Joint distribution of subdeterminants of Wishart matrices

Let us consider H a 3×3 matrix with i.i.d.$\sim \mathcal{N}_{\mathbb{C}}(0,1)$ entries. What is the joint distribution of the following 3 random variables‘?

$$\begin{cases} X_1 = |h_{11}|^2 \\ \\ X_2 = |h_{11}h_{22} - h_{12}h_{21}|^2 \\ \\ X_3 = |\det(H)|^2 = \det(HH^*) \end{cases}$$

Notice that X_i correspond to the modulus square of the determinant of the upper left $i \times i$ submatrix of H.

Same question when 3 is replaced by n.

Remark: The answer is known for the following random variables:

$$Y_i = \det(H_i H_i^*)$$

where H_i is the $i \times n$ upper submatrix of H. The joint distribution of the Y's can be computed by using the Choleski decomposition of the matrix HH^*. But such a technique does not work for the X's.