Fig. S1. Time evolution of the number of nodes \( N(t) \) (A), the number of links \( L(t) \) (B), the average link weight \( \langle w \rangle(t) \) (C), and the average node strength \( \langle s \rangle(t) \) (D) in the US airport network from January 1990 to December 2000. Dashed lines are exponential fits.
Fig. S2. Distribution of the relative weights increments $\eta = (w(t+1) - w(t))/w(t)$. The full line corresponds to the distribution obtained over the 11 years under study. Circles correspond to 1 month (May 1995). In the Inset, we show the tail of the distribution of $\eta$, with a power law fit $P(\eta) \sim \eta^{-\nu}$, giving $\nu = 1.9 \pm 0.1$ (dashed line).
Fig. S3. Histogram of the number $d$ of appearances and disappearances of a link. The line is an exponential fit of the form $e^{-d/d_0}$ with $d_0 = 5$ showing that most links appear/disappear less than 5 times in the 11 years period.
Fig. S4. Fraction $f_a$ of appearing links in the USAN as a function of the ratio $s_{\text{max}}/s_{\text{min}}$ of the strengths of their extremities. Circles, squares, and diamonds correspond to the data of 3 distinct years, whereas the pluses represent the data averaged over the whole 11-year time period. This figure clearly illustrates the stationarity of $f_a$. 
Fig. S5. Fraction $f_d$ (open circles) of disappearing links and $f_a$ (pluses) of appearing links in the USAN as a function of their weight $w$. We also show the logarithmically binned reference distribution $P(w)$ (line above the shaded area, scale on the right-hand y axis). Data are averaged over the whole 11-year time period.
Fig. S6. Fraction $f_a$ (open circles) of disappearing links in the USAN as a function of the ratios $w/s_{\text{min}}$ and $w/s_{\text{max}}$. We also show the logarithmically binned reference distributions $P(w/s_{\text{min}})$ and $P(w/s_{\text{max}})$ (line above the shaded area, scale on the right-hand $y$ axis). Data are averaged over the whole 11-year time period.
Fig. S7. Model: evolution of the average degree of the network for the parameters $\eta = 0.002$, $\sigma = 0.05$, $p_I = 0.1$, $p_d = 0.005$. (Inset) Zoom of the final part displaying small fluctuations of the average degree.
Fig. S8. Model: Fraction $f_d$ (open circles) of disappearing links and $f_a$ (pluses) of appearing links in the model as a function of the ratios $w/s_{\text{min}}$ and $w/s_{\text{max}}$. We also show the logarithmically binned reference distributions $P(w/s_{\text{min}})$ and $P(w/s_{\text{max}})$ (line above the shaded area, scale on the right-hand $y$ axis).