ΤΥΠΟΛΟΓΙΟ

$${}_tp_x = \exp\left(-\int_x^{x+t}\mu_z\, dz\right) = \exp\left(-\int_0^t \mu_{x+z}\, dz\right)$$

$$A_x = \sum_{k=0}^{\infty} \upsilon^{k+1}\, {}_kp_x\, q_{x+k} \qquad \bar{A}_u = \int_0^{\infty} \upsilon^t\, {}_tp_u\, \mu_{u+t}\, dt \qquad \ddot{a}_x = \sum_{k=0}^{\infty} \upsilon^k\, {}_kp_x \qquad \bar{a}_x = \int_0^{\infty} \upsilon^t\, {}_tp_x\, dt$$

$$\bar{a}_x = \frac{1-\bar{A}_x}{\delta} \qquad \ddot{a}_x = \frac{1-A_x}{d} \qquad \upsilon = \frac{1}{1+i} \qquad \delta = \ln(1+i) \qquad d = 1-\upsilon$$

$$A_{xy} + A_{\overline{xy}} = A_x + A_y \qquad \bar{A}^{1}_{xy:\overline{n}|} = \bar{A}^{1}_{x:\overline{n}|} + \bar{A}^{1}_{y:\overline{n}|} - \bar{A}^{\;1}_{\overline{xy}:\overline{n}|} \qquad \bar{A}_{xy} + \bar{A}_{\overline{xy}} = \bar{A}_x + \bar{A}_y \qquad \bar{a}_{xy} + \bar{a}_{\overline{xy}} = \bar{a}_x + \bar{a}_y$$

$$\ddot{a}_{xy} + \ddot{a}_{\overline{xy}} = \ddot{a}_x + \ddot{a}_y \qquad \ddot{a}_{xy:\overline{n}|} + \ddot{a}_{\overline{xy}:\overline{n}|} = \ddot{a}_{x:\overline{n}|} + \ddot{a}_{y:\overline{n}|}$$

$$\bar{A}_{x\overset{2}{y}} = \int_0^{\infty} \upsilon^t\, {}_tq_x\, {}_tp_y\, \mu_{y+t}\, dt = \int_0^{\infty} \upsilon^t\, {}_tp_y\, \mu_{y+t}\, dt - \int_0^{\infty} \upsilon^t\, {}_tp_x\, {}_tp_y\, \mu_{y+t}\, dt = \bar{A}_y - \bar{A}_{x\overset{1}{y}}$$

$$\bar{A}_{\overset{1}{x}y} = \int_0^{\infty} \upsilon^s\, {}_sp_y\, {}_sp_x\, \mu_{x+s}\, ds = \int_0^{\infty} \upsilon^s\, {}_sp_{xy}\, \mu_{x+s}\, ds \qquad A_{x\overset{2}{y}} = \sum_{k=0}^{\infty} \upsilon^{k+1}\, {}_{k|}q_{x\overset{2}{y}} = \sum_{k=0}^{\infty} \upsilon^{k+1}\left({}_{k|}q_y - {}_{k|}q_{x\overset{1}{y}}\right)$$

$$\bar{A}_{xy} = \bar{A}_{\overset{1}{x}y} + \bar{A}_{x\overset{1}{y}} \qquad \bar{A}^{\;1}_{\overline{xy}:\overline{n}|} = \bar{A}_{\overset{1}{x}y:\overline{n}|} + \bar{A}_{x\overset{1}{y}:\overline{n}|} \qquad A^{\;1}_{\overline{xy}:\overline{n}|} = A_{\overset{1}{x}y:\overline{n}|} + A_{x\overset{1}{y}:\overline{n}|}$$

$$A_{\overset{2}{x}y:\overline{n}|} + A_{x\overset{2}{y}:\overline{n}|} = A_{\overline{xy}:\overline{n}|} \qquad \bar{A}_{\overset{2}{x}y:\overline{n}|} + \bar{A}_{x\overset{2}{y}:\overline{n}|} = \bar{A}_{\overline{xy}:\overline{n}|} \qquad \bar{A}_{\overset{2}{x}x} = \bar{A}_{x\overset{2}{x}} \qquad \bar{A}_{\overset{1}{x}x} = \bar{A}_{x\overset{1}{x}}$$

$$a_{x|y} = \frac{A_{xy} - A_y}{d} \qquad \bar{a}_{x|y} = \bar{a}_y - \bar{a}_{xy} \qquad \bar{a}_{v|u} = \bar{a}_u - \bar{a}_{vu} \qquad \ddot{a}_{x|y} = a_{x|y}$$

$$\ddot{a}_{v|u} = \ddot{a}_u - \ddot{a}_{vu} \qquad \ddot{a}_{x|y} = a_{x|y} \qquad \ddot{a}_{x|y:\overline{n}|} = \ddot{a}_{y:\overline{n}|} - \ddot{a}_{xy:\overline{n}|}$$

$$\ddot{a}_{v|u:\overline{n}|} = \ddot{a}_{u:\overline{n}|} - \ddot{a}_{vu:\overline{n}|} \qquad \bar{a}_{v|u:\overline{n}|} = \bar{a}_{u:\overline{n}|} - \bar{a}_{vu:\overline{n}|}$$

$$\bar{a}_{\overline{x:\overline{n}|}|y} = \bar{a}_y - \bar{a}_{\overline{x:\overline{n}|}:y} = \bar{a}_y - (\bar{a}_{xy} + \bar{a}_{y:\overline{n}|} - \bar{a}_{xy:\overline{n}|}) = (\bar{a}_y - \bar{a}_{y:\overline{n}|}) - (\bar{a}_{xy} - \bar{a}_{xy:\overline{n}|}) = {}_{n|}\bar{a}_y - {}_{n|}\bar{a}_{xy}$$

$${}_{n|}\bar{a}_{xy} = \bar{a}_{\overline{n}|\,|\,xy} = \bar{a}_{xy} - \bar{a}_{xy:\overline{n}|}$$

$$\mu^{(\tau)}_{x+t} = \sum_{j=1}^{m} \mu^{(j)}_{x+t}, \qquad {}_tp^{(\tau)}_x = \exp\left(-\int_0^t \mu^{(\tau)}_{x+s}\, ds\right), \qquad f_{T,J}(t,j) = {}_tp^{(\tau)}_x\, \mu^{(j)}_{x+t}$$