Abstract: In this paper, we propose a minimum distance (MD) estimator to estimate panel regression models with measurement errors. The model considered is more general than studied in the literature in that (i) the measurement errors can be non-classical in the sense that they are allowed to be correlated with the true regressors, and (ii) serially correlated measurement errors and idiosyncratic errors are allowed. We estimate such a model by applying the covariance structure analysis, which does not require any instrumental variables to deal with the endogeneity caused by measurement errors. The asymptotic properties of our MD estimator are established, which is non-trivial because an identification problem must be solved. Since our approach estimates the variances and covariances of latent variables as well as the coefficient of regressors, we can directly test, for instance, if the measurement errors are correlated with the true regressors or not. Monte Carlo simulation is carried out to investigate the finite sample performance and confirm that the proposed estimator has desirable performance. We apply the proposed method to estimate an investment equation for 2002-2016 and find that (i) there is a structural break between 2007 and 2008 (ii) Tobin's marginal q is strongly significant, (iii) cash flow is not significant before 2009, but tends to be significant after 2009 indicating increased investment-cash flow sensitivity, (iv) measurement error and idiosyncratic error are serially correlated, (v) measurement error is significantly negatively correlated with the marginal q, and hence non-classical measurement error.