

The Electricity Authority  
PO Box 10041  
Wellington 6143

29 March 2022

## **Hedge Market Enhancements - Commercial Market Making Scheme Code Change Consultation**

To whom it may concern,

emhTrade Markets Ltd (emhTrade) is a participant in the market for New Zealand electricity risk. We were founded a decade ago and, from our inception, we have been active in the ASX futures market, and have been pioneers in the market for options over futures, FTRs and other risk management products. We consider that we've played an important role in the evolution of these markets through bringing our unique, highly quantitative approach to pricing and risk management, which has increased the liquidity and efficiency of the various forward curves.

We've also contributed to the design of the market through numerous submissions and by sitting on various technical and advisory groups. We recognise that we are uniquely placed, as an independent but deeply informed participant, to contribute to the regulatory process and hold a strong sense of corporate responsibility to ensure that we do so for the long term benefit of consumers.

The Authority and the industry have achieved a lot since 2009 when the futures market started, and today's 10,000 GWh of open interest makes the at the time very lofty goal of 3,000 GWh seem quaint. We've collectively achieved a lot, but there is still plenty to do as we embark on an energy transition that will require unprecedented levels of investment, which must be informed by robust forward pricing.

We have been generally supportive of the work being undertaken as part of the Hedge Market Development programme and agree that an enduring market-making approach will create significant long-term benefits for consumers. As such, we have participated, and are pleased to have been short-listed, in the procurement process for Commercial Market Making services.

Given that we are participating in the Request for Proposals (RFP), we had not intended to make a submission on this consultation due to the risk that there may be a perception of anti-competitive behaviour in making public submissions on a topic that is so closely related to the RFP.

However, we are so deeply concerned with certain aspects of the proposal, and the damage that will likely be done to the liquidity, which has taken many years of nurturing to achieve, that we feel our responsibility to highlight these issues outweighs the risk.

Accordingly, whilst no part of this submission is confidential, we'd ask that the Authority, if it perceives any detriment to the competitive process in doing so, not publish this submission until RFP submissions have been made and that the competitive part of the process is complete.

The changes to the Code proposed in the consultation paper cover four aspects of the market-making scheme:

- **Volume** - We agree with the conclusion that open interest and overall liquidity has increased since the global volume requirement was re-established at 12MW. We agree this creates net benefits, and we therefore agree that the 12MW setting should be retained (or potentially increased).
- **Spread** - We agree with the conclusion that tight spreads are critical to achieving liquidity. We note that their impact is non-linear as they must be tight enough to create a critical mass of divergent views. We agree 3% will create greater economic benefit than 5% and support the proposal of retaining 3% spreads (noting that refresh will increase the *effective spread*).
- **Exemption Regime** - We agree that the lack of liquidity at the end of the month is a problem in that it increases costs for all market participants. We agree that the proposal will resolve the issue. Unfortunately the delay in addressing this issue is likely to have already resulted in long-term increases in margins, which are the greatest impediment to wider participation.
- **Refresh:**
  - We agree that the lack of subsequent trading, or even quoting, following instantaneous trading leads to “a weakening of the forward curve”.
  - We disagree with the conclusion drawn from the evidence presented, that a significant portion of trading on the open is “inadvertent” overlapping of market-makers’ two way quotes.
  - Consequently, we observe that the Authority is incorrect in its conclusion that the proposal will likely:
    - Increase robustness of the forward price curve
    - Reduce the cost of commercial market making
    - Not impact the total volume of contracts available to trade.
  - Instead of operating as the Authority has concluded, the proposal will in fact:
    - Reduce the overall volume of contracts available to trade.
    - Increase the effective spread faced by all participants.
    - therefore increase the cost of market making and general participation.
    - And ultimately reduce the robustness of the forward price curve.
  - We note that the cost benefit analysis on this aspect of the proposal is, at best, misleading and unlikely to stand up to scrutiny.
  - We note that with a slight change to the implementation a refresh would be an appropriate mechanism to resolve the underlying issue.

In the remainder of this submission, we will focus on the refresh obligation proposal. Specifically we will:

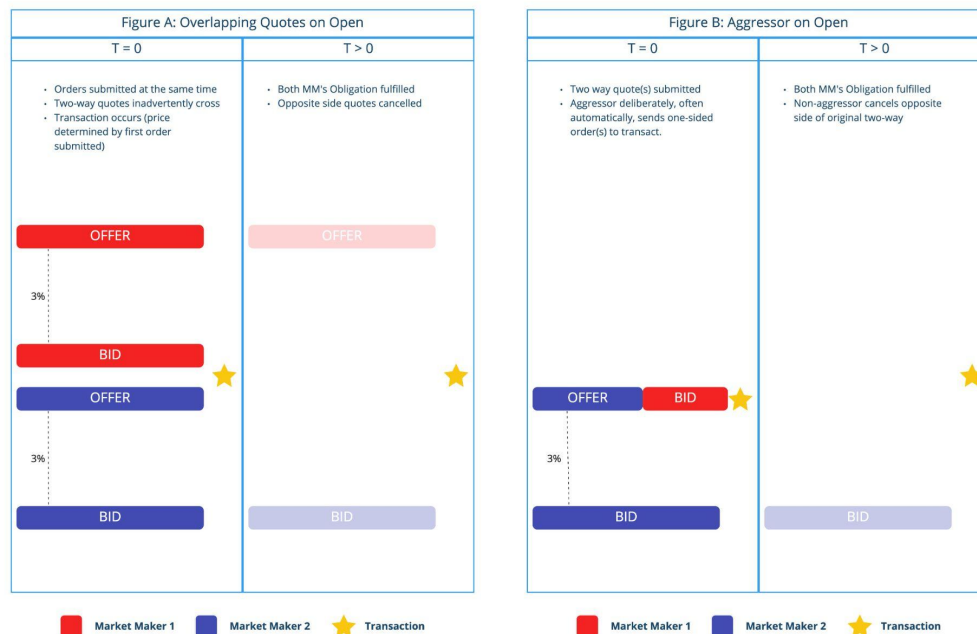
1. Highlight why the conclusions drawn from the evidence are incorrect.
2. Demonstrate why, when the incorrect premise is discarded, it becomes clear that the proposal will increase volatility and effective spreads, reduce volume and continue to incentivise instantaneous trading and subsequent lack of liquidity, further reducing the value of the forward curve.
3. Demonstrate why this will increase, rather than decrease the cost of market-making.
4. Propose an alternative approach to refresh that will resolve the issues.

### ***Evidence presented does not support the conclusions drawn***

It is pleasing to see that the data that the Authority is able to procure in regards to market making and ASX activity is able to inform the regulatory process. The analysis presented in the consultation paper is a great example of work that wouldn't have been possible two years ago. However, in this case we think the conclusions drawn are incorrect.

The Authority is rightly trying to address the issues caused by “...significant trading activity happening instantaneously and the majority of trading activity occurring in the first five minutes of the market-making window.”, however the hypothesis that any significant portion of this is due to ‘inadvertent’ overlapping of market-maker orders, as in Figure A, is incorrect.

Rather, our observation is that the activity at the open is almost always due to an aggressor (either a market-maker or another participant) buying or selling as soon as market-maker orders are placed - often using simple automated algorithms (eg if offer < \$x, send buy order at \$x) that are essentially instantaneous, as in Figure B.



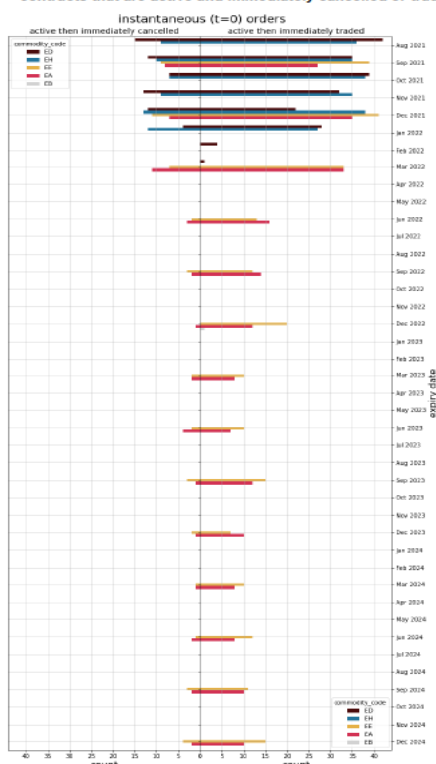
The evidence that the Authority presents supports this.

If market-makers' orders overlapped on the open 'inadvertently' we would then expect that they would, having fulfilled their market making obligations, subsequently cancel the other side of their two way quotes as in Figure A. Thus, if this inadvertent overlap was generally the cause of the issue, we would expect to see the amount of orders that are active and then immediately cancelled be roughly equivalent to the number of orders that are active and immediately traded.

The almost total lack of symmetry in Figure 7 in the Consultation paper shows that this clearly isn't the case. This is strong evidence against the hypothesis that opening activity is caused through inadvertent overlapping two-way quotes.

Furthermore, the asymmetry supports the hypothesis that generally one party is the aggressor and rather than a two-way quote, submits only one side, often 'sweeping' the quotes on the screen, perhaps algorithmically, as they appear.

**Figure 7 Violin plot of different commodity codes and expiration month for contracts that are active and immediately cancelled or traded<sup>28</sup>**



The Authority could confirm this by measuring how often there was one party to an instantaneous trade that didn't submit the opposite quote<sup>1</sup> (indicating they didn't passively trade, but were in fact an aggressor) or measuring how often there is a party to an instantaneous trade that is also a party to another trade in the same direction in the same contract (indicating they were *actively* acquiring a position in excess of their quoting obligation).

We are confident the results of the above experiments will further support our hypothesis and invalidate the initial conclusion reached by the Authority.

### ***Proposal will further incentivise opening aggression***

The root cause of the issues at the opening is that there is initial aggression and no subsequent volume available once market makers have transacted once.

We agree that a refresh obligation is the way to address the second aspect of this issue, however as proposed, the refresh obligation will create an

even stronger incentive for aggression at the open, as well as a reduction in the overall volume that market makers will be obliged to contribute to the market, further exacerbating the problems.

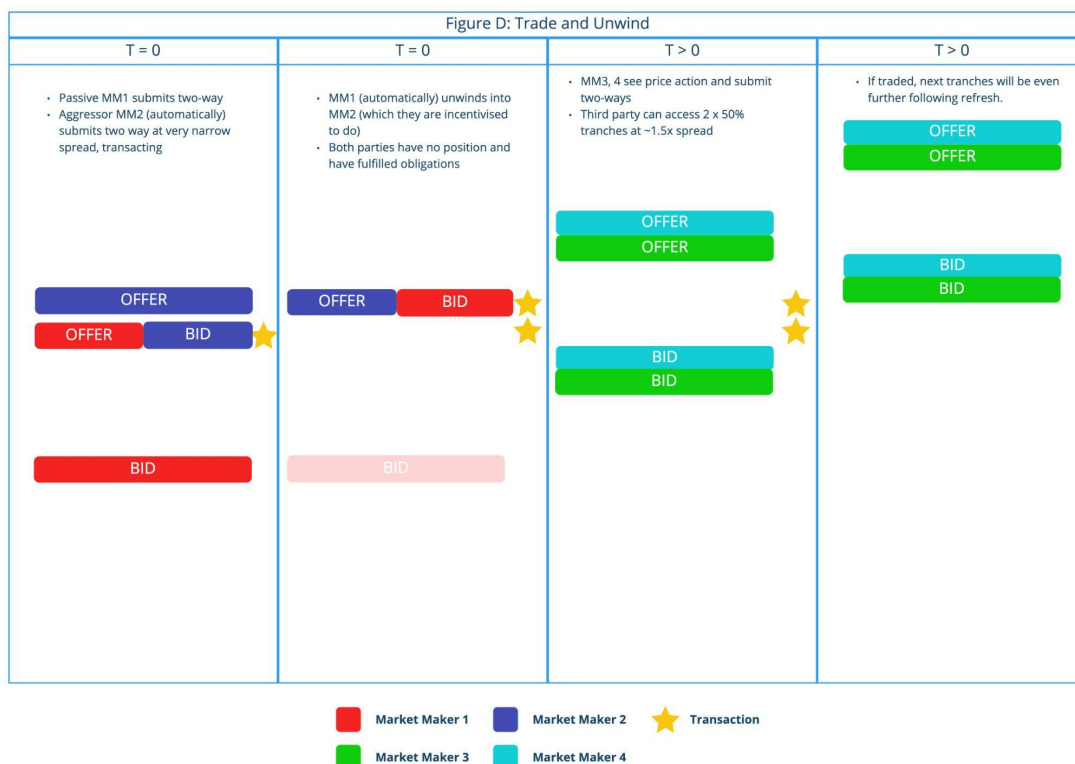
Under the proposal, market makers will be required to submit 50% of the current volume requirement in their initial quotes. Subsequently, they'll be required to submit another 50%, but their obligations will be fulfilled once they have *traded* 100% of their obligation.

For a market maker, this creates a strong incentive to be the aggressor and either:

- If a position is desired, trade two tranches in the direction desired. Fulfilling all obligations Figure C.
- If a position isn't desired, but there is likely to be market activity, trade one tranche and quickly unwind that position. Fulfilling all obligations and remaining net flat Figure D

Either of these actions are likely to also prompt the market-maker(s) that were passive to instantly unwind their positions (often algorithmically) - they're heavily incentivised to do this as it fulfils their obligations without inventory risk - creating a domino effect that will leave at most 2 market makers providing 1 tranche each of residual volume in the market.

<sup>1</sup> The Authority's figure 7 suggests this happens in the vast majority of cases where there are instantaneous trades.



To third parties, there will be fewer, smaller tranches available, at wider spreads than under the status quo. We expect this to be a detrimental outcome for all participants attempting to utilise the ASX to manage risk, including the market-makers themselves.

We expect that because of the incentives above, created by the fact that refresh is based on total 'traded' volumes, this sort of behaviour will occur as frequently as instantaneous trading does today, but with lower net liquidity due to the smaller tranches and opportunity and incentive to unwind.

The Authority highlights this issue in 4.15(b) of the consultation paper where it notes that it has "observed behaviour where a market maker obtains a position in a contract on one day, and the next day trades out of that product. This trading behaviour when initiated by an inadvertent trade, removes volume from the market over two trading days." There is no doubt whatsoever that this will occur within-day under the current proposal given the strong incentives for opening aggression and unwinding of positions to avoid refresh obligations.

### ***Effective spreads will increase and total available volume will decrease***

In the situations described above, it is obvious that prices will move rapidly as market-makers 'pass the parcel'. The few market makers that end up with an obligation to quote a second tranche will move that tranche in the direction of aggression (their propensity to buy/sell will reduce/increase as a result of the first tranche buy/sell).

Even if the above instant unwinding doesn't occur (this would be unusual in our view), participants trying to acquire positions to manage risk (whether market-makers or not) will face a higher effective spread as a result of refresh. This is due to the fact that market-makers will move their refresh quotes with the market. A party that today would transact 12MW for a 3% spread, will now be faced with a situation where, at best, they can transact 12MW at 4-6% spread.

It is far more likely that they will not be able to transact a full 12MW, because at least some market-makers will unwind and therefore not need to quote their second tranche. Market participants will now only have access to 6-9MW at 4-6% spread..

Effective spreads will increase and available volume will decrease if the proposal is implemented.

### ***Market making costs will increase***

The cost of market making arises primarily from inventory risk. Broadly speaking, where a market maker acquires a position that is not aligned with its underlying propensity to hold that position, the mis-alignment drives cost<sup>2</sup>.

As has been well documented by the Authority, the cost of managing risk is reduced when there is a well functioning forward market that has both depth in transactable volume and clear and efficient price signals.

Thus, any change that reduces volume and creates additional transaction costs (through higher spreads), is likely to result in a net increase in cost to market making. This is especially true if the change results in increased intra-day volatility (and does nothing to address the current issues with opening aggression).

It is clear that market-making costs will increase if refresh is implemented as proposed.

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<sup>2</sup> Please see Appendix 1 for more detail on our perspective on this

### **Cost benefit analysis is not robust**

Primarily because the Authority has drawn the incorrect conclusion in regards to the root cause of instantaneous trading at the open, the cost benefit analysis for the change to the refresh obligation is completely flawed.

As benefits, the Authority asserts that the change:

- Reduces inadvertent trading at market opening between market makers i.e. improve liquidity
- Reduces financial risk for market makers because they will hold less unintended inventory due to inadvertent trading
- It is expected that reducing these inadvertent trades will increase liquidity and contribute to a strengthening of the forward price curve as it may increase the likelihood of buy and sell prices remaining at the conclusion of the trading window

However, in reality none of these benefits will be achieved and in fact the proposal will:

- Increase the incentive for aggression on the open
- Increase the financial risk for market makers because there will be less available volume (at wider spreads) to manage inventory risk
- Reduce liquidity and result in a weakening of the forward price curve as the total volume will decrease and volatility will increase. Ultimately leading to costs for all market participants.

Furthermore, the Authority makes the note that *“The benefits of the change in refresh obligation have the potential to be significant to levy payers. Indications from the procurement process, while ongoing, suggest some potential market makers see the change in refresh obligation regime resulting in a reduction in service fee of greater than 10%. This could result in a lower fee for market-making of at least \$1,000,000 per annum.”*.

In our submissions as part of the procurement process (which have resulted in us being shortlisted to the RFP stage) we have been explicit that a refresh obligation, implemented as proposed, would *increase* the cost of us providing market-making services.

In light of the issues above, it is clear that the cost benefit analysis on the proposed refresh obligation is neither robust nor likely to stand up to independent scrutiny.

### **An amended proposal will resolve the issues and result in net benefits**

In order to remove the incentives for market-makers to be aggressive on the open and/or subsequently unwind, the refresh obligation should be implemented without the ‘cumulative trading method’.

That is to say that a market maker should have an obligation to refresh a bid until the market-maker has *bought* 2.4MW and refresh an offer until the market maker has *sold* 2.4MW. Spreads would apply where the market maker still has an obligation to quote *both* bids or offers. If, through trading activity, only a bid *or* offer obligation remained, the market-maker could quote this at whatever price they saw fit (presumably representing the supply or demand function of their portfolio).

This will reduce the incentive to be the aggressor to fulfil the obligation before removing quotes, and will limit the reduction in volume caused by market-makers instantly unwinding to clear their refresh obligation. Even in the event that this did occur, spread discipline will ensure that there is residual volume available for third parties without the price moving two spreads away.





As we have advised the Authority on numerous occasions through various submissions, this change to the proposal is necessary if the benefits (over the status quo) are going to be achieved, namely that:

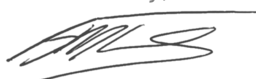
- The incentive for opening aggression will be reduced, market-makers will not be able to abstain by instantly unwinding. This will lead to an improvement in price and volume availability and a more robust forward curve.
- Total available volume will not reduce compared to the status quo.

We note that to some extent, the effective spread will still increase relative to the status quo, which is a cost but is likely to be minor in comparison to the benefit of an otherwise more robust curve.

To summarise our submission on this topic, we agree with the approach to volume, spread and exemptions, but strongly recommend against a 'total traded' implementation of a refresh if the Authority's purpose is to achieve its statutory objectives. We provide some additional detail in our answers to the specific questions below.

Please don't hesitate to contact me if I can provide any further clarification on any aspect of this submission.

Yours faithfully,



Stuart Innes,  
Managing Director,  
emhTrade Markets Ltd



Do you have any feedback on the Authority's proposal to align regulated market-making obligations with commercial market-making obligations?	This is imperative to Commercial Market Making.
Do you agree that the total volume should remain at 12 MW per contract, if not why?	Yes.
Do you agree that the spread between bid and offer prices should remain at a maximum of 3% if not why?	<p>Yes but we note that:</p> <ul style="list-style-type: none"> <li>• With a 50% refresh the <i>effective spread</i> will increase for any party seeking to transact more than 6MW. The refresh design should aim to minimise this effect.</li> <li>• We are not convinced it is necessary or desirable to stipulate that market-makers can't provide multiple tranches (each at 3%). We expect that being able to do so would mean that: <ul style="list-style-type: none"> <li>○ Market-makers could more efficiently align the <i>shape</i> of their obligations to their underlying supply and demand curves - lowering their cost.</li> <li>○ The result would be tighter spreads at the margin, which would lead to lower transaction costs for smaller participants (and likely dynamic efficiency benefits from a more robust and liquid curve at the margin)</li> <li>○ There would be no increase in spread for parties transacting larger volumes (ie a party buying 1.2MW that had been broken into multiple tranches, all quoted simultaneously, each at 3% would pay the same weighted average price for that volume if it was all in one tranche at 3%)</li> <li>○ There appears to be no downside to allowing this, aside from a trivial change to monitoring systems.</li> </ul> </li> </ul>
Do you agree that changing to a rolling 20 trading days exemption scheme will benefit the New Zealand electricity futures market if not why?	Yes. The proposed change is incredibly simple and, we are confident, will lead to all participants market-making on all but the most costly of days, as was the original intent of exemptions.
Do you propose an alternative solution to maintaining market-making services through a calendar month?	We are of the view that the back-stop Code should have the same mechanism (with fewer exemptions allowed). As the consultation paper is silent on this decision, we assume it is a drafting error (the proposed Code refers to calendar months).
Do you agree that introducing a refresh obligation will benefit the New Zealand electricity futures market if not why?	<p>As proposed the refresh obligation will do the opposite - it will be damaging to the liquidity in the market and lead to significant net costs compared to the status quo.</p> <p>In order to resolve the issues created by instant</p>

	<p>trading and subsequent lack of liquidity, the Authority must implement a refresh obligation solution that doesn't create incentive for even more of the same behaviour.</p> <p>As proposed, the change will increase instantaneous trades on the open, decrease volume, increase effective spreads and reduce the value of the forward curve.</p> <p>We strongly suggest the Authority implement a refresh obligation for each of bids and offers, not a 'total traded' obligation.</p> <p>We also note that the current calculation is convoluted and may be more easily implemented by traders and monitored by the ASX and the Authority if it was simplified to:  An obligation to quote:  Buy volume which is the greater of 12 or 24 less the volume bought AND  Sell volume which is the greater of 12 or 24 less the volume sold.</p>
Do you have any feedback on the Authority's cost-benefit analysis set out in Appendix A?	It is misleading and fundamentally incorrect in regards to refresh. Please see the body of our submission for further detail.
Do you have any feedback on the Regulatory statement in Appendix B?	NA
Do you have any feedback on the Code amendment set out in Appendix C?	<ul style="list-style-type: none"> <li>• It is not clear to us what 13.236L (3) means or is intended to achieve.</li> <li>• 13.236N (1) (b) means the back-stop arrangements provide exemptions on a calendar month basis. We presume this is a drafting error.</li> <li>• 13.236L (1) (1) - there appears to be a typo in the labelling of this clause number. Furthermore, see comments in the spread section as to the necessity of the 'for avoidance of doubt' clarification.</li> </ul>

## Appendix 1: Market Making Costs

We include this short note to help the Authority and other participants understand our perspective on what drives the cost of providing market-making services and therefore the likely impact of various regulatory settings on those costs.

We start by highlighting that any participant in the electricity market will have some price-exposure supply and demand function. We expect that all parties are risk averse to some extent, but that as forward prices deviate further from their view of the expected price distribution, their propensity to take positions will increase.

Supply and Demand Curves

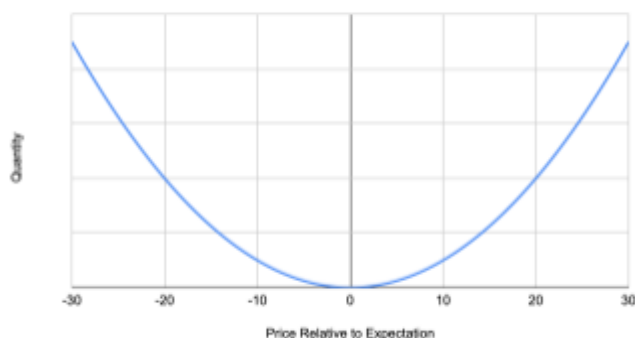


Diagram 1

The curve in Diagram 1 is a simplification for the sake of demonstration.

- The reality is that these curves are very unlikely to be symmetrical given the asymmetry in the underlying price distribution.
- We are only considering one price, and in subsequent diagrams this could represent one product. In reality the supply and demand function will reflect the position that the party has in correlated products (ie other nodes, sales channels etc), and will change with any changes to those positions.

In reality, different participants have different risk tolerance functions and different views on the price distribution. These change the shape and magnitude of each party's supply and demand functions.

Consider a hypothetical retailer that has a policy of hedging sales volume as it is sold vs a hypothetical speculator with a mandate to actively seek profitable risk exposure.

Supply and Demand Curves

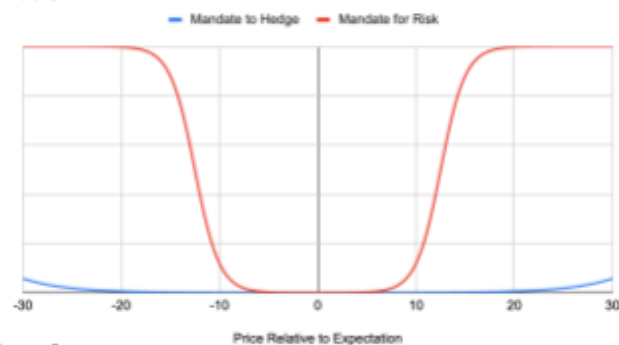
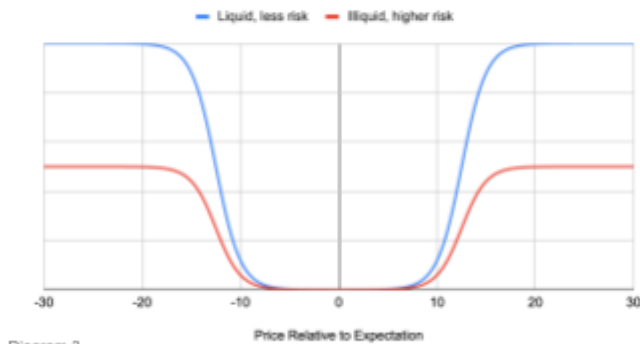


Diagram 2

For any party, all other things being equal, when price risk increases, propensity to take positions decreases. Critically, liquidity (or lack thereof) is a key driver of risk because positions are less easily altered and prices are more uncertain. As liquidity reduces, volatility increases, as does risk, and so propensity to take positions and participate in the market will also decrease. This feedback loop is important to note.

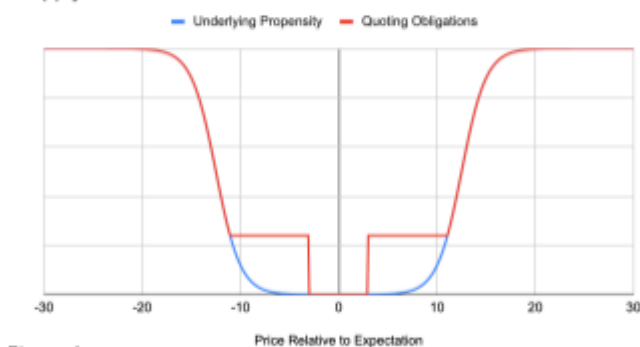
Supply and Demand Curves



It is the effect in Diagram 3, and all of its flow on effects to the wider economy that lead to the numerous documented benefits to NZ of the market-making scheme. Active participants can become more active, increasing liquidity in a positive feedback loop, which increases economic efficiency.

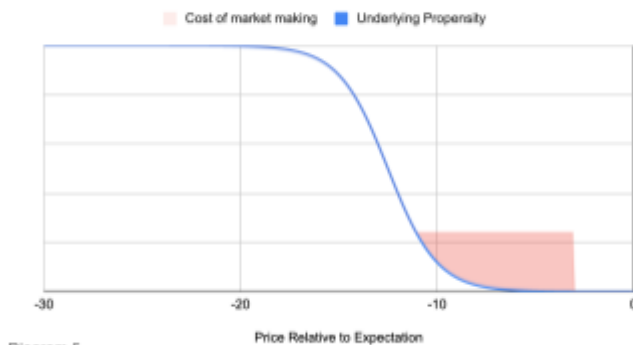
Noting that all current and potential market-makers have some existing propensity to trade, the effect of market making obligations is to constrain (for 25 minutes per day) their quoting activity away from their otherwise optimal supply & demand functions, artificially increasing their propensity to trade. For a market-maker, their supply and demand curves in a contract would appear as in diagram 4. Note that the difference is illustratively large in this example.

Supply and Demand Curves



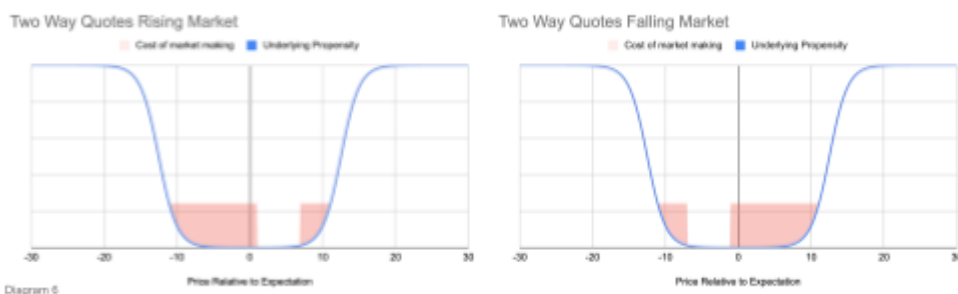
When a market-maker submits these orders, *if they were to transact*, the cost to the market-maker is represented by the area between their underlying supply/demand function and the artificial one that the order represents. This is true regardless of the eventual price outcome (because the distribution of outcomes is an input into the underlying propensity).

Transacted Bid



Therefore, prior to submitting two-way quotes, the market-maker will consider the probability of each quote transacting (having regard to the market price and likely activity) and move prices up or down to minimise the probability weighted cost of transacting away from their portfolio's optimal supply/demand curves.

If the market maker has perfect foresight (and impossibly fast reflexes), they will transact with zero probability (by moving their quotes with the market) unless their quotes are aligned with their underlying propensity.

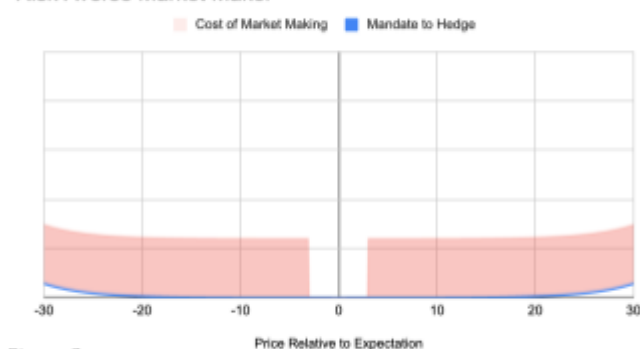


The challenge for the market-maker is that changing the price of a quote affects both the quote's cost, and its probability of transacting. This decision process happens, whether implicitly or explicitly, algorithmically or subconsciously, every time there is new information that alters the probability of transacting, the market price, the portfolio position, or the expected distribution of outcomes.

These trade-offs get increasingly difficult to make as the underlying curves get flatter or their symmetry decays, which may occur as the market maker acquires inventory or as market uncertainty or volatility increases.

It is clear from these illustrative examples that the cost of market-making is directly related to the underlying propensity to trade. Consider the cost to the hypothetical hedged retailer if they were to have a market-making obligation.

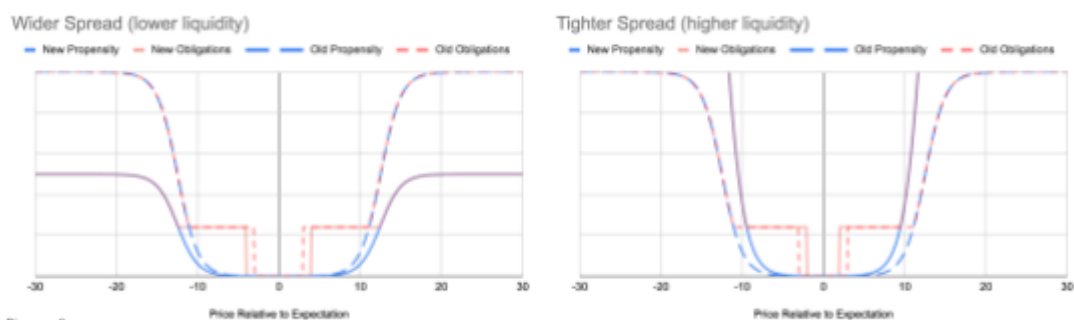
### Risk Averse Market Maker



The Authority's decisions in regards to market making impact costs in two ways:

- The first, and most obvious, is through direct changes to the artificial propensity to trade.
- However this is only half the equation. Every change to the market-making settings will impact liquidity in the market and therefore all participants' propensity to carry risk.

This is illustrated in diagram 8 with a hypothetical change to spreads. It becomes clear that to calculate the impact of the change on the cost/benefit to market-makers, changes in both the constrained and underlying supply/demand curves need to be considered.



Given that:

- For market-makers, market-making activity is only a small portion of their overall price risk exposure; and
- There are reinforcing feedback loops when underlying propensity to take positions is increased (liquidity begets liquidity);

when attempting to derive the maximum economic benefit from market-making, the Authority should place the greatest emphasis on the impact of any proposed change on the market-makers' underlying propensity to take positions. The secondary consideration is the magnitude of any incremental step away from that underlying propensity that might be created by any given set of obligations.