

## Index Formula Analysis

Draft Auction Resolution 700Mhz, 1900MHz, 2500MHz

$$Indice = A \cdot [Valor\ ofertado_{700MHz}] + B \cdot \left[ \sum_{i=1}^5 \sum_{j=1}^3 Z_j \cdot \frac{\overbrace{Localidades_{ji}}^{\% \text{ Localities covered}}}{Localidades_{j\ total}} \cdot \underbrace{\frac{1}{1,1^{i-1}}}_{\text{Factor to determine the investment recognition to Operator due the opportunity to deploy coverage}} \right]$$

Related with Investment (Capex and Opex) per locality type.

Then, To value the coverage (right side) in the current “índice” Formula has three factors:

- **Indice:** Valor por bloque que resulta de la combinación entre el valor ofertado 700MHz y cobertura ofertada.
- **Valor ofertado 700MHz:** Valor en pesos colombianos equivalente a mínimo el 40% y máximo al 100% de la contraprestación económica y que corresponde a la contraprestación pecuniaria
- **Localidades<sub>j,i</sub>:** Cantidad de localidades del tipo j en el tiempo i
- **Localidades<sub>j total</sub>:** Cantidad total de localidades del tipo j
- **i:** Período máximo (en años) para tener en funcionamiento el servicio móvil, de acuerdo con las condiciones del Artículo 23 de la presente Resolución. Donde i=1,2,3,4 o 5
- **j:** Tipo de localidades. j=Tipo I, Tipo II, Tipo III
- **A, B, Z<sub>j</sub> y X%** son valores conocidos en la fórmula.

**Z<sub>j</sub>** Related with the investment (Capex and Opex) per locality type.

$\frac{Localidades_{ji}}{Localidades_{j\ total}}$  % Localities covered

$\frac{1}{1,1^{i-1}}$  Factor to determine the investment recognition to Operator due the opportunity to deploy coverage

$$Indice = A \cdot [Valor\ ofertado_{700MHz}] + B \cdot \left[ \sum_{i=1}^5 \sum_{j=1}^3 z_j \cdot \overbrace{\frac{Localidades_{ji}}{Localidades_{j\ total}}}^{\% \text{ Localities covered}} \cdot \overbrace{\frac{1}{1,1^{i-1}}}^{\text{Factor to determine the investment recognition to Operator due the opportunity to deploy coverage}} \right]$$

Related with Investment (Capex and Opex) per locality type.

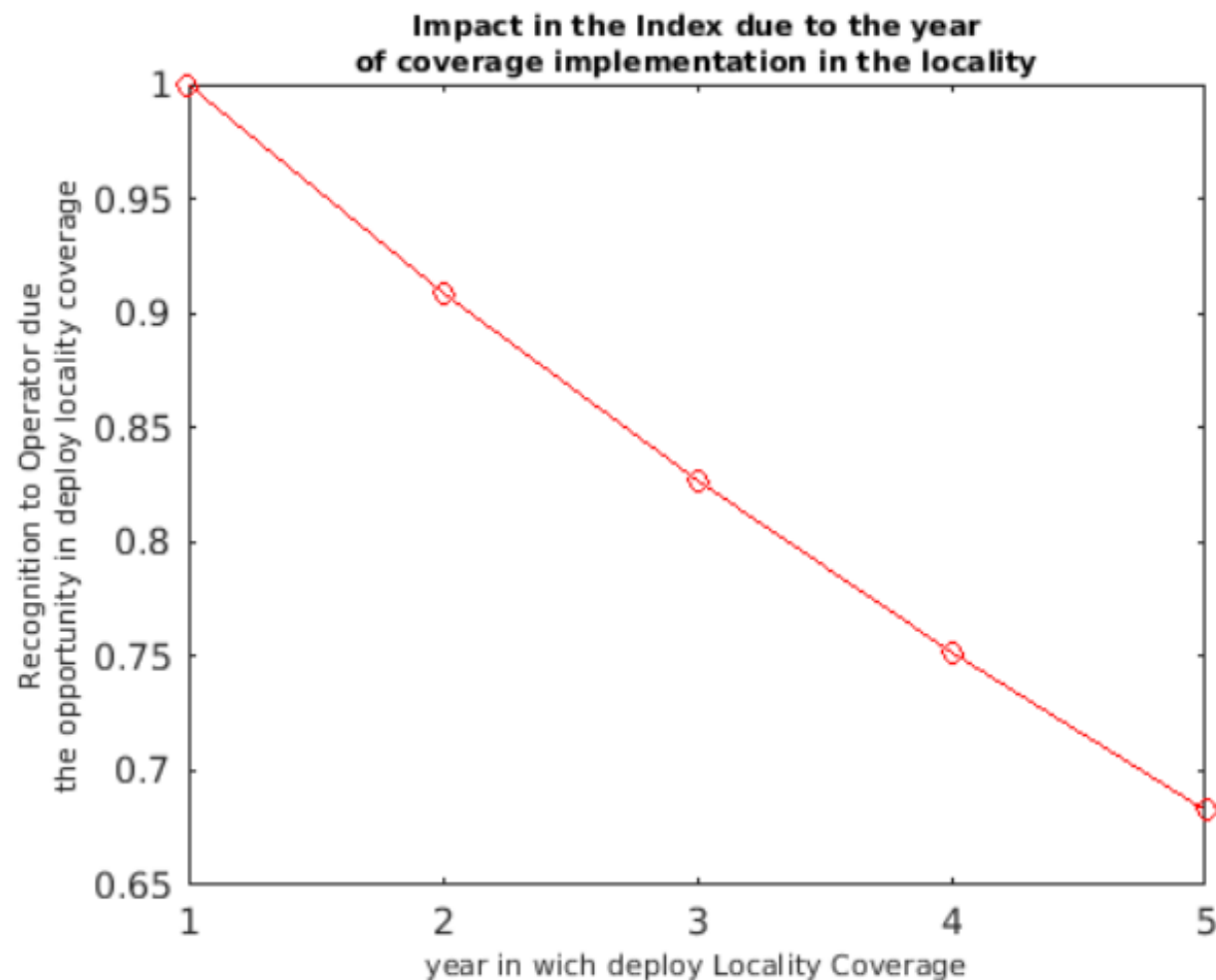
The formula does not have any factor that consider the Operator's scale. Big Operators (Dominant) must make less effort (investment) to reach high levels of localities covered but Small Operators (or new entrant) must make a huge effort, due to these does not have enough infrastructure scale economies<sup>1</sup>

<sup>1</sup> Big Operators have enough Sites Infrastructure in wich the Operator deploy new 4G technology over current sites (in current 3G or 2G coverage), without full implementation investment (less Capex, less time to market) and less Opex (due the marginal growing by new technology), in the other hand , a Small Operator or New Entrants Operators does no have sites to achieve scale economies, then these Operators have huge cost (Capex, Opex and Time to Market) to deploy 4G technology in the localities.

$$+ \mathbf{B} \cdot \left[ \sum_{i=1}^5 \sum_{j=1}^3 \underbrace{z_j}_{\text{\% Localities covered}} \cdot \underbrace{\frac{Localidades_{ji}}{Localidades_{j_{total}}}}_{\text{Factor to determine the investment recognition to Operator due the opportunity to deploy coverage}} \cdot \frac{1}{1,1^{i-1}} \right]$$

Related with Investment (Capex and Opex) per locality type.

Assuming  $Z_j = 1$  and % localities = 1, the picture shows the impact in the index (right side in the Equation) due the opportunity to deploy coverage, that equation puts to each operator in the same scale condition. But in the reality the Small or New Entrants Operators does not have scale, then this values ( $Z_j$ , etc) should be sensibilized in accord to Operator Scale.



$$+ \mathbf{B} \cdot \left[ \sum_{i=1}^5 \sum_{j=1}^3 z_j \cdot \frac{\text{Localidades}_{ji}}{\text{Localidades}_{j_{total}}} \cdot \frac{1}{1,1^{i-1}} \right]$$

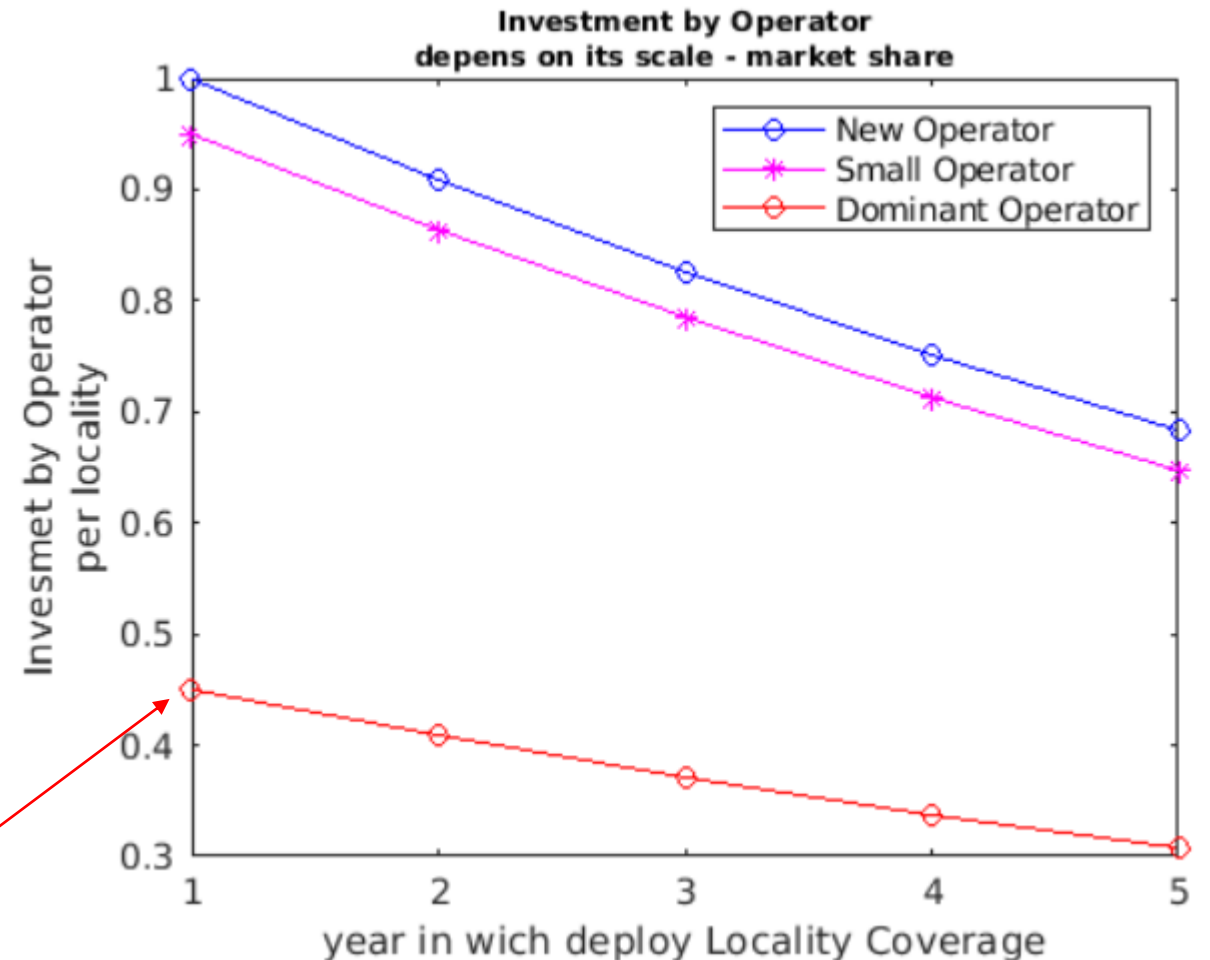
Related with Investment  
(Capex and Opex) per locality  
type.

% Localities covered

Factor to determine the investment  
recognition to Operator due the  
opportunity to deploy coverage

The picture shows the real effort (investment) that each Operator makes in accord to its scale, to deploy coverage (in a year).

for example, a Big Operator makes less of 50% investment (due a its scale) than the New Entrant Operator if both deploy locality coverage in the year 1.



$$Indice = A * [Valor Ofertado 700_{Mhz}] + B * \left[ \sum_{i=1}^5 \sum_{j=1}^3 Z_j * \frac{Localidades_{ji}}{Localidades_{jtotal}} * \frac{1}{(1,1^{(i-1)}) * MarketShare} \right]$$

This formula includes the Operator's Scale (Market Share), that considers the huge effort for Small or New Entrants Operator to deploy coverage in localities.

for example, for a Small Operator with 4% of Market Share the impact in the right side of the formula will be 25 versus 2 from the Big Operator (with market share of 50%) , this is more equitable, due to that consider the major effort from the Small Operator to achieve coverage.

