Calculamos K:

$$K = \frac{\lambda_1 \lambda_2}{\left(\frac{\lambda_2}{\lambda_1} \frac{w}{1-w} \lambda_1 + \lambda_2\right)^2} \cdot \frac{\lambda_2}{\lambda_1} \cdot \frac{1}{(1-w)^2} = \frac{\lambda_2^2}{\left(\lambda_2\left(\frac{w}{1-w}+1\right)\right)^2} \cdot \frac{1}{(1-w)^2} =$$

$$= \frac{1}{\left(\frac{w+1-w}{1-w}\right)^2} \cdot \frac{1}{(1-w)^2} = 1$$

Por tanto $f_W(w) = \frac{1}{Beta(n_1,n_2)} \cdot w^{n_1-1}(1-w)^{n_2-1}$ con $w \in (0,1)$,

es decir, $W \sim Beta(n_1, n_2)$.

Esta va a ser nuestra cantidad pivotal porque recordemos que

$$W = \frac{1}{1+\frac{\lambda_2}{\lambda_1 u}} = \frac{1}{1+\frac{\lambda_2}{\lambda_1 A/B}} = \frac{1}{1+\frac{\lambda_2 B}{\lambda_1 A}} = \frac{1}{1+\frac{\lambda_2 \sum_{i=1}^{n_2} Y_i}{\lambda_1 \sum_{i=1}^{n_1} X_i}} =$$

$$= \frac{1}{1+\frac{\lambda_2 n_2 \bar{Y}}{\lambda_1 n_1 \bar{X}}}$$ y la distribución de esta cantidad no

depende de λ_1 ni λ_2.

Por tanto nos podemos construir nuestro intervalo de nivel de confianza $1-\alpha$ como

$$P(a \leq W \leq b) = 1-\alpha$$

$$a \leq W \leq b \Leftrightarrow a \leq \frac{1}{1+\frac{\lambda_2 n_2 \bar{Y}}{\lambda_1 n_1 \bar{X}}} \leq b \Leftrightarrow \frac{1}{a} \geq 1 + \frac{\lambda_2 n_2 \bar{Y}}{\lambda_1 n_1 \bar{X}} \geq \frac{1}{b} \Leftrightarrow$$

$$\Leftrightarrow \frac{1}{a} - 1 \geq \frac{\lambda_2 n_2 \bar{Y}}{\lambda_1 n_1 \bar{X}} \geq \frac{1}{b} - 1 \Leftrightarrow \frac{1-a}{a} \geq \frac{\lambda_2 n_2 \bar{Y}}{\lambda_1 n_1 \bar{X}} \geq \frac{1-b}{b} \Leftrightarrow$$

$$\Leftrightarrow \frac{a}{1-a} \leq \frac{\lambda_1 n_1 \bar{X}}{\lambda_2 n_2 \bar{Y}} \leq \frac{b}{1-b} \Leftrightarrow \frac{a}{1-a} \cdot \frac{n_2 \bar{Y}}{n_1 \bar{X}} \leq \frac{\lambda_1}{\lambda_2} \leq \frac{b}{1-b} \cdot \frac{n_2 \bar{Y}}{n_1 \bar{X}}$$