1. **Endogeneity Test**

In order to test for endogeneity we extend the method proposed by Naik and Tsai (2000) to account for Extended Kalman Filter (EKF). Filtering measurement error of AMO contribution level, which may be source of endogeneity, may be important as the bias in parameters may result in suboptimal solution, as proposed by Naik and Tsai (2000). Therefore, we assume that AMO contribution is first order Markov chain, evolving with a drift and a stochastic error term, and we jointly estimate latent AMO’s contribution dynamic on the diffusion of the platform in a state space model. More formally, we consider the following model:

(E1)

We rewrite the model in the state space form as the following:

 (E2)

In order to estimate this model we use a two-step approach. In the first step we run Extended Kalman Filter (EKF) to estimate state vector  given conditional distribution of variance of each component of vector given all other elements. There are two differences from the normal EKF. First is that in order to calculate the variance of each component of vector , we use multivariate normal theory, as the following:

 (E3)

The second difference is that our Jacobian matrix will be in the form of 2\*2 matrix for the extra state variable. In the second stage we use normal Gibbs sampler to estimate the non-state parameters, of each equation separately given conditional distribution of the variances, yet in order to estimate the variance term , we pool the error terms of the second and the third equation in (E2) and draw it from inverse Wishart distribution.