In order to capture the dependency among exchange rates we construct semiparametric multivariate copula models with ARMA-GARCH margins. As multivariate copula models we utilize pair-copula constructions (PCC) such as regular and canonical vines. As building blocks of the PCC’s we use bivariate t-copulas for different tail dependence between pairs of exchange rates. Alternatively we also consider a non-Gaussian directed acyclic graph (DAG) model which can be imbedded as a special PCC. We apply these models to Euro exchange rates. A nonnested model comparison technique is developed to compare DAG, regular and canonical vine based models. This provides a modeling framework for constructing high dimensional joint models and allows extensions to asymmetric marginal models and time varying dependence models.