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Economists

Review of the Retail Advisory Group Research Paper – Effects of Low Fixed Charges

7 September 2015

1. Introduction

I have been asked to review a paper and underlying calculations undertaken by NZIER for the Retail Advisory Group (RAG) of the Electricity Authority (EA). The context of the review has been a focus by the RAG on the effects of Low Fixed Charge (LFC) Regulations on (amongst other things):

- efficiency in the use of electricity network assets, with associated implications for investment by consumers in conservation and technologies such as solar photovoltaics (solar PV); and
- retail electricity competition.

EA has asked that I provide my opinion as to the appropriateness of the economic logic applied in the paper, and the appropriateness and robustness of the associated quantitative analysis undertaken. I have been provided with a copy of the report titled "Research project: Effects of low fixed charges", and a number of excel spreadsheets that have been used to derive the figures and calculations contained in the report. I have also had the opportunity to ask questions of the NZIER to clarify my understanding of the analysis that has been undertaken.

I have focused my preliminary review on the report, and have referred to the analysis set out in the excel spreadsheets only to better understand the analysis and arguments set out in the report. I have also undertaken a thorough review of the calculations undertaken in the spreadsheets, with a particular focus on those related to chapters 6, and 7 of the report.

This note sets out, at a high-level, the conclusions arising from my review. I have also provided the EA with an electronic copy of the report, which contains a number of comments in relation to specific points made in the report.

The remainder of this note is structured as follows:

- sections 2 and 3 provides my comments in relation to the principles and empirical analysis of the implications for efficiency of the LFC tariff regulations, ie, chapters 5 and 6 of the report, respectively;
- section 4 provides my comments on the analysis of the effect of the LFC tariff regulations for the uptake of solar PV contained in chapter 7 of the report;
- section 5 provides my comments related to the discussion on the implications of the LFC tariff regulations for retail competition, ie, chapter 8 of the report; and
- section 6 sets out the conclusions arising from my review, and some suggestions as to next steps.

2. In-principle Impacts on Efficiency of Pricing (Chapter 5)

Chapter 5 of the report summarises the economic principles for determining network tariffs that promote efficient use of and investment in the distribution network, and provides an in-principle assessment of the effect of the LFC tariff regulations for network efficiency.

The argument set out in chapter 5 can be summarised as follows:

- the level and structure of distribution tariffs should be determined so as to signal the costs of meeting demand (implicitly although unsaid in the report so as to promote efficient use of and investment in the network), and allow investors to recover the cost of their investments (unsaid by presumably efficient costs);[1]
- distributor's costs should be allocated to those activities (eg, consumption of electricity) that create those costs;[2]
- revenue should be recovered in a manner that minimises distortions in consumers' consumption;[3]
- in combination this means that efficient pricing implies charging a variable charge linked to activities that create costs, with a fixed charge to recover any remaining revenue requirements;[4]
- the LFC-tariff regulation leads to a cross-subsidy between customers, as it forces distributors to charge more than the efficient consumption charge (set with reference to the long-run marginal cost), so as to satisfy the low fixed charge obligation.[5] For this to be true, the paper must be presuming that the LFC-tariff regulation requires distributors to recover the same amount of revenue from LFC-tariff customers as compared to non-LFC customers, with average consumption; and
- the LFC-tariff regulation obliges distributors to recover more from some customers (presumably non-LFC customers) than LFC-tariff customers, and so this will promote inefficient network usage by non-LFC customers.[6]

In economics, for network pricing to promote efficient use of and investment in network services network tariffs should be set with reference to the marginal costs, with any residual costs being recovered in a manner that minimises any distortions in the pattern of usage of the network. I believe that this notion is underlying the principles set out in Chapter 5, but could be more clearly explained in the current text.

Importantly, minimising distortions in use can mean that remaining costs are recovered through a combination of markups on consumption charges, and fixed charges, depending on the responsiveness of consumption to changes in price.

That said, for the LFC-tariff to promote inefficient use of the network, with associated implications for the efficiency of investment, it would need to be proven that:

- the consumption tariff charged to LFC-tariff customers differs from a proper estimate of the long-run marginal cost for serving these customers. Assuming this can be shown, then;
- the fixed charges and/or markups on top of the LRMC implied consumption tariff is leading to distortions in the patterns of usage. For this to be proven, some consideration would need to be given to the price elasticity of demand for customers on the LFC-tariff; and
- the LFC-tariff regulation creates strong incentives for distributors to charge a consumption charge above what they might otherwise charge. This is different from saying that in practice distributors charge a higher consumption charge from the level they might otherwise charge. For there to be a problem with the regulations, there is a need for there to be a causal link between the regulation and the outcome.

In my opinion, the analysis would be improved by comparing the size of any mark-up of consumption charges compared to the implied LRMC level. In addition, it would be helpful to consider whether the price elasticity of demand for customers on LFC-tariffs is low, or differs from those on non-LFC tariffs.

[1] Paragraph 5.2.1

[2] Paragraph 5.2.3

[3] Section 5.3

[4] Paragraph 5.3.4

[5] Paragraph 5.4.5

[6] Paragraph 5.5.4

I understand that the regulation requires distributors to charge a lower fixed charge, and ensure that a customer with average consumption is no worse off than if they were on the non-LFC tariff. A distributor could, at least in principle, charge both LFC-tariff customers and non-LFC tariff customers the same consumption charge, with LFC-tariff customers having a lower fixed charge, in accordance with the regulations. If there were no other changes, then this would mean that a non-LFC customer at all levels of consumption would have a higher bill compared to an LFC customer and so all customers would elect to be on the LFC tariff. This outcome could be avoided by LFC-tariff customers being charged some other amount, say via a maximum demand tariff, to ensure equivalence of bills for an average non-LFC customer.

It follows that the regulations cannot be assumed as only providing an incentive to raise the consumption charge for LFC-tariff customers. Rather this is a choice that distributors implicitly make.

In the circumstance set out above a distributor could still recover its total revenue, and also promote efficient use of the network through the use of other, innovative tariff structures, without impacting on efficient outcomes. Importantly, recovering a higher amount from one customer compared to another through different fixed charges has no implications for efficiency. It is also not a cross-subsidy – which implies that there is a notion that there is some implied 'correct' amount that should be recovered from a particular customer. From an economist's perspective, so long as the amount recovered is within the efficient revenue recovery bounds, ie between incremental cost and standalone cost, then there is no cross-subsidy.

From my review, the paper provides no analysis of the standalone costs for which to judge whether a cross subsidy is likely to be arising between LFC and non-LFC customers. Indeed, given LFC-tariff customers are a segment of the total customer base and likely to be meshed throughout the network, it can probably be safely assumed that total revenue recovered from these customers is some proportion of the total revenue needed by the business. This would mean that the standalone costs for LFC-tariff customers are most likely to be below standalone cost.

In summary, in my opinion the in-principle argument presented in Chapter 5 has some flaws, and so does not support the contention that the LFC-tariff regulation provides a strong incentive for tariff structures that lead to inefficient use of the network, or cross-subsidies between customers.

Importantly, this does not mean that the same conclusion applies to the current tariff structures of distributors. It might be that the current differences in consumption charges is leading to distortions in the use of the network, and is not supported by differences in the price elasticity of consumption. However, to make this conclusion, the argument would need to be based on an assessment of the characteristics of customers on the LFC-tariff and those without. I suspect that such a case could be readily made if LFC-tariff customers are distributed evenly throughout the network as non-LFC tariff customers.

Finally, the discussion in Chapter 5 on efficient retail pricing is based on a commonly made but incorrect assumption that efficiency would oblige a retailer to pass through the efficient distribution tariff structure through to customers, and that the regulation does not allow retailers to rebalance tariff structures to achieve this. This notion is inconsistent with retail competition, whereby retailers should be able to compete on retail tariff structures, including offering tariff structures that provide alternative ways of managing the incentives provided by distribution tariff structures.[7]

It follows that in my opinion the better argument to make is that the regulations inhibit tariff structure competition (to the extent that they in fact do) amongst retailers. While this will not necessarily impact on competition *between* retailers because it affects all retailers equally,[8] it might still lead to inefficient outcomes. This is because there may be circumstances where consumers would choose different tariff structures if given the opportunity by retailers, thereby making alternative and more efficient decisions about their own electricity use in response to those alternative tariff structures.

[7] A retailer can offer alternative tariff structures to those provided by the distributor, as a way of competing for consumers in a competitive retail market. In so doing they take on the responsibility of managing the risks that arise from a disconnection between the retail and distribution tariff structure. Retailers would then have the incentive to manage the distribution costs of these customers, potentially in other ways (eg, direct load control etc). Alternatively, retailers may have assessed that these customers are not responsive to price signals and so the different tariff structure does not lead to the retailer taking on significant risks. In either case, the distribution tariff is still providing the appropriate price signal and efficient outcome, even though the end-use customer is not receiving the price signal directly through the tariff they pay.

[8] I address this matter further in section 5 below.

3. Implications for Efficient Price Structures (Chapter 6)

The focus of Chapter 6 is on empirically assessing the 'efficiency' of revenue recovered from the LFC-tariff versus other consumers. The approach taken is to:

- determine an 'efficient' fixed charge by estimating the revenue that should be recovered from a notional LRMC-based charge;[9]
- subtracting the LRMC-based revenue from the total revenue requirement and dividing by the installation connection points (ICP) to estimate the 'average efficient fixed charge per ICP'; and
- comparing the actual fixed charge for LFC-tariff customers to this efficient level.

In my opinion this methodology is inconsistent with the economic principles for network pricing to promote efficient use of and investment in the electricity network. This is because it can be entirely efficient for some customers to pay less of a contribution to revenue recovery (ie, have a lower than average fixed charge), and some to pay more of a contribution to revenue recovery (ie, have a higher than average fixed charge). Indeed, the level of the fixed charge (and so contribution to revenue recovery) has no impact on use of or investment in the network and so will have no impact on efficiency, whatsoever.[10] It follows that the analysis set out in section 6.2 does not provide any insights on the question being considered.

The analysis in section 6.3 seeks to estimate the extent to which the regulations lead to cross-subsidisation between LFC-tariff customers and non-LFC tariff customers. In light of the conclusions I have drawn above, in my opinion the example simply estimates the implications of rebalancing the LFC-tariff to an alternative tariff structure on customer's bills. I do not believe that the alternative tariff structure necessarily represents a more efficient structure, although in principle it might, depending on the elasticity of demand of consumers.

Relevantly, it is incorrect to characterise some customers paying more and others less as a 'cross-subsidy', as this implies that there is a notional correct amount that should be recovered from each customer. For the reasons explained above, this notion is incorrect as a matter of economic principle.

I would therefore suggest that this example be characterised as considering the implications for a customer's bill of reducing the consumption tariff for an LFC-tariff customer, while assuming the average customer pays the same bill. It would then show that low consumption customers would be worse off, and high consumption users better off.

4. Effects of the Regulations on Household Investment Decisions (Chapter 7)

Chapter 7 analyses the extent to which household investment decisions for conservation and solar PV might be influenced by consumption charges that differ from those that promote efficient use of the network. It also analyses the extent to which this is caused by the regulations.

The chapter indicates that there are subsidies provided to solar PV, created by the regulations.[11] The logic that supports this conclusion is as follows:

- the regulations means that consumption charges are higher than they would otherwise be, or should be when compared to estimates of LRMC;

[9] I have also reviewed the methodology employed to estimate the revenue that would be associated from a consumption based charge set to the LRMC. The average incremental cost methodology used to generate the results in Table 2 uses data on total commissioned asset capex, and incremental opex. To estimate LRMC data is needed on only growth-related capex, and the associated opex to support those additional assets. It follows that the current estimates are incorrect and are most likely significantly higher than they would be if the proper data had been available.

[10] That said, there is a limited circumstance where a sufficiently high fixed charge might cause a customer to inefficiently disconnect from the network, but this circumstance is more theoretical than practical given the economics of connection and the likely size of a fixed charge.

[11] 7.1.6

- the higher consumption charges makes solar PV investments more financially viable, because it reduces a customer's bill by more than those customers with lower consumption charges; and
- the higher return to investment in solar PV leads to greater investment in solar PV than might otherwise have been the case.

In my opinion there are two problems with this logic. First, it assumes that the higher consumption charges is a consequence of the incentives created by the regulations. As discussed earlier, in my opinion while consumption charges for LFC-tariff customers are higher this is not necessarily the result of the incentives created by the regulations.

Second, it assumes that a higher rate of return will lead to more investment in solar PV. In my opinion, simply having a positive return to solar PV should create investment in solar PV and the size of the return should not affect the binary decision to install solar PV or not. That said, a higher return might lead to more solar PV investment because:

- it lowers the barrier to investment caused by the capital constraints of some customers. Indeed, this will be enhanced as the total cost of solar PV reduces over time; and/or
- it leads to previously negative returns becoming positive.

Indeed, there may be other non-financial considerations to a consumer's decision to invest in solar PV. I believe these additional arguments need to be articulated in the report and are preferable to the current presentation in the report which relies simply on the incorrect notion that a higher return means there will be more investment.

The chapter estimates the impact of the LFC tariff on investment in solar PV by:

- estimating the return to solar PV under a number of alternative tariff structure scenarios and consumption levels;
- assuming that investment is a function of returns, and so higher returns leads to more investment;
- calibrating the shape of the relationship to actual penetration rates; and
- estimating the implied uptake of solar PV associated with this relationship.

Given my opinion that there is unlikely to be a simple direct relationship between higher returns and investment, I believe that this analysis does not support a conclusion that the LFC-tariff leads to greater uptake of solar PV. This does not mean that a higher consumption tariff does not lead to inefficient investment in solar PV, but rather the method by which this is calculated might overestimate the extent of the problem.

To estimate the relationship between a high consumption tariff and investment in solar PV requires:

- consideration of the change in rates of return to solar PV depending on the tariff structure (as done in the paper);
- consideration of the number of customers for which current consumption levels and tariff structures makes solar PV not have a positive return;
- a decision rule that says when the rate of return reaches a particular level, then customers with available capital and space would invest in solar PV (because the return say is higher than placing the funds in the bank); and
- an estimate of the number of customers that would either have a positive return, or for which the return threshold for investment has been reached.

This would provide a better understanding of the likely uptake of solar PV arising from a particular tariff structure and return to solar PV.

5. Effects on Retail Competition (Chapter 8)

Chapter 8 presents conclusions as to the effects on retail competition arising from the LFC-tariff regulations. It identifies potential detrimental effects resulting from the regulations increasing:[12]

- compliance costs;
- the adoption of inefficient pricing practices; and
- barriers to entry, by constraining tariff innovation and consumer confusion leading to inefficient consumer switching.

As a matter of economic principle, competition in a market can be effected by circumstances where a rival's costs are inappropriately raised, or there are barriers to entry. It follows that for the regulations to impact on retail competition it would need to be proven that it leads to costs for some retailers that are significantly different from other retailers, affecting the ability for those retailers to compete, or it creates a barrier to entry.

In my opinion, compliance costs arising from the LFC-tariff are unlikely to affect retail competition because:

- it applies equally to all retailers; and
- it is a sufficiently small cost of providing electricity in the market (as set out in Chapter 4) that differences in compliance costs arising from economies of scale are likely to be small.

Similarly, I understand that the regulations impose obligations on retailers relating to the tariff structure applied to LFC-tariff customers, but it is not clear that this has any impact on retail competition because:

- it applies equally to all retailers; and
- it does not prevent retailers from competing on the procurement of wholesale energy, or retailing costs, so as to offer lower consumption charges.

Importantly, effective retail competition means that there should be no opportunity to cross-subsidise customers with higher charges to other customers. This means that retailers effectively compete for LFC-tariff customers and non-LFC tariff customers on their own merits.

The only opportunity for the regulation to affect retail competition arises if it leads to a barrier to new entry, such that it allows incumbent retailers to charge more than the implied new entrant costs. This might arise if the compliance costs are sufficiently large so as to not allow a retailer to compete on other input costs. Given the compliance costs are small, it seems that the regulations are unlikely to create a barrier to entry.

It follows that in my opinion the case has not been made that as a matter of principle or evidence, the regulations has any impact on retail competition. Importantly, in my opinion the logic applied to support the conclusions set out in Chapter 8 are incorrect as a matter of economic principle.

6. Conclusions

My review has identified a number of significant flaws in both the expression of the economic principles, and subsequent application through the quantitative analysis. In summary:

- Chapter 5 incorrectly concludes that efficient pricing principles means that a variable charge should be linked to activities that create costs, with a fixed charge recovering any remaining revenue requirements, and by implication this applies to each customer group. In practice, efficiency requires charging on those parameters that cause future costs, based on the change in those future costs, with any remaining costs being recovered in the least distorting manner, which can include markups on consumption charges;
- there is no basis for concluding that the LFC-tariff regulations create a strong incentive to apply the current charging structure. In my opinion, the current tariff structures are a discretionary choice of distributors and it would be possible to be consistent with the regulations and charge the same

[12] 8.1.1

consumption charge to all customers, with differences in bills for an average customer being made up with alternative tariff components, for example, maximum demand charges;

- the analysis in Chapter 6 is problematic as it focuses on the concept of there being an 'efficient fixed charge', which is inconsistent with the economic theory underpinning network tariff structures;
- the analysis in Chapter 7 is based on the incorrect logic that higher returns to solar PV investment leads to incrementally higher investment in solar PV and so could be improved by directly referencing a number of non-financial considerations that might imply that using higher investment for higher returns is an appropriate proxy; and
- the conclusions in Chapter 8 are incorrect as a matter of economic principle, as it takes into account factors that from an in-principle perspective are unlikely to have any impact on retail competition.

In my opinion, these conclusions raise a number of matters that should be addressed in the report prior to its release.

For any questions arising from this peer review, please contact:

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