Final goal:

$$
\begin{aligned}
q &= \frac{a * P}{(1 - b * P)(1 - b * P + C * P)} \\
a \;\&\; b \;\&\; C \;\&\; P \; &\in \mathbb{R} \\
P &\geq 0 \\
Axiom\ 1 : A &= \sum_{i=0}^{+\infty} \theta_i \\
A \;\&\; \theta &\in \mathbb{R} \\
i &\in \mathbb{N} \\
\theta &\geq 0 \\
\&\; \theta &\leq 1 \\
Axiom\ 2 : V_{ads} &= V_0 * \sum_{i=0}^{+\infty} i * \theta_i \\
V_{ads} \;\&\; V_0 \;\&\; \theta &\in \mathbb{R} \\
i &\in \mathbb{N} \\
V0 &> 0 \\
Axiom\ 3 : q &= \frac{V_{ads}}{A} \\
q \; &\in \mathbb{R} \\
Axiom\ 4 : r_{ci-1} &= k_i * P * \theta_{i-1} \\
k_i \; &\in \mathbb{R} \\
k_i &\geq 0 \\
Axiom\ 5 : r_{ei} &= k_{-i} * \theta_i \\
k_{-i} \; &\in \mathbb{R} \\
k_{-i} &\leq 0 \\
Axiom\ 6 : r_{ei} &= r_{Ci-1} \\
Axiom\ 7 : k_{-2} &= ... = k_{-i} = k_{des} \\
k_{des} &\geq 0 \\
Axiom\ 8 : k_2 &= ... = k_i = k_{ads} \\
k_{des} &\geq 0 \\
Axiom\ 9 : \theta_i &= C * x^i * \theta_0 \\
\theta_0 \;\&\; x \; &\in \mathbb{R} \\
\theta_0 &\geq 0 \\
\&\; \theta_0 &\leq 1
\end{aligned}
\tag{1}
$$

$$
\begin{aligned}
&Proving: \\
&applying\ Axiom\ 3\ : q = \frac{V_{ads}}{A} \\
&Substituting\ Axiom\ 1\ \&\ 2\ at\ Axiom\ 3\ :\ q = \frac{V_0 * \sum_{i=0}^{+\infty} i * \theta_i}{\sum_{i=0}^{+\infty} \theta_i} \\
&Dividing\ both\ side\ of\ equation\ by\ V_0 \\
&and\ Changing\ starting\ point\ of\ summation\ from\ zero\ to\ one: \\
&\frac{q}{V_0} = \frac{0 * \theta_0 + \sum_{i=1}^{+\infty} i * \theta_i}{\theta_0 + \sum_{i=1}^{+\infty} \theta_i} \\
&Substituting\ \theta_i\ : \\
&\frac{q}{V_0} = \frac{0 * \theta_0 + \sum_{i=1}^{+\infty} i * C * x^i * \theta_0}{\theta_0 + \sum_{i=1}^{+\infty} C * x^i * \theta_0} \\
&Taking\ out\ constant\ values\ like\ C\ \&\ \theta_0\ from\ summation: \\
&\frac{q}{V_0} = \frac{C * \theta_0 * \sum_{i=1}^{+\infty} i * x^i}{\theta_0 * (1 + C * \sum_{i=1}^{+\infty} x^i} \\
&cancelling\ \theta_0 \\
&\frac{q}{V_0} = \frac{C * \sum_{i=1}^{+\infty} i * x^i}{(1 + C * \sum_{i=1}^{+\infty} x^i)} \\
&using\ this\ assumption\ : \sum_{i=1}^{+\infty} x_i = \frac{x}{(1-x)} \\
&\sum_{i=1}^{+\infty} i x_i = \frac{x}{(1-x)^2} \\
&Substituting\ them\ at\ the\ above\ equation: \\
&\frac{q}{V_0} = \frac{\frac{C*x}{(1-x)^2}}{1 + \frac{C*x}{(1-x)}} \\
&\frac{q}{V_0} = \frac{\frac{C*x}{(1-x)^2}}{\frac{1-x+c*x}{1-x}} \\
&Cancelling\ (1-x): \\
&\frac{q}{V_0} = \frac{C * x}{(1-x)(1-x+C*x)} \\
&x = \frac{k_{ads}}{k_{des}} * P \\
&y = \frac{k_1}{k_{-1}} * P \\
&C = \frac{y}{x}
\end{aligned}
\tag{2}
$$

$$Substituting\ C\ \&x:$$

$$C = \frac{y}{x} = \frac{\frac{k_1}{k_{-1}}}{\frac{k_{ads}}{k_{des}}}$$

$$\frac{q}{V_0} = \frac{\frac{k_1}{k_{-1}} * P}{(1 - \frac{k_{ads}}{k_{des}} * P)(1 - \frac{k_a ds}{k_d es} * P + \frac{k_1}{k_{-1}} * P)}$$

$$q = \frac{\frac{k_1}{k_{-1}} * V_0 * P}{(1 - \frac{k_{ads}}{k_{des}} * P)(1 - \frac{k_a ds}{k_d es} * P + \frac{k_1}{k_{-1}} * P)}$$

$$Assigning\ the\ following\ to\ constants\ a\ b$$

$$a = \frac{k_1}{k_{-1}} * V_0$$

$$b = \frac{k_{ads}}{k_{des}}$$

$$q = \frac{a * P}{(1 - b * P)(1 - b * P + C * P)} \quad (3)$$

Type of Variables:
A & V_{ads} & q & θ & θ_0 & V_0 & P & k_1 & k_{-1} & k_{ads} & k_{des} & k_2 & k_{-2} *are real numbers*
i : *natural number*
Constraints:
$\theta \geq 0$ & $\theta \leq 1$ & $k_{ads} > 0$ & $k_{des} > 0$ & $k_1 > 0$ & $k_{-1} > 0$ & $k_2 > 0$ & $k_{-2} > 0$ & $V_0 > 0$ & $P \geq 0$