Abstract: The Wyner-Ziv video coding (WZVC) rate distortion performance is highly dependent on the quality of the side information, an estimation of the original frame, created at the decoder. This paper, characterizes the WZVC efficiency when motion compensated frame interpolation (MCFI) techniques are used to generate the side information, a difficult problem in WZVC especially because the decoder only has available some reference decoded frames. The proposed WZVC compression efficiency rate model relates the power spectral of the estimation error to the accuracy of the MCFI motion field. Then, some interesting conclusions may be derived related to the impact of the motion field smoothness and the correlation to the true motion trajectories on the compression performance.