

Submission to the ACCC inquiry into water markets in the Murray-Darling Basin

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Background

We are a team of economists (April and Tiho) and a hydrologist (Willem) currently working on a project titled 'Optimal portfolio of water right holdings in the Australian water market', which is exploring the types of water products that market participants should optimally hold, and how does the optimal mix change in a changing climate. We are investigating these questions by specifically looking at the problem of optimal water right holdings from a perspective of irrigators and from a perspective of investors. The project is in early stages, and we cannot report full results yet, but we welcome the opportunity to comment on the points raised in the Issues Paper. We (Tiho and Willem) have a long-standing interest in water markets and hydrology in the MDB and have previously published a number of peer-reviewed studies on these topics.

Comments on points raised under Issue 1 in the Issues Paper

Prices of water products in the market are primarily driven by water availability (determined by highly variable and uncertain rainfall) and by demand for water. The number of participants and the total volume and value of water traded in the market have grown significantly since 2010. Products that are available in the water market have also become more diverse, and now include forward contracts and carryover contracts.

On the demand side of the market there are various forces that have shaped the demand for irrigation water over the last few years: one is the overall reduction of marketable water due to large purchases by the Environmental Water Holder over the previous period, which in turn has possibly increased the demand by irrigators, who are trying to fill the void created by environmental purchases by more actively participating on the demand side of the market; another is the increase in investor activity in the market, which has increased the apparent demand (although not necessarily the fundamental demand); another factor has been the shift towards more irrigated production of certain crops: e.g. almonds and cotton in response to global demand for those crops, and away from rice and grapes and oranges. These shifts are generally driven by large corporate entities who want to buy large volumes of water to secure their business model, which translates into increased demand in the water market.

The supply side of the market has been marked by decreasing water availability over the last two-three years due to widespread draught conditions. Since 2017, the rainfall in most regions in MDB has stayed well below average and the total volume of water allocated to entitlements in 2018-2019 has reached the lowest point since 2008-09 (Aither, 2019). In response, the prices of major water products have increased dramatically. The average surface water allocation price in Southern MDB in 2018-2019 was about \$560/ML compared to the average price of less than \$100/ML in 2017-2018 (NSW Water register, VIC water register, 2019). The entitlement prices also have grown by 35%-50% in major trading zones in Southern MDB from 2017-18 to 2018-19 (Aither, 2019). For example, the average price of high-security entitlements in 2017-18 in NSW Murray was \$3892 and was \$5740 in 2018-19 (Aither 2019). The average price of general-security entitlements was \$1362 in 2017-18 and was \$1964 in 2018-19 (Aither 2019).

This price movements are to be expected, and in fact, it is the fundamental role of the water market to reflect the increased scarcity of the water resource during times of drought by rising prices. There is fundamentally nothing extraordinary about the spikes in prices for various water products in the market, given the drought conditions. Figure 1 in the Issues Paper clearly shows that water prices over the last 12 years have followed an expected trend. Just before the break of the Millennium Drought in mid-2008, real prices have been at their historic heights. We are currently approaching those heights, but equally we are in a drought situation that is as bad as, or perhaps even worse than the Millennium Drought. So, despite the alarmist media coverage, looking at the water price trends does not immediately suggest that anything is wrong with the water market, and in fact the rise in prices adequately reflects the growing water scarcity.

Having said that, we also want to stress that the future water availability is quite worrying as the average surface water availability across the entire Basin for 2030 is projected to fall by 10% and the impact is expected to be greater in the southern Basin (MDB Authority, 2019). This is a systematic, long-term expected decline in water availability, largely driven by the expected climatic change. It is important to distinguish between it, and the shorter-term variations in water availability, which manifest as droughts, floods and normal conditions, and which affect market prices as discussed above.

With the systematically decreasing water availability in the MDB, we expect the prices of the key water products would exhibit a growing trend. At the same time, as general-security and low-security entitlement products are likely to receive ever more often very low or even zero allocation due to increased water scarcity, we anticipate the price gaps between high-security entitlements and entitlements with lower reliabilities to be enlarged. This price gap then might be further enlarged as irrigators try to purchase and hold on high-security entitlements to ensure water supply for their permanent plantations.

There are recently debates over the “speculative activities” in the water market and some believe that investors have driven the water prices higher. The number of investors has indeed grown over the past decade and some of them are large corporations, such as Duxton Water and Blue Sky Investments. However, majority of water entitlements, are still held by farmers. Estimates from the Victorian water market indicate that the speculative activities are only 5% of the total activities in the water market (O’Donnell and Loch, 2016). Investors contribute to the efficiency of the market by adding liquidity. While investor activity might have contributed to increased prices to some, albeit probably relatively minor, extent, we believe that the fundamental driver of the prices in the market is still water availability as discussed above.

Comments on points raised under Issue 2 in the Issues Paper

For our research purposes, we obtain water market data mainly from the Bureau of Meteorology (BoM) and Water Registers of NSW and VIC. While the datasets from both sources contain sufficient information about the volume, price, trading zones and trading categories, we sometimes find a lack of consistency between alternative sources. For example, the average prices and total volume traded could turn out to be quite different in a dataset obtained from BoM compared to that obtained from the state water registers. There are also inconsistencies within a single data source. For example, we find that the trading data displayed on the VIC water register website cannot be perfectly matched with the full extraction of data files (in form of csv files) downloadable from the same website. This inconsistency could be misleading in research and raises concerns about the accuracy of the price and volume information recorded. Similar inconsistency exists in allocation announcement data downloaded from different sources. We strongly suggest that efforts be undertaken so that the quality

of data will be improved in the future to help both researchers and water market participants to better understand the market.

In addition, we find that the available information on some of the newly developed products, such as forward contracts or options and contracts on carryover, is very limited. There are only few records about forward contracts on allocations listed on Waterexchange.com.au and nowhere else. We also only found information about carryover trade on [Waterexchange](http://Waterexchange.com.au), but we are not able to confirm this information by looking at relevant state water registers, or at other public institutions. It is important that trading data on these water products be released in a comprehensive form by the state water registers.

Comments on points raised under Issue 3 in the Issues Paper

From a market efficiency perspective, it would be better to have a uniform set of rules and a maximum flexibility in trading between zones. The current differences in state policies and trading zones therefore limits the free flow of water trade.

However, water is a unique commodity that apart from its monetary value for production has substantial environmental value and this value can differ by landscape and ecosystems involved.

A first issue that needs to be addressed in relation to zones and water markets is a recognition that groundwater and surface water are highly connected in many places in the MDB (Lamontagne et al. 2013) and that therefore having separate zones for groundwater and surface water in the market should be reviewed. This is also important if new technologies such as managed aquifer recharge (Dillon and Arshad 2013) need to be included in the trading options.

A difficulty is that water in relation to ecological systems has relatively long-term effects ('long memory'), particularly in the Northern Murray Darling Basin, where the beneficial effects of a flood on an ecosystem can often last several years (Bunn et al. 2006). This might make opening up the regulation and increasing the tradeability of water between zones and even within zones problematic, in absence of a clear framework that values the environmental impacts. While the distinction between groundwater and surface water should be removed (see above) and all types of water should be available for production and therefore should have the capacity to be traded, it also means that the boundary conditions of the trade should reflect and create the correct environmental price signal in the water market.

If we would have perfect knowledge of the impact of the water extraction on the environment and a group of "environmental investors or water buyers" that control water to manage the environmental impact, then the market can solve this problem. This is however currently not the case, we still have limited direct information about the environmental impacts and insufficient returns on "environmental water", partly because of the 'long memory' in the systems. This therefore requires some level of government intervention or regulation which could vary by zone.

At the same time, the role in the market of the allocations on the entitlements held by the Commonwealth Environmental Water Holder (CEWH) is currently unclear. CEWH has stipulated trading rules under which they are allowed to offer allocations on the market, but those rules are overly rigid, and as a result very few such trades have occurred even at times with good water availability and good environmental conditions in the MDB. There is evidence that offering allocations on CEWH held entitlements into the water market can be beneficial from the societal perspective under a given set of environmental conditions (Ancev, 2015).

Comments on points raised under Issue 4 in the Issues Paper

We expect that irrigators with permanent crops prefer high-security entitlements to secure water supply while more flexible irrigators may favour general-security entitlements if the prices of high-security entitlements become very high due to increased water scarcity in the future. Flexible irrigators may only irrigate in years with good water availability, when they receive enough allocation from the general-security entitlements, or they may purchase allocations in the market for a reasonable price. In other times, this type of producers might choose to practice dryland farming.

Based on preliminary, and not-yet published results from our current project, investors tend to favour products with high returns and low volatility in returns. Our preliminary results find that the general-security entitlements have historically had higher returns and lower volatility, while high-security entitlements exhibit larger variability in returns. Our preliminary results indicate that investors may tend to hold relatively greater proportion of general-security entitlements in the optimal portfolios as they do not have the need to guarantee water supply to crops as irrigators do. Conversely, irrigators – especially with permanent, high-value crops – are expected to optimally hold greater proportion of high security entitlements in their portfolios.

Comments on points raised under Issue 5 in the Issues Paper

Overall, water markets should be maintained and further encouraged in the MDB as they are an efficient way of allocating water to the most valuable use, whether this is the environment or a productive use. However, the participation of a wider group of investors in the water market may be limited by lack of information on impacts and the lack of recognition of groundwater surface water connectivity.

This issue implies that due to incomplete information and market participation, the following policy objective would be difficult to meet:

- ‘appropriately manage the third-party hydrological and environmental impacts of changes in the timing and location of water use that arise from water trading activities’

In addition, due to the lack of information on long term values and effects of water use, the value of water for the environment and for users outside productive uses might be lowered.

We would like to conclude by stressing that water markets are an indispensable institution for efficient allocation of water. The advent of water markets, and their largely adequate operation is something that distinguishes Australia as one of the most advanced nations in terms of water management. Of course, operation of water markets has not been perfect, and there are number of areas where improvements are needed, some of which were discussed above. Nevertheless, it is important to recognise the significance of water markets and to continue with their further development and use, which should ultimately lead to improvements of overall efficiency and productivity of irrigated agriculture.

The question of who should be allowed to have access to water markets has been raised strongly over the past year or so. In principle, the efficiency of markets requires as wide and as open participation as possible. This is well documented in the literature. Proposals that participants who do not have direct physical use of water from accessing the market are therefore not well founded. Nevertheless, like in many other markets, there is a need for adequate regulation and enforceable ‘code of conduct’ that would ensure all market participants behave in a way that would allow the market to deliver efficient outcomes. Development of such rules and regulations should be high on the policy agenda.

The final point to make is that the success of any market hinges critically on the confidence that the market offers to market participants. Without confidence, there will be limited participations, which will result with 'thin' markets, as raised in the Issues Paper. Consequently, it is very important that any activities around the water markets, including the ACCC Inquiry is cognisant of the significance to maintain confidence in the markets.

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