Why do we index the regulatory asset base?

What is the regulatory asset base?

The regulatory asset base (RAB) is an accumulation of the value of investments that a service provider has made in its network. It includes assets of various useful lives. Most of these assets depreciate in value, although a small number (such as easements and land) do not.

What return is needed to attract investment?

The return investors receive on their assets should reflect the risks of their investment. These risks include the prospect of inflation eroding the investor's purchasing power. An allowance for expected inflation provides compensation for this risk.

There are three main ways to provide compensation for inflation. Each approach provides the right amount of compensation.[1]

The three main approaches

The three main approaches to accounting for inflation are:

1. Real rate of return approach – This approach combines a real rate of return (which is lower than a nominal rate of return by the degree of expected inflation) with an indexed RAB. Compensation for inflation is provided only through the indexation of the RAB.
2. AER approach – This approach combines a nominal rate of return with an indexed RAB, and a negative revenue adjustment. Because compensation for inflation is provided through both the RAB and rate of return, the negative revenue adjustment is needed to prevent double compensation for inflation. We make this revenue adjustment through the depreciation component of our decisions. Our approach produces an identical revenue outcome to the real rate of return approach.
3. Nominal rate of return approach – This approach combines a nominal rate of return with an unindexed RAB. Compensation for inflation is provided only through the rate of return.

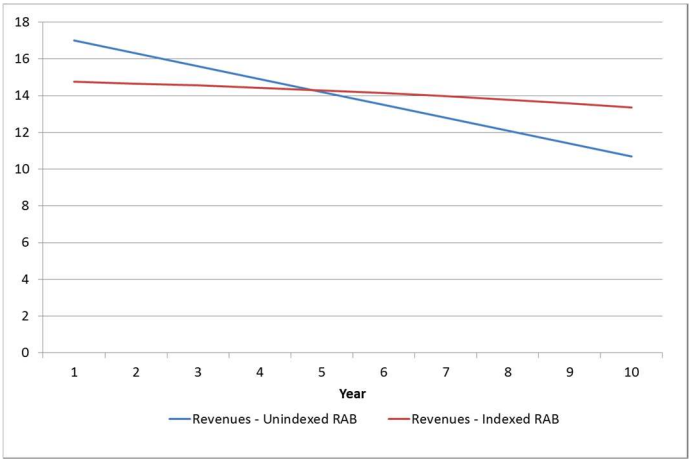
[1] All three approaches are equivalent in net present value terms.

The first two approaches (which involve indexing the RAB) produce identical revenue profiles, while the third approach (which does not index the RAB) produces a relatively steeper path.

What revenue path does each approach produce?

Figure 1 shows the revenue paths of the three approaches. Approaches 1 and 2 (where the RAB is indexed) produce an identical and relatively flat revenue profile. Under approach 3 (where the RAB is unindexed) revenues are higher in the earlier part of an asset's life and lower later in the asset's life.[2]

Figure 1: Revenue path example – indexed vs unindexed RAB approaches ($ nominal)



What happens to revenues if we change approach?

If we were to stop indexing the RAB then investors would no longer receive compensation for inflation, without further adjustments to our approach. Because of the negative adjustment we make to revenue, our approach is effectively

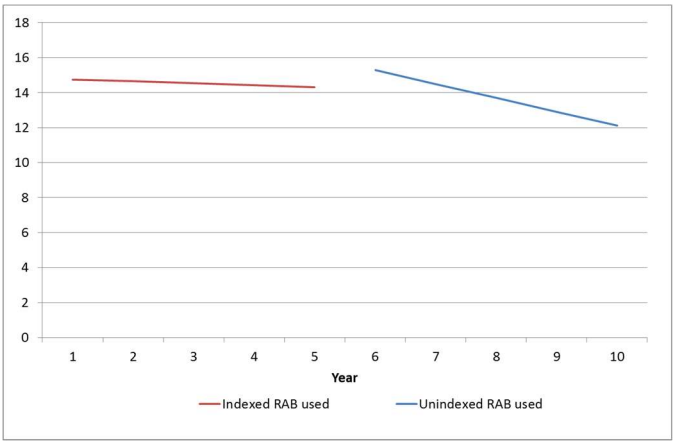
[2] The example uses an asset value of $100 with an expected life of 10 years, a nominal rate of return of 7% and expected inflation of 2.5%. We have also excluded the operating expenditures and tax amount from the calculation of revenue to simplify the examples shown here, and because these components have a similar effect under each approach.

applying a real rate of return. Presently, this is around 3.5 per cent. If we stopped indexing the RAB we would then need to apply a nominal rate of return which is around 6 per cent at present.[3]

More importantly, if we stopped indexing the RAB then the service provider would recover a greater proportion of revenues sooner. This would mean revenues and prices would increase in the near to medium term.

Figure 2 shows the impact of switching from an indexed RAB approach to an unindexed RAB approach mid-way through the life (end of year 5) of the same asset used in figure 1. There is a step increase in revenues in the year the change occurs. The increase is about 7% between years 5 and 6 in this example. It takes until year 9 (the year before the asset is replaced) for the revenues to be lower than had the RAB continued to be indexed. Extending this across an entire RAB, would see increases in revenue across every asset, although the size of the increase will vary depending on the remaining value of the asset and the remaining useful life of the asset at the time of the switch.

Figure 2 – Impact on revenues of change in approach mid-way through an asset's life ($ nominal)



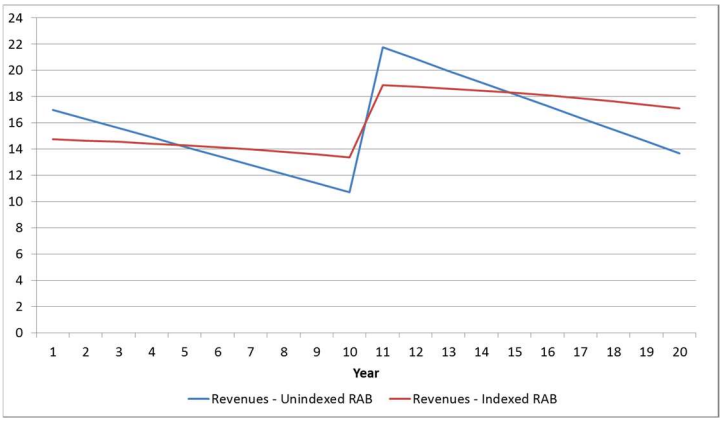
What happens to revenues when assets are replaced?

Replacing assets will virtually always cause an increase in revenues.[4] The increase, however, is greater when the RAB is unindexed. Indexing the RAB, in contrast, reduces the revenue jump that can occur from the replacement of assets.

Figure 3 shows the replacement of the asset in the previous examples at the end of year 10. The example assumes no change in the real replacement cost of the asset.[5] There is a significant increase in revenues under both the indexed RAB (about 40%) and unindexed RAB (about 100%) approaches when an asset is replaced. This is because the value of the asset, which is only 10% of its original value in the final year of its useful life (year 10), is suddenly worth 100% of its replacement value the following year (year 11). The return on capital accordingly steps up by multiples at this time.

However, the increase in revenues under the indexed RAB approach is less than half of what it would be if the unindexed RAB approach was used.

Figure 3 - Revenue path example with replacement – indexed vs unindexed RAB ($ nominal)



Conclusion

Indexation of the RAB leads to a somewhat higher asset valuation during an asset's life and therefore a higher overall RAB value. However, the negative revenue adjustment we apply to the depreciation component means there are compelling reasons for indexing the RAB.

As shown above, indexation of the RAB leads to smoother revenue recovery and therefore prices.[6] It also significantly reduces the increase in revenues that invariably happens when assets are replaced at the end of their useful life.[7]

Switching to an unindexed RAB approach will also not reduce prices. It will, in fact, increase prices over the near to medium term. In the long run, it would also increase the price shock of replacing assets.

[3] The negative revenue adjustment would also be removed.

[4] The only situation where this would not occur is if the replacement cost is less than the depreciated value of the asset being replaced. This is highly unlikely for an old asset that is close to being fully depreciated.

[5] The real replacement cost is still $100 in terms of year 0 dollars or $128 in nominal terms. If the real replacement cost is higher, for example, then the difference shown will be even greater.

[6] Other things being equal, smooth prices can be justified on the expectation of an asset providing similar levels of service (utility) during its life.

[7] Avoiding or reducing price shocks promotes better planning in customers' investment and consumption decisions.