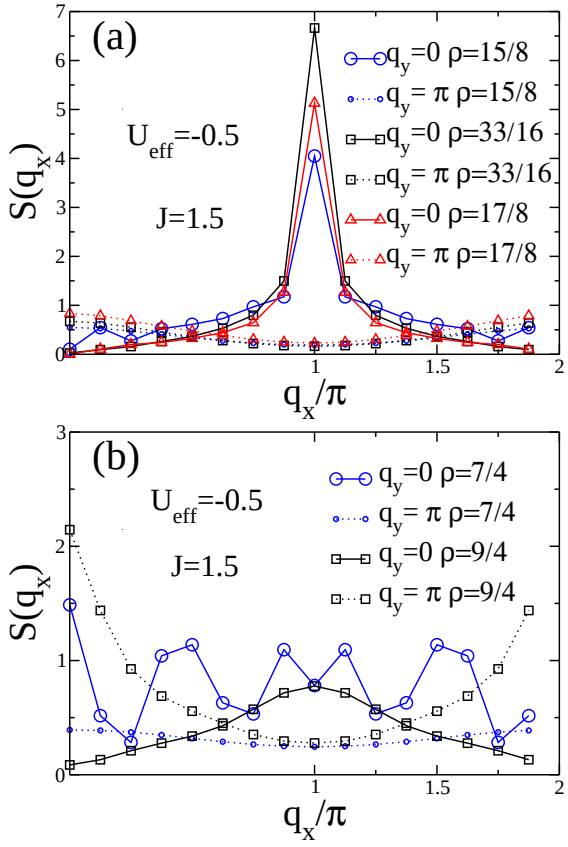

Figure 4: (Color online). Spin-structure factor $S(q_x)$ vs. q_x for the two-leg ladder system with size $L = 16$, $J = 1.5$, and $U_{\rm eff} = -0.5$. (a) $S(q_x)$ for the densities $\rho = 15/8$, $\rho = 33/16$, and $\rho = 17/8$ (see legend). (b) $S(q_x)$ for the densities $\rho = 7/4$ and $\rho = 9/4$.

$\mathbf{q} = (\pi, 0)$ for densities close to $\rho = 2$. Note that these peaks have smaller intensity than those found for $\rho = 2$ in Fig. 4(a), for the system with size $L = 16$. We have also observed that the height of the peak at $\mathbf{q} = (\pi, 0)$ increases with the system sizes for the densities close to $\rho = 2$. These results indicate that a stripe-like AFM magnetic order also exists for densities close to $\rho = 2$. As shown in Fig. 4(b), this order does not exist anymore for $\rho \gtrsim 2.2$ and $\rho \lesssim 1.7$, at least within the precision of our calculations, and it is replaced by ferromagnetic tendencies. Note that for the electron doped case, there is a small peak at $\mathbf{q} = (0, \pi)$ for densities $\rho \gtrsim 2.2$.

IV. CONCLUSION

Using ladders, we have studied analytically and numerically a two-orbital Hubbard model. Via the DMRG technique we were able to investigate the model defined on a two-leg ladder geometry for systems with linear sizes up to $L = 24$. Our spin structure factor data show that for the "undoped" density $\rho = 2$, a stripe-like AFM order is present, as observed in previous Exact Diagonalization studies.[12,13] We have also presented evidence for triplet pairing tendencies of added electrons/holes close to the density $\rho = 2$, in some range of couplings, in qualitative agreement with previous investigations using chains,[11] and with Exact Diagonalization calculations in a less extreme FM regime of models for pnictides.[12,13] More precisely, we have found that pairing (and presumably superconductivity) and ferromagnetism co-exist for a large region of parameters in the regime $U' < J$. Even for U' comparable to J our results still indicate a (mild) tendency to pairing. Whether this range of couplings for U' and J is realized in real materials, such as heavy fermions or pnictides, is a matter to be decided via experiments, or with the help of ab-initio computer simulations.

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