FIG. 3: a) An example of a node with in-degree $k_{in} = 3$, out-degree $k_{out} = 2$, and one feed-forward-loop (FFL) passing by it (red arrows). The nodes with a link pointing to the central node (open circle) are called in-neighbors, while nodes that are pointed at by the central node are called out-neighbors. b) Examples of directed $n$ node subgraphs, with a central node (empty circle) and $n - 1$ in-neighbors, forming $t$ FFLs.

FIG. 4: FFL clustering coefficient for the two transcription regulatory networks studied here. The continuous line corresponds to the power law $C_{FFL}(k_{out}) \sim k_{out}^{-1}$. 

D. Directed subgraphs

Many biological networks, from the transcription regulatory to the metabolic network, are directed. Next we generalize our calculations to describe directed subgraphs as well, showing that distinction between Type I and Type II subgraphs is relevant for directed networks as well. As an example, we study the aggregation of the three node subgraph shown in Fig. 3a, often called feed-forward