- Symmetry $\sigma : \Theta \to \Theta$ is a measurable function with a measurable inverse satisfying
$$\Pi_k F_k(\theta) \propto \Pi_k F_k\left(\sigma(\theta)\right)$$
- Local symmetry σ satisfies
$$F_k(\theta) \propto F_k\left(\sigma(\theta)\right)$$
- Class of transformations of model parameters $T \subset \{f : \Theta \to \Theta\}$. Subset of local symmetries contained in T $S_T \subset T$ defined by
$$S_T = \{\sigma \in T | \sigma \text{ is a local symmetry }\} = \bigcap_k \{\sigma \in T | F_k(\theta) \propto F_k\left(\sigma(\theta)\right)\}$$
- Scaling symmety is a symmetry σ which multiplies θ pointwise by a vector
$$v = (r_1, ..., r_N) = (e^{d_1}, ..., e^{d_N})$$
where $r_n \in \mathbb{R}_+$ and $d_n = \log r_n$.

  Case of $r_n \in \mathbb{R}_-$ is covered by a combination of scaling symmetry and sign-flip symmetry.

  Let $\Sigma(v)$ be the diagonal matrix with v on the diagonal. Then $\sigma(\theta) = \Sigma(v)\theta$.

  Let matrix C be the matrix of constraints on d_n. The scaling symmetries of the model are the vectors in the null space of C, $\mathcal{N}(C)$.

  Let $d = (d_1, ..., d_N)$. Let $v(d) = (e^{d_1}, ..., e^{d_N})$. Then the scaling symmetries of the model are $\sigma_d(\theta) = \Sigma(v(d))\theta$, $d \in \mathcal{N}(C)$.

  Then $\{\Sigma(v(d))\theta : d \in \mathcal{N}(C)\} \subset \Theta$ is an equivalence class for the model (θ, F).

  Definition 1?

  Let Ξ be a σ-algebra on Θ. A symmetry breaker $\phi : \Xi \to \Theta$? is a deterministic function that satisfies

  1. $\phi(\emptyset)$ is undefined?
  2. for $\mathcal{T} \in \Xi$, $\phi(\mathcal{T}) = \theta$ where $\theta \in \mathcal{T}$

  Definition 2?

  A symmetry breaker $\phi : \Theta \to \Theta$ is a deterministic measurable function that satisfies

  Equivalence class

  - symmetry detection: canonical surjection?

  - symmetry breaking: section?