that is:

$$\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{[1-p(\mathbf{x})]}\right\}=\mathrm{E}\{w(y_1-y_0)\}$$

From the LIE 3 we know that, if x is a generic discrete variable assuming values $x = (x_1, x_2, \dots, x_M)$ with probabilities $p = (p_1, p_2, \dots, p_M)$, then:

$$\mathrm{E}(h) = p_1 \cdot \mathrm{E}(h \mid x_1) + p_2 \cdot \mathrm{E}(h \mid x_2) + \dots + p_M \cdot \mathrm{E}(h \mid x_M).$$

Thus, by assuming $h=w(y_1-y_0)$, we get that:

$$\mathrm{E}(h)=\mathrm{E}[w(y_1-y_0)] = p(w=1) \cdot \mathrm{E}[w(y_1-y_0) \mid w=1] + p(w=0) \cdot \mathrm{E}[w(y_1-y_0) \mid w=0] =$$
$$= p(w=1) \cdot \mathrm{E}[(y_1-y_0) \mid w=1] = p(w=1) \cdot \mathrm{ATET} .$$

It means that:

$$\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{[1-p(\mathbf{x})]}\right\}=\mathrm{E}\{w(y_1-y_0)\}=p(w=1)\cdot\mathrm{ATET}$$

proving that:

$$\mathrm{ATET}=\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{p(w=1)[1-p(\mathbf{x})]}\right\} \tag{5}$$

Now, by remembering that ATE = $p(w=1)\cdot$ATET + $p(w=0)\cdot$ATENT, we have that:

$$\mathrm{ATENT}=\frac{\mathrm{ATE}}{p(w=0)}-\frac{p(w=1)}{p(w=0)}\mathrm{ATET}=$$
$$=\frac{1}{p(w=0)}\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{p(\mathbf{x})[1-p(\mathbf{x})]}-p(w=1)\frac{[w-p(\mathbf{x})]y}{p(w=1)[1-p(\mathbf{x})]}\right\}=$$
$$=\frac{1}{p(w=0)}\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{p(\mathbf{x})[1-p(\mathbf{x})]}-\frac{[w-p(\mathbf{x})]y}{[1-p(\mathbf{x})]}\right\}$$
$$=\frac{1}{p(w=0)}\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y-p(\mathbf{x})[w-p(\mathbf{x})]y}{p(\mathbf{x})[1-p(\mathbf{x})]}\right\}=$$
$$=\frac{1}{p(w=0)}\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y[1-p(\mathbf{x})]}{p(\mathbf{x})[1-p(\mathbf{x})]}\right\}=\frac{1}{p(w=0)}\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{p(\mathbf{x})]}\right\}=$$
$$=\mathrm{E}\left\{\frac{[w-p(\mathbf{x})]y}{p(w=0)\,p(\mathbf{x})]}\right\}$$