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Internationalization, Premiumization and Diversity of the World's Winegrape Varieties

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Abstract

This article reveals the extent to which national mixes of winegrape varieties (in terms of vineyard bearing area) have become more ‘internationalized’ and of arguably higher quality since wine globalization accelerated from the 1990s, and what that means for diversity of consumer choice. It does so using an updated global database involving 700+ wine regions that account for 99% of the world’s winegrape vineyard area and 1,700+ DNA-distinct prime winegrape varieties and 1350+ synonyms, for 2000, 2010 and 2016. It shows that vignerons’ winegrape varietal choices are narrowing in the various wine-producing countries of the world by converging on the major ‘international’ varieties, especially French ones. This is not inconsistent with the fact that wine consumers are enjoying an ever-wider choice range, thanks to far greater international trade in wine associated with the current wave of globalization. Nor is it inconsistent with strengthening vigneron interest in ‘alternative’ and native varieties. The data also suggest the quality of the current global mix of varieties has been rising well above the average quality of the most-planted varieties as of 1990 or 2000.

Keywords: Index of similarity between national and global varietal mixes, index of internationalization of prime varieties, quality of winegrape varieties

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Introduction

The dramatic globalization of the world's wine markets over the past three decades has seen the share of global wine consumption that is imported rise from below 15% pre-1990 to above 40% (Anderson and Pinilla, 2018). Consumers in most countries have never enjoyed such a diversity of wines to choose from in terms of styles, qualities/prices, and the range of winegrape varieties and blends. Countless new wine consumers have joined the market, many shifting from beer or spirits to wine as their preferred beverage (Holmes and Anderson 2017). Contributing to this consumer diversity has been the opening up of new wine regions, including cool ones in response to global warming and an increasing preference for more-refined, food-friendly wines. Both opportunities and competitive challenges abound for producers seeking to attract the attention of consumers by differentiating their product, or alternatively by emulating the most successful producers.

One strategy for producers to attract consumer attention has been to display names of (especially popular) grape varieties on wine bottle labels. Its success, particularly for popular lower-priced New World wines, has led to demands in the European Union for freeing up labelling laws so as to allow such labelling there also. As well, producers in the New World are increasingly realizing the marketing value of going beyond country of origin to regional labelling as another form of product differentiation – something that has long been practiced by Europe's traditional producers, for reasons made clear in Patterson and Buechenstein (2018).

Meanwhile, producers everywhere are well aware of the impact climate changes (higher temperatures, more extreme weather events) are having on the quality their winegrapes and on vineyard yields. Adaptation strategies include switching to warmer-climate or more-resilient grape varieties, and re-locating to a region at a higher latitude or elevation to retain the current mix of grape varieties in their portfolio. Especially in the New World, where regions are still trying to identify their varietal comparative advantages and where regulations do not restrict varietal choice, winegrowers are continually on the lookout for attractive alternative varieties that do well in climates similar to what they expect theirs to become in the decades ahead.

These various forces could, on the one hand, lead one to expect winegrowing countries to be importing more exotic varieties to diversify their plantings, especially in the unconstrained growing environment in New World countries and particularly from the largest and most successful winegrowing countries of the Old World (France, Italy and Spain). On the other hand, if vigneron still experimenting with their terroir in the New World and in Eastern Europe felt that emulating the most successful Old World producers was the most profitable strategy, one might expect to see new plantings dominated by the most popular varieties.

With that in mind, this paper seeks to answer the following questions: What has been the net impact of these various forces this century on the diversity of winegrape varietal plantings globally, and in key wine-producing countries? In particular, has wine globalization been accompanied by the varietal mix in national vineyards becoming more

‘internationalized’ since the 1990s? And has that improved the quality of winegrapes available in the world?

Materials and methods

Addressing those questions requires a global database of winegrape bearing areas by variety and region. The first such database, provided by Anderson (2013), has recently been revised, expanded and updated by Anderson and Nelgen (2020). In addition to bearing area (in hectares), shares and indexes are estimated for each of 53 countries involving 700+ wine regions that account for 99% of the world’s winegrape vineyard area and 1,700+ DNA-distinct winegrape varieties and 1350+ synonyms, for 2000, 2010 and 2016 (plus a more-limited country coverage for 1990). The prime varieties are linked to their country of origin, and synonyms are as nominated by Robinson, Harding, and Vouillamoz (2012) or otherwise JKI (2019). Numerous climate variables are included for each of the regions, prepared with the assistance of Gregory Jones of Linfield University, Oregon and Germán Puga of the University of Adelaide.

This paper leaves aside the regional details so as to focus on global and national changes. To do so, it introduces indexes of varietal mix similarity and of internationalization of prime varieties. Specifically:

- The *Index of Similarity between national and global varietal mixes* is like a correlation coefficient that ranges from 0 (no similarity) to one (identical mixes)¹; and
- The *Index of Internationalization of Prime Varieties* for each country is defined as the share of prime varieties originating from that nation in the global area of winegrapes divided by the share of that country in the total global area of all winegrapes.

Results and discussion

The extent of varietal concentration in the world’s vineyard increased non-trivially between 2000 and 2016. Half the world’s plantings were accounted for by 21 prime varieties in 2000 but, by 2016, it took just the top 16 varieties to contribute half the area (Figure 1). This increasing concentration occurred almost entirely in the New World: both it and the Old World needed almost the same number of varieties to reach half their bearing areas in 2000, but by 2016 the New World needed just 9 varieties compared with 18 in the Old World. This increasing concentration is evident as well in the varietal data: for all but two of the world’s top 30 varieties, the number of countries growing them is higher in 2016 than in 2000. And in three-quarters of the countries with available data, the share of the nation’s top ten varieties in their total bearing area is higher in 2016 than in 2000 (Figure 2).

[insert Figures 1 and 2 around here]

This reduced diversity of the world’s vineyards is summarized in the *Index of Similarity between national and global varietal mixes*, reported in Figure 3. It reveals that the

¹ When there are M varieties in the world, this index is defined as:

$$\omega_{ij} = \frac{\sum_{m=1}^M f_{im} f_{jm}}{\left(\sum_{m=1}^M f_{im}^2 \right)^{1/2} \left(\sum_{m=1}^M f_{jm}^2 \right)^{1/2}},$$

where f_{im} is the area of plantings of grape variety m as a proportion of the total grape plantings in country i , and f_{jm} is the area of plantings of grape variety m as a proportion of the total grape plantings in the world, such that these proportions fall between zero and one and sum to one.

varietal mix of less than one-quarter of countries became less similar to the global mix between 2000 and 2016. That is, since the new millennium a strong majority of winegrape-producing countries have become more similar to the global average in terms of the mix of grape varieties in their vineyards.

[insert Figure 3 around here]

Internationalization

At the same time as the varietal mix in vineyards is becoming less diversified nationally and globally, it is also becoming more internationalized. The extent of that necessarily varies hugely across countries, given that the share of national area that is planted to own-country prime varieties varies from zero to almost 100%. But note from Figure 4 that only 17 of our 53 countries have more than one-tenth of their winegrape bearing area in own-country prime varieties.

[insert Figure 4 around here]

A way to gauge the extent of internationalization is to examine the share of global bearing area of prime varieties that is outside their country of origin. More than three-quarters of countries of origin saw their varieties' aggregate share of the global bearing area rise between 2000 and 2016 (Figure 5).

[insert Figure 5 around here]

Another way to gauge the extent of spread of prime varieties from their place of origin is to divide the share of prime varieties originating from that nation in the global area of winegrapes by the share of that country in the total global area of all winegrapes. This *Index of Internationalization of Prime Varieties* is reported in Figure 6. Only one-third of countries of origin saw that index of internationalization of their prime varieties fall between 2000 and 2016.

[insert Figure 6 around here]

Even so, from a global viewpoint this internationalization is predominantly due to the greater adoption in many countries of French varieties. Between 1990 and 2016, the share of plantings of French prime varieties nearly doubled, rising from 21% to 39%. Varieties from Greece and Portugal increased their shares by one-sixth and one-seventh, respectively, but only to 3% each, while the shares of Italian and Spanish varieties in the global vineyard fell by a little below and a little above one-third, respectively. The net effect of these changes on the distribution of prime varieties, shown in Figure 7, is that the combined share of the big three wine countries remained at around 70% as France gradually replaced Spain in first place and Italy's share in third place also shrank.

[insert Figure 7 around here]

The apparent paradox of reduced diversity and greater internationalization in the world's vineyards is partly explained by changes in national bearing areas. On the one hand, between 1990 and 2016 Spain had by far the biggest fall in its winegrape bearing area, by 515,000 ha or 35%, shrinking its share of global plantings from 18.2% to 12.5% (Anderson, Nelgen and Pinilla, 2017). On the other hand, the countries whose bearing areas expanded most during 1990-2016 were Australia, Chile, the United States and especially China, all of which now have a much higher proportion of their area under French varieties than any other country except France itself.

Expanded consumer choice

The claim in the paper's Introduction that the world's consumers have never before had such a wide range of wines to choose from is not inconsistent with reduced varietal diversity in the world's vineyards. The main reason is that the equivalent of two of every five bottles crosses a national border before being consumed now, compared with less than one in seven pre-

1990. Greater openness to trade in any product leads to increased specialization in production and simultaneously increased diversity of consumer choice. In the case of wine, that happens in terms of styles, qualities, prices as well as the range of winegrape varieties used either on their own or in myriad blends.

Premiumization

The quality of the wines produced and consumed depends on myriad factors of course, but one indicator that the quality globally may have risen is provided by the change in shares of the global bearing area of what are arguably some of the most iconic varieties: the top ones from Bordeaux (Cabernet Franc, Cabernet Sauvignon, Merlot and Sauvignon Blanc), Burgundy and Champagne (Chardonnay and Pinot Noir), Germany and Alsace (Pinot Gris and Riesling), and the northern Rhone (Syrah) plus the top ones now in Argentina (Côt), Italy (Nebbiolo and Sangiovese) and Spain (Tempranillo). Almost all of those 13 have been ranked among the highest-priced winegrapes in both Australia and California (Anderson 2015; Alston, Anderson and Sambucci 2015). These are also the varieties listed by Wine-Searcher (2021) as the ones most sought after by fine wine consumers (along with Garnacha Tinta and Tribidrag).

Between 2000 (1990) and 2016, the global bearing area of those 13 varieties rose 51% (129%), during which time the area of all other varieties globally fell by 26% (39%), see Table 1. Their combined share of the global vineyard area rose from 14% to 38% between 1990 and 2016 (with their individual shares shown in Figure 8). By contrast, the combined share of the top 13 varieties planted in 2000 that are *not* listed in Table 1 – of which few are considered high quality – fell from 38% to 19% (Table 2).

[insert Tables 1 and 2 and Figure 8 around here]

Conclusion

These results reveal that vignerons' winegrape varietal choices are narrowing across the world, becoming less diversified as many countries converge on the major 'international' varieties, especially French ones. This is not inconsistent with the fact that wine consumers are enjoying an ever-wider choice range, thanks to far greater international trade in wine associated with the current wave of globalization. Nor is it inconsistent with strengthening vigneron interest in 'alternative' and native varieties in numerous countries, including Italy (D'Agata, 2014) and Australia (Halliday, 2018; Higgs, 2019). That interest stems in part from a desire to diversify their varietal mix to differentiate their offering – including through the terroir-driven use of minor varieties in blends – and to hedge against increasing weather volatility. It just happens that in recent decades the latter centrifugal forces are dominated by the centripetal force of embracing the most popular varieties. Moreover, the quality of the current global mix of varieties is arguably substantially above the mix as of 2000. In short, it would seem that 'internationalization' of the world's varietal mix has been accompanied by premiumization, and the reduced varietal diversity of global and national vineyards has been accompanied by increased varietal choice for consumers thanks to the far greater international trade in wine over the past three decades.

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Table 1: Bearing areas of 13 high-quality winegrape varieties, 1990 to 2016 (hectares)

	2016	2010	2000	1990	2016/2000	2016/1990
Cabernet Sauvignon	310671	290083	223074	127678	1.39	2.43
Merlot	266440	267888	213368	154752	1.25	1.72
Tempranillo	219379	232988	93370	47429	2.35	4.63
Chardonnay	201649	199743	145543	69282	1.39	2.91
Syrah	181185	185117	102490	35086	1.77	5.16
Sauvignon Blanc	124700	111552	65190	44677	1.91	2.79
Pinot Noir	105480	98623	68810	41539	1.53	2.54
Sangiovese	73464	78030	68877	98946	1.07	0.74
Riesling	54106	50014	43316	52164	1.25	1.04
Cabernet Franc	49309	53008	48595	39619	1.01	1.24
Côt	52233	38158	26285	17263	1.99	3.03
Pinot Gris	48570	43773	18893	6509	2.57	7.46
Nebbiolo	7997	6125	5264	5300	1.52	1.51
Total of above	1695183	1655102	1123075	740244	1.52	2.31
<i>% of global area</i>	<i>38</i>	<i>36</i>	<i>23</i>	<i>14</i>		
All other varieties	2787945	2960659	3764554	4576057	0.74	0.61
Global total	4483128	4615761	4887629	5316301	0.92	0.84

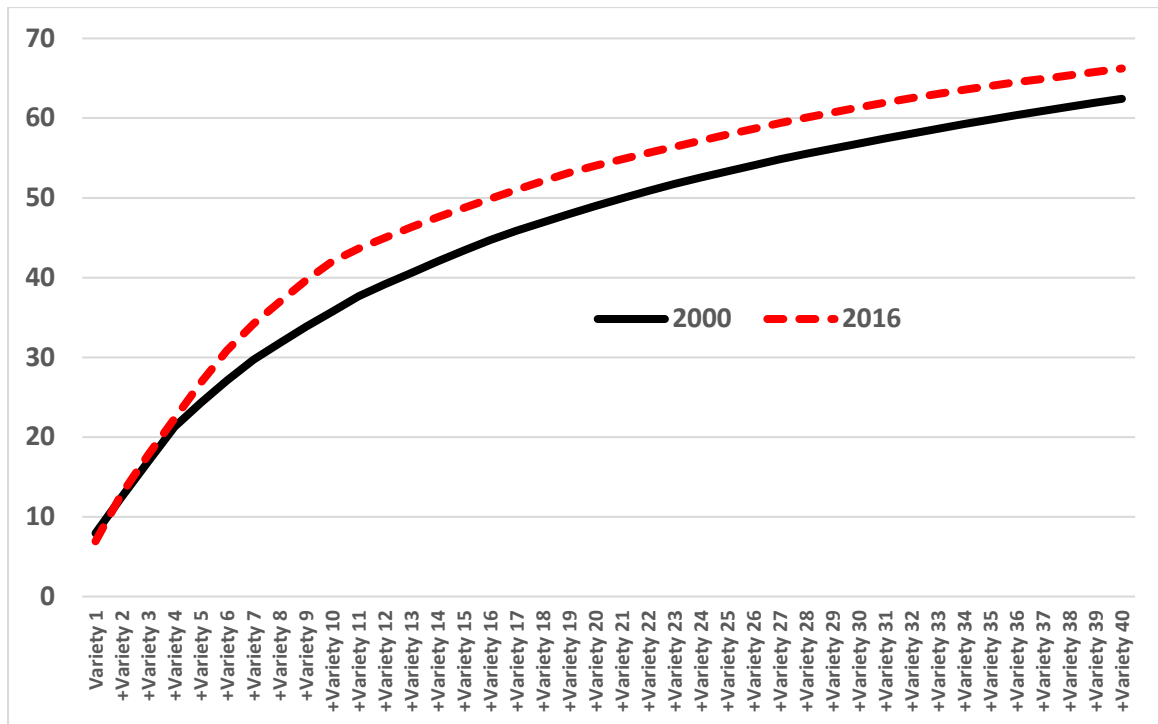
Source: Authors' compilation from data in Anderson and Nelgen (2020).

Table 2: Bearing areas of the 13 most-planted varieties as of 2000 not listed in Table 1, 1990 to 2016 (hectares)

	2016	2010	2000	1990	2016/2000	2016/1990
Airén	203801	252364	387978	476396	0.53	0.43
Garnacha Tinta	150096	181553	216349	304864	0.69	0.49
Trebbiano Toscano	120343	111290	137201	207442	0.88	0.58
Mazuelo	47312	75716	127692	202869	0.37	0.23
Bobal	59189	80120	100128	106149	0.59	0.56
Graševina	24384	61200	92306	19384	0.26	1.26
Monastrell	51930	69742	76304	108213	0.68	0.48
Rkatsiteli	51374	58641	67354	280569	0.76	0.18
Cayetana Blanca	36401	39781	55776	66139	0.65	0.55
Catarratto Bianco	28613	34863	50711	80128	0.56	0.36
Cinsaut	22926	34751	48428	63900	0.47	0.36
Macabeo	38625	40864	48128	43504	0.80	0.89
Chenin Blanc	32221	35703	45761	59974	0.70	0.54
Total of above	867215	1076587	1454115	2019532	0.60	0.43
<i>% of global area</i>	<i>19</i>	<i>23</i>	<i>30</i>	<i>38</i>		

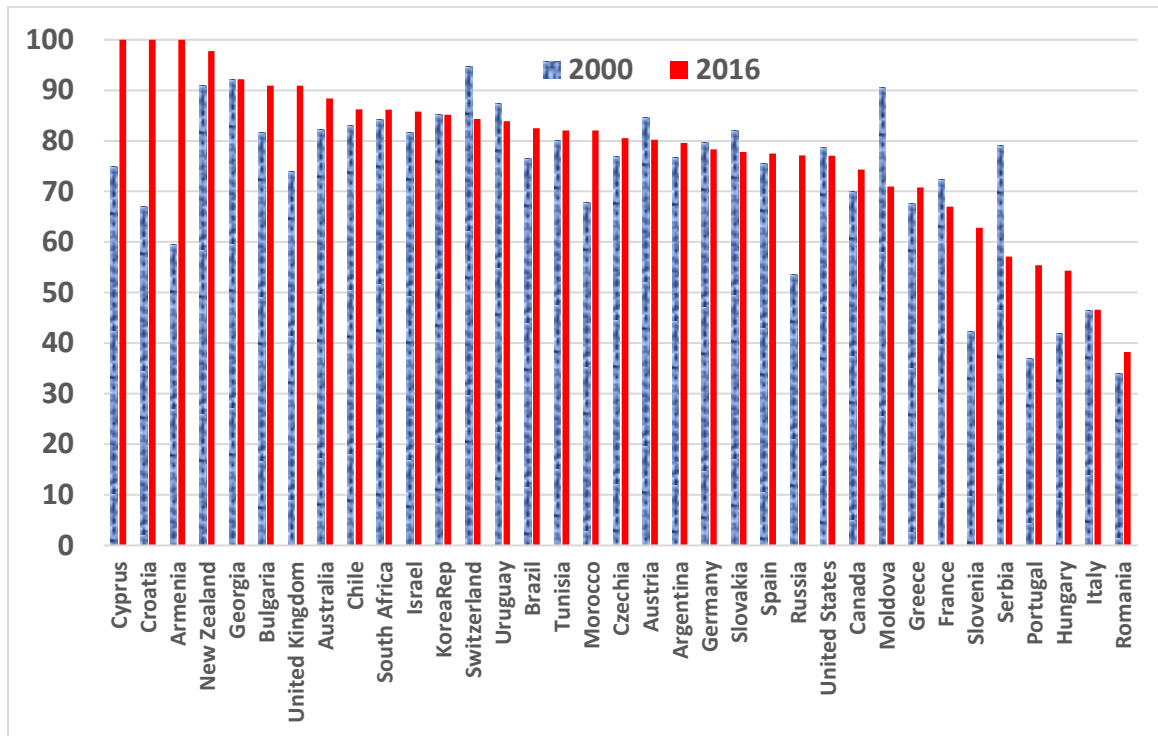
Source: Authors' compilation from data in Anderson and Nelgen (2020).

Figure 1: Cumulative varietal shares of global winegrape area, 2000 and 2016 (%)



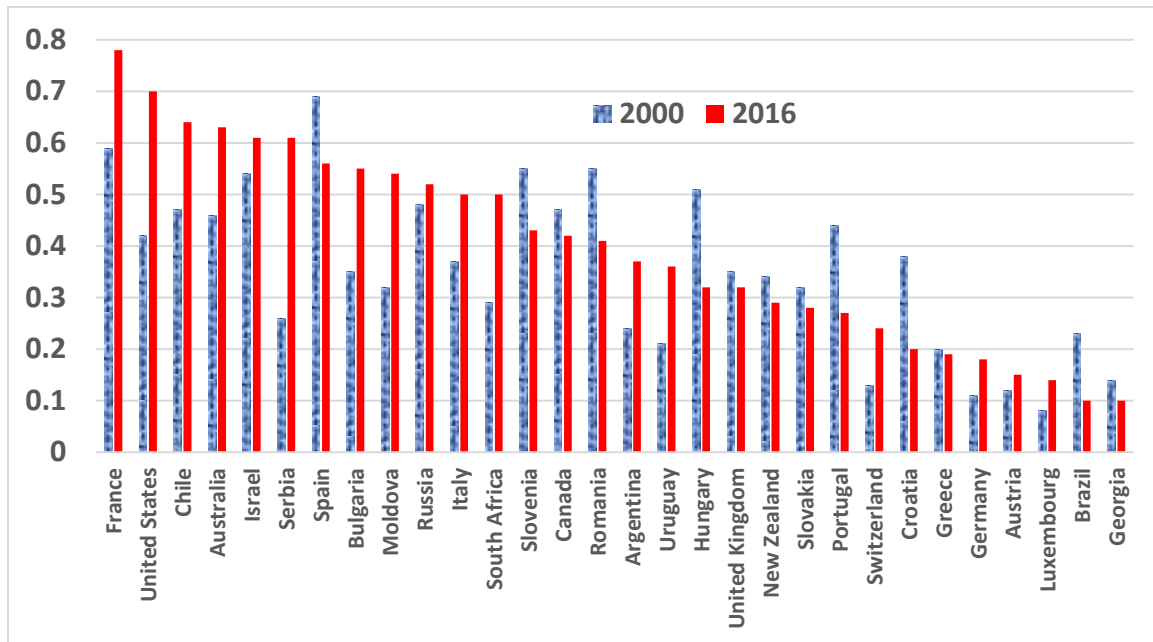
Source: Based on data in Anderson and Nelgen (2020).

Figure 2: Share of nation's top 10 varieties in national winegrape area, 2000 and 2016 (%)



Source: Based on data in Anderson and Nelgen (2020).

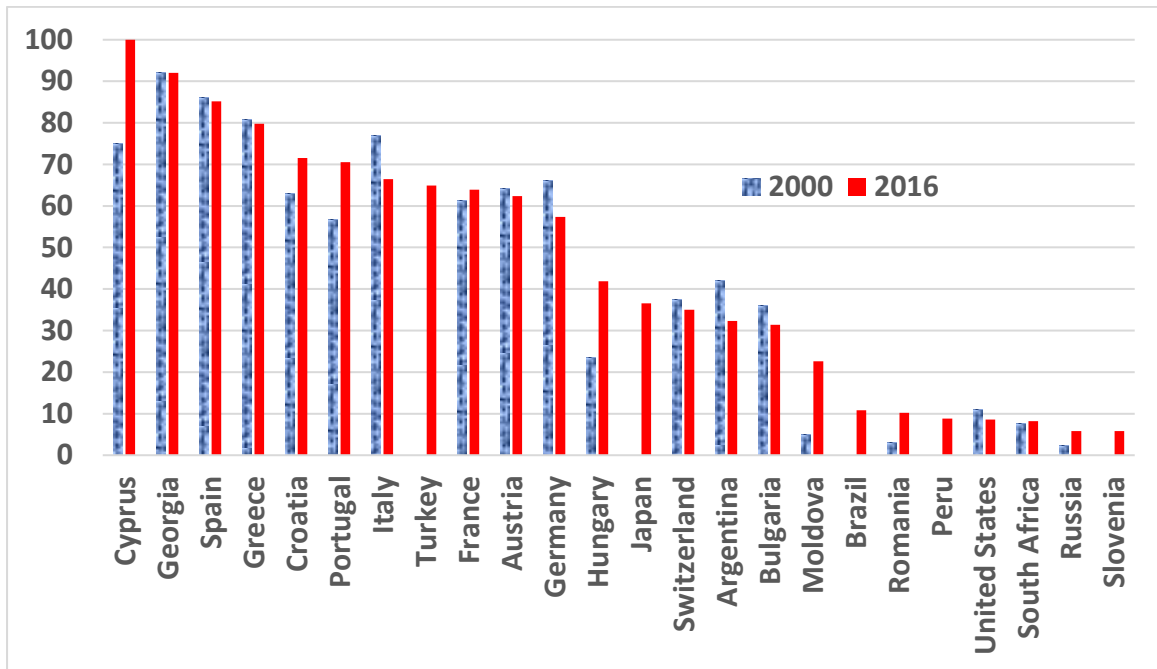
Figure 3: Index of Similarity^a between national and global varietal mixes, 2000 and 2016



^a The Index of Similarity is defined in footnote 2.

Source: Based on data in Anderson and Nelgen (2020).

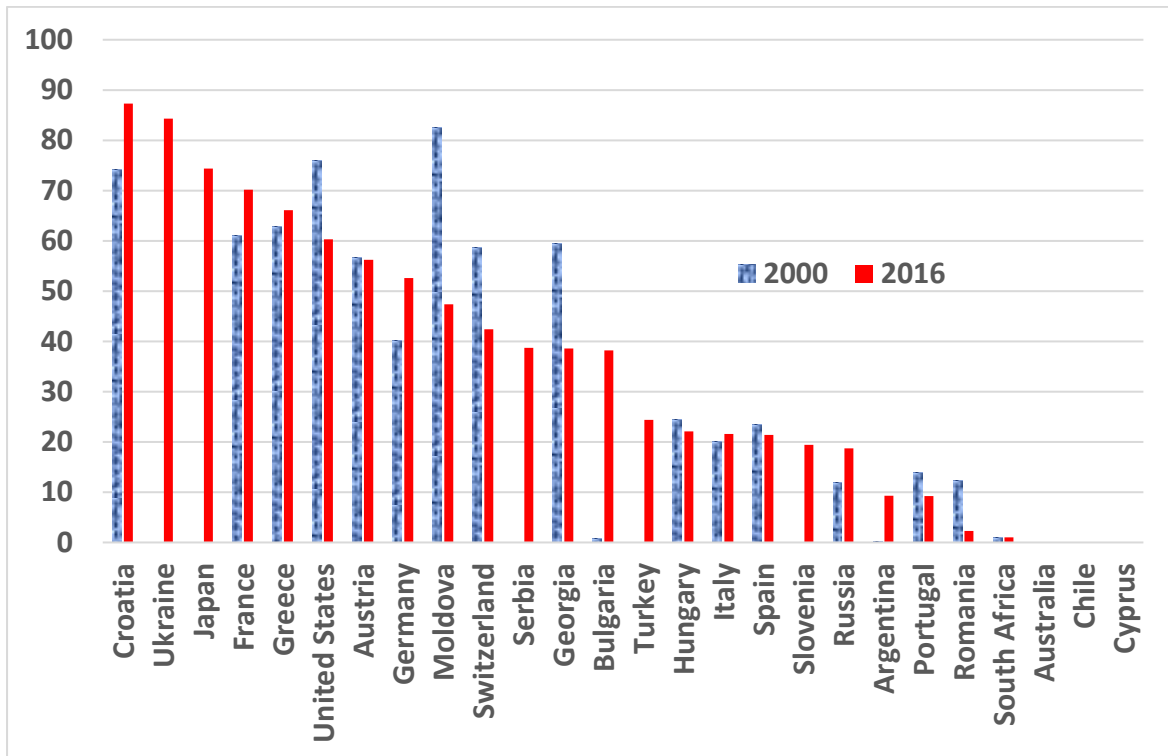
Figure 4: Share of national bearing area that is planted to own-country prime varieties, by country of planting,^a 2000 and 2016 (%)



^a All other countries are <5%.

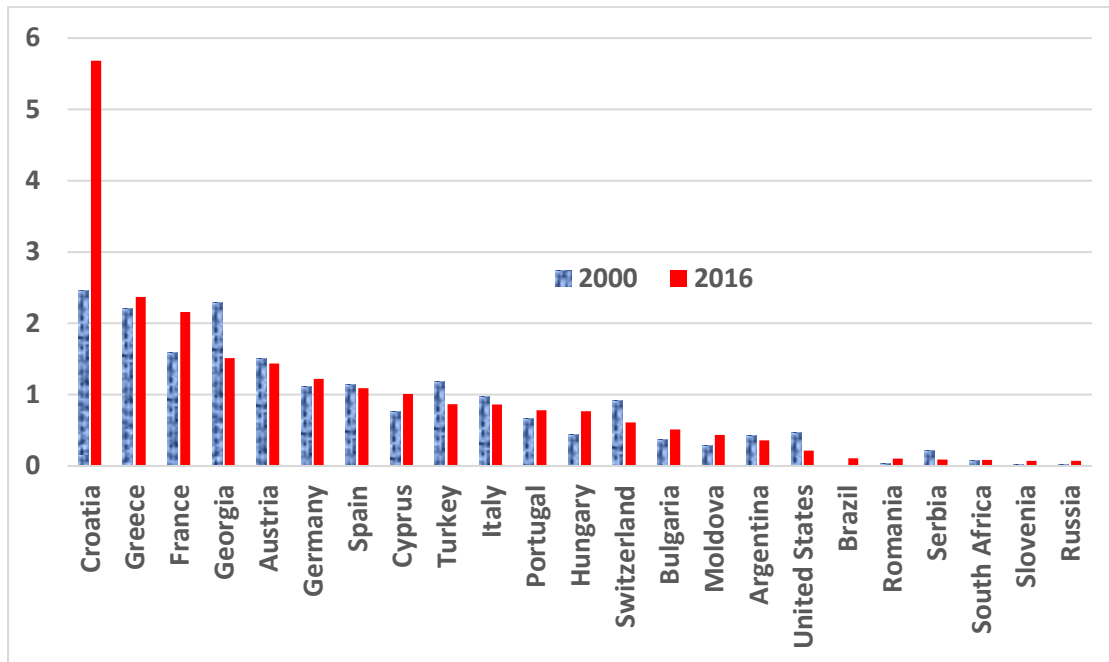
Source: Based on data in Anderson and Nelgen (2020).

Figure 5: Share of global bearing area of prime varieties that is outside the country of origin, by country of origin, 2000 and 2016 (%)



Source: Based on data in Anderson and Nelgen (2020).

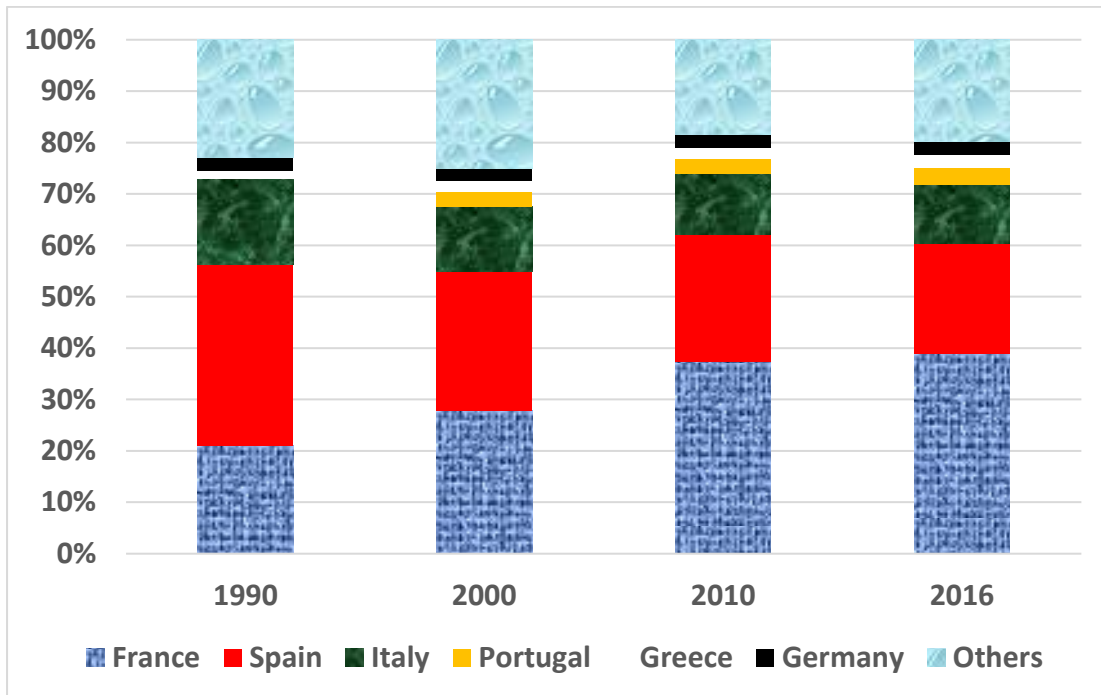
Figure 6: Index of Internationalization of prime varieties,^a by country of origin, 2000 and 2016



^a Defined for each country as the share of prime varieties originating from that nation in the global area of winegrapes, divided by the share of that country in the total global area of all winegrapes.

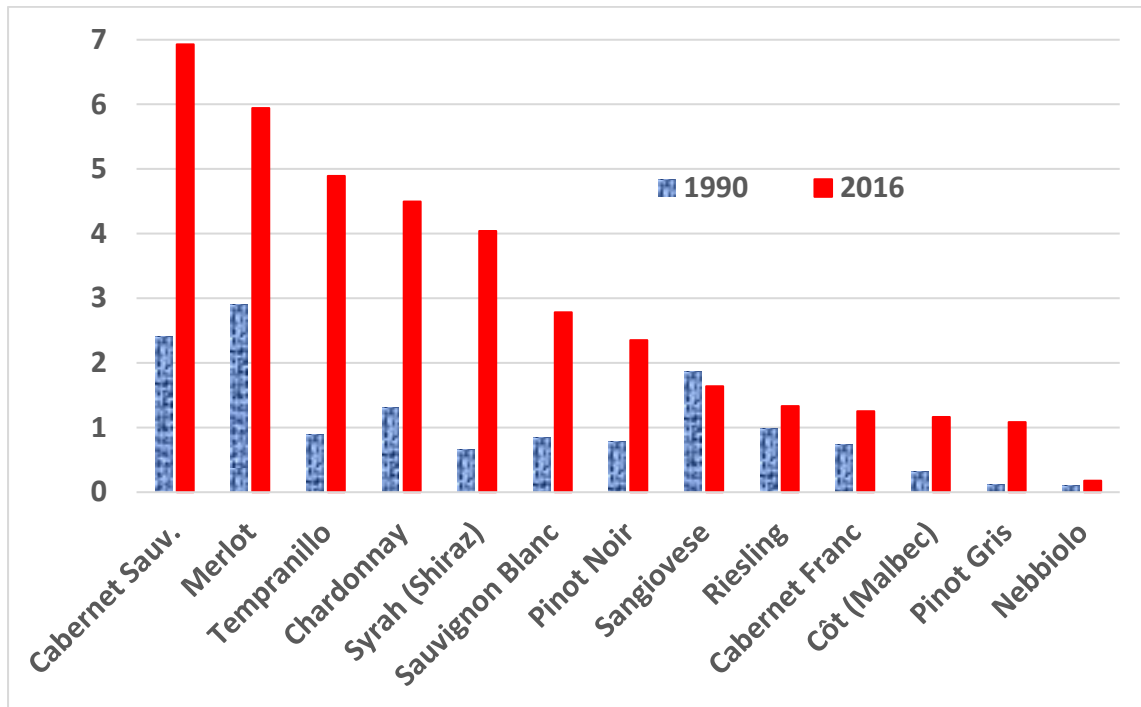
Source: Based on data in Anderson and Nelgen (2020).

Figure 7: Shares of global winegrape bearing area by varietal country of origin, 1990 to 2016 (%)



Source: Based on data in Anderson and Nelgen (2020).

Figure 8: Share of global winegrape bearing area, premium varieties, 1990 and 2016 (%)



Source: Based on data in Anderson and Nelgen (2020).