

# **THE VALUE OF IDENTIFYING COHORTS THROUGH RETROSPECTIVE PANEL DATA: PRELIMINARY FINDINGS FROM AUSTRALIA (REFEREED)**

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## *Abstract*

Marketers who identify predictable patterns of consumption behaviour are best positioned to cope with increasing supply by catering to the needs of their market more effectively. In order to cater to future demands of consumers, their patterns of behaviour must first be identified. Where patterns of behaviour are maintained, production can be manipulated to meet future demand. Further, identifying changes in consumption behaviour by a homogeneous group of consumers also aids in managing future demand. The concept of consumers who maintain a constant pattern of behaviour over time is known as a cohort.

Cohorts of wine consumers have been identified in The Netherlands (Neve et al. 1993), Japan (Mori, Lowe & Gorman 2000), France (INRA & ONIVINS 2001), and the US (Kerr et al. 2004). The cohorts were found in each country using cross-sectional samples of data. As such, changes in behaviour cannot be identified, nor can the influence of age or period effects be rejected. An alternative method of data collection is proposed by generating panel data through the use of a retrospective method. The retrospective panel identifies cohorts of wine consumers by wine style consumed. This method of research and the value of the findings are presented as a valuable tool to wine marketers.

## *Introduction*

Wine Marketing is a discipline where the practitioner is always at risk of responding to consumer demand years too late. The simple fact that production takes place in a brief period of three to ten weeks every year, means there is always a lag phase between changes in the market and producers' capacities to respond to those changes. Although the marketer can theoretically source raw materials from different regions or styles to satisfy excess demand in the short term, incapacity to

predict changes or identify stable demand means that production is seldom aligned with market demand.

The most common way that this lag phase, and subsequent surplus of less desirable wine, is dealt with in today's market is to discount the retail price. If that marketing tactic not successful (enough) a brand is often liquidated by the retailer, harvesting for whatever recovery of funds is possible (Woodard 2003). This discounting tactic is not conducive to brand building or development and is counter-productive to the aims of an enduring and successful global wine industry (Spawton 1991). Under a discounting strategy, the largest producers and those with the most available funds would be the only producers capable of dealing with the squeeze on margins and profitability that this practice entails. In the long term, consumers would be the greatest losers due to the subsequent reduction in alternative brands and competition in the open market.

With the 'glut' of wine currently available to the consumer, as forecast by observers in the past five years (Stanford 2000; Anderson, Norman & Wittwer 2002), marketers need to identify practices that can best cope with further increases in supply. Evidence from retailers indicate that there are still deficiencies of certain varieties and wine styles (Wilson 2003). The main problem for wine producers is that they do not know what the market is likely to demand in coming years.

Simple economics stipulates that with excess supply to the market, either the price must fall to clear the market or demand must be increased (or of course, both). If we accept that continuing to discount wine is not practical for the long-term health of the industry, nor the financial viability of small producers, the industry needs to address the other alternatives, which are to either increase demand or to accurately forecast changes in demand and adjust supply accordingly.

### ***Increasing the Demand for Wine***

There is a dearth of literature on improving demand for wine. This is surprising considering the current situation of the world wine industry's wine glut, and the continuing fall in demand in the traditional wine producing countries (Zins et al. 2003; Kerr et al. 2004). Spawton and Bourqui (1997) and Olsen, Thompson and Thach

(2003) suggest that consumers are sensitive to the various risks associated with a wine purchase. Spawton and Bourqui suggested that wine needs to be 'demystified' in order to improve the product's image among non-drinking or uninvolved consumers (Spawton & Bourqui 1997). Whilst recent suggestions by Olsen *et al* (2003) suggest that there are a number of informative and risk reducing strategies that distribution channel members can conduct in order to help improve a consumer's confidence in selecting wine as a beverage of choice (Olsen, Thompson & Clarke 2003).

Thach, Olsen and Rice identified the importance of a positive introduction to wine as a key element in encouraging adoption of wine as a beverage of choice throughout life (Thach, Olsen & Rice 1999). The authors discussed a range of initiatives including advertising campaigns and 'de-snobbing' wine, which could be adopted in order to improve the approachability of wine as a beverage to a majority of the market of marginal or abstainers from wine (Thach, Olsen & Rice 1999).

The only concern about these suggestions is that most are based on preliminary findings. Quantitative evidence would test the validity of their assertions by testing the market generalisability of their suggestions for improving demand. Clearly, the importance of this topic to the industry cannot be underestimated. Research on the topic of increasing demand should not be delayed further, as wineries are already beginning to fold due to the financial pressures affecting producers.

However, the concept of 'de-snobbing' wine is not easy to measure (or one suspects, change). Secondly, aside from individual brand-oriented advertising to inform or persuade consumers to purchase a particular brand, the highly fragmented nature of the wine market means that organising an industry based promotional campaign would be inoperable. Another difficulty with increasing demand is attempting to organise a positive introduction to wine. Considering that the age (or window of opportunity) of the respondent, when introduced to wine, is unknown the appropriate method of informing the market of wine's appeal would be complicated. Additionally, how could a positive introduction be organised for each and every potential wine consumer?

### ***Forecasting Changes in Demand***

An alternative option to increasing demand is to match supply to forecasts from known patterns of consumption. The problem affecting wineries is not that they cannot sell wine; it is often that they can't sell all or even much of their wine. Wineries often know the demographics of their market, due to the modern practice of maintaining databases on sales and enquiries (Jarvis 2002). However, with an absence of information on the contrary, wineries then either forecast demand based on previous sales or forecast changes in demand on some known pattern of behaviour.

According to Rentz, Reynolds and Stout (1983), the changing age distribution of the population is one of the most important [marketing] phenomena on society and marketing (Rentz, Reynolds & Stout 1983). Specifically, the differences in demographic categories by age and size means that marketers must develop strategies for coping with changes in demands as these consumers progress through life. A key point of Rentz et al.'s (1983) article was that recognising the changing make-up of the age and size of various sections of the market is important. However, the authors went on to stipulate that [measuring change] in consumption behaviour is also important (Rentz, Reynolds & Stout 1983).

### ***Identifying Patterns of Consumption***

Forecasting changes in demand is risky, even when based on 'good' data. Therefore, with an absence of 'good' information available on changes in wine consumption, forecasting is tantamount to guesswork. Consequently, wineries often sell out of one style of wine well before any of the other styles available, leaving many consumers without an option of a wine they would otherwise have purchased. An improved method of forecasting what the consumer is more likely to want in coming year(s) could be conducted if the producer had information on the segments of their market that are likely to maintain their consumption patterns over time. The concept of perpetuated consumption patterns is the cohort.

### ***The Concept of Cohorts of Wine Consumers***

Ryder presented one of the first examples of the concept of cohorts in an article on the concept as a study of social change (Ryder 1965). The core sentiment behind

Ryder's concept was well defined in his first paragraph:

“Changes in an individual throughout his life are distinguishable from changes in the population of which he is a component” (Ryder 1965, 843).

Ryder defined a cohort as “those persons born in the same time interval and aging together..” (pg.844), or more effectively, a cohort is “the aggregate of individuals [within some population definition] who experienced the same event within the same time interval” (p. 845). Ryder described one of the distinctions of a cohort as a result of the group's fresh contact with society, and as such, was expected to respond in a different manner than those groups who already exist in society.

The issue of defining cohorts has been studied by numerous researchers in marketing literature. The process of identifying cohorts is, however, a topic of much conjecture. One point of consensus among researchers is that age, period and cohort are all confounded. Specifically, a cohort is a function of age and period, and manipulating any of the three components affects at least one of the other two (Glenn & Zody 1970; Klecka 1971; Mason et al. 1973; Glenn 1976, 1977; Hagenaaers & Cobben 1978; Palmore 1978; Rentz & Reynolds 1981; Rentz, Reynolds & Stout 1983; Schuman & Scott 1989; Rentz & Reynolds 1991; Henry 1994; Meredith & Schewe 1994; Schewe, Meredith & Noble 2000; Noble & Schewe 2003; Kerr et al. 2004; Schiffman & Kanuk 2004; Schuman & Rodgers 2004). As such, there are various methods of analysis used to identify cohorts, with each method's validity measured by the feasibility of the assumption underpinning its use (Rentz & Reynolds 1981).

The use of cohort analysis can improve the understanding of the connection between membership in an age cohort and changes in behaviour (Rentz, Reynolds et al. 1983). Cohort analysis should go beyond the understanding of the changing cohorts in age and size distribution, seeking an understanding of the ageing, cohort succession and environmental influences that elicit consumer responses to products and categories of products. Specifically, the authors summarised the direction of cohort analysis well, with the statement that “...when size and behaviour are both examined...marketers will know whether or not their markets [change over time]....” (Rentz, Reynolds et al. 1983). For wine marketers, knowledge of the segments within the market that maintain their behaviour over time would be invaluable.

### ***Comparing the Outcomes of Cohort Analyses***

The existence of cohorts of wine consumers has been investigated in other countries with time-series data. Findings from other countries have produced mixed results as each author used different samples and cohort analyses to identify the existence of cohorts. This section presents the findings from other countries and discusses the value and limitations of each study.

Neve *et al* (1993) used descriptive graphical analyses to illustrate their findings that a cohort of alcohol abstaining consumers was mediated by age effects. Further, they found that period effects helped explain cohorts of consumption (Neve *et al.* 1993). Despite the support for the existence of cohorts in their findings, the use of repeated cross-sectional data in their analysis means that net movements in and out of cohorts of respondents will not be captured in their analysis. Consequently, the conclusion that cohorts exist is open to conjecture.

Beverage-specific consumption was investigated by Mori *et al* (2000) on five generalised, cross-sectional household samples of the population of consumers. They found cohorts of saké drinking consumers for older age cohorts and beer drinking cohorts for younger age cohorts. However, the interval between each period was not controlled in all samples., and along with Neve *et al* (1993)'s findings, net movements in and out of each sample between periods cannot be controlled for with cross-sectional data.

INRA identified a cohort effect in their repeated, population generalised, sample of wine consumption. Data from their study illustrated that almost all age groups consumed in excess of 70L of wine per person per annum in 1980. By the time the 2000 data was collected, age groups under 35 years of age consumed less than 40L per person per annum, with the younger age groups consuming even less.

However, age groups over 35 continued to consume a similar amount of wine as the same age groups in 1980. This finding supports the notion of a cohort of wine consumers, but the alternative is that a period effect could explain the same phenomenon. Further, the perpetuation of behaviour cannot be validated as different respondents were interviewed for each sample (INRA & ONIVINS 2001).

Kerr *et al* (2004) used a number of different methods of analysis to identify cohorts. Further, the data on US households was collected in a variety of manners over time. As such, a number of data samples were not capturing the same information, and required conversions and assumptions to be conducive to cohort analysis.

However, Kerr *et al* (2004) found a number of cohort, period and age effects were evident in a population generalised sample of consumers. Cohorts of consumers exist in the US for spirit drinkers born before 1946, particularly for men born before the 1930s, and that cohorts of beer drinkers exist for those male respondents born between 1946 and 1965. Women born prior to 1940 were also found to be a cohort of beer drinkers. Beer and spirits consumption was found to decrease with age and period effects were found for men's beer and wine consumption and women's spirits consumption. The period effect was attributed to educational attainment in the population over time for reduced beer consumption and increased wine consumption (Kerr *et al.* 2004).

However, problems exist in identifying cohorts through these cross-sectional samples. Problems occur when there are differences across different age groups, cohorts and periods. The problems are that with cross-sectional data, there is little possibility to identify whether the differences between two age groups in the same period are because of an age effect (Rentz & Reynolds 1981). The difference could also be a cohort effect, but without monitoring the same respondents over time, it is impossible to determine the effect with certainty.

Further, even with successive samples of a generalisable sample from the population of concern, unless the respondents are the same (ie. a panel study) then changes in respondent values may be due to sampling error rather than changes in (or perpetuated) behaviour. Secondly, population representative samples can still be questioned on the applicability to the population at large. Depending on the survey instrument used, non-response bias is always a concern that will not be resolved just by weighting the sample to represent the population (Sharp 2000).

Consequently, Neve *et al* (1993), Mori *et al* (2000), INRA and ONIVIN (2001) and Kerr *et al* (2004)'s findings are suggestive rather than certain. Hansman and Shutjens' conclusions support this assertion, and suggested that the use of qualitative research would help determine the period effects responsible for changes

in behaviour, and should be used to support any findings from cohort analysis (Hansman & Schutjens 1993).

### ***Findings from Australia***

The limitations of the above studies addressed for a cohort analysis of wine consumption behaviour of Australian respondents. Respondents were recruited from a database of wine buyers from a large mail-order wine distributor. This sample is biased in favour of those who consume wine and are more likely to have a level of interest in wine that supports the possibility of returning valid data on their wine consumption patterns (Raaijmakers & Shiffrin 1981; Burke, Heuer & Reisberg 1992).

Respondents have been shown to recall reliable and valid data on their alcohol consumption for earlier periods, where the respondents are given reason to commit their behaviour to memory (Giovannucci et al. 1991). The respondents' patterns of wine consumption were recorded with an adjusted time-line survey instrument, consistent with model suggested by earlier researchers on alcohol consumption (Sobell et al. 1988; Hilton 1989). A sample of over 1000 respondents provided their history of wine consuming behaviour for each year of their life that they would have been categorised as at least an occasional consumer. Occasional consumption was designated for those respondents who drank wine at least once per month (Murray & Lockshin 1997).

Cohorts were identified for those respondents where their consumption behaviour was perpetuated from the year that they first began drinking the wine type occasionally or more regularly. For each wine type, the percentage of consuming respondents is given for age cohorts, and then decomposed into cohorts within each beverage. Where respondents changed or halted their occasional consumption, the number of years consumed was provided as a way of determining the mean period of consumption for each cohort. Further, for those members of an age cohort that changed their consumption patterns subsequent to membership of a cohort, the most popular alternate beverage was presented to show where the majority of the cohort moved. Each cohort was further decomposed into gender categories to test for the effects of gender on cohort membership.

An example of the findings is given for women over the age of 37, but under 52, who drink white wine: 95% of women in this age group who drink any wine, at least drink



white wine. 75% of the members who started drinking white wine occasionally or more regularly have perpetuated that behaviour. For the remainder of this cohort, the mean number of years of not consuming white wine is 5. The most popular beverage for those members of this cohort who stopped drinking white wine regularly was red wine.

Some authors have suggested that there is a cohort of white wine drinking women who began drinking wine in the period when white wine production improved and became popular in the 1970s (Beeston 1994; Stanford 2000). The findings above would certainly support that assertion.

Cohorts exist in every wine category analysed. The incidence of cohort behaviour and period maintained differs across the data sets. The mean age for beginning cohort behaviour was 23. However this value ranged from 17 for sparkling wine to 29 for red wine. However, the strongest findings are for fortified wine drinking cohorts of consumers over the age of 50 and red wine drinkers under 28 and red wine drinking males over 45.

### ***Conclusion***

Identifying the patterns of wine consumption over time is a valuable prospect for the wine industry. Where consumption behaviour is perpetuated over time, a cohort behaviour may be evident. Identifying cohorts are valuable for marketers due to the group's more stable behaviour over time. Cohorts of wine consumers have been identified in the US and The Netherlands, but the samples used cannot conclusively identify a cohort due to the cross-sectional nature of the sampling in each study.

This study uses panel data to illustrate the proliferation of cohorts of wine consumers in a sample of wine consumers who purchase wine through a mail order database. The findings of this cohort study suggest that there are a number of cohorts of wine consumers in the Australian market of wine buyers by mail order. The period from the late-teen years to early adulthood is most commonly associated with cohort membership. Further, cohorts of older consumers clearly exist, and with these consumers maintaining their wine consumption patterns from their early adulthood, marketers not only need to apply these patterns to their forecasting, but should actively encourage young adults to consume wine in order to provide greater opportunity to become part of a wine drinking cohort.

## List of References

- Anderson, K, Norman, D & Wittwer, G 2002, 'Globalisation of the world's markets', paper presented at the Australian Conference of Economists, The Stamford Grand Hotel, Glenelg, Adelaide, Australia, Oct 2.
- Beeston, J 1994, *A Concise History of Australian Wine*, 2nd. edn, Allen & Unwin, Sydney, Australia.
- Burke, A, Heuer, F & Reisberg, D 1992, 'Remembering Emotional Events', *Memory and Cognition*, vol. 20, no. 3, pp. 277-290.
- Giovannucci, E, Colditz, G, Stampfer, MJ, Rimm, EB, Litin, L, Sampson, L & Willett, WC 1991, 'The Assessment of Alcohol Consumption by a Simple Self-Administered Questionnaire', *American journal of Epidemiology*, vol. 133, no. 8, pp. 810-817.
- Glenn, ND 1977, *Cohort Analysis*, 9th edn, SAGE, Beverly Hills, California.
- Glenn, ND 1976, 'Cohort Analysts' futile Quest: Statistical Attempts to separate age, period and Cohort Effects', *American Sociological Review*, vol. 41, pp. 900-904.
- Glenn, ND & Zody, RE 1970, 'Cohort Analysis with National Survey Data', *The Gerontologist*, no. Autumn, pp. 233-240.
- Hagenaars, JA & Cobben, NP 1978, 'Age, Cohort and Period: A General Model for the Analysis of Social Change', *The Netherlands Journal of Sociology*, vol. 14, no. 1, July, pp. 59-91.
- Hansman, H & Schutjens, V 1993, 'Dynamics in Market Segmentation: A demographic perspective on age-specific consumption', *Marketing and Research Today*, no. September, pp. 139-147.
- Henry, NW 1994, 'Categorical Longitudinal Data: Loglinear Panel, Trend and Cohort Analysis', *Contemporary Sociology*, vol. 20, no. 6, November, pp. 954-956.

Hilton, ME 1989, 'A comparison of a Prospective Diary and Two Summary Recall Techniques for Recording Alcohol Consumption', *British Journal of Addiction*, vol. 84, pp. 1085-1092.

INRA & ONIVINS 2001, *La Consommation de vin en France. Comportments, attitudes et représentations.*, Paris.

Jarvis, W 2002, 'Cellar Door - A Strategic Perspective', *The Australian Grapegrower and Winemaker*, no. February, pp. 43-45.

Kerr, WC, Greenfield, TK, Bond, J, Ye, Y & Rehm, J 2004, 'Age, Period and Cohort Influences on Beer, Wine and Spirits Consumption in the US National Alcohol Surveys', *Society for the Study of Addiction*, vol. 99, May, pp. 1111-1120.

Klecka, WR 1971, 'Applying Political Generations to the study of political behavior. A Cohort Analysis', *Public Opinion Quartely*, vol. 35, pp. 358-73.

Mason, KO, Mason, WM, Winsborough, HH & Poole, WK 1973, 'Some Methodological Issues in the Cohort Analysis of Archival Data', *American Sociological Review*, no. April, pp. 242-258.

Meredith, G & Schewe, CD 1994, 'The Power of Cohorts', *American Demographics*, vol. 16, no. 12, December, pp. 22-28.

Mori, H, Lowe, E & Gorman, WD 2000, 'Measuring the impact of Age and Consumer Cohorts on the Consumption of Alcoholic Beverages: the Japan Case', paper presented at the 2000 Agribusiness Forum Papers, Chicago, Illinois, USA, June 25.

Murray, W & Lockshin, L 1997, 'Consumer acceptance of synthetic corks', *International Journal of Wine Marketing*, vol. 9, no. 1, pp. pp.31-52.

Neve, RJM, Deiedericks, JPM, Knibbe, RA & Drop, MJ 1993, 'Developments in Drinking Behaviour in The Netherlands from 1958 to 1989: A Cohort Analysis', *Journal of Addiction*, vol. 88, pp. 611-621.

Noble, SM & Schewe, CD 2003, 'Cohort Segmentation: An exploration of its validity', *Journal of Business Research*, vol. 56, pp. 979-987.

- Olsen, JE, Thompson, KJ & Clarke, TK 2003, 'Consumer Self-Confidence in Wine Purchases', *International Journal of Wine Marketing*, vol. 15, no. 3, pp. 40-51.
- Palmore, E 1978, 'When Can Age, Period and Cohort be Separated?' *Social Forces*, vol. 57, no. 1, September, pp. 282-295.
- Raaijmakers, JGW & Shiffrin, RM 1981, 'Search of Associative Memory', *Psychological Review*, vol. 88, no. No. 2, March, pp. 93-134.
- Rentz, JO & Reynolds, FD 1991, 'Forecasting the effects of an ageing population on product consumption: An Age-Period-Cohort Framework', *Journal of Marketing Research*, vol. 28, August, pp. 355-60.
- Rentz, JO & Reynolds, FD 1981, 'Separating Age, Cohort and Period Effects in Consumer Behaviour', *Advances in Consumer Research*, vol. 8, pp. 596-601.
- Rentz, JO, Reynolds, FD & Stout, RG 1983, 'Analyzing Changing Consumption Patterns with Cohort Analysis', *Journal of Marketing Research*, vol. 20, February, pp. 12-20.
- Ryder, NB 1965, 'The Cohort as a Concept in the Study of Social Change', *American Sociological Review*, vol. 30, pp. 843-861.
- Schewe, CD, Meredith, GE & Noble, SM 2000, 'Defining Moments: Segmenting by Cohorts', *Marketing Management*, no. Fall, pp. 48-53.
- Schiffman, L & Kanuk, LL 2004, *Consumer Behavior*, Eighth edn, Pearson- Prentice Hall, Upper Saddle River, New Jersey.
- Schuman, H & Rodgers, WL 2004, 'Cohorts, Chronology, and Collective memories', *Public Opinion Quarterly*, vol. 68, no. 2, April-June, pp. 217-254.
- Schuman, H & Scott, J 1989, 'Generations and Collective memories', *American Sociological Review*, vol. 54, June, pp. 359-381.

Sharp, B 2000, *If you ask the wrong people.*, Adelaide, p. Comment on sampling techniques and validity.

Sobell, LC, Sobell, MB, Leo, GI & Cancilla, A 1988, 'Reliability of a Timeline method: Assessing Normal Drinkers' Reports of Recent Drinking and a Comparative Evaluation Across Several Populations', *British Journal of Addiction*, vol. 83, pp. 393-402.

Spawton, A 1991, 'Marketing Planning for Wine', *European Journal of Marketing*, vol. 25, no. 3, pp. 1-48.

Spawton, A & Bourqui, M 1997, 'Consumers Reactions to Risk Reducers', *Recherche*, vol. 97, no. 1, March, pp. 3-17.

Stanford, L 2000, 'Observations on Alcohol Beverage Consumption', *Australian and New Zealand Wine Industry Journal*, vol. 15, no. 1, Jan/Feb, pp. 14-27.

Thach, L, Olsen, J & Rice, E 1999, 'Expanding the Population of Wine Consumers', *Wines and Vines*, pp. 39-40,42.

Wilson, D 2003, 'What Consumers are Drinking, and Why', *Australia and New Zealand Wine Industry Journal*, vol. 17, no. 6, Nov/Dec, pp. 98-102.

Woodard, R 2003, 'Moment of Truth', *Wine & Spirit International*, no. August 2003, pp. 28-29.

Zins, M, Gueguen, A, Leclerc, A & Goldberg, M 2003, 'Alcohol Consumption and marital Status of French Women in the Gazel Cohort: A Longitudinal Analysis between 1992 and 1996', *Journal of Studies on Alcohol*, November, pp. 784-9.