

Contents

Remerciements	i
Abstract	ii
1 Introduction	1
1.1 Preliminary test estimation in the literature	2
1.2 Some useful results from the Le Cam asymptotic theory	4
1.3 This work chapter by chapter	8
1.3.1 Preliminary test estimation for multisample principal components	9
1.3.2 Preliminary test estimation in ULAN models	11
1.3.3 Preliminary multiple-test estimation, with applications to k -sample covariance estimation	12
2 Preliminary test estimation for multi-sample principal components	14
2.1 Introduction	14
2.2 Preliminary test estimator	17
2.2.1 Gaussian and pseudo-gaussian inference for CPC	17
2.2.2 The proposed preliminary test estimator	19
2.3 Asymptotics	20
2.4 Simulations	26
2.5 Technical details	30
3 Preliminary test estimation in ULAN models	34

3.1	Introduction	35
3.2	ULAN models and preliminary test estimators	36
3.3	Asymptotic results	40
3.4	Two specific applications	46
3.4.1	Simple linear regression	46
3.4.2	Multisample estimation of covariance matrices	48
3.5	Technical details	52
4	Preliminary multiple-test estimation, with applications to k-sample co- variance estimation	56
4.1	Introduction	57
4.2	Preliminary multiple-test estimators (PMTEs)	60
4.3	Asymptotic results	62
4.3.1	Assumptions	62
4.3.2	Asymptotic results	64
4.4	Multisample covariance estimation	69
4.4.1	PMTE based on scale and shape constraints	69
4.4.2	PMTE vs single-constraint PTEs: asymptotic and finite-sample com- parisons	72
4.4.3	CPC and homogeneity of eigenvalues: a real data example	77
4.5	Technical details	80
5	Conclusions	86
	Bibliography	89