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The CMA's assessment of customer detriment in the GB retail energy market

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EPRG WORKING PAPER

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Abstract

The Competition and Markets Authority (CMA) has recently investigated the GB energy market and found an Adverse Effect on Competition (AEC) in the retail market for domestic (residential) customers. It estimated the associated customer detriment to be an average of £1.4 billion per year over 2012-15, rising to almost £2 billion in 2015. Citing these figures, the Government has introduced a Bill to require the energy regulator Ofgem to impose a price cap on most domestic energy tariffs. The CMA's calculation is unprecedented with respect to its nature, magnitude and policy impact. It has implications for the conduct of competition policy and beyond. This paper seeks to understand and appraise the nature of this calculation, and to question whether it is appropriate as a basis for future policy.

1. Introduction

In 2014 the Competition and Markets Authority (CMA) began an investigation of the Great Britain (GB) energy market. In 2016 it found several Adverse Effects on Competition (AECs). The most serious finding was "an overarching feature of weak customer response" in the domestic (i.e. residential) retail market that gave market power to the large suppliers. In calculating the associated customer detriment, the CMA used what it called a 'direct approach' and an 'indirect approach' that it said gave the same results 'in theory'. Its preferred estimate put customer detriment at an average of £1.4 billion per year over 2012-2015, rising to almost £2 billion in 2015. The CMA considered and rejected introducing a widespread price cap as a remedy. But in a dissenting report, one member of the CMA panel recommended such a cap because of the size of the customer detriment. The energy regulator Ofgem declined to introduce such a cap. In March 2018 the Government introduced a Bill to require Ofgem to impose such a price cap on domestic energy tariffs. This Bill has widespread all-party support, and the much-publicised CMA detriment calculation has often been invoked to justify this.

The CMA's calculation is unprecedented with respect to its nature, magnitude and policy impact. The present paper examines the calculation in order to understand why the customer detriment is so large, and why these two different approaches can be said, in theory, to give the same result. It begins with some background on the energy market investigation. The paper then examines the recent investigation of the cement market by the CMA's predecessor body the Competition Commission (CC). Both investigations made two sets of calculations of customer detriment, but there were significant differences between the calculations. A diagram from the CC cement investigation is convenient for explaining the difference in approach.

[1] Emeritus Professor, University of Birmingham, and Fellow, Cambridge Judge Business School. This is a revision and reorientation of an earlier paper (Littlechild 2017a). I am grateful to a referee for pointing out an error in the previous exposition, and to Monica Giulietti, Eileen Marshall, Robert Ritz, Catherine Waddams and other referees for helpful comments.

It turns out that the CMA's energy customer detriment is significantly larger than the detriment in any other market investigation, not because the retail energy market is less competitive, but because the CMA introduced a novel benchmark based on a more extreme concept of a well-functioning competitive market. The paper challenges the methodology, calculations and procedures in the energy market analysis. In passing, it also sheds light on a disputed issue in the CMA report. The paper questions whether the CMA energy market approach is appropriate for future policy.

2. Background to the retail energy market investigation

The GB domestic markets for electricity and natural gas were opened to retail competition over the period 1997-1999. The 14 vertically integrated retail electricity supply businesses and local network distribution businesses in the 14 geographical regions were restructured into separate businesses, and many were taken over by other owners though some remained in the same ownerhip. By 2002 the former incumbent electricity retail suppliers had consolidated into five national suppliers and in aggregate had also taken 40 per cent of the domestic gas market customers. The former national gas monopolist British Gas (rebranded as Centrica) also separated from its network business. By 2002 it had lost that 40 per cent of the gas market but had taken 22 per cent of the electricity market. Dual fuel supply (taking both fuels from the same supplier) became common. During this early period, there were several new entrant suppliers but few survived, never taking in total more than about 1 per cent of the domestic market. The focus was on the Six Large Energy Firms (SLEFs), commonly known as the Big Six.

In 2002 the regulator Ofgem removed some transitional price caps, and until 2008 repeatedly declared that competition was developing well. However, energy prices increased sharply during the mid-2000s, there were increasing public concerns that competition was not working, and political pressures on Ofgem to take action. In 2008 Ofgem found that there were "unfair price differentials" and a lack of engagement by some customers, including vulnerable customers. Ofgem introduced a non-discrimination condition on tariffs and followed that up with a series of other regulatory measures, notably limiting each supplier to a maximum of four "simple tariffs". This was intended to facilitate more customer engagement.

But customer engagement fell, concerns remained, and the political debate intensified. In October 2012 Prime Minister David Cameron suddenly announced that energy suppliers would be required to put customers on the lowest tariff in the market. In December 2012 Which? magazine proposed that suppliers be allowed to set only one unit price per kWh, as with petrol pricing. In some variants, this would be a uniform national price. In September 2013 Ed Miliband, leader of the Labour opposition party and a former Energy Secretary, proposed an energy price freeze. In October 2013 former Prime Minister John Major proposed a windfall tax on energy suppliers.

In November 2013 the Government announced that Ofgem would work with the Office of Fair Trading (OFT) and the Competition and Markets Authority (CMA), which was in the process of being formed by merging the CC and the OFT, "in preparing a framework for the assessment of

competition in energy markets and would then conduct that assessment". In June 2014, in the light of this framework and assessment (Ofgem, OFT and CMA 2013, 2014), Ofgem referred the energy market to the CMA for investigation.

Like the CC before it, the CMA was required to decide whether 'any feature, or combination of features, of each relevant market prevents, restricts or distorts competition'. If so, this constitutes an Adverse Effect on Competition (AEC), and the CMA has to decide how to deal with it.

> "Where we find that there is an AEC, we have a duty to decide whether we should take action ourselves and/or whether we should recommend others to take action to remedy, mitigate or prevent the AEC or any resulting detrimental effects on customers. In deciding these questions we have a duty to achieve as comprehensive a solution as is reasonable and practicable to the AEC and any resulting detrimental effects on customers." (CMA 2016 para 3, p 1)

The CMA's energy market investigation covered almost all aspects of the electricity and gas sector. Exceptions were the transmission and distribution networks, whose prices were regulated by Ofgem, and the retail market for large commercial and industrial customers, where Ofgem saw no cause for concern. The CMA reported in June 2016. (CMA 2016) Contrary to many expectations, it found that four of the five issues that Ofgem had identified for examination – incumbency, tacit coordination, vertical integration, and barriers to entry and expansion – were not a problem. Nor were other important and sometimes controversial aspects of the GB energy market, such as the wholesale electricity and gas markets, found to be problematic. And there had been significant new entry, with some two dozen new entrant suppliers increasing their aggregate domestic market share from under 1 per cent in 2011 to around 13 per cent in early 2016. (CMA 2016 para 108 p 24) (As of early 2018 there are over 60 new entrants and their aggregate share of the domestic market has increased to about 20 per cent.)

The CMA found that Ofgem's regulatory interventions in the domestic retail market had not materially improved customer engagement and had restricted rather than promoted competition. It recommended that these restrictions be removed. But it did agree with Ofgem's fifth issue for investigation, that there was a problem of "weak customer response" in that market, which constituted an Adverse Effect on Competition. It said:

> "160. Overall, our view is that the overarching feature of weak customer response gives suppliers a position of unilateral market power concerning their inactive customer base and that suppliers have the ability to exploit such a position through their pricing policies: through price discrimination by pricing their standard variable tariffs materially above a level that can be justified by cost differences from their non-standard tariffs; and/or by pricing above a level that is justified by the costs incurred in operating an efficient domestic retail supply business." (CMA 2016, p 39)

The CMA was also concerned that the extent of engagement was not randomly distributed across the customer population.

> "135. … The survey results also suggest that those who have low incomes, have low qualifications, are living in rented accommodation or who are above 65 are less likely to be engaged in the domestic retail energy markets." (p. 33)

Before privatisation and retail competition, customers were supplied on Standard Variable Tariffs (SVTs). Customers still remain on such tariffs unless they have actively chosen otherwise, hence the term default tariff is now sometimes used. Standard variable tariffs can be varied by the supplier at one month's notice, and they are indefinite in duration, but the customer can leave at any time without a termination fee. As competition developed, suppliers increasingly offered fixed-price fixed-period tariffs, at the end of which the customer normally reverts to that same supplier's standard variable tariff unless the customer chooses another fixed tariff with that supplier or another supplier.[2] The great majority of domestic customers do not yet have smart meters, so a domestic customer consumption profile (which specifies average usage in each half hour of the day, on each day of the year) is used as the basis for estimating half-hourly usage and hence for settlement between generators and suppliers.

In recent years, suppliers have priced fixed tariffs below standard variable tariffs. For example, the CMA found that a dual fuel customer on a standard variable tariff, and paying by direct debit (from their bank account), could save an average of £205 per year over the period Q1 2012 to Q2 2015 by moving to the supplier with the lowest tariff (typically a fixed price tariff) with the same payment method. (CMA 2016 Table 9.2 p 465) This represented an average saving of 16% on an average annual (dual fuel) bill (implying that the average bill was £1281). Yet the majority of customers remained on standard variable tariffs. The CMA commented

> "this finding – of material potential savings that are persistent over time, available to a significant number of domestic customers and that go unexploited – provides evidence of weak customer engagement in the domestic retail markets for electricity and gas in Great Britain". (para 9.72 p 465)

The CMA explained that the "most significant" detriment that this weak customer engagement caused was that "domestic energy customers are, on average, paying higher prices than they would do in well-functioning markets". (para 10.3 p 598) It used two methods to quantify this detriment. Using its 'direct approach', the CMA calculated that the customer detriment averaged £1.4 billion per year over 2012-2015, and reached almost £2 billion in 2015. Using its 'indirect approach' the CMA calculated that the detriment averaged £720m per year over the longer and slightly earlier period 2007-2014.

To remedy this detriment, the CMA recommended that Ofgem should experiment with different ways of promoting greater customer engagement and switching. This included setting up a Disengaged Customer Database.

The CMA also found that certain technical constraints limiting the number of tariffs that suppliers could offer to customers with prepayment meters constituted an additional AEC. It recommended a temporary price cap on tariffs for prepayment meter customers, until smart metering removed those technical constraints. About 4 million customers are on such meters.

[2] In both cases the retail tariffs include all costs, including distribution and transmission network charges, wholesale costs, social and environmental levies, suppliers' customer handling costs, etc. This is unlike practice in the US competitive states (except Texas), where the local distribution network utilities typically bill residential customers and include separate lines on the bill for generation charge from the chosen supplier, and certain other costs.

The CMA considered the possibility of extending a price cap to all standard variable tariffs. To include such tariffs would have extended the coverage of the price cap from nearly one sixth of GB domestic customers (those with prepayment meters) to about two thirds of all customers. The CMA explained why it rejected such a price cap:

> "11.86 … attempting to control outcomes for the substantial majority of customers would – even during a transitional period – undermine the competitive process, potentially resulting in worse outcomes for customers in the long run. This risk might occur through a combination of reducing the incentives of customers to engage, reducing the incentives of suppliers to compete, and an increase in regulatory risk." (para p. 656)

One CMA panel member (Professor Martin Cave) dissented on this particular issue, arguing that the proposed customer engagement remedies did not go far enough.

> "2. The harm which is presently inflicted on households in this market (£2 billion in 2015, or an average of £75 for every British household) is very severe, and in my opinion how far and how fast that harm is reduced is the key indicator of the success of the household market remedies. But the remedies proposed for the large majority of households will take some time to come into effect, and are in any case untried and untested." (p. 1415)

The dissenting member said that, over the previous three years, a wide variety of information remedies and other measures had been tried but "had not made a dent" in the proportion of customers on standard variable tariffs. He therefore proposed to supplement the engagement remedies with a price cap on standard variable tariffs for a temporary period, say two years, to remove a significant part of the 2015 detriment of £2 billion. The body of the report said this would "reset the market". (para 339 p 79)

The CMA itself implemented the price cap on prepayment tariffs, covering about 4 million customers from April 2017. The (Conservative) Secretary of State commented that £1.4 billion annual detriment to customers "is clearly a huge amount of money" and wondered whether the CMA's pro-switching recommendations were sufficient to deal with such a detriment. Ofgem indicated that it would extend the prepayment meter price cap to an additional 1 million customers who qualified for the Warm Home Discount scheme (which provides a discount for pensioners and low income households), and that it was exploring ways to extend the cap to an additional 2 million vulnerable customers.

In April 2017 the Prime Minister declared a general election, indicating an intention to deal with "rip-off energy tariffs". The Conservative Party manifesto promised a safeguard tariff cap to extend the protection to more customers on poor value tariffs. The Scottish National Party supported a price cap on standard variable tariffs. The Labour Party manifesto cited the £2 billion estimate of detriment and proposed an immediate price cap to keep dual fuel bills below £1000 per year, with the energy sector gradually taken back into public ownership.

After the election, the Secretary of State pressed Ofgem to extend the price cap to all standard variable tariff customers. Ofgem countered that "this kind of intervention – an intervention that will, frankly, have significant redistributional effects – is really a matter for Parliament". Ofgem also pointed out that the large suppliers would "almost certainly" appeal an Ofgem price cap proposal. This would take time, and the appeal would be to the CMA, a panel of which had already

decided (by a majority) against a widespread price cap. In February 2018 the Secretary of State, again citing the CMA's calculated £1.4 billion customer detriment, introduced a Bill to require Ofgem to "impose a cap on all standard variable and default rates". On 6 March the second reading of the Bill received almost universal support, with an aim to have it in place (Royal Assent) by end-June. Ofgem would then take 5 months to implement the price cap, which in turn would be in place by end-November 2018.

3. The CMA's two approaches to quantifying customer detriment

There is a large economic literature on how to assess competition and market power. The analyses and policy measures proposed or adopted by Ofgem and the CMA over the last decade raise a host of fascinating questions. I have commented, generally critically, on a number of these analyses and policy measures (Littlechild 2014, 2015b, 2017b), including in joint submissions with other former GB energy regulators to the CMA and Parliament. (Littlechild et al 2016 a,b, 2017) Other UK regulatory economists, too, have expressed concerns. (Pollitt and Haney 2014, Smith 2015, Yarrow 2015, Deller et al 2016)

This paper is focused more narrowly on one particular issue: the nature and calculation of the customer detriment that the CMA found in its retail market investigation. Recall that the competition authority (initially CC then CMA) is required to consider action to remedy, mitigate or prevent any detrimental effects on customers resulting from an identified Adverse Effect on Competition. In the 18 completed market investigations since the Enterprise Act 2002 first made provision for such investigations, the authority made no explicit quantification of the detriment in 8 cases. Table 1 shows the calculations of quantified annual detriment in the remaining 10 cases. The median detriment, excluding the energy investigation, is about £75 million. The oft-quoted £1.4 billion and £2 billion annual detriment figures in the retail energy market are at least an order of magnitude greater than found in any other report.

Moreover, since the size of the retail energy market detriment has been used by others to justify radical intervention in a competitive market, this CMA report seems to have had greater impact than any other market investigation report in the history of UK competition policy. The size and policy impact justify examination of the CMA's calculation.

Table 1 Customer detriments found in market investigations[3]

Date of Final Report	Market Investigation	Estimated annual customer detriment
2006	Store card credit services	At least £55m
2006	Domestic bulk liquefied petroleum gas	£4 – 12m
2006	Home credit	At least £75m
2008	Groceries	At least £210 – 250m
2011	Local bus services	£115 – 305m
2016	Aggregates, cement & ready-mix concrete	At least £45 – 50m
2014	Private healthcare	At least £155 – 174m (see footnote)
2015	Payday lending	£48 – 85m (£74 – 127m against low price scenario)
2015	Private motor insurance	£110m (£101 – 214m)
2016	Energy	£1400m average, £2000m in 2015

How to estimate the customer detriment associated with an Adverse Effect on Competition? The CC/CMA 2013 *Guidelines for Market Investigations* refers, inter alia, to prices and profitability, and also suggests that 'a well-functioning market' can be used as a benchmark. (For concerns about this approach, see Littlechild 2014, 2015b.) The CMA energy market report explained as follows how it estimated the detriment.

> "10.5 We have adopted two approaches to assessing the extent to which prices are excessive (ie have exceeded those we would expect in a well-functioning market):
> *(a)* A 'direct' approach, which involves comparing the average prices charged by the Six Large Energy Firms with a competitive benchmark price which is based on the prices charged by the most competitive suppliers, adjusted to allow for a normal return on capital and where appropriate for differences in suppliers' size, rate of growth and the cost elements that are outside of their control.
> *(b)* An indirect approach, which involves assessing both: (i) the Six Large Energy Firms' levels of profitability (and in particular whether the return on capital employed by such suppliers exceeds their cost of capital); and (ii) the extent to which the Six Large Energy Firms have incurred overhead costs inefficiently (ie whether costs are higher than we estimate an efficient supplier would incur)." (CMA 2016 p 599)

[3] Source: Final Reports of the CC and CMA market investigations. The Private Healthcare report was remitted upon appeal, and the subsequent Report retracted the quantification of the detriment.

As noted above, the CMA found that the detriment using the direct approach amounted to an average of about £1.4 billion per year over the period 2012-2015. The indirect approach suggested a detriment amounting to about £720 million per year on average over the period 2007-2014. This comprised £303 million for excess profit and £420 million for inefficient cost.

The CMA said that "in theory, the results generated from each approach should be the same – as they both seek to provide an estimate of customer detriment". (para 10.109 p 627) The CMA conjectured two possible reasons for the detriment using the indirect approach being about half that using the direct approach: differences in the time period, and the use of historic cost in the indirect approach versus opportunity cost in the direct approach. (paras 10.110 – 111, p 628) Having made a few other calculations, it concluded

> "10.112 Therefore, we find that our direct and indirect approaches, when compared on a like-for-like basis, provide similar estimates of the level of detriment to domestic customers in GB energy retail markets arising from the AECs we have found in the domestic retail energy markets. The fact that these two approaches, which are based on different data sets and methodologies, provide similar estimates, gives us confidence that our overall conclusions on the level of detriment are robust." (p 628)

Whether the estimates are similar is perhaps debatable, but the focus here is on whether, and if so why, in theory the results generated by each approach should be the same. The CC's slightly earlier investigation of the cement market shows how a different competition panel approached similar issues and in some respects took a significantly different approach. It also provides a simple graphical model for analysing the calculation of customer detriment.

4. The CC's cement market investigation

In 2012 the OFT asked the CC to investigate the market for cement and related products.[4] The CC's duties with respect to assessing AECs and recommending remedies were the same as for the CMA in the energy market investigation as described above. There were four main cement companies, plus some imports. There was considerable evidence of coordinated behaviour (which was not the case in the energy market investigation). The CC found "a combination of structural and conduct features in the GB cement markets that gave rise to an AEC in those markets through coordination … The likely effect of these features is higher prices of cement in GB than would otherwise be the case". (CC 2014 paras 4, 6 p 1) Remedies included the divestment of a cement plant by the largest company and two measures to reduce transparency in the cement market (restrictions on the publication of market data and prohibition on issuing generic price announcement letters).

Our interest here is in the way in which the CC estimated the customer detriment in the form of higher prices. Like the CMA later, it used two approaches, similar to but not the same as the CMA's.

[4] The chairman of the CC cement panel was Professor Martin Cave, who was later the dissenting member of the CMA energy panel. One other member was on both panels.

> "1. … We used two different approaches to quantify the customer detriment arising from high cement prices: (a) profitability-based approach, and (b) estimate of the customer detriment based on comparing average cement prices and a benchmark price that would prevail in a well-functioning market ('cost-based approach').
>
> 2. Our results are the following. Using the profitability-based approach, we estimate the annual customer detriment from high cement prices to be of the order of £30 million per year on average for the period 2007 to 2012. We think that this estimate underestimates the scale and significance of customer detriment in the future because the period that we have investigated includes a very severe and prolonged economic downturn and because our analysis did not cover a complete business cycle.
>
> 3. Using the cost-based approach, we find a total customer detriment of £92 million in 2011. This is comparable with an estimated detriment of £78 million in 2011 using the profitability-based approach (see Table 1). However, we noted that our cost-based estimate is based on a single year's data (2011) and that it is based on a model where, necessarily, we have had to make significant simplifying assumptions. On the other hand, we considered that the cost-based approach to estimating the detriment is less likely than the profitability-based approach to be affected by the point in the business cycle at which the analysis is carried out. Therefore, despite its limitations, we considered that the cost-based approach was a useful secondary point of reference in our estimation of the detriment arising from high cement prices.
>
> 4. For these reasons, we use the profitability-based estimate of the annual customer detriment as our baseline estimate for the annual customer detriment arising from the AEC, but we consider that this is likely to be an underestimate of the average annual detriment over a full business cycle." (CC 2014, Appendix 8.6 p 1)

Under the first (profitability) approach, the CC calculated excess industry profit as the industry return (after impairment losses due to lower asset values as a result of the unexpected slump in demand in 2007) less a cost of capital of 10 per cent, multiplied by capital employed. Over the period 2007-2012 the excess profit ranged from minus £41.5 million to £78.6 million with an average of £29.4 million per year. Average excess profit per tonne varied from minus £4.00 to £9.00, with an average of £3.20.

Under the second (cost-based) approach, the CC estimated the competitive price of cement from cost and demand data, and then compared this with the market price in order to calculate the overcharge. This suggested an overcharge of £10.50 per tonne, implying a customer detriment of £92 million in 2011. The CC described this approach as follows.

> 10. In this section, we seek to estimate the customer detriment using another method, namely by comparing the average cement prices and the cement price that we would expect to observe under effective competition. We refer to this difference as the overcharge in cement. To do this, we aimed to establish a benchmark price that would prevail in a well-functioning market and compared that benchmark price with the actual price of cement. The difference between the benchmark price and the actual price allowed us to quantify some aspects of the customer detriment in cement.
>
> 11. To establish our benchmark price, we have derived a competitive supply curve of cement. The competitive supply curve is derived from producers' costs of supplying cement. In a well-functioning market, the interaction of competitive supply and demand would be expected to establish a market-clearing, competitive price of cement.
>
> 12. We find a benchmark price for 2011 of about £69.50 per tonne, around £10.50 less than the average price of a tonne of cement in 2011. Based on 8.78 million tonnes of cement sold in GB in 2011, an overcharge of £10.50 per tonne translates to a customer detriment of £92 million in 2011.

The competitive supply curve was constructed by calculating a unit cost for each plant, assumed constant up to its level of capacity. Fixed costs, overheads, depreciation, cost of capital etc were all considered sunk and irrelevant to the determination of output and market price.

> 15. In our approach to estimating a benchmark price for cement we took existing cement works' capacities and costs as given. We used data on capacities and costs to derive a competitive short-run supply curve of cement. Between them, the supply curve and the demand for cement will pin down a market-clearing price of cement. Since the supply curve was derived based on the assumption of cement suppliers acting competitively, the market-clearing price gives a reasonable indication of what would constitute a competitive price of cement. The cement overcharge was the difference between the benchmark price and the actual price.
> …
>
> 27. A price-taking firm's decision about whether to produce at a plant or not depends on the plant's costs and the prevailing cement price. In deciding whether to produce or not, an operator of an existing plant will not take sunk costs into consideration since these costs have by definition already been incurred or will be incurred regardless of whether the plant is used for production or not. We considered any central or divisional fixed costs as being sunk for the purpose of this analysis. If variable costs and site fixed costs are covered at the prevailing price, there will be a positive contribution to central or divisional costs. Foregoing this contribution would not be rational. We also considered depreciation and cost of capital as being sunk for the purpose of this analysis, since these costs would be incurred regardless of whether the plant was used for production or not.
>
> 28. We defined a plant's operating costs to include the plant's site fixed cost, the plant's variable cost and the cost of distributing the plant's output (ie distribution cost). The operating cost thus excludes divisional and central fixed costs, depreciation and cost of capital. The operating cost excludes costs which are avoidable only in the long term and are therefore considered sunk. The operating costs are thus the relevant costs in deciding whether to use a plant or not in the short term.

The CC argued that the price thus calculated would be the competitive market price in that particular year. It did not argue that such a price would be sustainable over time, or represented a long run equilibrium. This was one reason why the CC treated this calculation as "a useful secondary point of reference" rather than as its "baseline estimate" of customer detriment.

5. The CC's cement diagram and the contrast with the CMA's energy market approach

Figure 1 reproduces (with added numbers and labelling) a Figure from the CC's report to show how the CC's second approach calculated the competitive market price and hence the overcharge. The CC ranked the four existing cement plants A, B, C, D in order of increasing unit cost per tonne. Demand for cement was taken as given and equal to realised demand in 2011. The CC then defined the competitive market price as the unit cost of the least efficient and therefore highest cost plant C required to meet demand (viz £69.50 per tonne). It measured the overcharge (customer detriment) as the difference between observed actual market price in 2011 (£80 per tonne) and this calculated competitive market price, multiplied by the annual demand (8.78 million tonnes), a total of £92 million, as shown in the thin rectangle at the top of the Figure. This approach seems consistent with conventional economic analysis.

FIGURE 1

Comparison of CC and CMA calculations of customer detriment: cement market

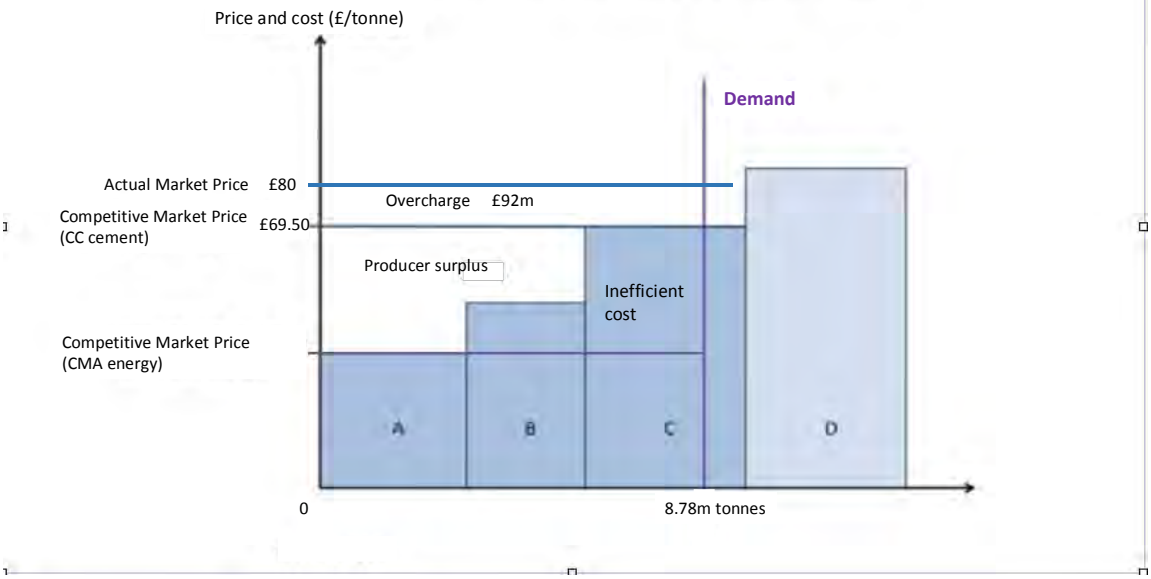


Figure 1 also indicates how the CMA's energy market investigation approached the analogous calculation of detriment. The CMA's 'direct approach', like the CC's second or cost-based approach, measures customer detriment as the difference between actual market price and the calculated competitive market price, multiplied by total demand. However, whereas the CC defined the competitive market price as the unit cost of the *least* efficient plant required, the CMA defined the competitive price as the unit cost of the *most* efficient plant available. The CMA's customer detriment is larger than the CC's customer detriment (overcharge) simply because the most efficent plant A has lower unit cost than the least efficient required plant C. And if the CC's Figure is drawn to scale, in the cement case customer detriment using the CMA's direct approach would have been more than eight times the customer detriment (overcharge) using the CC's cost-based approach.

What about the CMA's 'indirect approach' and the claimed equivalence with the direct approach? The 'indirect approach' measures customer detriment as the sum of profit (comprising overcharge plus producer surplus) and inefficient cost (relative to the lowest cost plant in the market). In Figure 1 the two approaches can be seen to be equivalent (in this simple context) because the 'indirect approach' corresponds to the unshaded areas marked Overcharge and Producer surplus and the shaded area (above the CMA competitive market price) marked Inefficient cost, and the whole are thus defined is equal to the rectangle defined by actual market price less competitve market price times total demand, which is what the direct approach specifies. In other words, the 'indirect approach' is a particular way of dividing up and estimating the area of the rectangle defined by the 'direct approach'.

Note, however, that this equivalence requires the excess profit calculations to be based on the same forward-looking costs as assumed in Figure 1, rather than on historic accounting costs. It also requires a distinction to be made between overcharge and producer surplus. In practice, neither the

CC's nor the CMA's calculation was consistent with these requirements. And whether this equivalence is the one the CMA energy market investigation had in mind is unknown.

Perhaps the most important question is whether, and if so when, the CMA's energy market approach should be adopted rather than the CC's cement market approach. What is the appropriate benchmark for a well-functioning competitive market? Should it be based on a conjecture about the most efficient cost of production? The CMA did not pose or answer such questions.

6. Comments on the CC cement market analysis

A few observations on the CC's cement market analysis before moving on to a more detailed examination of the CMA's analysis of the retail energy market. The CC's first (profit-based) approach was relatively straightforward and familiar. It used historic accounting cost data which are generally different from the forward-looking costs reflected in the CC's second approach.

Such accounting approaches have been subject to criticism by economists (e.g. Fisher and McGowan 1983), though this does not seem to have discouraged their use. In fact, Fisher (2002) made similar points in a short submission to the CC (2002) investigation into SME banking, on behalf of one of the banks. This included the following explanation of why high accounting rates of return did not necessarily imply monopoly profits, and why profits were important.

> "6. … While it is true that in long-run competitive equilibrium, economic profits are zero and the economic rate of return (adjusted for risk) is equal to the risk-free interest rate, it is very much not the case that economic profits are generally zero in competitive industries. The pursuit and attainment of profits is the engine that drives the competitive economy. To use another metaphor, the "Invisible Hand" works through profits and losses. Only when (if ever) the "Invisible Hand" is finished working will economic profits be zero. Too often, economists are so fascinated by the beautiful properties of equilibrium, especially long-run competitive equilibrium, that they forget that real markets are not always in such a state. Profits play a major and useful role in competition." (CC 2002 p 109)

At that time, the CC seemed favourably disposed to this argument – provided it could still use a return equal to the cost of capital as its benchmark.

> "2.415. We also considered whether we should allow a margin above the cost of capital to reflect more general considerations of competition. It could, for example, be argued that competition not only is a force driving down costs to their most efficient level and prices to the minimum consistent with companies being able to finance themselves, but also has a more dynamic role through time. Thus, competition drives resources to their most efficient use, creating both pressure and incentives for companies to expand or contract production as determined by consumer preferences, and to innovate by investment in new products or processes. Profits play a role in this process by signalling where demand is rising or falling, where resources are most efficiently deployed etc; and by creating the incentives necessary to bring about appropriate resources. In essence, we accept this argument. We nonetheless regard returns equal to the cost of capital as an appropriate long-term benchmark for most or all of the suppliers in a market, and towards which fully effective competition would normally drive the market…." (CC 2002 p109)

The point to make here is not to refight the battle about accounting rates of return, but simply to note that, in consequence, the CC's calculation of excess profit in its first (profit-based) approach makes no distinction between the exercise of market power and the reward to superior efficiency. In terms of Figure 1, the CC's first approach makes no distinction between excess profit - what its second approach terms overcharge, namely the area below the actual market price and above the calculated competitive market price - and producer surplus, namely the area below the calculated competitive market price but above the costs of the intra-marginal plant.

These points are reflected in the considerable gap – indeed, the inconsistency - between the CC's two calculations in the cement investigation. From the perspective of the second approach and as reflected in Figure 1, total profit would be equal to overcharge at £92 million plus producer surplus which is not evaluated, yet total profit by the first approach averages only £30 million. Partly, as the report suggests, this reflects the observations at different periods of the business cycle. But it also reflects differences in stance towards different kinds of cost. From the economist's forward-looking cost-based approach, the calculations and considerations in the profitability approach must seem out of touch with present market conditions. From the accountant's profitability approach, the cost-based approach must seem to ignore the realities of actual incurred expenditures and the risks of survival over time. We note later the different choices that the CC and CMA made when having to decide between the two approaches.

7. The CMA's two approaches in the energy market investigation

This section seeks to construct a diagram for the CMA's energy market investigation analogous to the CC's diagram for the cement market. This is not straightforward because the CMA's Final Report redacted most of its data relating to the retail market. However, some comparable data is available from published Ofgem sources that can used to calculate some illustrative numbers, as shown in Table 2, to illustrate the CMA's two approaches to calculating the customer detriment in the energy market.

Table 2 Retail energy market data				
Supplier	Market share (%)[5]	Average indirect cost per domestic customer[6]	Average domestic supply profit (EBIT)[7]	Average domestic supply profit margin (EBIT as % of revenue)[8]
		2009-2012	2009-2014	2009-2014
Entrants	13.5			
SSE	14	£77	£230.6m	4.94%
Centrica	30	£96	£586.1m	6.93%
SP	10	£107	£82.1m	1.38%
E.On	13	£115	£80.3m	1.79%
RWE	9.5	£134	-£17.5m	-0.18%
EdF	10	£150	-£100.0m	-3.61%
Total	100		£861.5m	

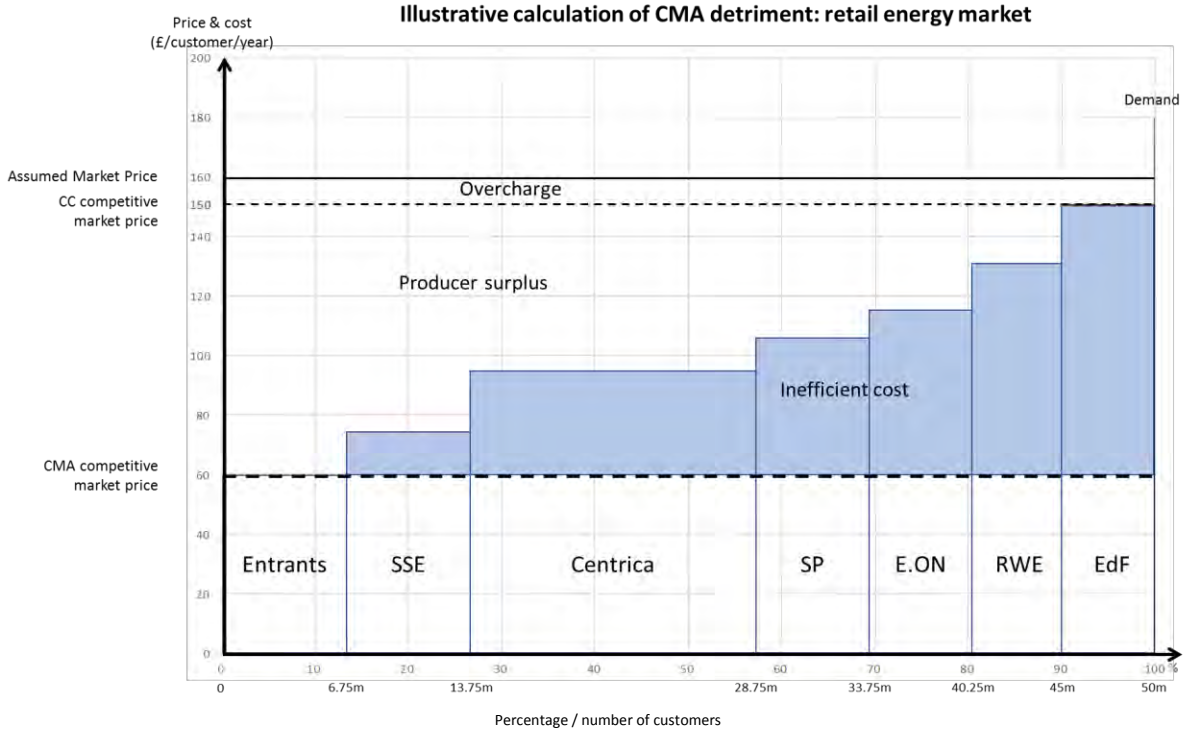
Figure 2 presents this data in a comparable format to the cement market in Figure 1. It shows the new entrants (in aggregate) and the Six Large Energy Firms. The horizontal axis shows the size of each supplier in terms of number of customers (both in absolute numbers and as a percentage of the total of 50 million single fuel customers). The vertical axis shows the suppliers' average unit costs, ranging from £77 to £150 per customer (net of wholesale and network costs etc). For simplicity, it is assumed that the maximum capacity of each supplier is equal to its actual customer numbers.

These are illustrative assumptions in order to elucidate the CMA's approach. It is not claimed that this is what the CMA assumed or that this is an accurate representation of the retail energy market. There are clearly differences between the cement and energy markets. For example, in practice the limits on energy suppliers expanding their output are not so much their capacities to supply as their

[5] Source: Ofgem retail market indicators for Q1 2016, simple average of gas and electricity markets. Total number of (single fuel) customers is assumed to be 50 million.
[6] Source: My calculation based on Ofgem et al (2014), Fig 50 and para 6.37.
[7] Source: My calculation based on Segmental Statements of Six Large Suppliers, per Ofgem website.
[8] Source: My calculation based on Segmental Statements of Six Large Suppliers, per Ofgem website.

ability to attract additional customers; residential energy customers may be less active in the market than industrial cement customers; and each energy supplier typically has several products offered at different prices whereas the CC assumed (in its calculations) no price discrimination and a uniform market price.

Figure 2
Illustrative calculation of CMA detriment: retail energy market



Assume for illustrative purposes that the average new entrant unit cost per customer is £60, where in practice this refers to what the CMA called mid-tier suppliers.[9] Assume, again for illustrative purposes, that the observed average market price per customer is £160 (though in practice there is considerable variation between tariffs and suppliers). A later calculation explores the implication of a lower market price.

Using the CC's cement market cost-based approach, the competitive market price would be assumed equal to the unit cost of the least efficient supplier required to produce in the market, viz EdF at £150. Hence the overcharge would be £(160-150) x 50 million (single fuel) customers = £500 million per year.

In contrast, the CMA's direct approach "involves comparing the average prices charged by the Six Large Energy Firms with a competitive benchmark price which is based on the prices charged by the most competitive suppliers". That is, the competitive benchmark is the cost of the *most* efficient or *lowest* cost plant, here assumed to be that of new entrants at £60. The resulting customer detriment is the area of the rectangle whose height is the difference between the actual market

[9] The CMA identified four of the largest entrants as 'mid-tier suppliers' and indicated that some of them were more efficient than the lower quartile of the six large suppliers. Little is known about the costs of the smallest entrants, who are not directly comparable insofar as they are exempt from certain social and environmental charges.

price and the unit cost of the lowest cost plant, and whose length is the annual volume of demand. That is £(160 - 60) x 50 million customers = £5 billion per year. In this stylised example, the customer detriment is ten times higher with the CMA's direct approach than with the CC's cost-based approach.

The CMA's indirect approach involves calculating then adding excess profit and inefficient cost. In calculating excess profit the CMA, like the CC, uses historic rather than forward-looking costs, and does not draw a distinction between excess profit and producer surplus. Suppose, by contrast, that excess profit is defined in Figure 2 as the entire area below the observed market price and above the cost curve. That is, it is equal to overcharge plus producer surplus. And suppose inefficient cost is defined as the extent to which actual costs exceed those of the least cost supplier, here assumed to be the average new entrant.

Under these assumptions, customer detriment given by the indirect approach (the sum of excess profit and inefficient cost) is precisely equal to customer detriment given by the direct approach (the difference between actual market price and the unit cost of the lowest cost plant). Again, the indirect approach is just a particular way of dividing up the rectangle defined by the direct approach. In this illustrative example, at an assumed market price of £160, the excess profit may be calculated as £2.947 billion per year and the inefficient cost as £2.053 billion per year, a total of £5 billion per year, the same detriment as in the direct approach.

This is an illustration of how, 'in theory', the CMA's two approaches could yield the same answer. Whether this is what the CMA assumed or intended is unknown. And whether or how the CC's cement approach could be modified to accommodate the different cost and pricing structures in the retail energy and other markets is a question for the CMA.

The CC (cement) and CMA (energy) calculations of customer detriment thus have important similarities. Both use two methodological approaches, one based on an accounting calculation of excess profit using historic costs, the other comparing observed average market price with the price estimated to obtain in a well-functioning competitive market using forward-looking costs.

More striking, however, is the difference in the basis for estimating the price that would obtain in the benchmark well-functioning competitive market. The CC based its estimate on the highest cost plant needed to meet demand, the CMA based its estimate on the lowest cost plant in the market. Presumably to reflect this latter assumption, the CMA added inefficient cost to profit in its indirect approach. As noted, the CMA's methodology increases the calculation of customer detriment by an order of magnitude over the CC's approach.

8. The CMA's direct approach

The next few sections examine in more detail the CMA's calculations. As noted above, the CMA's direct approach "involves comparing the average prices charged by the Six Large Energy Firms with a competitive benchmark price which is based on the prices charged by the most competitive suppliers, adjusted to allow for a normal return on capital and where appropriate for differences in suppliers' size, rate of growth and the cost elements that are outside of their control." Such adjustments were necessary because "the most competitive suppliers" were generally not earning

a normal or even positive return on capital, were sometimes an order of magnitude smaller than the large suppliers, were often growing fast, and to differing extents were exempt from certain social and environmental charges that applied only above specified customer numbers.

Not surprisingly, the Six Large Energy Suppliers challenged the CMA's assumptions and adjustments. The CMA rebutted these challenges. (CMA 2016 paras 10.67-10.80, pp 616-620) This paper is not in a position to adjudicate on these issues, but three more general points can be noted.

First, the CMA acknowledged that its calculated customer detriment was large in relation to the annual profits of the Six Large Energy Firms, and explained that this reflected their inefficiency. It meant that, at the calculated competitive price, these suppliers would not merely lose their excess profits, they would actually make losses except to the extent that they could increase their efficiency.

> "10.114 We note also that detriment calculated under the direct approach is similar to the net profits earned by the Six Large Energy Firms from their sales to domestic customers from 2012 to 2014, but significantly higher than our estimate of excess profits from domestic sales over this period. The implication is that there is a material degree of inefficiency in current prices. (ie, if prices were to decline to the competitive level, the Six Large Energy Firms would need to reduce their cost bases substantially in order to make profits in line with their cost of capital.)" (p 629)

Second, there seems some question whether the CMA's benchmark complied with its own *Guidelines for Market Investigation*. These *Guidelines* note that the market may be judged against a benchmark of a "well-functioning market", explained as "one that displays the beneficial aspects of competition … but not an idealized perfectly competitive market". (CMA 2016 para 5.43 fn 22 p 192) But the conditions that the CMA specified were quite idealized.

> "10.27 We have based our assessment on the principle that a competitive benchmark price in the domestic retail energy markets should fulfil the following criteria: *(a)* it should be reflective of the prices charged to active/engaged customers; *(b)* it should be reflective of the costs of an energy supplier which has reached an efficient scale (ie a large supplier) and which is in a steady state (ie the supplier that is neither growing nor shrinking rapidly); and *(c)* it should generate revenue that is consistent with a normal return (equivalent to an average EBIT margin of 1.25%)." (p 605)

In consequence, the adjustments that the CMA had to make to the actual costs of the comparator suppliers were very significant. The CMA ended up comparing actual prices of the six large suppliers with the CMA's guess at what just two of the much smaller mid-tier suppliers would charge *if* they were not exempt from costly environmental obligations and *if* they had reached an efficient scale and *if* they were in a steady state and *if* they were not loss-making and *if* instead they were earning a normal return on capital. It was thus a comparison between actual prices and a hypothetical more efficient alternative. The CMA acknowledged that its benchmark price was "a hypothetical construct, a 'supplier' that is a combination of the suppliers that we have identified as being the most competitive in the markets". (para 10.18 p 602)

How this hypothetical construct differed from "an idealized perfectly competitive market" is not entirely clear. And if it was inappropriate for the CMA to use an idealized perfectly competitive market as a benchmark, why did not the same prohibition apply to the particular idealized

hypothetical construct that the CMA did use? And how, finally, is the concept of "a competitive benchmark price" (singular) "in a steady state" to be reconciled with the insistence in the CMA *Guidelines* (para 10) that "competition is a process of rivalry", involving "cutting prices, increasing output, improving quality or variety", which presumably implies differences between firms in efficiency, cost and price at any point in time, as well as differences and changes over time?

Third, the CMA's precise calculations remain unknown and therefore not capable of properly informed appraisal and challenge. During the investigation, Oxera (2017), advising one of the SLEFs, argued that if the CMA had made what it considered proper adjustments to the costs of the mid-tier suppliers, this could more than wipe out the alleged customer detriment. Oxera estimated that the correct detriment figure could be anywhere between £0.7 billion (half of the CMA's estimated £1.4 billion detriment) and minus £0.7 billion (implying that the SLEFs were actually more efficient than the entrants).

As noted, this paper does not seek to assess the strength of that calculation. The point of concern is that the CMA's *Final Report* made significant further adjustments after the data room closed, so the final calculations could not be scrutinised by anyone and were not subject to consultation. And these final adjustments were apparently not negligible: Oxera estimated that they were about £1 billion – in other words, of the same order of magnitude as the claimed detriment itself. But since their details were redacted in the final report, literally no one other than the CMA panel knows or can know what the final calculations actually were. The concerns expressed by Friend (2016) are understandable.

9. The CMA's indirect approach: excess profit

In assessing profitability as part of its 'indirect approach', the CMA assumed that a normal profit would be a 10 per cent return on capital. For the SLEFs' business model it said that this would mean an EBIT (Earnings Before Interest and Tax) margin of just over 1.9%. On that basis, the CMA calculated that, in aggregate, the net revenues of the SLEFs exceeded a normal return by an average of £303 million per year over the period 2007-2014.

As with its other calculations, the CMA made numerous significant assumptions and modifications, which were challenged by the suppliers. Again, this paper is not in a position to adjudicate. But even taken at face value, £303 million is only one fifth of the cited £1.4 billion. It amounts to only about £12 on a dual fuel bill of around £1200 per year, or about 1%.

Even this figure arguably reflects an inconsistency in the CMA's position. The CMA noted that the achieved average EBIT margin in the Industrial and Commercial (I&C) market was around 1.9%. However, it said that the I&C market was lower risk than the domestic market because wholesale prices were more directly passed through to I&C customers. Adjusting for this difference in risk, the CMA estimated that the I&C 1.9% margin would correspond to around 2.4% in the domestic market. (CMA 2016 Appendix 9.13 para 184) Now average annual revenue in the domestic market was £26.5 billion (CMA 2016, Appendix 9.13, Table 1), so the higher benchmark would reduce excess profit by about (2.4% - 1.9% =) 0.5% x £26.5 billion = £132.5 million. Thus, if the actual I&C market (adjusted for risk) were taken as the competitive benchmark in the

domestic market, this would reduce the alleged excess profit by nearly a half, to about £170 million.

In other words, if normal profits are based, not upon theoretical assumptions but upon what is deemed acceptable in practice - recall that Ofgem deemed the I&C market too competitive to warrant investigating, and the did not challenge this - then the excess profit in the domestic market is under £7 per dual fuel customer per year. This is about half of one percent of an average annual duel fuel bill, and an order of magnitude less than the assumed detriment of £75 per household per year cited in the CMA minority report as the rationale for a wide-ranging price cap. Furthermore, as now explained, it seems that, whatever value is used, it is likely to be producer surplus rather than excess profit in the conventional sense.

10. Profit and producer surplus

As noted above, the CC and CMA calculations of (excess) profit do not distinguish between monopoly profit (overcharge) and producer surplus. Yet competition as normally understood is consistent with some firms making profits above a normal return. One of the large suppliers cited a publication coauthored by the CMA's present Chief Economist that made precisely this point. "The [basic competitive] theory predicts that the marginal firm in long-run equilibrium earns zero economic profits, but firms with lower costs will earn positive economic profits." (Lind and Walker 2003, p 4, cited in RWE 2015, fns 236, 237)

In practice, is producer surplus likely to be significant, because there are significant differentials in costs and efficiency, or should the calculated (excess) profit be accepted as largely monopoly profit or overcharge? The CMA applied its indirect approach for the eight-year period 2007-2014. Here, too, the CMA redacted almost all the figures. However, Table 2 above with Ofgem data provides clear evidence for differential costs and profits over similar periods.

The CMA focused on a comparison of operational costs: the indirect cost per customer account for the domestic supply businesses. Table 2 shows the average indirect cost per domestic customer over the period 2009-2012, for each of the Six Large Suppliers. Ofgem et al (2014) commented as follows.

> "On a per domestic customer basis, and adjusting for inflation, SSE has consistently had the lowest costs and EDF and RWE the highest costs. The supplier with the highest costs had total indirect costs that were 76 per cent higher than the supplier with the lowest costs in 2012 and 32 per cent higher than the average for the six largest suppliers. The variation in indirect costs among the major suppliers has remained significant over time, with little convergence in costs, as one might expect if competition were driving down costs to the efficient level over time." (Ofgem et al 2014, para 6.37)

The last two propositions in the final sentence are not sustainable, either in terms of economic theory or as an empirical proposition, as explained elsewhere.[10] Unfortunately, they may have

[10] " … economic theory does not imply, as claimed, that operating costs of suppliers in a competitive market will converge over time; as it happens, however, the evidence presented in the *Assessment* suggests that operating costs of the major suppliers *did* converge over the period 2009 – 2012, arguably by more than the "little convergence" referred to in the *Assessment*; and the extent of cost differences between major suppliers, and the extent of convergence, reflect the impact of state ownership of one major supplier as well as the extent of competition; after removing that

influenced the CMA to believe that competition had not been effective. However, the point here is to establish a significant difference in cost between the suppliers. This implies that producer surplus is likely to be significant in relation to excess profit, rather than negligible.

Not surprisingly, significant differences in cost mean significant differences in average profitability (EBIT: Earnings Before Interest and Tax) between the six large suppliers, and this is what Table 2 shows. In fact, over the period 2009-2014, the largest supplier Centrica accounted for no less than two thirds of the total domestic supply profits (£586.1m/£861.5m = 68%). The two largest suppliers (Centrica and SSE) together accounted for 95% of total accounting profits.

The average domestic profit margins, defined as the average ratio of EBIT to revenue, indicate that two of the six large suppliers made profit margins in the range 5-7% of revenue, two made low profit margins (about 1.5% of revenue) and two of them were loss-making. These data confirm that producer surplus, reflecting differences in profits between suppliers, must be a very significant part of the CMA's £300 million average annual "excess profit", and monopoly profit or overcharge a correspondingly smaller part.

To illustrate with Figure 2, suppose as before that the actual market price were £160 and, on the CMA's direct approach, total profit (overcharge plus producer surplus) were £2.947 billion per year. On the CC's cost-based approach, overcharge (relative to EdF's marginal plant cost of £150) would be £10 x 50m customers = £500 million. So producer surplus would be the remaining £2.447 billion. Overcharge, or monopoly profit, would be only about one sixth of total calculated excess profit. There is, however, reason to believe that even this is an over-estimate of overcharge in the retail energy market.

11. Pricing below cost

The Figure 2 numbers are obviously very sensitive to the assumed level of market price. What, if anything, can be said about actual market price on the Table 2 data? The absolute levels of the EBIT profits and profit margins suggest another very important point about the competitiveness of the market. On average, two of the large suppliers made a loss rather than a profit over 2009-2014. (And suppliers' losses were heavier in the earlier period 2007-2008.[11] So the above figures overstate rather than understate suppliers' profits over the whole period 2007-2014 to which the CMA's indirect approach calculations apply.) Moreover, these EBIT margins are measures of profit before deduction of any return on capital. So two large suppliers made even more severe losses relative to normal profit than these figures indicate, and whether the two companies with positive but low margins actually covered their cost of capital is unclear.

These losses suggest that, for the least efficient producer(s) in the market, average price over the period 2007 – 2014 was not above cost, or even equal to it. It was *below* cost. This suggests, in

comparator the extent of cost difference is markedly less than indicated in the *Assessment* and the convergence over time is markedly greater than indicated there." Littlechild (2015a)

[11] "We note that the level of profits in excess of the cost of capital earned on domestic customers was significantly higher from 2009/10 onwards, than in 2007 and 2008, when the industry made economic losses overall (ie profits which were less than the firms' cost of capital)." CMA (2016a), para 10.95

turn, that not merely some but probably *most,* possibly *all,* of the CMA's calculated "excess profit" was producer surplus rather than monopoly profit, relative to how the CC cement case defined a competitive market price.

In an earlier investigation, the CC (2009) observed that excess profits would not indicate a failure of competition if they were specific to a particular firm. [12] If two of the six large energy suppliers were regularly making losses in this market, and two others were barely breaking even, it throws doubt on any suggestion that the profits of the remaining two large suppliers in the market reflect market power. The more plausible conclusion is that average price in the market during the period 2007—2014 was not above what the CC deemed to be "the competitive level", and was more likely below it.

To illustrate from Figure 2, suppose the average market price were actually about £150 – that is, equal to the unit cost of the highest cost supplier EdF - instead of £160. Then overcharge would be zero (according to the CC's cost-based benchmark of competitive market price), and the entirety of suppliers' profits would be producer surplus.

If average market price were £120 (just above E.On's average unit cost and below RWE's, to reflect the fact that RWE as well as EdF was loss-making), then again there would be no overcharge. In fact, there would be an undercharge of £(150 – 120) x 50 million customers = £1.5 billion. In contrast, using the CMA's direct approach, with £60 as the assumed efficient cost, there would be a customer detriment of £(120-60) x 50 million = £3 billion.

How to calculate customer detriment when some firms are making losses? Figure 2 suggests that, using the CMA's indirect approach, there are two equivalent ways to express the calculation (that is, two ways to divide up the total detriment rectangle that has area £3 billion). One way is to take total producer surplus of the four profitable suppliers at the market price of £120 (ignoring the losses incurred by RWE and EdF) plus the inefficient costs of all six large suppliers (excluding that part of the inefficient costs incurred by RWE and EdF that exceed the market price of £120 and that are reflected in losses to those companies).

Alternatively, and more simply, the calculation could be expressed as total net producer surplus at a market price of £120 (viz the profits of the first four suppliers net of the losses of the last two suppliers) plus total inefficient costs of all six suppliers. Taking this latter approach, net producer surplus (or profit) at market price £120 may be calculated as £0.947 billion. (This is equal to the £2.947 billion profit at £160, less £40 x 50 million = £2 billion.) Total inefficient costs amount to £2.053 billion. Again, producer surplus and inefficient cost sum to £3 billion.

[12] C.f. "6.152 In order to be indicative of a failure of competition, profits in excess of the cost of capital must be persistent, ie there must have been sufficient time for a competitive response (entry or expansion) to have occurred, rather than being just a short-lived or temporary situation relative to the life of the investment. Profits should also not be specific to a particular firm; we would expect that suppliers who are particularly innovative or efficient will realize higher profits than others in the same market." CC (2009)

12. The CMA's indirect approach: inefficient costs

As the second part of its indirect approach, the CMA calculated "the extent to which suppliers have incurred costs inefficiently (that is, whether costs are higher than we estimate an efficient supplier would incur)". (CMA 2016 para 2.164)

As a base-case benchmark for the cost of an efficient supplier, the CMA used the lower quartile indirect cost per customer of the SLEFs. (That is, it benchmarked these large suppliers against each other, not against smaller suppliers.) This gave an estimated average inefficiency cost of £290 million per year over 2007-2014. This was an average over some large suppliers that were less efficient than the benchmark and other large suppliers that were more efficient. The CMA also indicated that if the benchmark were to be set on the basis of another supplier - name redacted but presumably the most efficient large supplier SSE – then the average inefficiency cost would increase to around £850 million a year. (CMA 2016 para 10.101)

This lower quartile assumption provides an additional explanation for the differences between the CMA's direct and indirect calculations. In order to yield equal answers, the two approaches need to be defined with respect to the same level of efficient unit cost. However, the CMA's direct approach used as a benchmark a hypothetical construct reflecting the lowest cost suppliers in the market, whereas the CMA's indirect approach used a preferred benchmark based on the lower quartile cost of the six large suppliers. This would build in a difference.

To illustrate using the numerical example in Figure 2, at an assumed market price of £120 and benchmark efficient cost of £60, the CMA's direct approach yields a customer detriment of £3 billion, as previously calculated. Under the CMA's indirect approach, if Centrica were deemed to have the lower quartile cost at £96, the detriment calculated via the indirect cost would be £(120-96) x 50 m = £1.2 billion. Or if the even lower cost of SSE at £77 were taken as the benchmark, the detriment would be £(120-77) x 50 m = £2.15 billion. Thus, even if excess profit were calculated consistently with the direct approach calculation (using the same opportunity costs rather than historic accounting costs), detriment calculated via the indirect approach would be about one or two thirds of the detriment calculated via the direct approach.

At one point the CMA proposed to exclude from its calculation of inefficient cost those large suppliers that were more efficient than the lower quartile benchmark. Doing so – that is, taking the average over only those suppliers that were less efficient than the benchmark - increased the aggregate inefficiency cost from £290 million to an average of £420 million per year. (This implies that the outperformance of the more efficient large suppliers was about £130 million per year.) Suppliers argued that this was unreasonable and that the outperformance should be deducted from the estimated detriment i.e. the £290 million figure should be used rather than the £420 million. The CMA rejected this and continued to omit the outperformance of the more efficient suppliers because "the evidence did not indicate that these firms were particularly efficient compared to the mid-tier suppliers". (para 10.100) But it also recognised "some uncertainty as to the overall efficient level of costs" and considered the £290 million as part of a sensitivity analyis.

Figure 2 provides a way to resolve this issue. Suppose inefficient cost in the CMA's indirect approach is defined with respect to a benchmark level of cost - such as the lower quartile unit cost

– that is above (or for that matter below) the minimum unit cost. If the direct and indirect approaches are to yield the same level of customer detriment, then i) as before, the direct approach must be defined with respect to the same level of unit cost as the indirect approach and ii) either the outperformance of the lowest cost plant(s) must be subtracted from the calculation of profit (more precisely, producer surplus) or, more straightforwardly, the outperformance must be netted off the calculation of inefficient cost.

The protesting large suppliers were thus correct in principle, if the aim was to obtain a consistent calculation of customer detriment. In practice, however, the other conditions were not fulfilled, since the CMA did not calculate both the direct and indirect approaches using the same benchmark efficient cost, and the indirect approach profit calculations were on a historic cost accounting basis that differed from the forward-looking cost basis used for the direct approach and the inefficient cost calculation in the indirect approach.

13. Should inefficient costs be included in customer detriment?

All this assumes that it is reasonable to estimate and include calculations of inefficient cost in estimating customer detriment. The CMA energy market investigation did so without particular comment or discussion. But is this consistent with economic analysis and usual in competition authority practice?

There is no doubt that some large energy suppliers are less efficient than others, as Table 2 indicates. But ther are such efficiency differences in all actual markets. There is also a basis in the economic literature, notably Liebenstein (1966) on X-efficiency, for arguing that a lack of competitive pressure can lead to lower efficiency. Scherer (1970 p 408) suggested that "the static inefficiency burden of monopoly does not appear to be overwhelming. But it is also not so slight that it can be ignored." Early textbooks (e.g. Hay and Morris 1979) wondered what more specific inference to draw for competition policy.

Present policy to encourage competition is based, inter alia, on the assumption that it will improve efficiency. Mergers or restrictive agreements might be justified in terms of their impact on efficiency. And network monopoly price caps in the UK and elsewhere are customarily set by observing differentials in efficiency, and seeking to provide an incentive to increase efficiency where competition in the market does not obtain. But do or should competition authorities routinely seek to quantify the extent of inefficiency and its impact on market price, and thereby make adjustments for inefficient costs in their assessments of customer detriment in competitive markets?

Two previous reports by the CC that predated market investigations commented on cost inefficiency. In the case of *Supermarkets* the CC (2000) considered whether to adjust for inefficiency. It decided not to do so because the inefficient companies in question made losses, so that shareholders rather than customers bore the consequences, and the effect of any adjustment on its profit calculation was minimal.

> "2.153. We also considered whether adjustments should be made to take account of any inefficiencies among the major parties. We found evidence that two of the major parties had higher costs than the other three (see paragraph 10.18). In one case, this was explained by cost disadvantages, attributable to smaller stores and

> distribution costs. In the other, we estimated that there were potential annual cost savings to be made of some £150 million. In both cases, there was clear evidence that profitability had suffered accordingly, so that shareholders rather than consumers were bearing the consequence. We considered whether industry profitability would have been significantly higher had these excess costs been eliminated, but found that the effect was minimal." (CC 2000 p 43)

Table 2 shows that the two least efficient suppliers routinely incurred losses in the retail energy market too. But the CMA took no explicit account of this in its assessment.

In *SME Banking*, the CC (2002) initially considered that it should identify an efficient level of operating costs and add any excess cost to its estimate of profitability, and that the more efficient suppliers should be the benchmark rather than the least efficient supplier.

> "2.391. In general, if market power exists it is likely to result in excessive prices and profits. It may also, however, be reflected in higher costs than would be the case in a more competitive market structure. If this occurs it will reduce measured profitability, and attempts to establish whether charges are excessive by reference to actual profitability will underestimate the extent of any such excess profits. In principle, this suggests that we should seek to identify an efficient level of operating costs, and add to our estimate of long-term profitability any excess costs that might be identified.
> 2.392. RBSG argued that the CC should adopt the *least* efficient comparator as the benchmark. In a competitive market, however, competition or the prospects of entry should act as an incentive to reduce costs towards those of the most efficient operators. The persistence of efficiency significantly below this level would be an indication of lack of full competition; and the notion that an entrant would be ready to enter provided it could match the efficiency of the least efficient incumbent is only tenable if the entrant believes there will be insufficient competition to threaten its position. Therefore, in assessing the scope for lower prices, we believe costs should be based on those of the more efficient suppliers."(CC 2002 Ch 2 p 99)

But on further consideration, the CC decided on cost-income benchmarks "significantly above" those that it initially suggested. They were similar to those of the average of the four largest banks. The CC applied a cost-income adjustment to only one of the six major banks examined, explaining that this was "in order to allow for other factors that influence the ratios: we acknowledge that this is a generous approach, and that the scope for efficiency improvements may well prove significantly greater". (2.397) There seems no reason to think that the CC erred in not using the more efficient suppliers as the benchmark. In a recent re-investigation of some SME banking issues (CMA 2016), the question of cost efficiency and possible efficiency adjustments did not feature.

The CMA's approach to the retail energy market, where it used a lower-quartile cost benchmark in its indirect approach and a lowest-cost benchmark in its direct approach, thus stands in contrast to the CC's approach in SME banking. The CMA gave no indication that the scope for efficiency improvements might well prove significantly greater than it had assumed: on the contrary, it commented that "A large part of the detriment we have observed in the form of high prices is likely due to inefficiency rather than excess profits, such that if we were to eliminate the entirety of the detriment we have observed through a price cap it would create substantial losses for the sector as a whole". (CMA 2016, para 11.90)

Although the CC's 2003 *Market Investigation Guidelines* briefly mentioned the possibility of calculating excess costs relative to those that would obtain in a well-functioning market, in practice the CC never actually did this, and its 2013 *Revised Market Investigation Guidelines* note that practical considerations might prevent it. The centrality of a calculation of excess costs is unique to the CMA energy market investigation. It does not derive from the CC/CMA *Market*

Investigation Guidelines. As documented elsewhere (Littlechild 2015b), it can be traced back to the *State of the Market Assessment Framework* and the subsequent *Assessment* put together jointly by Ofgem, the OFT and the CMA (2013, 2014), and these in turn reflect the approach of Ofgem (2008).

Perhaps some overseas competition authorities have made significant adjustments for efficiency in assessing a competitive market price. But there is no precedent for doing so in UK market investigations, at least not to the degree that the CMA energy market investigation did.

14. Some questions about cost differences in the retail energy market

Presumably there will always be differences in costs between companies in actual competitive markets, as some companies innovate more quickly or successfully than their rivals, or simply maintain efficiency as others fall behind. Why then should differential costs be regarded as a cause of customer detriment in the retail energy market but not, in general, in other markets? The CMA seemed to assume that competition should have forced out the high-cost providers, and failed to do so because of 'weak customer reponse', but it did not show or claim that cost differentials were greater in this sector than in others. Are they a cause of detriment here because "energy is a special and essential service"? (House of Commons 2018, p 3) Or should cost differentials be regarded as a cause of customer detriment in all markets, a point that the CC failed to realise in the case of cement (and, presumably, in most of its other market investigations)?

How is it that customer response in the retail energy market was so weak that suppliers were not under pressure to be efficient, yet so strong that suppliers in aggregate do not seem to have been able to set prices above "the competitive level", and two suppliers repeatedly made losses?

Why has the capital market not functioned to discipline efficiency here, regardless of the strength of customer response? Why did company managers and shareholders accept losses, or minimal margins of tens of million pounds, if a share of efficiency savings of £1 to £2 billion per year was available?

Should "weak customer response" be singled out as responsible for differential efficiency when other possible factors might be relevant that could have different policy implications? For example, the CMA found that Ofgem's regulatory interventions had an adverse effect on competition, and recommended these interventions be rescinded. How far should Ofgem then share the responsibility for any differentials in efficiency and increases in prices?

Economic theory and evidence suggest that publicly owned entities are likely to be less efficient (e.g. De Alessi 1980, although there is a considerable literature on this theme). One of the six large suppliers, Electricite de France (EdF), is largely in public ownership, and Table 2 shows that it has the highest operating cost of the six large suppliers. Should a prohibition on publicly owned suppliers be considered, particularly since several local authorities are now entering the market?

15. Comparing the CC and CMA approaches

The reason why the customer detriment was so high in the energy market is not because competition is less effective in the domestic retail energy market than in other markets. It is because the CMA adopted different and more severe criteria for calculating customer detriment than used in previous market investigations.

In the two cases examined (cement and energy), the CC and CMA each made two estimates of customer detriment: one based on a historic cost calculation of excess profit, the other based on an assessment of how observed market price compares with the price that was conjectured to obtain in a hypothetical well-functioning competitive market.

The differences are 1) that in the first approach, the CMA added an estimate of inefficient cost to its estimate of excess profit, which was not done in previous CC investigations; and 2) that in the second approach, the CMA assumed that a well-functioning competitive market would be characterised by price equal to the *lowest* unit cost plant in the market rather than the *highest* unit cost plant. Illustrative calculations in this paper suggest that the difference in customer detriment between the CC and CMA approaches could well be an order of magnitude.

A third difference is the contrasting choices made by the CC and CMA as between their two estimates. The CC decided in favour of the profitability approach because its cost-based approach (involving the postulated well-functioning competitive market) was based on only a single year's data and was "based on a model where, necessarily, we have had to make significant simplifying assumptions". But at least these were assumptions about the costs of running an actual existing cement plant, they implied financial viability for the suppliers (relative to forward-looking costs), and the parties could challenge the calculations. The CC acknowledged that its two approaches were different, and erred on the side of caution with its lower estimate of customer detriment.

The CMA had more than a single year's data for its direct approach (again involving the well-functioning market) but was evidently less concerned about the limitations of significant simplifying assumptions. Its direct approach calculation was its preferred estimate of customer detriment, even though this was "a hypothetical construct", inconsistent with the large suppliers covering their costs, and in the event unable to be checked by anyone. The CMA argued that its two approaches were basically the same, and reinforced each other, and it put greater weight on its higher estimate of detriment.

The CMA's energy market investigation raises some important questions. The CMA claimed that its two approaches – direct and indirect - to calculating customer detriment were equal "in theory", without explaining how this was so. Did the CMA intend its claim to be taken literally, or was it just a figure of speech to help justify the use of two different calculations of customer detriment?

If the CMA's claim was intended to be taken literally, does the simple model in this paper, in which two calculations give the same result, capture what the CMA had in mind? If so, were its estimates not compromised by the inconsistency between the historic accounting costs used in the calculation of (excess) profit and the forward-looking opportunity costs used in the other calculations? And by the inconsistency between the assumed benchmarks in the direct approach

and the calculation of inefficient costs? And how far can the interpretation in this paper be extended to different or more complex cost, demand and pricing structures (such as flexible capacity, less engaged customers and differentiated tariffs) that might characterise the retail energy sector if not the cement sector? Alternatively, if the interpretation in this paper is not what the CMA had in mind, how exactly were its two approaches equivalent?

16. Conclusions

The CMA investigated the GB domestic retail energy market and found excess profits, prices significantly above the competitive level, and a customer detriment averaging £1.4 billion per year over 2012-2015 and almost £2 billion in 2015. This paper has suggested, on the contrary, that excess profit in the domestic retail energy market is at most small and reflects producer surplus rather than genuine excess profit. If the CC's more conventional cement market approach had been adopted, then the average price in the retail energy market would have been found to be below rather than above what the CC conceived of as "the competitive level".

The CMA's high customer detriment derives from the its decision to add an estimate of inefficient cost to its estimate of excess profit, and from its novel interpretation of the nature of a competitive market. The CMA assumed that a well-functioning competitive market would be characterised by a price equal to the unit cost of the most efficient supplier in the market. It then took it upon itself to guess the price that would be charged by such a supplier, "a hypothetical construct, a 'supplier' that is a combination of the suppliers that we have identified as being the most competitive in the markets". The outcome was an unprecedentedly high level of customer detriment, that fuelled a political and public demand for introducing widespread price controls. The CMA panel had explicitly advised against such controls, but they captured the public imagination, and the Government not surprisingly succumbed.

The CMA cannot say it wasn't warned about the plausibility of its stance.[13] This paper has argued that the problem lies in the CMA's definition of customer detriment. How best to assess adverse effects on competition and to estimate their possible detrimental effects on customers lie beyond the scope of this paper. But we can at least ask whether a CMA panel should really be encouraged to speculate in detail on what a well-functioning competitive market would look like, and more particularly to assume that it would be characterised by all competitors being as efficient as the most efficient competitor in the market at the time of the market investigation.

This has implications beyond the conduct of competition policy. If the outcome of a well-functioning competitive market is represented, not by the intersection of the market supply and demand curves, but by a price equal to where the supply curve starts on the vertical axis, then economics textbooks will need some rewriting.

[13] "Overall we find it surprising that the majority of the CMA panel does not feel that stronger interventions are justified if they believe their detriment estimates are robust. Either the CMA has substantially overestimated the detriment of non-engagement or the majority of the panel are being extremely optimistic about their ability to raise consumer engagement." (Deller et al 2016 p 5)

The approach of the CMA's energy market investigation panel has been challenged by large suppliers, by myself and other former GB energy regulators, and by several independent UK regulatory economists. However, the CMA's customer detriment figure has been widely albeit uncritically accepted, and its methodology has been officially endorsed by a Parliamentary Committee.[14] The CMA itself, and Ofgem, and economists from other jurisdictions, have not spoken. Perhaps it is time to hear from them.

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[14] "30. … In the absence of any appeal against the Competition and Markets Authority's findings and after review of the Authority's methodology, we were unconvinced by criticisms of the £1.4 billion annual customer detriment figure. We found no valid reason to question this figure." House of Commons (2017), p 14

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