bonded to an extensive range of international markets. The *terroir* which also convenes a broad assortment of wine tourism activities (*quintas* and hotels) seems to be very much dependent on the domestic market. Although these two fields are in some cases functionally connected, they display dissimilar and distinct demand volumes and trends which confirm the need to strengthen and deepen their relationship. If on one hand the hotel boats subsector appears to embody an important gateway for the wine tourism economy to achieve a relevant level of internationalization, it seems however to be lacking a level of convergence with the tourism *terroir* resources and activities.

5. LITERATURE CITED

- Andresen, T. and J. Rebelo (2013). *Assessment of the State of Conservation of the Property Alto Douro Wine Region – Evolutive and Living Cultural Landscape – Assessment Report*. Porto: CCDRN/EMD, CIBIO UP-UTAD.
- Arezki R., R. Cherif and J. Piotrowski (2009). *Tourism Specialization and Economic Development: Evidence from the UNESCO World Heritage List*. International Monetary Fund – Institute and Fiscal Affairs Department, IMF working paper AP/09/176.
- Cuccia, T., C. Guccio and I. Rizzo (2013). *Does UNESCO Inscription Affect the Performance of Tourism Destinations? A Regional Perspective*. Association for Cultural Economics International. ACEI working paper series AWP-04-2013.
- Ditter, J. G. (2005). Reforming the French Wine Industry : Could Clusters Work? *Cahiers du Ceren*, 13 : 39-54.
- ERTD (2012), Guia Turístico do Douro, Vila Real, Portugal.
- Hall, M.C., M. Sharples, B. Cambourne, N. Macionis; R. Titchell and G. Johnson (Eds), (2000). *Wine Tourism Around the World: Development Management and Markets*. Oxford: Butterworth- 'Heinemann.
- INE – Instituto Nacional de Estatística (2002-2013), Anuário Estatístico da Região Norte: 2001-2012, Portugal.
- IPTM – Instituto Português e dos Transportes Marítimos (2013). *Estatística Via Navegável do Douro (VND)*. Retrieved May 13, 2013, from http://www.douro.iptm.pt/admin/upload/estatisticas/7/8044952_file01.pdf.
- Magalhães N., Magalhães M., Sousa V. (2013). *A1 – Alterações ao Uso do Solo*, in Avaliação do Estado de Conservação do Bem Alto Douro Vinhateiro – Paisagem Cultural Evolutiva Viva, Volume 2 – Estudos de Base. Porto: CIBIO UP/UTAD: A1.01-A1.31.
- Nunes, P. and M. Loureiro (2012). *Agricultural Landscape, Vineyards and Tourism Flows in Tuscany, Italy: Results from an Applied Economic Study*. American Association of Wine Economists, AAWE working paper No. 103 Economics www.wine-economics.org.
- Quatenaire Portugal/UCP (2007). *Plano Estratégico para os Vinhos com Denominação de Origem Controlada Douro, Denominação de Origem Porto e Indicação Geográfica Terras Durienses da Região Demarcada do Douro*. IVDP, Porto, Portugal.
- Rastoin, J.L. and V. Vissac-Charles (1999). Le Group Stratégique des Entreprises de Terroir. *Revue Internationale PME*, vol. (12): 171-192.
- Rebelo, J., A. Guedes, L. Lourenço-Gomes, M. T. Sequeira (2013). *Balanço de Concretização do Programa de Ação*, in Avaliação do Estado de Conservação do Bem Alto Douro Vinhateiro – Paisagem Cultural Evolutiva Viva, Volume 2 – Estudos de Base. Porto: CIBIO UP/UTAD: B.3-01-B.3-74.
- Rebelo, J. and D. Muhr (2012). Innovation in wine SMEs: The Douro Boys informal network. *Studies in Agricultural Economics*, 114: 111-117.
- Rebelo, J. and J. Caldas (2013). The Douro Wine Region: a cluster approach. *Journal of Wine Research*, March 2013, vol. 24 (1): 19-37.