Filtering of non-stationary time series

Think about an overdetermined and underdetermined problem:

$$
\begin{aligned}
d &= Bm \\
Rank(B) &<= dim(d) = 235 \\
B'd &= B'Bm \\
Rank(B'B) &= Rank(B) <= 235
\end{aligned}
$$

$B'B$ is underdetermined since

$$dim(B'B) = 250x250 but Rank(B'B) <= 235$$

We should probably use BB' instead! Try it out!

$$d = MbRank(M) <= dim(b) = 16$$

very few unknowns b many equations

$$M'd = M'MbRank(M'M) = Rank(M) <= 16$$

$M'M$ is overdetermined?