

# Submission from Economics New Zealand on the draft petrol market report

September 13 2019

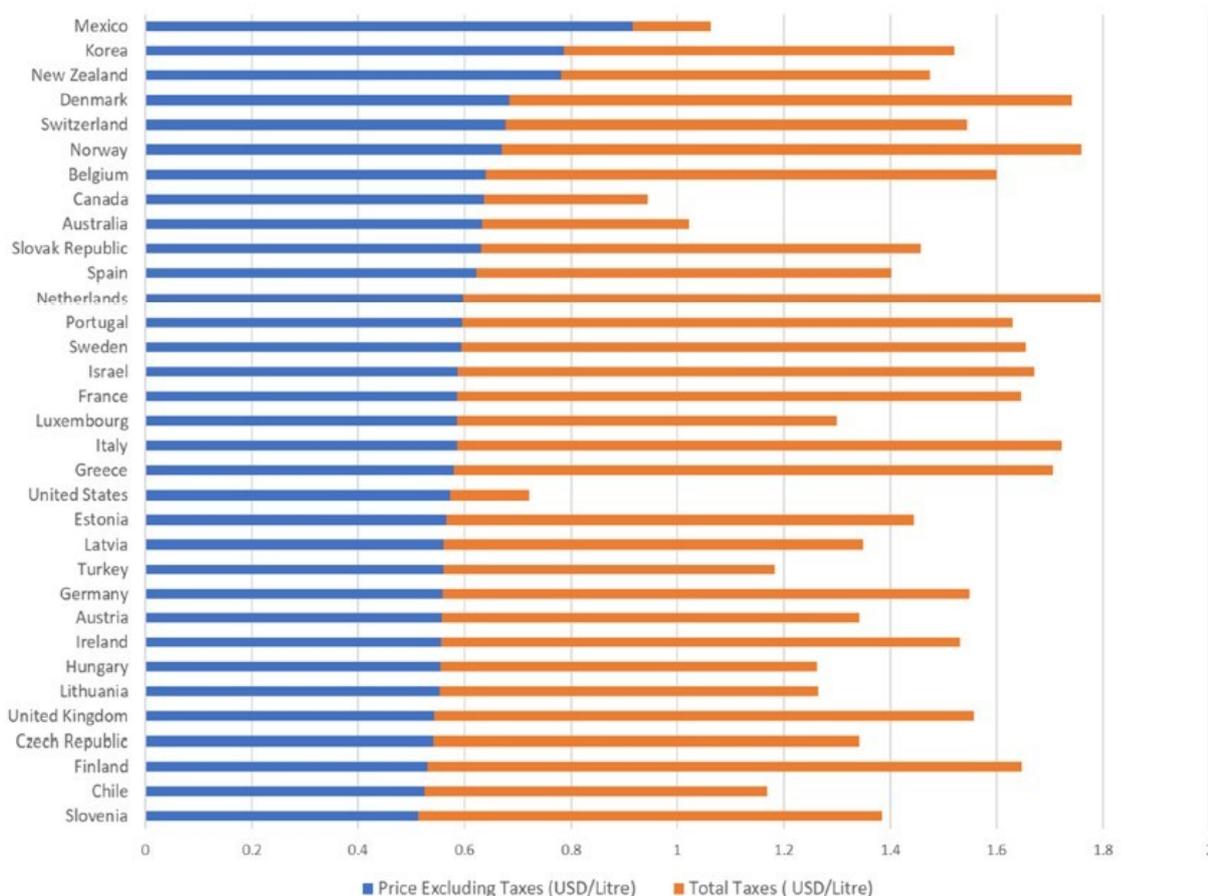
## Summary

This submission makes two methodology points. One is that the comparison of New Zealand petrol prices with those overseas should be made on a purchasing power parity basis, not at spot market exchange rates. The other is that one anomalous regression result is more likely to be a statistical artefact than a genuine behavioural pattern.

## Exchange rate conversion of petrol prices

Figure 3.8 on page 82 of the petrol market study is reproduced below.

**Figure 3.8** Pre-tax premium petrol prices in OECD countries (Quarter ended March 2019)



Source: International Energy Agency, Energy Prices and Taxes (Quarter 1 2019).

It shows the price at the New Zealand pump of a litre of premium petrol in a wide range of higher income countries, standardised by being converted into US dollars. Eyeballing the graph, you see New Zealand is there at roughly US\$1.47. At the exchange rate of the time (March quarter '19) of

68 US cents, the price converts into NZ\$2.16, which looks right.

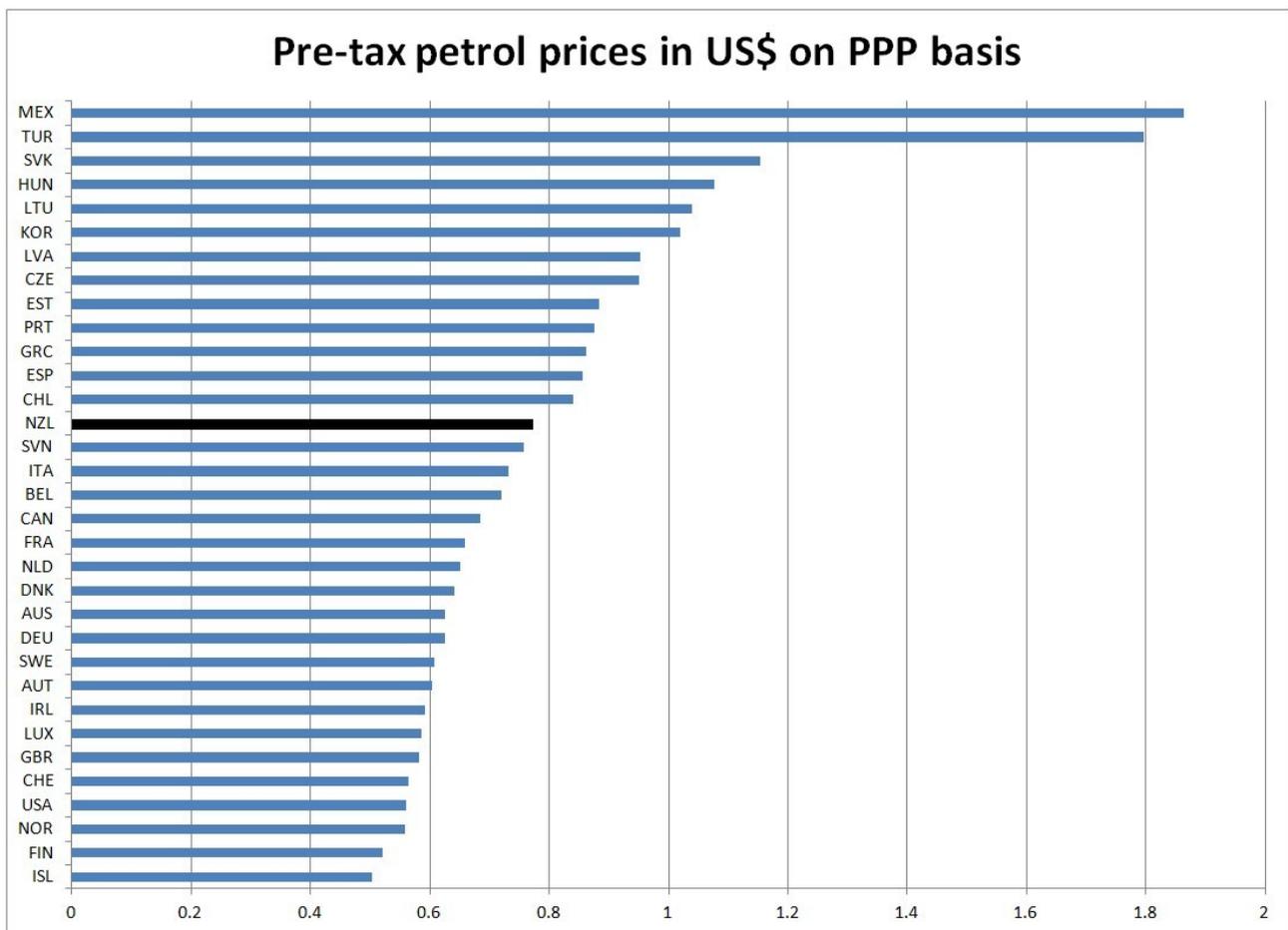
Because the price at the pump is heavily affected by local taxes, for competition policy purposes you need to focus on the price ex taxes, which is shown in blue in the graph. New Zealand does not show to advantage, with the third highest petrol price.

However, the ordering of the countries is puzzling. Your first inclination is to go looking for some underlying explanatory patterns - transport costs from major oil fields or refineries? - but it's hard to spot any. The three countries at the top - Mexico, Korea, us - are as odd an assortment as you'll ever see. The three at the bottom - Slovenia, Chile, Finland - don't obviously have much in common, either.

The ordering could of course reflect differences in local competitive intensity. You look at Mexico's top billing, for example, and you wonder about Pemex, a state owned monopoly up to 2013 which still has nearly three quarters of the petrol stations. You wouldn't know about the rest of them without some intensive investigation along market study lines.

But the somewhat jumbled pattern might also partly reflect the fact that the petrol prices have been converted into US dollars at market exchange rates, rather than at purchasing power parity (PPP) exchange rates. Because spot market exchange rates are volatile, you shouldn't be drawing any long-term competition policy conclusions about petrol (or anything else) on the basis of an exchange rate that might show a quite different picture a few months down the track.

These international comparisons are more normally, and rightly, done on a PPP basis (and indeed the Commission has used PPP rates in, for example, regulatory benchmarking of international telco prices). Recasting your Figure 3.8, here's what happens when you convert ex tax prices at PPP. The PPP rates are the OECD's PPP estimates for calendar 2018: while they are not precisely aligned with the March quarter '19 date of the petrol price data, for macroeconomically stable developed economies this does not matter as their PPPs tend to move slowly. The data are also slightly imprecise as the original price points have been eyeballed from Figure 3.8 rather than sourced from the IEA database, but using exact data would not alter the main conclusions.



In New Zealand's case, the pre-tax petrol price doesn't change much. It was around 77.5 US cents before: at the March quarter market exchange rate of the time, 68 cents, that was NZ\$1.14. The PPP exchange rate wasn't very different: it was 67.6 cents. So our local price translated into US\$ at PPP was 77.1 US cents, rather than the 77.5 US cents price you get at market exchange rates.

But *other* countries' prices move around quite a lot when their PPP rates are used instead of their market exchange rates. And the end result is that our relative position changes significantly. We were third highest out of 33 on a market rate basis: on a PPP basis we're 14th out of 33. Again noting the imprecision of using eyeball data rather than precise ones, an exact measurement might produce a slightly different ranking, but the qualitative conclusion is the same. The "we're one of the dearest in the OECD" line of argument does not withstand an entirely conventional, alternative way of making the comparison. It is also worth noting that the PPP ordering also makes a bit more intuitive sense than the market rate one: the bottom three, for example (now Norway, Finland, Iceland) look like a more coherent bunch.

There are still good reasons for having a market study in the petrol market: the rates of profitability identified in the market study, for example, need investigation. But I would at a minimum supplement the message suggested by Figure 3.8 with a PPP version of the same numbers. While there is a good case for going further and dropping the spot market rate comparison completely, I accept that people have seen it referred to (eg in MBIE's price monitoring) and a better approach would be to show both, but explain why PPP shows another and (in my view) more reliable picture. Deemphasising the current version of Figure 3.8 would also lower the risk of the report seeming to endorsing a mistaken logic that "high prices indicate a competition problem".

## **An anomaly in the regression results**

It was excellent to see regression analysis applied to the wealth of data available, and it yielded generally plausible, significant, and interesting results. There was one oddity, however. In F69.4 on p369 the draft report says (my explanatory glosses in square brackets):

It is not clear why these [regression] models show a significant price effect [in New Zealand] on the same day as a change in the Singapore benchmark, since it takes some time for a tanker to physically bring fuel to New Zealand. One possibility is that this is related to executive reward systems inside one or more import firms. We understand that some industry executives are rewarded for profitability assessed against the replacement cost of fuel, rather than the cash cost of fuel sold.

It is always tempting to find an explanation for a surprising result, but the same-day response still looks anomalous. An alternative suggestion is that the Singapore spot price is serially autocorrelated. The correct relationship is between the New Zealand board price and the Singapore price some days earlier (let's say four). But the Singapore price at  $t = 0$  is likely to be very similar to the Singapore price at  $t = t + 4$ , so the price at  $t = 0$  will show up in the regression almost as well as the  $t = t + 4$  price, even if there is no real relationship.

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