

ACCC inquiry into water markets in the Murray-Darling basin: a submission on the Issues Paper

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Introduction

1. The Australian Competition and Consumer Commission (ACCC) is conducting an inquiry into markets for tradeable water rights relating to water in the Murray-Darling Basin. As part of its inquiry, the ACCC has released an Issues Paper seeking comment on a variety of issues relevant to the Murray-Darling Basin water markets.¹ The present paper is a submission on the ACCC's Issues Paper, authored by Kevin Counsell of NERA Economic Consulting.²
2. I am an economist with expertise in environmental, competition and regulatory economics, and I have a strong interest in the economics of water markets. I hold a Masters degree in economics (with Distinction), an Honours degree in economics (First Class), and an undergraduate degree in mathematics, all from Victoria University of Wellington. My Masters thesis (completed in 2004) analysed economic approaches to allocating and valuing water rights, and I have since undertaken numerous consultancy projects in respect of water allocation and management,³ and published papers on these issues.⁴ I do not hold or trade any water rights in respect of Australian water markets.
3. The Issues Paper seeks information and comments on a number of different issues, including market trends, regulatory functions, and the efficient operation of water markets. I do not have any specific comments I wish to make on the various detailed issues identified in the Issues Paper.
4. Rather, the purpose of this submission is a more general one. In particular, I:
 - a. Set out some of the unique features of water which help in providing context to an assessment of market dynamics, competition, and market outcomes; and
 - b. Outline the roles that non-users (such as investment funds) can play in tradeable rights markets.

Relevant features of water for assessing market dynamics

5. In its Issues Paper, the ACCC is seeking information that will help it in understanding the dynamics of water markets in the Murray-Darling Basin. For example, the ACCC is seeking information on factors driving supply and demand movements and prices (p.12), the behaviour of market participants (p.17), and how competition has changed over time (p.19). There are well-

¹ ACCC (2019), "ACCC inquiry into water markets in the Murray-Darling Basin", Issues Paper, 17 October.

² The views expressed in this document are personal, and this submission has not been commissioned by a client. The views expressed do not necessarily represent the views of other economists at NERA.

³ Non-confidential examples include a report for the UK Environment Agency on experiences in selected sectors and countries in transitioning to market-based trading arrangements, as an input to the Agency's proposals to reform the water management framework in England and Wales; and analysis for Wairakei Pastoral Limited, a New Zealand irrigator, in respect of its appeals to the Environment Court over a proposed water allocation plan.

⁴ For example, Kevin Counsell and Lewis Evans (2005), "Essays on Water Allocation in New Zealand: The Way Forward", Research Monograph, New Zealand Institute for the Study of Competition and Regulation, October; and Kevin Counsell (2018), "Using price signals to better manage water use", *Resource Management Journal*, April.

established principles of microeconomics that, in general, can provide insight into an assessment of these market dynamics. However, water has some distinct features that sets it apart from other sectors of the economy,⁵ and it is therefore important to understand the unique economics of water markets to help inform this assessment.

6. In describing these economics, it is useful to distinguish between the supply-side, being the availability of water through surface and groundwater resources, and the demand-side, being the use of water in human activities. On the supply-side, water is subject to both short-term and long-term supply variability. In the short-term, instream surface water flows can vary on a daily or monthly basis because of variation in rainfall and due to hot/dry weather conditions. This supply variability can extend into the medium term, i.e., from year-to-year. For example, prolonged drought can lead to reductions in supply availability over multiple years, as was the case for the Millennium Drought (2001-2009)⁶ and the drought conditions experienced in the Murray-Darling Basin since 2017.⁷
7. Over the longer-term, climate change can also impact on supply availability of water resources. For the Murray-Darling Basin in particular, climate change is expected to result in warmer temperatures, reduced rainfall, and a greater frequency of (and time spent in) drought conditions.⁸
8. As well as temporal supply variations, water resources can also be subject to geographical supply variations. The Murray-Darling Basin is a case in point, with rainfall and inflows relatively more concentrated and consistent in the south of the Basin. As the Murray-Darling Basin Authority notes:⁹

Rainfall patterns vary between the Basin's north and south. The climate in the southern Basin receives more consistent, rain-bearing weather systems... The northern Basin has a more variable and intermittent rainfall pattern, with long dry periods and droughts interspersed with intense rainfall events.

9. Combined with this supply variability is that the supply-side itself is not associated with any production or extraction process. By this I mean that, unlike other commodities such as oil or gas, there is limited ability to achieve a human-induced increase or decrease in water supply in response to changing demand (with perhaps one exception) – any such changes in water supply arise from natural (e.g., weather-induced) factors. This is particularly important because supply variability typically does not match demand variability: the peak demand for water is usually in summer (e.g., for crop irrigation), but this is also the trough in terms of rainfall.
10. The exception is that water storage can be used as a means of smoothing supply variability over time so as to better meet demand. However, the ability to do so can be mitigated to some extent by periods of prolonged drought, which make it difficult to sufficiently recharge storage facilities. Moreover, investment in storage facilities can involve material fixed (and sunk) costs, and public storage facilities may give rise to free rider concerns, potentially creating difficulties in funding these investments.
11. On the demand-side, a key feature is the diversity of water use, with multiple and varying demands for both instream and out-of-stream (consumptive) water. The main consumptive use of Murray-Darling Basin water is irrigation, although there has been considerable variation over

⁵ In this regard see also Robert A. Young (1986), “Why Are There So Few Transactions among Water Users?”, *American Journal of Agricultural Economics*, 68(5), 1143-1151.

⁶ “Murray-Darling Basin drought update”, 19 November 2019, <https://www.mdba.gov.au/managing-water/drought-murray-darling-basin/murray-darling-basin-drought-update>

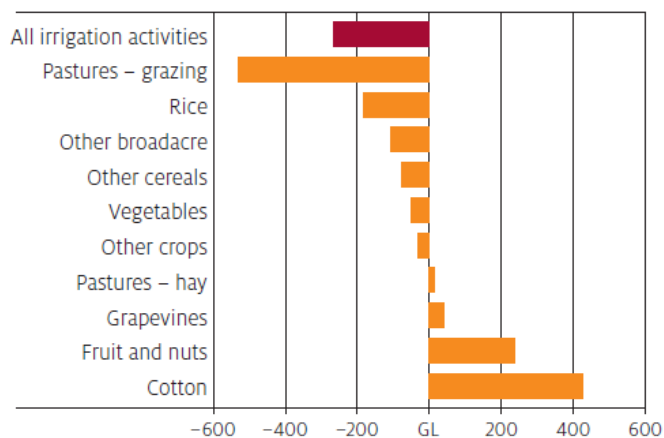
⁷ As the ACCC notes in its Issues Paper at p.11.

⁸ Murray-Darling Basin Authority (2019), “Climate change and the Murray-Darling Basin Plan”, MDBA Discussion Paper, February.

⁹ *Ibid*, pp.5-6.

time in the crops to which irrigation water is applied. Figure 1 illustrates how irrigation demand in the southern Basin has shifted between 2003 and 2017 from mostly pasture grazing (dairy) and rice to cotton and nut crops.

Figure 1: Changes in Water Use in the southern Basin (2002-03 compared to 2016-17)



Source: Tim Goesch, Manannan Donoghoe and Neal Hughes (2019), *A Snapshot of Australian Water Markets*, Department of Agriculture and Water Resources.

12. Demand for water also comes from other consumptive uses, such as urban water suppliers, for in-stream environmental purposes, and from investment funds that hold water rights for future profit-making opportunities (which are discussed further in the next section). In-stream environmental uses have been a driver of water demand on the Murray-Darling Basin in recent years, with federal government water recovery programmes purchasing approximately 2,100GL of water entitlements over the 2007-2018 period.¹⁰
13. Where competing demands for water interact on a single water resource, there is an element of interdependency across water users which can give rise to externality issues. That is, the actions of one user at an upstream point of a water resource can affect those water users located further downstream. This can arise with respect to both water quality and water quantity. Regarding quality, upstream water use that results in discharges of pollution to the waterway can adversely impact on the quality of water available to those located downstream. Similarly, water quantities that are taken from the river upstream may reduce the availability of water for those located downstream, or reduce instream flows required for environmental or recreational purposes.
14. These interdependencies may require constraints on trading to mitigate externalities. For example, there may need to be limits to water that is traded further upstream for consumptive use, to the extent that such trades may affect the availability of water to those located downstream of the new consumptive water use point. There may also need to be limits to trading of water rights into areas where additional consumptive takes will reduce flows below those necessary to satisfy instream requirements. The need for constraints may also depend on the hydrological connectivity of different areas within the same water resource. Trading constraints exist on the Murray-Darling, and have been binding in recent years, limiting trading out of the upstream Murrumbidgee and Goulburn trading zones.¹¹
15. It will be important to keep these features in mind as the ACCC conducts its inquiry, as they may explain many of the observed market outcomes. For example, the significant volatility in prices (as noted in the Issues Paper, at p.11) may be driven by supply variability and shifting demand

¹⁰ Tim Goesch, Manannan Donoghoe and Neal Hughes (2019), *A Snapshot of Australian Water Markets*, Department of Agriculture and Water Resources.

¹¹ *Ibid.*

patterns. Similarly, the rapid recent increases in prices also identified in the Issues Paper (p.11) may reflect drought conditions, or reduced availability of water for consumptive uses due to government water purchases. Such high prices may also be necessary to incentivize investment in storage facilities.

The role of non-users

16. One of the issues discussed by the ACCC (at p.17) is the role of water market participants that own and trade water rights, without necessarily owning any irrigable land. The ACCC identifies, for example, investment funds, retired irrigators, indigenous users and communities, and environmental groups that may not necessarily apply water to land for irrigation purposes, but will hold water rights for other purposes.
17. Indigenous users and environmental groups may be considered slightly distinct from other groups such as investment funds or retired irrigators, because the former hold water rights to help meet community, indigenous and environmental values,¹² while the latter may hold rights more for future profit-making opportunities. I focus in this section on that latter group of water rights holders, and refer to them collectively as “non-users”.
18. A concern that has been identified in media commentary is that such non-users on the Murray-Darling Basin are adversely affecting market outcomes, by manipulating the market and driving up water prices.¹³ While the evidence being collected by the ACCC over the course of its inquiry will likely allow for a robust assessment of this concern, it may be useful for the ACCC to consider the ways in which non-users can participate in markets, and evidence from other markets of this participation.
19. First, non-users are often an important contributor to increased market liquidity. An issue identified by the ACCC (at p.19 of the Issues Paper) is the potential for water markets to be relatively “thin”, in terms of the volume of trade. Indeed, many of the features of water markets identified earlier, such as periods of reduced water availability and intra-basin constraints on trading, can lead to fragmented markets in which there are very few traders. As Hansen (2015, p.355) states:¹⁴

Water markets often consist of a simple bilateral transaction between a willing buyer and seller. Given the high transportation costs and high degree of interaction between users, this level of market activity may be all that is economically and environmentally feasible in some locations.
20. Non-users can play an important role where such thin markets occur, by operating as additional buyers or sellers in the market, thereby increasing liquidity. This can improve competition within the market, as well as enhance the process of price discovery. Heckinger and Mengle (2013, p.7) state that non-users operating as speculators (“taking on risk from another party in order to profit

¹² Environmental groups can serve a valuable role in water markets, by purchasing water rights and “retiring” them, so as to allow the water to remain for instream uses. This is a common feature in water markets in the western United States. For example, Szeptycki et al (2015) record over 1,000 temporary or permanent purchases of rights in water markets in each of Oregon and Washington over the 1987-2014 period, with purchases by multiple water trusts and fisheries conservation groups (Leon F. Szeptycki, Julia Forgie, Elizabeth Hook, Kori Lorick, and Philip Womble (2015), “Environmental Water Rights Transfers: A Review of State Laws”, report prepared by Water in the West for The National Fish and Wildlife Foundation, 31 August).

¹³ See, for example, “Water market investors described as ‘parasites’ in first ACCC inquiry in Mildura”, 8 November 2019, <https://www.abc.net.au/news/2019-11-07/accs-first-public-forum-in-the-water-market-inquiry-mildura/11683704>; and “ACCC to study Murray-Darling Basin’s \$2 billion water market to see who owns what”, 7 August 2019, <https://www.abc.net.au/news/2019-08-07/water-study-announced-with-accs-investigation-into-trading/11389328>.

¹⁴ Kristiana Hansen (2015), “Water markets: from theory to practice (with focus on the USA)”, chapter 19 in Ariel Dinar and Kurt Schwabe (eds), *Handbook of Water Economics*, Edward Elgar.

from price changes”) are “a necessary part of a market” by acting as a source of liquidity.¹⁵ In a comprehensive review of the recent empirical literature on the role of speculators in commodity markets, Boyd, Harris and Li (2018) find that speculators provide liquidity and reduce market volatility, providing a benefit to the other market participants that produce or consume commodities.¹⁶

21. As an aside, I note also that water brokers and exchanges, while not necessarily trading in water rights themselves, can fulfil a similar role of enhancing market liquidity, by helping to match buyers and sellers and more generally facilitating trades.
22. In the Australian National Electricity Market there has been a desire to increase the role of non-users/speculators to improve the liquidity of these markets. For example, the Australian Energy Market Commission (AEMC) is considering the introduction of trading in a short-term forward contract market (STFM),¹⁷ and as part of this has identified the potential for a lack of liquidity in this market. In this regard, the AEMC (2019, emphasis added) states:¹⁸

*One option...to improve liquidity would be to open participation in the STFM to any party with the correct licensing and approvals, such as financial intermediaries. This would encourage non-physical participants (namely, persons other than generators and market customers) to enter the market, providing additional capital and trade in the products. **This additional trade may encourage more participation in the market, improving liquidity and reducing costs for physical participants.***
23. Similarly, in electricity hedge markets in New Zealand, an advisory group established to provide independent advice to the Board of the Electricity Authority recently identified the need to increase the role of speculators in the market. The advisory group stated that “[t]he greater the role of speculators and other traders, the lower the reliance on the market makers to provide liquidity”, and that speculators would support “improved liquidity and price efficiency”.¹⁹
24. Second, allowing non-users to participate in markets gives rights a value beyond their current use, which can allow rights holders to use this value as collateral to fund investments. This has occurred in markets for tradeable fishing quota in New Zealand and Iceland, allowing fishing vessel owners to finance investments on the basis of the value of their quota.²⁰ Similarly, in the US, the ownership and secondary trading of airport slots by financial institutions has allowed airlines to finance new fleet investments against the value of slots (as well as helping airlines overcome periods of financial strain).²¹
25. In this regard, it is relevant to note reports that many ex-farmers in the Murray-Darling Basin have sold their land but held on to their water rights as a form of superannuation fund for their

¹⁵ Richard Heckinger and David Mingle (2013), “Derivatives Overview”, *Understanding Derivatives: Markets and Infrastructure*, Federal Reserve Bank of Chicago, available at: <https://www.chicagofed.org/publications/understanding-derivatives/index>.

¹⁶ Naomi E. Boyd, Jeffrey H. Harris, and Bingxin Li (2018), “An update on speculation and financialization in commodity markets”, *Journal of Commodity Markets*, 10, 91-104.

¹⁷ See <https://www.aemc.gov.au/rule-changes/short-term-forward-market>

¹⁸ AEMC (2019), “National Electricity Amendment (Short Term Forward Market) Rule 2019, Consultation Paper, 11 April, at p.21.

¹⁹ Wholesale Advisory Group ((2015), “Hedge Market Development: Recommendations Paper”, 26 June, at 4.4.6 and at 5.2.3.

²⁰ Bill Baker, Daniel Radov, Adil Hanif, Tobie Cusson, Kevin Counsell, Wayne Olson and Harry Fearnough (2013), “A Cross-Sector and Cross-Country Review of Approaches to Transitioning to Markets”, NERA Economic Consulting Final Report for the Environment Agency, 10 May, at pp.5-6.

²¹ *Ibid.*, at p.8.

retirement.²² These outcomes arise because of the value that rights have outside of their current use.

26. Third, participation of non-users in water markets allows for future use value to be taken into account alongside current use value. Non-users, by definition, do not apply their water rights to a current use, and will hold their rights for sale to a future water use at a point later in time. If water is expected to be more valuable (in present day terms) in some future use, then an efficient water market would ensure that rights are held by non-users for this future use, rather than applied in some current use. This ensures that resource allocation is dynamically efficient, insofar as it maximises the net present value from allocation of water rights looking forward into the foreseeable future.
27. In summary, the evidence being collected by the ACCC will allow it to robustly assess the role of non-users in the Murray-Darling Basin water markets, and whether they are manipulating market outcomes. However, the existence of non-users *per se* does not imply that they are manipulating the market, as both users and non-users alike may have the ability and incentive to do so. This distinction between speculation and market manipulation is captured by Hansen, Howitt and Williams (2012, p.63), who state that:²³

A pure speculator provides a valuable social service by buying risk from producers who want to sell it and concentrate on production. Market manipulation, in contrast, attempts to distort the market for risk or any other product.

Indeed, as set out above, non-users can provide a “valuable social service” in markets, by enhancing liquidity and price discovery, allowing rights to be used as collateral to fund investments, and ensuring future use value is accounted for.

²² “Water market made murkier”, 9 October 2019, <https://www.farmonline.com.au/story/6429801/water-market-made-murkier/>

²³ Kristiana Hansen, Richard Howitt, and Jeffrey Williams (2012), “Water trades in the western United States: risk, speculation and property rights”, chapter 4 in Josefina Maestu (ed.), *Water Trading and Global Scarcity: International Experiences*, RFF Press.