# Online-Appendix: Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies

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## Abstract

This online appendix presents various additional results referenced in the main paper. In particular, it contains two additional simulations studies and two additional empirical applications.

## I. MONTE CARLO SIMULATIONS

In addition to the simulation experiment presented in the main paper we conducted two smaller simulation experiments which we describe in the sections below. We also show additional results for the third simulation study that is presented in the main text.

## A. Monte Carlo Experiment I: EPBR Data

The first experiment follows the design presented in Diamond and Sekhon (2006) for a setting that meets the EPBR conditions. We use 50 treated observations and 100 control observations, with three baseline covariates X that are multivariate normal with zero co-variances. For the treated observations the means of the X variables are .20 and for the control observations the means are equal to 0. We generate outcomes with a linear mapping  $Y = X\beta + \epsilon$  where  $\epsilon \sim N(0, .5)$  and  $\beta = (1, 1, 1)'$ . The true treatment effect is zero for all units. We consider three variants of this design:

- Design A: the variances of the covariates in X are unity in both groups; the easiest, but presumably most unrealistic case.
- Design B: the variances of the covariates in X are .5 in the control group and and 1.5 in the treatment group. This provides a somewhat more difficult but realistic case; in many empirical cases variances may differ between the two groups.
- Design C: the variances of the covariates in X are equal to unity, but we include all three squared terms in the preprocessing adjustment. Since these squared terms are omitted from the outcome equation (ie. the mapping from X to Y), this scenario mirrors a case where a researcher adjusts for three irrelevant covariates (as in Brookhart, Schneeweiss, Rothman, Glynn, Avorn and Sturmer (2006)). We include this case because adjusting for squared terms is often recommended in practice.

For the propensity score methods we use the correctly estimated propensity score (from a logistic regression that is linear in X), instead of the true score because the former is

known to be more efficient. We run 1,000 simulations and report the mean estimate which indicates the bias (multiplied by 100) and the root mean squared error (MSE).

#### A.1. RESULTS FOR DESIGN A: EQUAL VARIANCES

The results for design A (equal variances), design B (unequal variances), and design C (irrelevant covariates) are shown in the upper, middle, and lower panel of Table I respectively. We find that across all three designs the entropy balancing adjustment is unbiased and highly efficient; it outperforms all other propensity score methods and multivariate matching methods in terms of MSE. In particular for design A, the entropy balancing adjustment has an MSE that is more than four times lower than that of the conventional propensity score weighting estimator where a probit regression is used to estimate the score. This is expected because the entropy balancing adjustment fully incorporates the information about the known sample moments. The MSE of entropy balancing is 13 times lower compared to propensity score matching, about 8 times lower than Mahalanobis matching and about 11 times lower than the joint propensity score Mahalanobis distance matching. Consistent with Diamond and Sekhon (2006), Genetic matching dominates the other matching techniques in terms of MSE, but its MSE is still more than 3 times larger than that of entropy balancing. The fact that the matching adjustment (except Genetic matching) are generally less efficient is consistent with the results from Abadie and Imbens (2006). We also find that the multivariate matching methods are all biased. This is consistent with Abadie and Imbens (2006) who show that the bias of matching is of order  $O(N^{-1/k})$  where k is the number of continuous covariates. The patterns are very similar for design B with unequal variances, except that the differences in MSE are now amplified due to the higher variances in the treatment group. The results for design C (lower panel) shows that the inclusion of the irrelevant variables does not adversely affect entropy balancing, but the other methods now exhibit lower MSE compared to design A.

In summary, the first monte carlo experiment shows that in this setting where the conditions necessary for EPBR hold, entropy balancing outperforms the other preprocessing techniques.

## B. Monte Carlo Experiment II: Non-EPBR Data

## B.1. Design

The second experiment follows the second experiment in Diamond and Sekhon (2006). The covariates are taken from the Dehejia and Wahba (1999) experimental sample of the LaLonde (1986) data (see Diamond and Sekhon (2006) for details). The covariates are not ellipsoidally distributed and thus the EPBR conditions do not hold. Assuming a constant treatment effect of \$1,000 the fictional earnings are a non-linear function of only two covariates:

$$Y = 1000D + .1 exp[.7 log(re74 + .01)] + .7 log(re75 + .01)]) + \epsilon$$

where  $\epsilon \sim N(0, .5)$ , re74 and re75 are real earnings in 1974 and 1975 and D is the treatment indicator. The true propensity score is:

$$\pi_i = logit^{-1}[1 + .5.\mu + .01log(\texttt{age}^2) - .3log(\texttt{educ}^2) - .01log(\texttt{re74} + .01)^2 + .01log(\texttt{re75} + .01)^2]$$

where the linear predictor  $\mu$  is obtained from regressing the actual treatment indicator on age<sup>2</sup>, educ<sup>2</sup>, black, hispanic, married, nodegree, re74<sup>2</sup>, re75<sup>2</sup>, u74, and u75 in the Dehejia Wahba sample. So the true propensity score is a combination of this logistic regression plus the extra variables specified in the equation above.

In the Monte Carlo replications we use the following incorrect functional form to estimate the propensity score:

$$\begin{split} \hat{\mu} &= \alpha_0 + \alpha_1 \texttt{age} + \alpha_2 \texttt{educ} + \alpha_3 \texttt{black} + \alpha_4 \texttt{hispanic} + \\ &\alpha_5 \texttt{married} + \alpha_6 \texttt{nodegree} + \alpha_7 \texttt{re74} + \alpha_8 \texttt{re75} + \alpha_9 \texttt{u74} + \alpha_{10} \texttt{u75} \end{split}$$

We run 1,000 simulations and report the mean estimate which indicates the bias (multiplied by 100) and the root mean squared error (MSE). We also report the average computing time per simulation measured in seconds.

#### B.2. Results

The results are displayed in Table II. Entropy balancing achieves the second lowest bias and the lowest MSE across all adjustments. It is also much faster compared to Genetic Matching, which achieves the second lowest MSE in this experiment. The propensity score methods perform badly given the incorrect specification of the propensity score model. This indicates that entropy balancing retains good finite sample properties in this situation where the EPRB conditions do not hold.

#### C. Additional Tables for Monte Carlo Experiment III

Tables III and IV display the results for the third simulation discussed in the main paper for the samples sizes N = 600 and N = 1,500 respectively. Overall the results are very similar to the case of N = 300 except that the propensity score methods (with a correctly estimated score) improve as the sample size grows. Entropy balancing achieves the lowest MSE across all simulations.

## II. Additional Results for LaLonde Application

Table V presents additional statistics for the covariate balance in the LaLonde application described in the main text. We can see that both the means and the variances are much more similar after entropy balancing when comparing the treatment and control group in the preprocessed data (the last few columns present the balance results form propensity score weighting as a benchmark). Figure 1 shows the QQ-plots that compare the distributions for all four continuous variables: pretreatment earnings in 1975 and 1974, age, and education. The black dots represent empirical quantile estimates for the raw data. The gray dots represent quantile estimates for the reweighted data. The distributions of all four variables are much more similar after the entropy balancing adjustment.

## III. Additional Results for News Media Persuasion Application

Table VI shows additional balance statistics for the data used in the Ladd and Lenz (2010) study on the effect of news media persuasion in the 1997 British general election. As discussed in the main text, entropy balancing exactly adjusts all the means and almost all of the variances in this data.

## IV. Additional Application: The Fox News Effect

In this section we provide another application of entropy balancing by reanalyzing data from DellaVigna and Kaplan (2007) who study the effect of media bias on voting. The authors exploit the fact that between 1996 and 2000 the conservative Fox News Channel was introduced in the cable programming of about 20 percent of U.S. towns. Using voting data that is aggregated at the town level, the study compares the gain in Republican two-party vote share from the 1996 to 2000 Presidential election between towns that broadcasted Fox News by 2000 in their cable programming and towns that did not. The data covers 9,256 towns overall, 1,807 of which had Fox News availability by 2000 (the treated towns). Using various regression specifications, the authors find that the introduction of Fox News increased Republican vote share gains by 0.4 to 0.7 percentage points.

The authors control for a range of confounders that capture town characteristics measured in the 2000 census including the population size, median income, unemployment rate, and other socio-demographic characteristics for race, gender, urban, education, and married. They include additional controls that measure the trend in each of these variables from the 1990 to 2000 census. The authors also control for the number of cable channels and the number of potential cable subscribers in 2000. There are 26 covariates overall.<sup>1</sup>

Estimating the effect of Fox News from this data is difficult for various reasons. First, the effect is fairly small according to the original study. Second, all of the control variables are continuous and given the heterogeneity across towns their distributions are often heavily skewed as can be seeen in Figure 2 which visualizes the distributions using histograms. Third, since the introduction of Fox News into local cable markets was highly selective, the treatment and control towns strongly differ on many important characteristics. In particular, towns with Fox News availability in 2000 were much larger markets with more channels and potential cable subscribers; the standardized difference in means exceeds the

<sup>&</sup>lt;sup>1</sup>Notice that the authors also control for House district or county fixed effects in some of their analysis, but many districts and counties have no variation on the treatment variable and including these fixed effects if anything lowers the positive effect of Fox News on vote shares according to the authors' specifications. Also notice that the authors weight many of their regressions by population size which we ignore here (they do state that their results are robust to using no weights and a linear regression of the outcomes on all covariates confirms this).

extreme level of one on both of these key variables. The areas with Fox News were also more urban, richer, and more highly educated. To correct for these imbalances we conduct entropy balancing on all covariates and their squared terms to equalize the means as well as the variances between the two groups (52 covariates overall). As in the other examples we also apply the other perprocessing methods and for this purpose estimate the propensity score with a logistic regression of the treatment indicator on the raw variables and squared terms (below we replicate the same analysis while omitting the squared terms).

Figure 3 displays the standardized means (left panel) and p-values for the difference in means tests (right panel) for the raw data and after the various adjustment methods. After entropy balancing the means between the two groups are equal for all 52 covariate combinations. Given that we also include squared terms for each of the raw covariates, the variances on these variables are also equal as can be seen in Table VII which shows additional balance statistics. According to these metrics the balance is higher than that produced by the other adjustment methods. The other methods often leave several of the most important covariates imbalanced (the differences in means remain large and significant) and in several cases the imbalance on key moments is actually increased over the unadjusted data which can be avoided in entropy balancing by including the relevant moments in the reweighting.

A comparison of the average Republican two-party vote share between the treated and control towns in the preprocessed data yields an insignificant effect estimate that is very close to zero. To investigate the model dependency we again examine the effect estimates across a wide range of possible specifications. We create a dataset that includes all raw covariates, their squared terms, and all pairwise interactions (377 covariate combinations overall). We then fit one million regressions of the outcome on the treatment variable and covariates that we randomly sample from the set of all possible subsets of the covariates.<sup>2</sup> We fit each regression in the raw and the preprocessed data (regressions are weighted by the entropy balancing weights). Figure 4 shows the densities of the estimates of the Fox News effect across the regression specifications. In the raw data the estimates vary rather widely

<sup>&</sup>lt;sup>2</sup>Notice that there are  $3.078282 \times 10^{113}$  possible subsets  $\left(\sum_{i=1}^{377} \binom{377}{i}\right)$ .

within  $\pm 1.5$  percentage points of vote share, which may be expected given the limited overlap in the data. The model dependency is much reduced after the entropy balancing adjustment; the range of effect estimates is now narrowed down to  $\pm .3$  percentage points.<sup>3</sup>

Finally, to more closely mirror common practice in applied work, Figures 5 and 6 show a replication of the balance figures for the same analysis where we now omit all squared terms from the preprocessing; the propensity score is estimated with a logistic regression of the treatment indicator on all raw covariates. Such simple propensity score models are widely used in practice where researchers often do not include all squared terms. We can see that the balancing property of the propensity score is now much worse. In fact, when squared terms are omitted the balance on many variables is significantly worse after the propensity score weighting adjustment compared to the raw data (the results look slightly better for propensity score matching). This shows that ill-estimated propensity scores can fail to produce good balance. In this case weighting on the logistic propensity score increases the imbalance over the unadjusted data on many covariates. This may be expected given that the simple model with only the raw covariates does a poor job of capturing the assignment process and the procedure also assigns some very extreme weights since the logistic propensity score is close to zero for some units (Rosenbaum, 1987).

Taken together the application suggests that entropy balancing delivers a high degree of balance in this dataset (as measured by standard metrics). Higher balance reduces model dependence for the estimation of causal effects. It is important to recognize that this replication is intended to simply illustrate the use of entropy balancing in an interesting dataset, it does not invalidate the results of the original study which contains many additional tests and evidence that we do not consider here. We are grateful to the authors for making their data freely available.

<sup>&</sup>lt;sup>3</sup>Notice that the variability in the preprocessed estimates is entirely driven by the fact that the interaction terms are not included in the reweighting adjustment but only in the outcome regressions. Since the entropy balancing includes all raw covariates and their squared terms, the regression estimates are identical across all subsets that do not involve interaction terms.

#### V. Additional Application: The Financial Returns to Political Office

In this section we provide another application of entropy balancing by reanalyzing data from Eggers and Hainmueller (2010), who study the financial returns to serving in parliament using data on the estates of recently deceased British politicians. We focus on their sample of 223 conservative candidates that ran for the House of Commons during the 1950-1970 period (see the article for a detailed discussion of the data). The treatment variable is a binary indicator that is coded as one for the 104 candidates that ran successfully and served in parliament and zero for the 119 control candidates that lost and did not enter parliament. The outcome variable is logged wealth at death, which is measured using probate values that capture the value of the candidate's estate at the time of death (in real 2007 British Pounds). In order to account for the selection into political office the authors control for a variety of background covariates including the candidate's gender, year of birth, year of death, as well as educational, occupational, and aristocratic background. There are 18 covariates in total.

Columns 1-4 in Table VIII display the covariate balance in the unmatched data. As discussed by the authors there are important imbalances in this data. In particular, successful candidates are more likely than unsuccessful candidates to be male and to have aristocratic backgrounds and elite educations (Eton Schooling and Oxbridge Degrees). Successful candidates are also less likely to be in white-collar professions (engineering, accounting, or public relations), journalism, and teaching professions, and less likely to have business backgrounds. The standardized bias exceeds [.1] for all but three of the covariates.

To correct for these imbalances we conduct entropy balancing and specify moment conditions to equalize the means of all 18 covariates between the treatment and the reweighted control group. Columns 5-8 in Table VIII display the covariates means as well as the various balance metrics computed with the re-weighted control group. The mean differences are now reduced to zero on all covariates. Except for the year of birth and year of death measures, all variables are binary so by adjusting their means the variances are also adjusted. This constitutes a higher level of balance than previously achieved for these metrics in this dataset. The difference in means between the treatment group and the reweighted control group yields an average treatment effect on the treated of .99 with a t-statistic of about 2.8, indicating that at serving in Parliament considerably increased wealth at death from conservative MPs. This estimate is close to the magnitude estimated by the authors (the original study used genetic matching).

As a comparison the last few columns present similar balance measures when propensity score weighting, based on a score that is estimated with a logistic regression of the treatment indicator on all covariates, is applied to the same data. While propensity score weighting leads to some balance improvements, important imbalances remain one some key variables such as Oxbridge Degrees, Barrister and Solicitor, and aristocratic background an even worse one some covariates like White Collar professions and year of death the imbalance actually increases over the unmatched data. These imbalances may be corrected by tinkering with the propensity score specification. However, with 18 covariates is is difficult and tedious to find a model that jointly balance all covariates. This shows the benefits of entropy balancing which provides balance by construction of the moment conditions. Figures 7 and 8 show the standardized bias and p-value for the difference in means tests for each covariate when we apply various other matching methods to the same data. Entropy balancing improves on these balance metrics over all other methods including Mahalanobis distance matching, genetic matching, and matching or weighting on the logistic propensity score. Among the other methods, genetic matching does best although some imbalances remain on aristocratic backgrounds and Oxbridge degrees.

## References

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VI. TABLES

 Table I: Results for First Monte Carlo Experiment

 RAW
 DSM
 DSM
 DSW

Estimator:	KAW	PSM	MM	PSMD	GM	PSW	ЦЦ
Design A: equal variances							
Bias	-60.19	-2.34	-9.66	-9.83	-11.36	-0.58	0.02
MSE	45.51	4.87	2.31	2.47	3.25	1.21	0.23
Bias / Bias EB	2746.19	106.78	440.73	448.53	518.36	26.31	1.00
MSE / MSE EB	195.78	20.94	9.93	10.61	13.99	5.22	1.00
Design B: unequal variance	ŵ						
Bias	-59.79	-10.01	-20.84	-23.62	-13.37	-25.64	-0.11
MSE	46.58	5.17	7.07	8.78	3.88	9.38	0.25
Bias / Bias EB	564.52	94.54	196.76	222.99	126.19	242.09	1.00
MSE / MSE EB	188.78	20.94	28.64	35.59	15.73	38.04	1.00
Design C: equal variances a	and squared	l terms					
Bias	-63.24	-3.41	-10.10	-10.39	-11.11	-0.89	0.15
MSE	48.18	4.94	2.42	2.62	3.06	1.24	0.25
Bias / Bias EB	420.09	22.64	67.11	69.02	73.78	5.92	1.00
MSE / MSE EB	190.98	19.57	9.61	10.38	12.13	4.90	1.00
Note: Three independent norm	al covariates manning is	$X \operatorname{drawn} f$	or 50 treate $X \beta + \epsilon w$	ad units with $\beta = (1)$	h means .2	and for 100 $\epsilon \sim N(0.5)$	control
true treatment effect is zero fo	r all units.	Assumption	is satisfy th	le conditions	for EPBR.	1,000 simul	ations.
Design A: Equal unit variance:	s in both gr	oups. Desi	gm B: Uneq	ual variance	ss: 1.5 in t <sub>1</sub>	reatment an	d .5 in
control group. Design C: Equa	d unit varian	ices. Square	ed terms of	X are inclu	ded for all e	estimators, h	out not
the outcome. This mirrors the	situation of	adjusting fo	or additions	al irrelevant	covariates.	Raw: Differ	ence of

	s. Assumptions satisfy the conditions for EPBR. 1,000 simulations.	groups. Design B: Unequal variances: 1.5 in treatment and .5 in	iances. Squared terms of $X$ are included for all estimators, but not	of adjusting for additional irrelevant covariates. Raw: Difference of	; MD: Mahalanobis Distance Matching, PSMD: MD matching on the	Senetic Matching; PSW: weighting on the PS; EB: entropy balancing.	ensity score is estimated with a linear logit in $X$ .		
	the condi	equal var	of $X$ are	nal irrele	ance Mat	weighting	l with a l		
	s satisfy	m B: Un	d terms a	or additio	obis Dist	ig; PSW:	estimated		
•	sumption	os. Desig	. Square	justing fo	Mahalan	: Matchin	score is		
•	nits. As:	oth group	variances	ion of ad	ing; MD:	I: Genetic	ropensity		
:	or all u	ss in b	al unit	e situat	match	tes; GN	. The p		
	s zero 1	varianc	C: Equ	rrors the	ty score	covaria	atching		
5	effect i	al unit	Design	This min	ropensi	onalized	. pair m		
	eatment	A: Equ	group.	come.	PSM: F	orthogo	ng is 1:1		
	true tr	Design	control	the out	means;	PS and	Matchi		

Table II:	Results for	Seco	nd Mor	the $C_{\hat{\epsilon}}$	urlo Ex <sub>l</sub>	perime	$\operatorname{int}$
Estimator:	RAW	MD	GM	PS	PSMD	PSW	EB
Bias	-450	384	61	93	496	-183	-78
MSE	1632	690	518	1050	782	982	464
Time	0	0	23	0	0	0	0
Bias / Bias EB	5.8	4.9	0.8	1.2	6.4	2.3	
MSE / MSE EI	B 3.5	1.5	1.1	2.3	1.7	2.1	1
Time / Time E.	(B 0.0	1.0	1186.5	1.0	1.5	0.5	1
<i>Note:</i> \$1,000 is the presented in Dian mapping between score is misspecific	e true effect for all nond and Sekhon ( the baseline covar ed.	units. T 2006). iates and	The experim The conditi d the outco	ent follov ons do no me is no	vs the secor ot satisfy E n-linear. T	ıd experin PBR and he propen	the sity

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Sample Design 1	: Strong	g Separ	ation and	1 Norma	I Errors							
MSE	RAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Ratio CtoT 1 Y1	320	21	14	358	182	46	352	186	15	354	183	2
Ratio CtoT 1 Y2	497	15	7	153	524	49	164	449	19	152	529	2
Ratio CtoT 1 Y3	997	915	671	1326	1640	1764	1479	2026	742	1205	1526	172
Ratio CtoT 3 Y1	323	18	12	363	185	39	353	190	10	356	185	2
Ratio CtoT 3 Y2	499	13	5	153	525	41	155	459	12	156	532	2
Ratio CtoT 3 Y3	1041	807	599	1186	1675	1601	1357	2035	592	1123	1547	168
Ratio CtoT 5 Y1	324	17	14	368	186	33	352	190	8	360	182	2
Ratio CtoT 5 Y2	499	12	7	155	525	34	143	467	9	158	526	2
Ratio CtoT 5 Y3	1125	739	604	1133	1719	1431	1269	2022	627	1072	1589	186
BIAS	RAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Ratio CtoT 1 Y1	177	42	6	185	132	65	185	135	7	186	134	0
Ratio CtoT 1 Y2	222	35	10	121	227	68	126	211	8	121	229	2
Ratio CtoT 1 Y3	294	292	72	333	393	412	374	443	51	329	384	69
Ratio CtoT 3 Y1	178	38	7	187	133	60	185	136	11	186	134	0
Ratio CtoT 3 Y2	222	31	8	120	227	61	121	213	14	123	229	2
Ratio CtoT 3 Y3	296	272	63	311	393	390	355	441	76	314	384	61
Ratio CtoT 5 Y1	177	35	5	187	131	54	183	135	12	187	133	-1
Ratio CtoT 5 Y2	222	28	7	120	226	54	115	213	17	123	227	1
Ratio CtoT 5 Y3	294	253	58	284	389	362	335	432	96	302	384	50
Sample Design 2	: Weake	er Sepa	ration an	d Norm	al Errors							
MSE	RAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Ratio CtoT 1 Y1	144	8	5	126	82	18	126	88	3	121	78	1
Ratio CtoT 1 Y2	223	4	3	53	222	13	44	191	3	50	221	1
Ratio CtoT 1 Y3	514	440	273	458	823	859	722	1143	219	372	767	95
Ratio CtoT 3 Y1	145	8	5	126	85	16	124	89	2	123	79	1
Ratio CtoT 3 Y2	224	4	3	51	227	12	42	199	3	50	224	1
Ratio CtoT 3 Y3	557	387	259	431	861	775	659	1149	200	354	783	103
Ratio CtoT 5 Y1	146	8	8	131	86	14	123	92	2	124	80	1
Batio CtoT 5 V2	225	4	4	54	230	10	38	204	3	51	225	2
100101012												
Ratio CtoT 5 Y3	629	362	387	458	939	708	630	1138	215	330	786	130
Ratio CtoT 5 Y3 BIAS	629 RAW	362 MD	387 PSM1	458 PSM2	939 PSM3	708 PSMD1	630 PSMD2	1138 PSMD3	215 PSW1	330 PSW2	786 PSW3	130 EB
Ratio CtoT 5 Y3 BIAS Ratio CtoT 1 Y1	629 RAW 118	362 MD 25	387 PSM1 1	458 PSM2 107	939 PSM3 87	708 PSMD1 40	630 PSMD2 109	1138 PSMD3 91	215 PSW1 1	330 PSW2 107	786 PSW3 87	130 EB 0
Ratio CtoT 5 Y2 BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2	629 RAW 118 148	362 MD 25 15	387 PSM1 1 2	458 PSM2 107 68	939 PSM3 87 147	708 PSMD1 40 33	630 PSMD2 109 63	1138 PSMD3 91 136	215 PSW1 1	330 PSW2 107 68	786 PSW3 87 147	130 EB 0 1
Ratio CtoT 5 Y3 BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3	629 RAW 118 148 195	362 MD 25 15 200	387 PSM1 1 2 15	458 PSM2 107 68 175	939 PSM3 87 147 269	708 PSMD1 40 33 284	630 PSMD2 109 63 257	1138 PSMD3 91 136 329	215 PSW1 1 6	330 PSW2 107 68 173	786 PSW3 87 147 267	130 EB 0 1 18
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2     Ratio CtoT 1 Y3       Ratio CtoT 3 Y1	629 RAW 118 148 195 117	362 MD 25 15 200 23	387 PSM1 1 2 15 2	458 PSM2 107 68 175 107	939 PSM3 87 147 269 87	708 PSMD1 40 33 284 37	630 PSMD2 109 63 257 107	1138 PSMD3 91 136 329 91	215 PSW1 1 6 3	330 PSW2 107 68 173 108	786 PSW3 87 147 267 87	130 EB 0 1 18 0
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2	629 RAW 118 148 195 117 148	362 MD 25 15 200 23 13	387 PSM1 1 2 15 2 2 2	458 PSM2 107 68 175 107 67 67	939 PSM3 87 147 269 87 147	708 PSMD1 40 33 284 37 31	630 PSMD2 109 63 257 107 60	1138 PSMD3 91 136 329 91 138	215 PSW1 1 1 6 3 4	330 PSW2 107 68 173 108 68 68	786 PSW3 87 147 267 87 147	130 EB 0 1 18 0 1
Ratio CtoT 5 Y3 BIAS Ratio CtoT 5 Y3 Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y2	629 RAW 118 148 195 117 148 199	362 MD 25 15 200 23 13 184	387 PSM1 1 2 15 2 2 2 18	458 PSM2 107 68 175 107 67 161	939 PSM3 87 147 269 87 147 271	708 PSMD1 40 33 284 37 31 266	630 PSMD2 109 63 257 107 60 241	1138 PSMD3 91 136 329 91 138 326	215 PSW1 1 6 3 4 22	330 PSW2 107 68 173 108 68 165	786 PSW3 87 147 267 87 147 267	130 EB 0 1 18 0 1 14
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 3 Y3       Ratio CtoT 3 Y3       Ratio CtoT 5 Y1	629 RAW 118 148 195 117 148 199 117 147	362 MD 25 15 200 23 13 184 20 20	387 PSM1 1 2 15 2 2 18 -1	458 PSM2 107 68 175 107 67 161 107	939 PSM3 87 147 269 87 147 271 86 86	708 PSMD1 40 33 284 37 31 266 32 32	630 PSMD2 109 63 257 107 60 241 104	1138 PSMD3 91 136 329 91 138 326 91 130	215 PSW1 1 6 3 4 22 2	330 PSW2 107 68 173 108 68 165 107	786 PSW3 87 147 267 87 147 267 87 147 267 86	130 EB 0 1 18 0 1 14 -1
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2	629 RAW 118 148 195 117 148 199 117 147 147	362 MD 25 15 200 23 13 184 20 10	387 PSM1 1 2 15 2 2 2 18 -1 1	458 PSM2 107 68 175 107 67 161 107 67 161	939 PSM3 87 147 269 87 147 271 86 147 271	708 PSMD1 40 33 284 37 31 266 32 266 32	630 PSMD2 109 63 257 107 60 241 104 54 54	1138 PSMD3 91 136 329 91 138 326 91 138	215 PSW1 1 6 3 4 22 2 4 00	330 PSW2 107 68 173 108 68 165 107 67	786 PSW3 87 147 267 87 147 267 86 147 261	$     \begin{array}{r}       130 \\       \hline       130 \\       0 \\       11 \\       18 \\       0 \\       14 \\       -1 \\       -0 \\       2       \end{array} $
Ratio CtoT 5 Y3BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y3	629 RAW 118 148 195 117 148 199 117 147 198	362 MD 25 15 200 23 13 184 20 10 10 171	$     \begin{array}{r} 387 \\             PSM1 \\             1 \\             2 \\           $	458 PSM2 107 68 175 107 67 161 107 67 146	939 PSM3 87 147 269 87 147 271 86 147 270	$\begin{array}{r} 708 \\ \hline PSMD1 \\ 40 \\ 33 \\ 284 \\ \hline 37 \\ 31 \\ 266 \\ \hline 32 \\ 26 \\ 246 \\ \hline 246 \\ \end{array}$	630 PSMD2 109 63 257 107 60 241 104 54 226	$\begin{array}{r} 1138\\ \hline PSMD3\\ 91\\ 136\\ 329\\ 91\\ 138\\ 326\\ \hline 91\\ 138\\ 316\\ \end{array}$	215 PSW1 1 1 6 3 4 22 2 4 22 4 22	330 PSW2 107 68 173 108 68 165 107 67 154	786 PSW3 87 147 267 87 147 267 86 147 261	$ \begin{array}{r} 130\\ \hline \mathbf{EB}\\ 0\\ 1\\ 18\\ 0\\ 1\\ 14\\ -1\\ -0\\ 3\\ \end{array} $
Ratio CtoT 5 Y3BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y3	629 RAW 118 148 195 117 148 199 117 147 198	362 MD 25 15 200 23 13 184 20 10 171	387 PSM1 1 2 15 2 2 18 -1 1 6	458 PSM2 107 68 175 107 67 161 107 67 146	939 PSM3 87 147 269 87 147 271 86 147 270	708 PSMD1 40 33 284 37 31 266 32 26 246	630 PSMD2 109 63 257 107 60 241 104 54 226	1138 PSMD3 91 136 329 91 138 326 91 138 316	215 PSW1 1 1 6 3 4 22 2 4 22 4 22	330 PSW2 107 68 173 108 68 165 107 67 154	786 PSW3 87 147 267 87 147 267 86 147 261	$ \begin{array}{r} 130\\ \hline \mathbf{EB}\\ 0\\ 1\\ 18\\ 0\\ 1\\ 14\\ -0\\ 3\\ \end{array} $
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y3	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu	362 MD 25 15 200 23 13 184 20 10 171 m Sep	387 PSM1 1 2 15 2 2 2 18 -1 1 6 aration a	458 PSM2 107 68 175 107 67 161 107 67 146 nd Lepto	939 PSM3 87 147 269 87 147 271 86 147 270 bkurtic E	708 PSMD1 40 33 284 37 31 266 246 246	630 PSMD2 109 63 257 107 60 241 104 54 226	1138 PSMD3 91 136 329 91 138 326 91 138 316	215 PSW1 1 6 3 4 22 2 4 22	330 PSW2 107 68 173 108 68 165 107 67 154	786 PSW3 87 147 267 87 147 267 86 147 261	$ \begin{array}{r} 130\\ \hline \mathbf{EB}\\ 0\\ 1\\ 18\\ 0\\ 1\\ -1\\ -0\\ 3\\ \end{array} $
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y3       Sample Design 3       MSE	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW	362 MD 25 15 200 23 13 184 20 10 171 m Sepa MD	387 PSM1 2 15 2 2 2 18 1 1 6 aration a PSM1	458 PSM2 107 68 175 107 67 161 107 67 146 md Lepto PSM2	939 PSM3 87 147 269 87 147 271 86 147 270 0kurtic E PSM3	708 PSMD1 40 33 284 37 31 266 26 246 246 246 246 246 246	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3	215 PSW1 1 6 3 4 22 2 2 4 22 2 2 4 22 2 8 2 9 2 8 1 2 2	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2	786 PSW3 87 147 267 87 147 267 86 147 261 261	130 <b>EB</b> 0 1 18 0 1 14 -1 -0 3 <b>EB</b>
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y3       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       Batio CtoT 5 Y3       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       Sample Design 3       MSE       Ratio CtoT 1 Y1	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW 218	362 MD 25 15 200 23 13 184 20 10 171 m Sept. MD 16	387 PSM1 2 15 2 2 2 18 -1 1 6 aration a PSM1 12	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239	939 PSM3 87 147 269 87 147 271 86 147 270 0kurtic E PSM3 138	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 246	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150	215 PSW1 1 6 3 4 22 2 4 22 2 4 22 9 8 9 8 9 8 9 8 9 10	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234	786 PSW3 87 147 267 87 147 267 86 147 261 261 PSW3 139	130 EB 0 1 18 0 1 14 -1 -0 3 EB 1
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW 218 343	362 MD 25 15 200 23 13 184 20 10 171 m Sep: MD 16 10	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 12 16	458 PSM2 07 68 175 07 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103	939 PSM3 87 147 269 87 147 271 86 147 270 <b>okurtic E</b> PSM3 138 398	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246	630 PSMD2 63 257 60 241 104 54 226 PSMD2 233 108	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 346	215 PSW1 1 6 3 4 22 2 4 22 4 22 2 4 22 10 15 5	330 PSW2 68 173 108 68 165 165 107 154 PSW2 234 115	786 PSW3 87 147 267 87 147 267 86 147 261 PSW3 139 409	130 <b>EB</b> 0 1 18 0 1 14 -1 -0 3 <b>EB</b> 1 2 2 2 2 2 2 2 2 2 2 2 2 2
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 5 Y3       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       Bando CtoT 5 Y3       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW 218 RAW 218 343 1049	362 MD 25 15 200 23 13 184 20 10 171 m Sep MD 16 6 10 794	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 583	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843	939 PSM3 87 147 269 87 147 271 86 147 271 86 147 271 86 147 271 86 147 271 86 147 147 283 147 86 147 147 147 147 147 147 147 147	708 PSMD1 40 33 284 37 31 266 246 246 246 PSMD1 PSMD1 32 31 1512	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721	215 PSW1 1 6 3 4 22 2 4 22 2 9 8 4 22 2 9 8 9 8 9 8 9 10 15 506	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862	786 PSW3 87 147 267 87 147 267 86 147 261 261 9 86 147 261 147 261 147 261 147 261 147 261 147 261 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 147 267 267 267 267 267 267 267 267 267 26	130 <b>EB</b> 0 1 18 0 1 14 -1 -0 3 <b>EB</b> 1 2 234
Batis     CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2     Ratio CtoT 1 Y3       Ratio CtoT 3 Y1     Ratio CtoT 3 Y2       Ratio CtoT 5 Y3     Ratio CtoT 5 Y3       Sample Design 3       MSE       Ratio CtoT 1 Y1       Ratio CtoT 5 Y3       Ratio CtoT 5 Y3       Sample Design 3       MSE       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW 218 343 1049 216	362 MD 25 15 200 23 13 184 20 10 171 <b>m Sep</b> MD 16 10 794 14	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 583 11	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237	939 PSM3 87 147 269 87 147 271 147 271 147 271 147 270 <b>okurtic E</b> PSM3 138 398 1346 138	708 PSMD1 40 33 284 37 31 266 226 246 246 246 246 246 27 75 PSMD1 32 31 1512 27	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 233 108 227	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148	215 PSW1 1 6 3 4 22 2 4 22 2 4 2 2 2 4 5 506	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234	786 PSW3 87 147 267 87 147 267 86 147 261 PSW3 139 409 1210 139	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \end{array}$ $\begin{array}{c} \mathbf{EB} \\ 1 \\ 2 \\ 234 \\ 1 \\ 1 \\ \end{array}$
Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       Sample Design 3       MSE       Ratio CtoT 1 Y2       Ratio CtoT 1 Y2       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1	629 RAW 118 148 195 117 148 199 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 198 117 148 148 148 148 148 148 148 148	362 MD 25 15 200 23 13 184 20 10 171 m Sept MD 16 10 794 794 74 99	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 583 11 5 -5	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237 104	939 PSM3 87 147 269 87 147 271 86 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 396 138	708 PSMD1 40 33 284 37 31 266 246 246 PSMD1 527 27 27 27 27 27	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 1219 227 99	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348	215 PSW1 1 6 3 4 22 2 4 22 4 22 4 22 10 15 506 8 13 8	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115	786 PSW3 87 147 267 87 147 267 86 147 261 PSW3 139 409 1210 139 405	130 EB 0 1 18 0 1 14 -1 -0 3 EB 1 2 234 1 2 234 1 2 234
Bits     Cord 5     Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       Sample Design 3       MSE       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y1       Ratio CtoT 3 Y2       Ratio CtoT 3 Y2       Ratio CtoT 3 Y2	629 RAW 118 148 195 117 148 199 117 147 199 117 147 199 117 147 148 199 117 148 148 199 117 148 149 149 147 148 149 147 148 148 149 147 148 148 149 147 148 148 148 148 148 148 148 148	362 MD 25 15 200 23 184 20 10 171 m Sep: MD 16 10 794 14 9 680	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 583 11 5 5777	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761	939 PSM3 87 147 269 87 147 271 86 147 270 <b>okurtic E</b> PSM3 138 398 1346 1399	708 PSMD1 40 33 284 37 31 266 246 246 246 246 27 31 1512 27 1352	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 1644	215 PSW1 1 6 3 4 22 2 4 4 22 2 2 4 5 2 6 8 10 15 506 8 13 512	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115 862 234 115	786 PSW3 87 147 267 147 267 86 147 261 261 9 86 147 261 147 261 147 261 147 261 147 261 147 261 147 261 147 267 147 261 147 147 261 147 147 147 147 147 147 147 147 147 14	130 EB 0 1 1 18 0 1 14 -1 -0 3 EB 1 2 234 1 2 2222
Batio     CtoT 5 Y3       BIAS       Ratio     CtoT 1 Y1       Ratio     CtoT 1 Y2       Ratio     CtoT 1 Y2       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y2       Ratio     CtoT 3 Y2       Ratio     CtoT 3 Y2       Ratio     CtoT 5 Y2       Ratio     CtoT 5 Y2       Ratio     CtoT 5 Y2       Ratio     CtoT 1 Y1       Ratio     CtoT 1 Y1       Ratio     CtoT 1 Y1       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y2       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y2       Ratio     CtoT 3 Y1       Ratio     CtoT 3 Y1       Ratio     CtoT 5 Y1	629 RAW 118 148 195 117 148 199 117 147 198 <b>Mediu</b> RAW 218 343 1049 216 341 1069 224	362 MD 25 15 200 23 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 583 11 5 577 13	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761 249 249 249 249 249 249 249 249	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>kurtic E</b> PSM3 138 398 1346 138 399 144 1399	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 27 7 27 27 27 27 1352 25 25	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 348 1644 152 555	$\begin{array}{c} 215 \\ \text{PSW1} \\ 1 \\ 1 \\ 6 \\ 3 \\ 4 \\ 22 \\ 2 \\ 4 \\ 22 \\ \end{array}$ $\begin{array}{c} \text{PSW1} \\ 10 \\ 15 \\ 506 \\ 8 \\ 13 \\ 512 \\ 17 \\ 17 \\ \end{array}$	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115 862 234 116 789 246 6	786 PSW3 87 147 267 87 147 267 86 147 261 147 261 147 261 147 261 139 409 1210 139 405 1218 141 141 145 145 145 145 145 145	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \hline \mathbf{EB} \\ 1 \\ 2 \\ 234 \\ 1 \\ 2 \\ 222 \\ 222 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$
Bits     Cord 5 Y3       BIAS       Ratio CtoT 5 Y3       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y3       Ratio CtoT 5 Y1       Ratio CtoT 1 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 3 Y2       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1	629 RAW 118 148 195 117 148 199 117 147 198 : Mediu RAW 218 343 1049 216 341 1069 224 343 343	362 MD 25 15 200 23 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14	$\begin{array}{r} 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 18\\ \hline -1\\ 1\\ 6\\ \hline aration a\\ \hline PSM1\\ 12\\ 6\\ 583\\ 11\\ 5\\ 577\\ 13\\ 6\\ 020\\ \end{array}$	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761 249 108 765 107 107 107 107 107 107 107 107	939 PSM3 87 147 269 87 147 271 47 271 866 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 396 1396 1396 144 402 144	708 PSMD1 40 33 284 37 31 266 246 246 246 246 25 25 23 25 23 25 23 25 23 25 23 25 25 23 25 25 23 25 25 25 25 25 25 25 25 25 25	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 227 99 1044 232 292 200	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 348 1644 152 358	215 PSW1 1 6 3 4 22 2 4 22 4 22 2 4 22 5 5 5 06 8 13 5 12 7 7 11 1 5 5 1	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 862 234 116 789 246 118	786 PSW3 87 147 267 87 147 267 86 147 261 PSW3 139 409 1210 139 405 1218 141 407	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \end{array}$
Ratio CtoT 5 Y3         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           148           199           117           147           198           RAW           218           343           1069           224           343           1069           224           343           1172	362 MD 25 15 200 23 13 184 20 0 171 MD 16 10 794 14 9 680 14 9 655	$\begin{array}{r} 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 18\\ \hline -1\\ 1\\ 6\\ \hline 8\\ \hline 8\\ \hline 8\\ 12\\ 6\\ 5\\ 5\\ 5\\ 5\\ 7\\ 7\\ 1\\ 3\\ 6\\ 820\\ \hline \end{array}$	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237 104 761 249 104 761 249 104 761 249 104 723	939 PSM3 87 147 269 87 147 271 86 147 270 <b>okurtic E</b> <b>PSM3</b> 138 398 1346 138 396 1399 149 149 149 149 147 147 270 147 270 138 138 138 139 138 139 138 139 138 139 138 138 139 138 138 138 138 139 138 138 138 138 138 138 138 138	708 PSMD1 40 33 284 37 31 266 246 246 26 246 246 PSMD1 32 31 1512 27 27 1352 23 1244	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 1644 152 358 1670	215 PSW1 1 6 3 4 22 2 4 22 4 22 4 22 3 4 22 10 15 506 8 13 512 7 11 524	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 789 246 118 780	786 PSW3 87 147 267 87 147 267 86 147 261 PSW3 139 409 1210 139 405 1218 139 405 1218 141 407 1233	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \end{array}$ $\begin{array}{c} \mathbf{EB} \\ 1 \\ 2 \\ 234 \\ 1 \\ 2 \\ 222 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 38 \\ \end{array}$
Bits     Cord 5     Figure 13       Ratio CtoT 5     Y3       Ratio CtoT 1     Y1       Ratio CtoT 1     Y2       Ratio CtoT 1     Y3       Ratio CtoT 1     Y3       Ratio CtoT 3     Y1       Ratio CtoT 5     Y1       Ratio CtoT 5     Y2       Ratio CtoT 5     Y3       Ratio CtoT 1     Y1       Ratio CtoT 1     Y2       Ratio CtoT 3     Y1       Ratio CtoT 3     Y1       Ratio CtoT 3     Y1       Ratio CtoT 3     Y1       Ratio CtoT 3     Y2       Ratio CtoT 3     Y2       Ratio CtoT 3     Y3       Ratio CtoT 5     Y1       Ratio CtoT 5     Y2       Ratio CtoT 5     Y3       BIAS     BIAS	629 RAW 118 148 195 117 148 199 117 147 198 218 343 1049 216 341 1069 224 343 1172 RAW	362 MD 25 15 200 23 13 184 20 10 171 171 MD 16 10 10 171 4 9 680 14 9 680 14 9 655 MD	387 PSM1 1 2 2 2 2 18 -1 1 1 6 583 11 12 6 583 11 15 5577 13 6 6820 PSM1	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 249 103 843 249 104 723 PSM2	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>bkurtic E</b> PSM3 138 398 1346 138 138 138 138 138 138 138 138	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 246 247 727 1352 27 1352 27 1352 25 23 1244 PSMD1	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 99 1044 232 92 1006 PSMD2	1138 PSMD3 91 136 329 91 138 326 91 138 316 91 138 316 150 346 1721 148 348 1644 152 358 1670 PSMD3	215 PSW1 1 6 3 4 22 2 4 22 2 4 22 2 5 5 6 8 8 13 5 16 8 8 13 5 12 7 7 11 5 24 PSW1	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115 862 234 116 789 246 118 780 PSW2	786 PSW3 87 147 267 87 147 267 261 PSW3 139 409 1210 139 409 1210 139 405 1218 141 407 1233 PSW3	130 EB 0 1 18 0 1 14 -0 3 2 2 2 2 2 2 2 2 2 2 2 2 2
Ratio CtoT 5 Y3         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y3         Ratio CtoT 5 Y3         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1         Ratio CtoT 7 Y3         Ratio CtoT 7 Y3         Ratio CtoT 7 Y3         Ratio CtoT 7 Y3	629           RAW           118           148           195           117           148           199           117           148           199           117           147           198           W           218           343           1049           216           341           224           343           146	362 MD 25 15 200 23 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14 9 655 MD 36	387 PSM1 1 2 15 2 2 18 -1 1 6 6 583 11 2 2 2 18 6 6 5 8 7 7 7 7 7 7 7	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 249 108 783 237 104 761 763 764 765 767 767 767 767 767 767 767	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 396 1399 144 402 144 402 PSM3 115	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 246 25 23 124 27 27 27 27 27 27 27 27 27 27 25 23 1244 54 54	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 348 1644 152 358 1670 PSMD3 121	215 PSW1 1 1 6 3 4 22 2 4 4 22 2 4 4 22 2 4 5 506 8 13 512 7 11 524 7 11 524 PSW1 25	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 789 246 118 780 PSW2 151	786 PSW3 87 147 267 86 147 261 7 86 147 261 7 86 147 261 7 80 139 409 1210 139 409 1210 139 405 1218 141 407 1233 PSW3 116	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \end{array}$ $\begin{array}{c} \mathbf{EB} \\ 1 \\ 2 \\ 234 \\ 1 \\ 2 \\ 222 \\ 2 \\ 223 \\ \mathbf{EB} \\ 0 \\ \end{array}$
Batab CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 7 Y2       Ratio CtoT 1 Y2       Ratio CtoT 1 Y2       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 3 Y2       Ratio CtoT 3 Y2       Ratio CtoT 3 Y1       Ratio CtoT 3 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 5 Y1       Ratio CtoT 7 Y2       Ratio CtoT 5 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           148           199           117           148           343           1049           216           341           1069           224           343           1172           RAW           148	362 MD 25 15 200 23 13 184 20 171 MD 16 10 794 9 680 14 9 655 MD 655 MD 629	$\begin{array}{r} 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 18\\ \hline \\ -1\\ 1\\ 6\\ \hline \\ 8\\ \hline \\ 8\\ \hline \\ 12\\ 6\\ 583\\ 11\\ 5\\ 5\\ 577\\ 13\\ 6\\ 820\\ \hline \\ PSM1\\ \hline \\ 7\\ 11\\ \end{array}$	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761 249 108 723 PSM2 150 98	939 PSM3 87 147 269 87 147 271 866 147 270 <b>5kurtic E</b> PSM3 138 398 1346 138 396 1398 1346 138 396 1399 144 402 1462 PSM3 1147 147 147 147 147 147 147 14	708 PSMD1 40 33 284 37 31 266 246 246 246 246 PSMD1 32 31 1512 27 27 1352 27 27 1352 27 25 23 1244 PSMD1 54 55	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101	1138 PSMD3 91 136 329 91 138 326 91 138 316 75 75MD3 150 346 1721 148 348 1644 152 358 1670 PSMD3 PSMD3	215 PSW1 1 6 3 4 22 2 4 22 4 22 4 22 4 25 506 8 13 512 7 7 11 524 PSW1 7 11 524	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 789 246 118 789 246 118 789 246 118 789	786 PSW3 87 147 267 86 147 267 86 147 261 PSW3 139 409 1210 139 405 1218 1218 1218 1218 1218 1213 141 407 1233 PSW3 116 201	130 EB 0 1 1 18 0 1 14 -0 -0 3 EB 1 2 234 1 2 222 2 238 EB 0 0 4
Bailso CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 5 Y1       Ratio CtoT 7 Y2       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 3 Y1       Ratio CtoT 5 Y2       Ratio CtoT 5 Y2       Ratio CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2       Ratio CtoT 1 Y3	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           148           199           117           147           198           Wediu           RAW           218           343           1069           224           343           1172           RAW           146           301	362 MD 25 15 200 23 13 184 20 0 171 MD 16 6 10 794 9 680 14 9 680 14 9 655 MD 366 29 273	$\begin{array}{r} 387\\ \hline 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 2\\ 2\\ 18\\ \hline -1\\ 1\\ 1\\ 6\\ \hline 820\\ \hline 833\\ 11\\ 12\\ 6\\ 5537\\ 13\\ 6\\ 820\\ \hline PSM1\\ \hline 7\\ 11\\ 74\\ \end{array}$	$\begin{array}{r} 458\\ \hline \text{PSM2}\\ \hline 107\\ 68\\ 175\\ \hline 107\\ 67\\ 161\\ \hline 107\\ 67\\ 146\\ \hline \\ \textbf{md Lepte}\\ \hline \textbf{pSM2}\\ 239\\ 103\\ 843\\ 237\\ 104\\ 761\\ \hline 249\\ 108\\ 723\\ \hline \textbf{PSM2}\\ 150\\ 98\\ \hline \textbf{s}247\\ \end{array}$	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>bkurtic E</b> PSM3 138 138 138 138 138 138 138 13	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 245 727 1352 25 23 1244 PSMD1 54 53 381	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 99 1044 232 99 1044 232 99 1044 233 99 1044 233 99 1044 233 99 1044 233 99 1044 233 99 1044 233 30 108 129 109 109 109 109 109 109 109 109 109 10	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 1644 152 358 1670 PSMD3 121 184 407	215 PSW1 1 6 3 4 22 2 4 22 2 4 22 2 5 5 5 5 5 5 5 6 8 8 13 5 12 7 11 5 24 PSW1 15 5 24 7 7 11 5 24 7 7 11 5 24 7 7 7 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 789 246 118 780 PSW2 151 105 274	786 PSW3 87 147 267 87 147 267 86 147 261 986 147 261 147 261 139 409 1210 139 409 1210 139 405 1218 141 407 1233 PSW3 116 201 339	$\begin{array}{c} 130 \\ \hline {\bf EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 0 \\ 1 \\ -1 \\ -0 \\ 3 \\ \end{array}$
Batis     CtoT 5 Y3       BIAS       Ratio CtoT 1 Y1       Ratio CtoT 1 Y2     Ratio CtoT 1 Y2       Ratio CtoT 3 Y1     Ratio CtoT 3 Y1       Ratio CtoT 3 Y2     Ratio CtoT 5 Y2       Ratio CtoT 5 Y3     Ratio CtoT 5 Y2       Ratio CtoT 1 Y1     Ratio CtoT 5 Y2       Ratio CtoT 5 Y1     Ratio CtoT 1 Y1       Ratio CtoT 1 Y1     Ratio CtoT 1 Y1       Ratio CtoT 1 Y2     Ratio CtoT 3 Y1       Ratio CtoT 3 Y1     Ratio CtoT 5 Y1       Ratio CtoT 5 Y2     Ratio CtoT 5 Y1       Ratio CtoT 5 Y2     Ratio CtoT 5 Y1       Ratio CtoT 5 Y1     Ratio CtoT 5 Y2       Ratio CtoT 1 Y1     Ratio CtoT 7 Y1       Ratio CtoT 7 Y1     Ratio CtoT 7 Y1       Ratio CtoT 7 Y1     Ratio CtoT 7 Y1       Ratio CtoT 1 Y1     Ratio CtoT 1 Y2       Ratio CtoT 1 Y1     Ratio CtoT 1 Y1       Ratio CtoT 1 Y2     Ratio CtoT 1 Y2       Ratio CtoT 3 Y1     Ratio CtoT 3 Y1	629           RAW           118           148           195           117           148           199           117           198           : Mediu           RAW           218           343           1049           216           341           1069           224           343           1172           RAW           146           184           145	362 MD 25 15 200 23 13 184 20 10 171 MD 16 10 794 14 9 680 14 9 655 MD 36 293 273 32	387 PSM1 1 2 15 2 2 18 -1 1 6 aration a PSM1 12 6 5 5 5 7 13 6 820 PSM1 7 11 7 4 6 6	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761 249 103 843 237 104 761 249 108 783 249 108 783 249 108 783 249 108 783 249 108 783 249 108 783 249 108 783 761 761 767 767 767 767 767 767	939 PSM3 87 147 269 87 147 271 47 271 47 270 866 147 270 <b>bkurtic E</b> PSM3 138 398 1346 138 398 1346 1399 144 402 145 1981 399 144 402 145 1981 115 1981 315 115 1981 114	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 247 726 25 23 31 244 PSMD1 54 53 381 50	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101 339 147	1138 PSMD3 91 136 329 91 138 326 91 138 316 70 PSMD3 150 346 1721 148 348 348 1644 152 358 1670 PSMD3 121 184 407 119	215 PSW1 1 1 6 3 4 22 2 4 4 22 2 4 4 22 2 5 506 8 8 13 512 7 11 524 PSW1 25 35 777 24	330 PSW2 107 68 173 108 68 165 107 67 154 784 234 115 862 234 115 862 234 116 789 246 118 780 PSW2 151 105 274 151	786 PSW3 87 147 267 86 147 261 261 261 261 261 261 261 261 261 261	130 EB 0 1 18 0 1 14 -1 -0 3 EB 2 2 2 2 2 2 2 2 2 2 2 2 2
Ratio CtoT 5 Y3         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 5 Y3         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           148           199           117           147           198           218           343           1049           216           341           1069           224           343           1172           RAW           1216           341           1069           224           343           1172           RAW           146           184           301           145           184           301	362 MD 25 15 200 23 13 184 20 10 171 <b>m Sep</b> MD 16 10 794 14 9 680 14 9 685 MD 14 9 685 MD	$\begin{array}{r} 387\\ \hline 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ \hline 2\\ 2\\ 18\\ \hline -1\\ 1\\ 6\\ \hline 8\\ \hline 11\\ 12\\ 6\\ 583\\ \hline 11\\ 12\\ 6\\ 583\\ \hline 11\\ 5\\ 577\\ \hline 13\\ 6\\ 820\\ \hline PSM1\\ \hline 7\\ 11\\ 74\\ \hline 6\\ 10\\ \hline 0\\ 10\\ \hline \end{array}$	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 761 239 103 843 237 104 761 249 108 723 PSM2 150 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 98 247 140 108 108 109 109 109 109 109 109 109 109	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 396 139 1346 138 396 139 1346 138 396 139 1345 138 396 1395 138 395 137 144 402 144 402 144 402 157 198 351 198 351 117 198 351 117 117 117 117 117 117 117 1	708 PSMD1 40 33 284 37 31 266 226 246 246 246 25 23 1244 PSMD1 727 25 23 1244 PSMD1 PSMD1 54 53 381 30 1512 25 25 23 25 25 25 25 25 25 25 25 25 25	630 PSMD2 109 63 257 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101 339 147 96 95 147 96	1138 PSMD3 91 136 329 91 138 326 91 138 316 7 PSMD3 150 346 1721 148 348 348 348 348 348 1644 152 358 1670 PSMD3 121 184 407 119 185	215 PSW1 1 6 3 4 22 2 4 22 4 22 4 22 7 10 10 15 506 8 13 512 7 11 524 9SW1 25 35 177 7 117 25 35 177	330 PSW2 107 68 173 108 68 165 107 67 154 234 115 862 234 115 862 234 116 789 246 118 789 246 118 789 246 118 780 PSW2 151 105 274 151	786 PSW3 87 147 267 87 147 267 86 147 261 7 86 147 261 7 9 80 409 409 1210 139 409 1210 139 409 1210 139 405 1218 141 407 1233 116 201 339 116 200	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ 14 \\ -1 \\ 0 \\ 3 \\ \end{array}$
Ratio CtoT 5 Y3 BIAS Ratio CtoT 5 Y3 Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 5 Y1 Ratio CtoT 5 Y1 Ratio CtoT 5 Y1 Ratio CtoT 5 Y3 Sample Design 3 MSE Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 3 Y2 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 5 Y1 Ratio CtoT 5 Y1 Ratio CtoT 5 Y1 Ratio CtoT 5 Y2 Ratio CtoT 5 Y2 Ratio CtoT 5 Y2 Ratio CtoT 5 Y3 BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 3 Y2	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           148           198           218           343           1069           216           341           1069           224           343           1172           RAW           146           184           301           145           184           302	362 MD 25 15 200 23 13 184 20 0 171 MD 16 10 794 9 680 14 9 655 MD 655 MD 655 MD 36 29 273 32 255 250	$\begin{array}{r} 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 18\\ \hline \\ -1\\ 1\\ 6\\ \hline \\ 8\\ 11\\ 1\\ 6\\ \hline \\ 820\\ \hline \\ PSM1\\ \hline \\ 7\\ 13\\ 6\\ 820\\ \hline \\ PSM1\\ \hline \\ 7\\ 11\\ 74\\ 6\\ 10\\ 63\\ \hline \\ 8\\ 0\\ \hline \end{array}$	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237 104 761 249 108 723 PSM2 150 98 247 149 98 217	939 PSM3 87 147 269 87 147 271 86 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 398 1346 138 396 1399 1462 PSM3 145 145 198 351 114 197 357	708 PSMD1 40 33 284 37 31 266 246 246 246 PSMD1 512 27 27 1352 27 27 1352 23 1244 PSMD1 54 53 381 50 49 358	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 99 1044 232 92 1006 PSMD2 150 101 339 147 96 309 309	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 1644 152 358 1670 PSMD3 121 184 407 119 185 395 355	215 PSW1 1 6 3 4 22 2 4 22 4 22 4 22 7 10 15 506 8 13 512 7 7 11 524 PSW1 7 11 524 PSW1 7 7 11 524 35 1777 24 33 181	330 PSW2 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 116 789 246 118 780 PSW2 151 105 274 151 105 274 151	786 PSW3 87 147 267 87 147 267 86 147 261 980 147 261 147 261 147 261 147 261 147 261 149 139 409 1210 139 405 1218 141 407 1233 PSW3 116 201 339 116 201 339 116 201 339	130 EB 0 1 18 0 1 14 -0 3 2 234 1 2 234 1 2 234 1 2 234 1 2 238 EB 0 4 121 0 0 1 1 1 2 2 2 3 8 2 2 2 3 8 1 2 2 2 2 3 8 1 2 2 2 2 3 8 1 2 2 2 2 3 8 1 1 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 2 3 8 1 1 2 2 2 2 2 2 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 2 3 8 1 1 2 2 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 3 8 1 2 2 2 2 2 2 2 2 3 8 1 1 2 2 2 2 2 3 8 1 1 2 2 2 2 2 3 8 1 1 1 2 2 2 2 2 3 8 1 1 1 2 2 2 2 2 2 3 8 1 1 1 1 1 1 1 1 1 1 1 1 1
Ratio CtoT 5 Y3         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 3 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y3         Ratio CtoT 3 Y3         Ratio CtoT 3 Y3         Ratio CtoT 3 Y3 <td>629           RAW           118           148           195           117           148           199           117           198           216           343           1069           224           343           1172           RAW           146           184           301           302           146           145           184</td> <td>362 MD 25 15 200 13 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14 9 680 14 9 655 MD 36 299 273 32 255 250 31</td> <td>387 PSM1 1 2 15 2 2 18 -1 1 6 8 2 2 2 18 -1 1 1 6 5 5 5 777 13 6 820 PSM1 7 11 7 16 6 820 PSM1 7 13 6 820 9 9 9 11 12 6 8 8 11 12 12 13 14 15 15 15 16 10 10 10 10 10 10 10 10 10 10</td> <td>458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 843 237 104 843 237 103 843 237 104 105 249 105 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 150 150 150 161 161 161 161 161 167 146 167 167 146 167 146 167 146 167 167 146 167 167 167 167 167 167 167 16</td> <td>939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>kurtic E</b> PSM3 138 398 1346 138 1399 144 402 1462 149 145 198 351 115 197 115 155 155 155 155 155 155 15</td> <td>708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 245 727 32 31 1512 27 27 1352 25 23 31244 PSMD1 PSMD1 54 53 381 50 9358</td> <td>630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101 339 147 96 309 147</td> <td>1138 PSMD3 91 136 329 91 138 326 91 138 316 91 138 316 138 316 1721 148 348 1644 1721 148 348 1644 152 358 1670 PSMD3 121 184 407 119 185 395</td> <td>215 PSW1 1 6 3 4 22 2 4 22 4 22 2 4 3 5 506 8 8 8 13 512 7 7 11 524 PSW1 25 35 177 24 33 181 20 20</td> <td>330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115 862 234 115 862 234 115 862 234 115 106 246 118 780 PSW2 151 105 274 151 106 263 154</td> <td>786 PSW3 87 147 267 87 147 267 261 986 147 261 147 261 147 261 139 409 1210 139 409 1210 139 405 1218 405 1218 141 407 1233 PSW3 116 201 339 116 200 339 116</td> <td><math display="block">\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ -1 \\ -0 \\ 3 \\ \end{array}</math></td>	629           RAW           118           148           195           117           148           199           117           198           216           343           1069           224           343           1172           RAW           146           184           301           302           146           145           184	362 MD 25 15 200 13 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14 9 680 14 9 655 MD 36 299 273 32 255 250 31	387 PSM1 1 2 15 2 2 18 -1 1 6 8 2 2 2 18 -1 1 1 6 5 5 5 777 13 6 820 PSM1 7 11 7 16 6 820 PSM1 7 13 6 820 9 9 9 11 12 6 8 8 11 12 12 13 14 15 15 15 16 10 10 10 10 10 10 10 10 10 10	458 PSM2 107 68 175 107 67 161 107 67 146 PSM2 239 103 843 237 104 843 237 104 843 237 103 843 237 104 105 249 105 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 98 247 150 150 150 150 161 161 161 161 161 167 146 167 167 146 167 146 167 146 167 167 146 167 167 167 167 167 167 167 16	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>kurtic E</b> PSM3 138 398 1346 138 1399 144 402 1462 149 145 198 351 115 197 115 155 155 155 155 155 155 15	708 PSMD1 40 33 284 37 31 266 246 246 246 246 246 246 246 245 727 32 31 1512 27 27 1352 25 23 31244 PSMD1 PSMD1 54 53 381 50 9358	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101 339 147 96 309 147	1138 PSMD3 91 136 329 91 138 326 91 138 316 91 138 316 138 316 1721 148 348 1644 1721 148 348 1644 152 358 1670 PSMD3 121 184 407 119 185 395	215 PSW1 1 6 3 4 22 2 4 22 4 22 2 4 3 5 506 8 8 8 13 512 7 7 11 524 PSW1 25 35 177 24 33 181 20 20	330 PSW2 107 68 173 108 68 165 107 67 154 PSW2 234 115 862 234 115 862 234 115 862 234 115 862 234 115 106 246 118 780 PSW2 151 105 274 151 106 263 154	786 PSW3 87 147 267 87 147 267 261 986 147 261 147 261 147 261 139 409 1210 139 409 1210 139 405 1218 405 1218 141 407 1233 PSW3 116 201 339 116 200 339 116	$\begin{array}{c} 130 \\ \hline \mathbf{EB} \\ 0 \\ 1 \\ 18 \\ 0 \\ 1 \\ -1 \\ -0 \\ 3 \\ \end{array}$
Ratio CtoT 5 Y3         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 7 Y3         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y1<	629           RAW           118           148           195           117           148           199           117           148           199           117           148           199           117           198           Sava           1049           216           341           1069           224           343           1172           1166           184           302	362 MD 25 15 200 23 13 184 20 10 171 m Sep MD 16 10 794 14 9 680 14 9 655 50 00 14 9 655 50 00 273 32 255 250 031 32 25 250 250 253	$\begin{array}{r} 387\\ \hline PSM1\\ 1\\ 2\\ 15\\ 2\\ 2\\ 18\\ \hline -1\\ 1\\ 6\\ \hline 8\\ \hline 8\\ 11\\ 12\\ 6\\ 583\\ \hline 11\\ 12\\ 6\\ 583\\ \hline 11\\ 5\\ 577\\ \hline 13\\ 6\\ 820\\ \hline PSM1\\ \hline 7\\ 11\\ 74\\ \hline 7\\ 11\\ 74\\ \hline 6\\ 10\\ 63\\ \hline 5\\ 10\\ \hline 63\\ \hline 5\\ 10\\ 10\\ \hline 63\\ \hline 5\\ 10\\ 10\\ \hline 8\\ 5\\ 10\\ 10\\ \hline 8\\ 5\\ 10\\ 10\\ 10\\ \hline 8\\ 5\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10\\ 10$	458 PSM2 107 68 175 107 67 161 107 67 146 <b>nd Leptc</b> PSM2 239 103 843 237 104 239 103 843 237 104 761 249 108 753 249 108 753 249 108 764 764 764 764 764 764 764 764	939 PSM3 87 147 269 87 147 271 147 271 147 270 <b>okurtic E</b> PSM3 138 398 1346 138 398 1346 138 396 1395 138 396 1395 138 396 138 396 138 396 138 396 138 396 138 396 138 395 137 138 395 137 138 395 137 138 395 137 138 395 137 138 395 137 195 195 195 195 195 195 195 195	708 PSMD1 40 33 284 37 31 266 226 246 246 246 246 25 23 1244 PSMD1 27 27 27 27 27 27 25 23 1244 54 54 54 53 81 50 49 45 45 45 45 45 45 45 45 45 45	630 PSMD2 109 63 257 107 60 241 104 54 226 PSMD2 233 108 1219 227 99 1044 232 92 1006 PSMD2 150 101 339 147 96 309 147 90 202	1138 PSMD3 91 136 329 91 138 326 91 138 316 PSMD3 150 346 1721 148 348 1644 152 358 1670 PSMD3 121 184 407 119 185 395 119 186	215 PSW1 1 6 3 4 22 2 4 4 22 2 4 2 4 22 7 10 10 15 506 8 13 512 7 11 524 7 11 524 7 11 524 7 11 7 25 35 177 24 33 181 20 20 28 24 25 25 25 25 25 25 25 25 25 25 25 25 25	330 PSW2 107 68 173 108 68 165 107 67 154 234 115 862 234 115 862 234 116 789 246 118 780 PSW2 151 105 274 151 105 274 151 106 263 154 106	786 PSW3 87 147 267 86 147 267 86 147 261 7 80 147 261 7 9 80 409 409 409 1210 139 409 409 1210 139 405 1218 141 407 1233 116 200 339 116 200 339 116 199 202	$\begin{array}{c} 130 \\ \hline 130 \\ \hline 0 \\ 0 \\ 1 \\ 18 \\ \hline 0 \\ 1 \\ 14 \\ -1 \\ -0 \\ 3 \\ \hline 3 \\ \hline 2 \\ 223 \\ 238 \\ \hline 2 \\ 222 \\ 223 \\ \hline 2 \\ 222 \\ 238 \\ \hline 0 \\ 4 \\ 121 \\ 0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 121 \\ \hline 0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 3 \\ 117 \\ -0 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10$

Table III: Results for Monte Carlo Experiment (N=600) Strong Separation and Normal Errors

Note: Results show MSE and Bias across 1,000 simulations. Six covariates with a mixture of continuous, binary, and categorical variables. Experimental factors are: 3 sample designs (sample design 1: strong separation and normal errors; sample design 2: weaker separation and normal errors; sample design 3: medium separation and leptokurtic errors), 3 outcome designs (Y1 linear: Y1 =  $X_1 + X_2 + X_3 - X_4 + X_5 + X_6 + \eta$ ; Y2 somewhat non-linear Y2 =  $X_1 + X_2 + 0.2 X_3 X_4 - \sqrt{X_5} + \eta$ ; Y3 highly non-linear: Y3 =  $(X_1 + X_2 + X_5)^2 + \eta$ ), and 3 controls-to-treated ratios (Ratio CtoT 1, 3, and 5). Estimators are Raw: Difference of means; MD: Mahalanobis distance matching, GM: Genetic matching; PSM: Propensity score matching; ISMD: MD matching on the PS and orthogonalized covariates; PSW: weighting on the PS; EB: entropy balancing. All matching is 1:1 pair matching. We use three specifications (labeled with a 1, 2, or 3 postfix) for all propensity score based methods (PSM, PSW, PSMD). The first propensity score model is correct for sample designs 1 and 2, and slightly misspecified for sample design 3. Propensity score models 2 and 3 are increasing in misspecification (as measured by the linear correlation between the true and the estimated score). 1000 simulations for each scenario; the true treatment effect is zero.

Sample Design 1	: Strong	g Separ	ation an	d Norma	l Errors							
MSE	RAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Ratio CtoT 1 Y1	318	11	6	343	180	28	327	180	8	342	181	1
Ratio CtoT 1 Y2	496	8	2	147	526	30	134	467	10	146	530	1
Ratio CtoT 1 Y3	952	562	301	1097	1540	1262	1078	1863	488	1060	1498	95
Ratio CtoT 3 Y1	317	9	5	343	181	23	321	180	4	341	180	1
Ratio CtoT 3 Y2	495	6	2	143	522	24	123	468	6	149	524	1
Ratio CtoT 3 Y3	936	$475^{\circ}$	258	970	1547	1099	960	1833	280	977	1511	75
Batio CtoT 5 Y1	318	9	5	343	180	20	318	181	4	348	181	1
Batio CtoT 5 Y2	495	6	2	143	522	20	115	473	5	155	523	1
Ratio CtoT 5 Y3	988	$420^{\circ}$	263	837	1603	972	875	1833	263	910	1548	81
BIAS	BAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Batio CtoT 1 Y1	178	31	3	184	133	52	180	133	3	184	134	0
Batio CtoT 1 Y2	222	26	6	120	229	54	115	216	5	120	230	2
Batio CtoT 1 Y3	300	232	44	318	388	352	323	429	30	316	384	54
Batio CtoT 3 Y1	177	28	3	184	133	47	178	133	9	184	134	-0
Batio CtoT 3 Y2	222	22	4	119	228	48	109	216	12	121	228	1
Batio CtoT 3 Y3	296	213	32	297	388	327	304	424	61	304	385	41
Batio CtoT 5 Y1	177	26	2	183	133	42	176	133	12	185	134	0
Batio CtoT 5 V2	222	20	4	118	227	43	105	216	17	123	228	1
Batio CtoT 5 Y3	297	197	37	266	391	305	287	421	91	291	387	39
10010 0101 0 10	201	101	0.	200	001	000	201	121	01	201		00
Sample Design 2	· Woake	r Sena	ration ar	d Norm	al Errors							
MSE	BAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
Batio CtoT 1 V1	140	4	2	114	77	10	109	81	10.01	114	77	0
Batio CtoT 1 V2	221	2	1	47	219	7	32	197	2	47	220	l õ
Batio CtoT 1 Y3	444	238	95	329	774	557	465	972	103	298	734	41
Batio CtoT 3 V1	140	4	2	115	78	9	104	82	100	115	77	0
Batio CtoT 3 Y2	220	1	1	47	221	6	28	201	1	47	219	l õ
Batio CtoT 3 Y3	448	206	104	289	754	495	409	954	80	277	731	42
Batio CtoT 5 V1	142	4	3	118	80	8	105	86	1	118	79	1
Batio CtoT 5 Y2	221	2	1	48	222	5	28	205	1	49	220	1
Batio CtoT 5 V3	488	186	135	278	782	437	381	952	90	262	738	55
TUGUIO CUOT O TO						101	001	004				
BIAS	BAW	MD	PSM1	PSM2	PSM3	PSMD1	PSMD2	PSMD3	PSW1	PSW2	PSW3	EB
BIAS Batio CtoT 1 V1	RAW 117	MD	PSM1	PSM2 105	PSM3 87	PSMD1 31	PSMD2 103	PSMD3 89	PSW1	PSW2 106	PSW3 87	EB
BIAS Ratio CtoT 1 Y1 Batio CtoT 1 Y2	RAW 117 148	MD 18 10	PSM1 1	PSM2 105 67	PSM3 87 147	PSMD1 31 25	PSMD2 103 55	PSMD3 89 139	PSW1 0 1	PSW2 106 67	PSW3 87 148	<b>EB</b> 0
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3	RAW 117 148 196	MD 18 10 150	PSM1 1 1	PSM2 105 67 163	PSM3 87 147 271	PSMD1 31 25 232	PSMD2 103 55 210	PSMD3 89 139 308	PSW1 0 1	PSW2 106 67 164	PSW3 87 148 267	<b>EB</b> 0 0 10
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1	RAW 117 148 196	MD 18 10 150	PSM1 1 11 -0	PSM2 105 67 163 105	PSM3 87 147 271 87	PSMD1 31 25 232 28	PSMD2 103 55 210	PSMD3 89 139 308 89	PSW1 0 1 1 2	PSW2 106 67 164 106	PSW3 87 148 267 87	EB 0 0 10 -0
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2	RAW 117 148 196 117 148	MD 18 10 150 16 9	PSM1 1 11 -0 0	PSM2 105 67 163 105 67	PSM3 87 147 271 87 148	PSMD1 31 25 232 28 23	PSMD2 103 55 210 100 51	PSMD3 89 139 308 89 140	PSW1 0 1 1 2 3	PSW2 106 67 164 106 68	PSW3 87 148 267 87 147	<b>EB</b> 0 10 -0 0
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y2	RAW 117 148 196 117 148 196	MD 18 10 150 16 9 139	$     PSM1 \\     1 \\     11 \\     -0 \\     0 \\     6     $	PSM2 105 67 163 105 67 152	PSM3 87 147 271 87 148 267	PSMD1 31 25 232 28 23 218	PSMD2 103 55 210 100 51 195	PSMD3 89 139 308 89 140 304	PSW1 0 1 1 2 3 18	PSW2 106 67 164 106 68 158	PSW3 87 148 267 87 147 266	<b>EB</b> 0 10 -0 0 8
BIAS Ratio CtoT I Y1 Ratio CtoT I Y2 Ratio CtoT I Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y3 Ratio CtoT 5 Y1	RAW 117 148 196 117 148 196 117	MD 18 10 150 16 9 139 15	$     PSM1 \\     1 \\     11 \\     -0 \\     0 \\     6 \\     -0     $	PSM2 105 67 163 105 67 152 106	PSM3 87 147 271 87 148 267 87	PSMD1 31 25 232 28 23 218 25	PSMD2 103 55 210 100 51 195 100	PSMD3 89 139 308 89 140 304 91	PSW1 0 1 1 2 3 18 3	PSW2 106 67 164 106 68 158 107	PSW3 87 148 267 87 147 266 87	
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y3 Ratio CtoT 5 Y1 Batio CtoT 5 Y2	RAW 117 148 196 117 148 196 117 148	MD 18 10 150 16 9 139 15 7	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 11 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \end{array}$	$\begin{array}{r} {\rm PSM2} \\ 105 \\ 67 \\ 163 \\ 105 \\ 67 \\ 152 \\ 106 \\ 67 \end{array}$	PSM3 87 147 271 87 148 267 87 147	PSMD1 31 25 232 28 23 218 25 20	PSMD2 103 55 210 100 51 195 100 49	PSMD3 89 139 308 89 140 304 91 141	PSW1 0 1 1 2 3 18 3 4	PSW2 106 67 164 106 68 158 107 68	PSW3 87 148 267 87 147 266 87 147	
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y1 Ratio CtoT 3 Y3 Ratio CtoT 5 Y1 Ratio CtoT 5 Y2 Batio CtoT 5 Y3	RAW 117 148 196 117 148 196 117 148 196	MD 18 10 150 16 9 139 15 7 127	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 11 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \end{array}$	PSM2 105 67 163 105 67 152 106 67 136	PSM3 87 147 271 87 148 267 87 147 266	PSMD1 31 25 232 28 23 218 25 20 200	PSMD2 103 55 210 100 51 195 100 49 184	PSMD3 89 139 308 89 140 304 91 141 299	PSW1 0 1 1 2 3 18 3 4 26	PSW2 106 67 164 106 68 158 107 68 150	$\begin{array}{r} \text{PSW3} \\ 87 \\ 148 \\ 267 \\ 87 \\ 147 \\ 266 \\ 87 \\ 147 \\ 264 \end{array}$	EB 0 0 10 -0 0 8 -0 -0 2
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y3 Ratio CtoT 5 Y1 Ratio CtoT 5 Y2 Ratio CtoT 5 Y3	RAW 1117 148 196 117 148 196 117 148 196 117 148 196	MD 18 10 150 16 9 139 15 7 127	PSM1 1 1 1 -0 0 6 -0 0 0 0 0	PSM2 105 67 163 105 67 152 106 67 136	PSM3 87 147 271 87 148 267 87 147 266	PSMD1 31 25 232 28 23 218 25 20 200	PSMD2 103 55 210 100 51 195 100 49 184	PSMD3 89 139 308 89 140 304 91 141 299	PSW1 0 1 2 3 18 3 4 26	PSW2 106 67 164 106 68 158 107 68 150	PSW3 87 148 267 87 147 266 87 147 264	$\begin{array}{c c} \mathbf{EB} \\ 0 \\ 0 \\ 10 \\ -0 \\ 0 \\ 8 \\ -0 \\ -0 \\ 2 \\ \end{array}$
BIAS Ratio CtoT I Y1 Ratio CtoT I Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y2 Ratio CtoT 3 Y2 Ratio CtoT 5 Y1 Ratio CtoT 5 Y2 Ratio CtoT 5 Y3	RAW 117 148 196 117 148 196 117 148 196 117 148	MD 18 10 150 16 9 139 15 7 127	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ \end{array}$	PSM2 105 67 163 105 67 152 106 67 136	PSM3 87 147 271 87 148 267 87 147 266	PSMD1 31 25 232 28 23 218 23 218 25 20 200	PSMD2 103 55 210 100 51 195 100 49 184	PSMD3 89 139 308 89 140 304 91 141 299	PSW1 0 1 2 3 18 3 4 26	PSW2 106 67 164 106 68 158 107 68 150	PSW3 87 148 267 87 147 266 87 147 264	
BIAS Ratio CtoT 1 Y1 Ratio CtoT 1 Y2 Ratio CtoT 1 Y3 Ratio CtoT 3 Y1 Ratio CtoT 3 Y1 Ratio CtoT 3 Y3 Ratio CtoT 3 Y3 Ratio CtoT 5 Y1 Ratio CtoT 5 Y2 Ratio CtoT 5 Y3 Sample Design 3	RAW 117 148 196 117 148 196 117 148 196 : Mediu	MD 18 10 150 16 9 139 15 7 127 m Sep	PSM1 1 1 1 -0 0 6 -0 0 0 0 0 aration a	PSM2 105 67 163 105 67 152 106 67 136 nd Lepto	PSM3 87 147 271 87 148 267 87 147 266 <b>bkurtic E</b>	PSMD1 31 25 232 28 23 218 25 20 200 200	PSMD2 103 55 210 100 51 195 100 49 184	PSMD3 89 139 308 89 140 304 91 141 299 DEMD3	PSW1 0 1 2 3 18 3 4 26	PSW2 106 67 164 106 68 158 107 68 150	PSW3 87 148 267 87 147 266 87 147 264	EB 0 0 10 -0 8 -0 -0 2 EB
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y2	RAW 117 148 196 117 148 196 117 148 196 : Mediu RAW	MD 18 10 150 16 9 139 15 7 127 MD ND	PSM1 1 1 1 1 -0 0 6 -0 0 0 0 0 aration a PSM1	PSM2 105 67 163 105 67 152 106 67 136 <b>nd Lepto</b> PSM2	PSM3 87 147 271 87 148 267 87 147 266 PSM3 PSM3	PSMD1 31 25 232 28 23 218 25 20 200 200 Crrors PSMD1 25 20 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2	PSMD3 89 139 308 89 140 91 141 299 PSMD3 142	PSW1 0 1 2 3 18 3 4 26 PSW1	PSW2 106 67 164 106 68 158 107 68 150 PSW2	PSW3 87 148 267 87 147 266 87 147 264 87 147 264	EB 0 0 10 -0 0 8 -0 -0 2 EB
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1	RAW 117 148 196 117 148 196 117 148 196 : Mediu RAW 213 200	MD 18 10 150 16 9 139 15 7 127 <b>m Sep</b> MD 8 5	$\begin{array}{c} PSM1 \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ \hline \\ aration a \\ \hline PSM1 \\ \hline \\ 5 \\ 2 \\ \end{array}$	$\begin{array}{r} \text{PSM2} \\ 105 \\ 67 \\ 163 \\ 105 \\ 67 \\ 152 \\ 106 \\ 67 \\ 136 \\ \hline \\ \textbf{nd Lepto} \\ PSM2 \\ 226 \\ 226 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 200	PSMD1           31           25           232           28           233           218           25           200           200           Crrors           PSMD1           19           10	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 216 216	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 375	PSW1 0 1 2 3 18 3 4 26 PSW1 7 7 12	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 226 110	PSW3 87 148 267 87 147 266 87 147 264 87 147 264 9 SW3 137 137	EB           0           10           -0           0           -0           2
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2	RAW 117 148 196 117 148 196 117 148 196 <b>: Mediu</b> RAW 213 339 022	MD 18 10 150 16 9 139 15 7 127 MD 8 5 401	PSM1 1 1 1 1 -0 0 6 -0 0 0 0 0 0 0 0 0 0 0 0 0 0	PSM2 105 67 163 105 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 635	PSM3 87 147 271 87 148 267 87 147 266 <b>bkurtic E</b> PSM3 133 390 1264	PSMD1 31 25 232 28 23 218 25 20 200 200 200 200 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468	PSW1 0 1 2 3 18 3 4 26 PSW1 7 13 270	PSW2 106 67 164 106 68 158 158 150 PSW2 226 112 745	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146	<b>EB</b> 0 10 -0 0 8 <b>B</b> -0 -0 2 <b>EB</b> 1 1
BIAS           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3           Ratio CtoT 3 Y1           Ratio CtoT 5 Y2           Ratio CtoT 5 Y2           Sample Design 3           MSE           Ratio CtoT 1 Y1           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           213           339           933	MD 18 10 150 9 139 15 7 127 MD MD 8 5 491 7	PSM1 1 1 1 1 1 -0 0 6 -0 0 0 0 0 0 0 0 0 0 0 0 0 0	PSM2 105 67 163 105 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 625 220	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 3300 1264	PSMD1 31 25 232 28 23 218 25 20 200 200 200 200 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144	PSW1 0 1 1 2 3 3 8 4 26 PSW1 7 13 379 2	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 221	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 127	<b>EB</b> 0 0 10 -0 8 -0 2 <b>EB</b> 1 1 160
BIAS           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3           Ratio CtoT 3 Y1           Ratio CtoT 3 Y2           Ratio CtoT 5 Y1           Ratio CtoT 5 Y2           Ratio CtoT 5 Y3           Sample Design 3           MSE           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3           Ratio CtoT 3 Y1	RAW           117           148           196           117           148           196           117           148           196           ::           Mediu           RAW           213           339           933           217           228	MD 18 10 150 16 9 139 15 7 127 <b>m Sep</b> MD 8 5 491 7 5	PSM1 1 1 1 -0 0 6 -0 0 0 0 aration a PSM1 5 3 319 5 2	PSM2 105 67 152 106 67 136 <b>nd Leptc</b> <b>PSM2</b> 226 <b>pSM2</b> 226 98 98 625 230 230	PSM3 87 147 271 87 148 267 87 147 266 <b>Okurtic E</b> PSM3 133 390 1264 134 207	PSMD1 31 25 232 28 233 218 25 200 200 Crrors PSMD1 19 1075 17 16	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 70	PSMD3 89 139 308 89 140 91 141 299 PSMD3 143 354 1468 144 260	PSW1 0 1 2 3 3 18 3 4 26 PSW1 7 7 13 379 6 12	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401	EB           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           1           160           0
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         Sample Design 3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           213           339           933           217           338           967	MD 18 10 150 9 139 15 7 127 <b>m Sep</b> MD 8 5 491 7 5 426	$\begin{array}{r} \hline PSM1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 6 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 1 \\ 0 \\ 0$	PSM2 105 67 163 105 67 152 106 67 136 <b>nd Lept</b> <b>d</b> PSM2 226 98 625 230 97 557	PSM3 87 147 271 87 188 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 134 134	PSMD1 31 25 232 28 23 218 20 200 200 200 200 200 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 710	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 1450	PSW1 0 1 1 2 3 18 3 4 26 PSW1 7 13 379 6 12 286	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1162	EB 0 0 0 0 0 0 8 -0 -0 2 EB 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           399           339           933           217           338           967           216	MD 18 10 15 7 127 MD 8 5 491 7 5 426 7 7	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 6 \\ \hline -0 \\ 0 \\ 0 \\ \hline 0 \\ 0 \\ 0 \\ \hline 0 \\ 0 \\ \hline 0 \\ 0 \\$	PSM2 105 67 163 105 67 152 106 67 136 PSM2 226 98 625 230 97 527 237	PSM3 87 147 271 87 148 267 87 146 87 147 266 87 147 266 87 147 266 87 147 266 98 390 1264 133 390 1264 1391 1266	PSMD1 31 25 232 28 23 218 25 200 200 200 200 200 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 709 206	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 144	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\$	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700 22 <sup>±</sup>	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1163 126	EB 0 0 0 0 0 0 0 0 -0 -0 -0 2 EB 1 1 160 0 1 154 1
BIAS           BIAS           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 3 Y1           Ratio CtoT 3 Y1           Ratio CtoT 3 Y1           Ratio CtoT 3 Y2           Ratio CtoT 5 Y1           Ratio CtoT 5 Y2           Ratio CtoT 5 Y2           Ratio CtoT 5 Y1           MSE           Ratio CtoT 1 Y1           Ratio CtoT 1 Y2           Ratio CtoT 1 Y3           Ratio CtoT 3 Y1           Ratio CtoT 3 Y2           Ratio CtoT 3 Y3           Ratio CtoT 3 Y3           Ratio CtoT 3 Y3           Ratio CtoT 5 Y1           Ratio CtoT 3 Y3           Ratio CtoT 3 Y3           Ratio CtoT 5 Y1	RAW           117           148           196           117           148           196           117           148           196           : Mediu           RAW           213           333           217           338           967           216	MD 18 10 150 16 9 139 15 7 127 MD 8 5 491 7 5 426 7 426	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ \hline \\ aration a \\ \hline PSM1 \\ 5 \\ 3 \\ 319 \\ \hline \\ 5 \\ 2 \\ 291 \\ \hline \\ 6 \\ 2 \\ 291 \\ \hline \\ 6 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	PSM2 105 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 625 230 98 625 226 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 220 98 625 2205 2205 2205 2205 2205 2205 2205 2205 225 22	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 330 1264 134 134 135 266	PSMD1 31 25 232 28 23 28 23 20 200 200 200 200 200 200	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 208	PSMD3 89 139 308 89 140 91 141 299 PSMD3 143 354 1468 144 360 1450 1450	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 5 \\ 5 \\ 9 \\ \end{array}$	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 104 700 235 112	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1163 136 200	EB 0 0 0 0 0 0 0 8 EB 1 1 160 0 1 154 1 1
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y3         MSE         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2	RAW           117           148           196           117           148           196           117           148           196           339           933           217           338           967           216           338           1004	MD 18 10 150 16 9 139 15 7 127 m Sep. MD 8 5 491 7 5 426 7 426 7 427	$\begin{array}{r} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 0 \\ 6 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	$\begin{array}{r} {\rm PSM2} \\ 105 \\ 67 \\ 163 \\ 105 \\ 67 \\ 152 \\ 106 \\ 67 \\ 136 \\ \hline \\ {\rm nd \ Leptc} \\ {\rm PSM2} \\ 226 \\ 98 \\ 625 \\ 230 \\ 97 \\ 557 \\ 229 \\ 96 \\ 62 \\ \hline \end{array}$	PSM3 87 147 271 87 148 87 148 267 87 148 87 67 266 <b>5kurtic E</b> PSM3 133 390 1264 134 134 136 135 393 31307	PSMD1           31           25           232           28           23           218           25           200 <tr< td=""><td>PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 212 79 719 208 72 640</td><td>PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 1450 144 365 1470</td><td><math display="block">\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 9 \\ 307 \\ \end{array}</math></td><td>PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621</td><td>PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1163 136 399</td><td>EB 0 0 0 0 0 8 -0 -0 2 EB 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1</td></tr<>	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 212 79 719 208 72 640	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 1450 144 365 1470	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 9 \\ 307 \\ \end{array}$	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1163 136 399	EB 0 0 0 0 0 8 -0 -0 2 EB 1 1 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1
BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y3Ratio CtoT 5 Y3Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y3	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           399           339           933           217           338           967           216           338           1004	MD 18 10 150 16 9 139 15 7 127 m Sep. MD 8 8 5 491 7 5 426 7 4 387	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \\ \hline \\ \text{aration a} \\ \text{PSM1} \\ \hline \\ \frac{1}{5} \\ 3 \\ 319 \\ 5 \\ 2 \\ 291 \\ 6 \\ 2 \\ 407 \\ \hline \end{array}$	$\begin{array}{r} {\rm PSM2} \\ 105 \\ 67 \\ 163 \\ 105 \\ 67 \\ 152 \\ 106 \\ 67 \\ 136 \\ \hline \\ {\rm PSM2} \\ 226 \\ 98 \\ 625 \\ 230 \\ 97 \\ 557 \\ 229 \\ 96 \\ 463 \\ \end{array}$	PSM3 87 147 271 87 148 267 87 147 268 87 147 268 98 98 147 268 98 133 390 1264 133 390 1264 133 391 1266 393 393 1307	PSMD1 31 25 232 28 23 218 25 20 200 200 200 200 200 200 200 200 2	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 72 640	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 354 1468 1450 144 3665 1470	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 397 \\ \end{array}$	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 401 1163 399 1189	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 8 \\ \hline \\ -0 \\ -0 \\ 2 \\ \hline \\ {\bf EB} \\ 1 \\ 1 \\ 160 \\ 0 \\ 1 \\ 154 \\ 1 \\ 166 \\ \end{array}$
BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 3 Y2Ratio CtoT 3 Y3Ratio CtoT 5 Y2Ratio CtoT 5 Y3BIAS	RAW           117           148           196           117           148           196           117           148           196           : Mediu           RAW           213           339           933           217           338           967           216           318           1004           RAW	MD 18 10 150 16 9 139 15 7 127 <b>m Sep.</b> MD 8 5 491 7 5 426 7 4 387 MD	PSM1 1 1 1 1 -0 0 6 -0 0 0 0 aration a PSM1 5 3 319 5 2 291 6 2 291 6 2 407 PSM1	PSM2 105 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 625 230 97 557 229 96 463 PSM2	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 134 331 1266 135 393 300 1264 135	PSMD1 31 25 232 28 28 23 218 25 20 200 200 200 PSMD1 19 1075 17 16 955 15 13 850 PSMD1	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 79 719 208 72 640 PSMD2	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1448 360 1450 144 365 1470 PSMD3	PSW1 0 1 2 3 18 3 4 26 PSW1 7 13 379 6 12 386 5 9 397 PSW1	PSW2 106 67 164 106 68 158 107 68 150 226 112 745 231 114 745 231 114 700 235 113 621 PSW2	PSW3 87 148 267 87 147 266 87 147 264 264 264 264 264 147 403 1146 137 403 1146 137 401 1163 399 1189 PSW3	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y3MSERatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y3Ratio CtoT 5 Y3Ratio CtoT 1 Y1	RAW           117           148           196           117           148           196           117           148           196           : Mediu           RAW           213           339           933           217           338           967           216           338           1004           RAW           145	MD 18 10 150 16 9 139 15 7 127 <b>m Sep.</b> MD <b>8</b> 5 491 7 5 426 7 426 7 426 7 427	$\begin{array}{r} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	PSM2 105 67 152 106 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 625 230 98 625 230 98 625 230 98 98 625 230 98 98 98 98 98 98 98 98 98 98	PSM3           87           147           271           87           148           267           87           148           267           87           147           266           5kurtic E           PSM3           330           1264           134           391           1266           135           393           1307           PSM3           114	PSMD1           31           25           232           28           23           218           25           200           19           1075           17           16           955           15           13           850           PSMD1           43	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 216 87 216 87 216 87 219 208 719 208 72 640 PSMD2 146	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 365 144 360 1450 144 365 1470 PSMD3 119	PSW1 0 1 1 2 3 18 3 4 26 PSW1 7 13 379 6 12 386 5 9 397 PSW1 24	PSW2 106 67 164 108 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 149	PSW3 87 148 267 87 147 266 87 147 264 PSW3 137 403 1146 137 403 1146 137 401 1163 136 399 1189 PSW3 116	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 2 \\ \end{array}$
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 7 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           213           339           933           217           338           967           216           338           967           216           338           904           RAW           145           184	MD 18 10 150 16 9 139 15 7 7 127 MD 8 5 491 7 5 4266 7 4 387 MD 27 27 21	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	PSM2           105           67           163           105           67           152           106           67           136           md Leptc           PSM2           2266           98           625           2300           97           5577           296           463           PSM2           198           98           98           98           98	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 134 391 1266 135 393 1307 PSM3	PSMD1           31           25           232           28           23           218           25           20           200           200           200           200           200           200           200           200           200           200           200           200           200           200           200           200           2000           200 <tr< td=""><td>PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 719 719 208 72 640 PSMD2 146 92</td><td>PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 1450 144 365 1470 PSMD3 119 188</td><td><math display="block">\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 397 \\ \hline \\ \text{PSW1} \\ \hline \\ \text{PSW1} \\ \hline \\ \text{PSW1} \\ 24 \\ 34 \\ \end{array}</math></td><td>PSW2 106 67 164 108 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 149 105</td><td>PSW3 87 148 267 87 147 266 87 147 264 PSW3 1147 264 9 147 264 137 403 1146 137 403 1146 137 401 1163 399 1189 PSW3 PSW3</td><td><math display="block">\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ </math></td></tr<>	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 719 719 208 72 640 PSMD2 146 92	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 360 1450 144 365 1470 PSMD3 119 188	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 397 \\ \hline \\ \text{PSW1} \\ \hline \\ \text{PSW1} \\ \hline \\ \text{PSW1} \\ 24 \\ 34 \\ \end{array}$	PSW2 106 67 164 108 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 149 105	PSW3 87 148 267 87 147 266 87 147 264 PSW3 1147 264 9 147 264 137 403 1146 137 403 1146 137 401 1163 399 1189 PSW3 PSW3	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1	RAW           117           148           196           117           148           196           117           148           196           :           Mediu           RAW           213           339           933           217           388           967           216           338           1004           RAW           145           184           296	MD 18 10 150 16 9 139 15 7 127 MD 8 8 5 491 7 5 426 7 4 4 387 MD 27 21 218	PSM1 1 1 1 1 1 1 -0 0 0 0 0 0 0 0 0 0 0 0 0 0	PSM2           105           67           163           105           67           152           106           67           136           PSM2           226           98           625           230           97           557           229           96           463           PSM2           149           98           228	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 331 1266 135 393 300 1264 135 333 1307 PSM3 114 114 197 350	PSMD1 31 25 232 28 23 218 25 20 200 200 200 200 200 200 200 200 2	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 72 640 PSMD2 146 92 286	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 365 144 365 144 365 1470 PSMD3 119 188 380	PSW1 0 1 1 2 3 3 4 26 PSW1 7 13 379 6 12 386 5 9 397 PSW1 24 34 174	PSW2 106 67 164 107 68 158 150 PSW2 226 112 745 231 114 745 231 114 745 231 114 700 235 113 621 PSW2 149 105 265	PSW3 87 148 267 87 147 266 87 147 264 9 87 147 403 1146 137 403 1146 137 401 1163 399 1189 PSW3 116 200 335	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y3Ratio CtoT 5 Y3Ratio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 3 Y2Ratio CtoT 3 Y3Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 1 Y1Ratio CtoT 1 Y1Ratio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 1 Y3Ratio CtoT 1 Y3Ratio CtoT 1 Y3Ratio CtoT 3 Y1	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           217           338           967           216           338           1004           RAW           145           184           296           146	MD 18 10 150 16 9 139 15 7 127 MD 8 5 491 7 5 426 7 426 7 426 7 426 7 427 21 218 25	$\begin{array}{c} {\rm PSM1} \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ \hline \end{array}$ aration a PSM1 5 3 319 5 2 291 6 6 2 291 6 6 2 201 PSM1 4 4 7 44 3	PSM2           105           67           152           106           67           136 <b>nd Lepto</b> PSM2           226           98           625           230           97           557           229           96           463           PSM2           149           98           228           150	PSM3           87           147           271           87           148           267           87           147           266           okurtic E           PSM3           133           300           1264           135           135           1307           PSM3           114           197           350           115	PSMD1           31           25           232           28           23           218           25           200           350           PSMD1           43           42           324           40	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 212 79 719 208 72 640 PSMD2 146 92 286 144	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 365 144 365 144 360 1450 144 365 1470 PSMD3 149 188 380 119	PSW1 0 1 1 2 3 3 4 26 PSW1 7 13 379 6 12 386 12 386 5 9 397 PSW1 24 34 174 23	PSW2 106 67 164 106 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 149 105 265 151	PSW3 87 148 267 87 147 266 87 147 264 PSW3 1147 403 1146 137 403 1146 137 401 1163 399 1189 PSW3 116 200 335 117	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y1         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ra	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           213           339           933           217           338           967           216           338           967           216           338           967           216           338           904           RAW           1004           RAW           184           296           146           183	MD 18 10 150 16 9 139 15 7 127 MD 8 5 491 7 5 4266 7 4 387 MD 7 27 21 218 25 19	$\begin{array}{r} {\rm PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 6 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	PSM2           105           67           163           105           67           152           106           67           136           md Lepte           PSM2           226           230           97           557           229           96           463           PSM2           198           228           150           98           228           150           97	PSM3           87           147           271           87           148           267           87           147           266           okurtic E           PSM3           133           390           1264           133           390           1264           135           393           1307           PSM3           141           197           350           115           197	PSMD1           31           25           232           28           23           218           25           200           2000           3850           2000           2001           2001           2002           2003           2004           30	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 72 640 PSMD2 PSMD2 208 72 640 146 87 845 212 845 212 845 212 845 212 845 216 87 845 216 87 845 212 845 216 87 845 216 87 845 212 216 87 845 212 216 87 845 212 216 87 845 212 216 87 845 212 216 87 845 212 216 87 845 212 208 729 208 872 845 845 212 845 87 87 87 87 87 87 87 87 87 87	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 365 144 365 1440 1450 144 365 1470 PSMD3 119 188 380 119 189	$\begin{array}{c} \text{PSW1} \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 18 \\ 3 \\ 4 \\ 26 \\ \hline \\ \text{PSW1} \\ \hline \\ 7 \\ 13 \\ 379 \\ 6 \\ 12 \\ 386 \\ 6 \\ 12 \\ 386 \\ 5 \\ 9 \\ 397 \\ \hline \\ \text{PSW1} \\ \hline \\ \frac{5}{9} \\ 9 \\ 397 \\ \hline \\ \text{PSW1} \\ 24 \\ 34 \\ 174 \\ 23 \\ 33 \\ \hline \end{array}$	PSW2 106 67 164 108 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 PSW2 113 621 PSW2 105 265 151 106	PSW3 87 148 267 87 147 266 87 147 264 PSW3 1147 264 PSW3 1146 137 403 1146 137 401 1163 399 1189 1189 PSW3 PSW3 116 200 335 117 200	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 8 \\ -0 \\ -0 \\$
BIAS         BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y3         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 3 Y2	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           933           217           339           933           217           338           967           216           338           907           216           338           907           2184           296           146           301	MD 18 10 150 16 9 139 15 7 127 MD 8 8 5 491 7 5 426 7 4 4 387 MD 27 21 218 25 19 202	$\begin{array}{c} \text{PSM1} \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	PSM2           105           67           163           105           67           152           106           67           136           PSM2           226           98           625           230           97           557           229           96           463           PSM2           149           98           228           150           97           210	PSM3 87 147 271 87 148 267 87 147 268 98 30 146 98 30 1264 30 1264 30 1266 135 303 1307 PSM3 1107 98 303 1307 PSM3 115 197 349	PSMD1 31 25 232 28 23 218 25 20 200 200 200 200 200 200 200 200 2	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 72 640 PSMD2 146 92 286 144 87 262	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 360 1450 144 365 1470 PSMD3 119 188 380 119 188 380 119 189 376	PSW1 0 1 1 2 3 3 4 26 PSW1 7 13 379 6 12 386 5 9 397 PSW1 24 34 174 23 34 174 23 33 178	PSW2 106 67 164 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 149 105 265 151 105 265 151 105 265 151	PSW3 87 148 267 87 147 266 87 147 264 9 SW3 147 403 1146 137 403 1146 399 1189 PSW3 116 399 1189 PSW3 116 200 335 117 200 337	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIASRatio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 1 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y3Ratio CtoT 5 Y3Ratio CtoT 1 Y1Ratio CtoT 1 Y2Ratio CtoT 3 Y2Ratio CtoT 3 Y3Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y2Ratio CtoT 5 Y1Ratio CtoT 5 Y1Ratio CtoT 1 Y1Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 3 Y1Ratio CtoT 3 Y3Ratio CtoT 3 Y3Ratio CtoT 3 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y3Ratio CtoT 3 Y1Ratio CtoT 3 Y2Ratio CtoT 3 Y3Ratio CtoT 5 Y1	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           217           333           217           338           967           216           304           RAW           145           184           296           146           183           301           146	MD 18 10 150 16 9 139 15 7 127 <b>m Sep.</b> MD 8 5 491 7 5 426 7 4 426 7 4 426 7 426 7 426 7 426 7 127 218 225 19 202 24	$\begin{array}{c} {\rm PSM1} \\ 1 \\ 1 \\ 1 \\ -0 \\ 0 \\ 6 \\ -0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	PSM2 105 67 152 106 67 136 <b>nd Lepto</b> PSM2 226 98 625 230 97 557 229 96 463 PSM2 149 98 228 150 97 228 150 97 229 97 557 229 97 97 557 229 99 97 557 229 99 97 557 229 99 97 557 229 99 97 557 229 99 97 557 229 97 557 229 97 228 97 228 230 97 228 238 238 246 246 246 246 246 257 229 97 228 238 246 246 246 246 246 246 246 246	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 134 391 1266 135 135 135 135 135 135 135 135 135 135	PSMD1           31           25           232           28           23           218           25           200           19           1075           17           16           955           15           13           850           PSMD1           43           42           30           305           36	PSMD2 103 103 55 210 100 51 195 100 49 184 PSMD2 216 87 212 79 719 208 72 640 PSMD2 208 72 640 PSMD2 2286 144 87 2262 142	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 144 365 144 365 144 365 144 365 1470 PSMD3 148 380 119 188 380 119 189 376 118	PSW1 0 1 1 2 3 3 4 26 PSW1 7 13 379 6 12 386 5 9 397 PSW1 24 34 174 23 33 178 20	PSW2 106 67 164 106 68 158 107 68 150 226 112 745 231 114 700 235 113 621 PSW2 149 105 265 151 106 257 152	PSW3 87 148 267 87 147 266 87 147 264 87 147 264 147 264 137 403 1146 137 403 1146 399 1189 PSW3 116	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
BIAS         Ratio CtoT 1 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y3         Ratio CtoT 3 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y1         Ratio CtoT 5 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y2         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y1         Ratio CtoT 3 Y2         Ratio CtoT 5 Y2         Ratio CtoT 5 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 5 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 1 Y1         Ratio CtoT 3 Y1         Ratio CtoT 1 Y2         Ratio CtoT 1 Y2         Ratio CtoT 3 Y1         Ra	RAW           117           148           196           117           148           196           117           148           196           117           148           196           117           148           196           213           339           933           217           338           967           216           338           967           216           338           967           216           338           967           216           338           967           218           3004           RAW           184           296           146           183           301           146           183	MD 18 10 10 150 16 9 139 15 7 127 MD 8 5 491 7 5 426 7 7 4 387 7 7 27 21 218 19 202 24 18	$\begin{array}{c} {\rm PSM1} \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 0 \\ 6 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	$\begin{array}{r} {\rm PSM2} \\ 105 \\ 67 \\ 163 \\ 105 \\ 67 \\ 152 \\ 106 \\ 67 \\ 136 \\ \hline \\ {\rm PSM2} \\ 226 \\ 98 \\ 625 \\ 230 \\ 97 \\ 557 \\ 229 \\ 96 \\ 463 \\ \hline \\ {\rm PSM2} \\ 149 \\ 98 \\ 228 \\ 150 \\ 97 \\ 210 \\ 97 \\ 210 \\ 97 \\ 210 \\ 96 \\ \hline \end{array}$	PSM3 87 147 271 87 148 267 87 147 266 <b>okurtic E</b> PSM3 133 390 1264 133 133 390 1264 133 133 390 1264 133 133 390 1264 133 130 125 393 1307 PSM3 1147 197 350 115 197 349 114 197	PSMD1           31           25           232           28           23           218           25           200           2000           3rrors           PSMD1           19           1075           15           13           850           PSMD1           43           42           324           40           39           305           36           35	PSMD2 103 55 210 100 51 195 100 49 184 PSMD2 216 87 845 212 79 719 208 72 640 PSMD2 286 144 87 262 286 144 87 262 286 144 87 286 144 87 286 144 144 144 145 145 145 155 100 100 100 100 100 100 10	PSMD3 89 139 308 89 140 304 91 141 299 PSMD3 143 354 1468 144 365 1440 1450 1450 144 365 1470 PSMD3 119 188 380 119 189 376 118 190	PSW1 0 1 1 2 3 3 4 26 PSW1 7 13 379 6 12 386 12 386 5 9 397 PSW1 24 34 174 24 34 12 23 33 178 24 24 24 24 24 24 24 24 24 24	PSW2 106 67 164 108 68 158 107 68 150 PSW2 226 112 745 231 114 700 235 113 621 PSW2 105 105 105	PSW3 87 148 267 87 147 266 87 147 264 PSW3 1147 403 1146 137 403 1146 137 403 1146 137 403 1146 137 403 1163 136 399 1189 1189 1189 1189 1163 117 200 335 117 200 337 116 198	$\begin{array}{c} {\bf EB} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $

Table IV: Results for Monte Carlo Experiment (N=1,500) Strong Separation and Normal Errors

Note: Results show MSE and Bias across 1,000 simulations. Six covariates with a mixture of continuous, binary, and categorical variables. Experimental factors are: 3 sample designs (sample design 1: strong separation and normal errors; sample design 2: weaker separation and normal errors; sample design 3: medium separation and leptokurtic errors), 3 outcome designs (Y1 linear: Y1 =  $X_1 + X_2 + X_3 - X_4 + X_5 + X_6 + \eta$ ; Y2 somewhat non-linear Y2 =  $X_1 + X_2 + 0.2 X_3 X_4 - \sqrt{X_5} + \eta$ ; Y3 highly non-linear: Y3 =  $(X_1 + X_2 + X_5)^2 + \eta$ ), and 3 controls-to-treated ratios (Ratio CtoT 1, 3, and 5). Estimators are Raw: Difference of means; MD: Mahalanobis distance matching, GM: Genetic matching; PSM: Propensity score matching; ISMD: MD matching on the PS and orthogonalized covariates; PSW: weighting on the PS; EB: entropy balancing. All matching is 1:1 pair matching. We use three specifications (labeled with a 1, 2, or 3 postfix) for all propensity score based methods (PSM, PSW, PSMD). The first propensity score model is correct for sample designs 1 and 2, and slightly misspecified for sample design 3. Propensity score models 2 and 3 are increasing in misspecification (as measured by the linear correlation between the true and the estimated score). 1000 simulations for each scenario; the true treatment effect is zero.

		Raw	Data			á	atropy B	alancing			PS We	ighting	
	M. Treated	eans Controls	Std. Diffs	Var Ratio	T pval	Mean Controls	Std. Diffs	Var Ratio	T pval pval	Mean Controls	Std. Diffs	Var Var Ratio	T pval
Age :	25.82	33.23	-0.95	0.42	0.00	25.82	0	1.00	, , ,	27.76	-0.37	0.92	0.01
Schooling Black	0.01 0.84	12.03	3 96	0.49 1 95	00.0	10.35 0.84		00.1		10.22	-0.13	1.18	0.36
Hispanic	0.06	0.07	-0.07	0.84	0.47	0.06	0	1.00		0.04	0.10	1.35	0.47
Married	0.19	0.71	-1.62	0.75	0.00	0.19	0	1.00	1	0.16	0.12	1.16	0.39
HS Dropout	0.71	0.30	1.27	1.00	0.00	0.71	0	1.00		0.74	-0.10	1.07	0.49
Earnings 1974	2095.57 1533.06	14024.14	-1.75	0.26	0.00	2095.57 1533.06	0 0	1.15		1684.68	0.13	1.36	0.37
Larmings 1973	012201	1042.03 0 19	9 50	21.0	00.0	00.200T		090		10.70et	01.0	1.13	0.94
Unemployed 1975	0.60	0.11	2.18	2.48	0.00	0.60	0	1.00		0.66	-0.18	1.07	0.22
Age*Age	717.39	1225.91	-0.92	0.30	0.00	717.39	0	1.13	1	826.13	-0.36	1.03	0.01
Schooling*Age	266.98	395.54	-1.17	0.35	0.00	266.98	0	1.02	1	282.20	-0.24	1.09	0.09
Schooling*Schooling	111.06	152.90	-0.88	0.34	0.00	111.06	0 0	1.01		107.82	0.12	1.16	0.39
Black Age Black *Schooling	8.70	0.81	3.58	1.99	0.00	8.70		1.03		24.00 8.90	-0.07	1.25	0.62
Hispanic*Age	1.36	2.38	-0.16	0.37	0.01	1.36	0	0.97		0.96	0.11	1.36	0.45
Hispanic*Schooling	0.58	0.73	-0.07	0.70	0.40	0.58	0	0.94	1	0.42	0.10	1.28	0.48
Married*Age	5.56	25.85	-1.55	0.42	0.00	5.56	0	1.04	1	4.71	0.10	1.15	0.46
Married*Schooling	1.96	8.56	-1.55	0.49	0.00	1.96	0	0.98		1.58	0.14	1.20	0.34
Married*Black	0.16	0.05	0.74	3.05	0.00	0.16	0 0	1.00		0.13	0.11	1.17	0.44
INTARTIEG TILSPAILC	17.02	00.01 00.01	0.65.0	0.50	00.0	17.07		00.1		10.0	0.00	17.1	10.0
HS Dropout Age	0.61	0.03	4.25	7.74	0.00	0.61		1.00		0.66	-0.16	1.07	0.26
HS Dropout*Hispanic	0.05	0.04	0.07	1.25	0.53	0.05	0	1.00		0.03	0.10	1.40	0.47
HS Dropout*Married	0.14	0.20	-0.20	0.77	0.03	0.14	0	1.00	1	0.11	0.11	1.19	0.44
Earnings 1974*Age	54074.04	509069.25	-1.57	0.10	0.00	54074.04	0	1.14		43947.39	0.12	1.33	0.41
Earnings 1974*Schooling	22898.73	171241.56	-1.62	0.20	0.00	22898.73	0 0	1.23		18132.78	0.13	1.52	0.37
Earnings 1974*Black Ferninge 1074*Hismonic	151 40	840.59 803 68	0.36	1.54 0.00	10.0	151 40		1.21		1451.45	0.12	1.46 0.94	0.40
Earnings 1974* Married	760.63	11809.15	-1.48	0.12	0.00	760.63		1.37		608.57	0.07	1.73	0.64
Earnings 1974*HS Dropout	1094.15	3432.61	-0.45	0.21	0.00	1094.15	0	1.06		896.94	0.09	1.26	0.54
Earnings 1975*Age	41167.28	489047.95	-1.61	0.06	0.00	41167.28	0	1.00	1	35832.82	0.08	1.14	0.58
Earnings 1975*Schooling	15880.57	167310.76	-1.69	0.07	0.00	15880.57	0 0	0.93		13332.83	0.11	1.14	0.44
Earnings 1975*Hisnanic	1537.04	884 08	71.0	0.02	0.00	1537.04		0.87		122.19	0.04	1.14	00.00
Earnings 1975*Married	654.34	11366.04	-1.47	0.08	0.00	654.34	0 0	1.14		549.80	0.06	1.42	0.69
Earnings 1975*HS Dropout	1134.96	3290.78	-0.44	0.18	0.00	1134.96	0	0.89	1	983.57	0.07	1.06	0.60
Unemployed $1974^*Age$	18.78	3.60	1.97	1.63	0.00	18.78	0	0.99	1	21.92	-0.32	0.95	0.02
Unemployed 1974*Schooling	7.26	1.42	2.04	1.58	0.00	7.26	0	1.01		7.71	-0.13	1.17	0.35
Unemployed 1974*Black	0.60	0.01	6.44	23.63	0.00	0.60	0 0	1.00		0.68	-0.22	1.10	0.11
Unemployed 1974 Tuspanic	0.0	10.0	0000	0.74	0.0	0.00		8.1		70.00	01.0	06 I	0.40
Unemployed 1974 IN Dropout	0.52	0.05	2.93	5.28	70.0	0.52		1.00		0.59	-0.17	1.03	0.22
Unemployed 1974*Earnings 1975	307.44	175.27	0.14	0.69	0.12	307.44	0	0.50		310.15	0.00	0.51	0.98
Unemployed 1975*Age	15.98	3.57	1.58	1.73	0.00	15.98	0	0.99	1	19.22	-0.31	0.91	0.03
Unemployed 1975*Schooling	6.15	1.33	1.72	1.84	0.00	6.15	0	1.01	1	6.71	-0.15	1.11	0.28
Unemployed 1975*Black	0.52	0.01	5.51	22.19	0.00	0.52	0	1.00		0.60	-0.22	1.04	0.11
Unemployed 1975 Hispanic	0.03	0.01	0.32	3.61	0.10	0.03	0 0	1.00		0.02	0.10	1.59	0.49
Unemployed 1975*Married	0.09	0.00	71.0	1.31	0.30	0.09		00.1		0.07	0.07	11.1	10.0
Unemployed 1975*Earnings 1974	43.85	203.65	-0.14	0.08	0.00	43.85	0	0.67	•	35.68	0.02	0.77	0.87
Unemployed 1975*Unemployed 1974	0.59	0.07	2.69	3.56	0.00	0.59	0	1.00	1	0.65	-0.18	1.07	0.20
Note: Std. Diffs: Standardized differen	nce in means	s. Var ratio: I	tatio of ve	riances.	r-pval: I	o-value from	differen	ce of mea	ns t-test				

Table V: Covariate Balance in Lalonde Data

		Rav	v Data			Ē	ntropy B	alancing			PS Wei	ghting	
	Me Treated	ans Controls	Std. Diffs	Var Ratio	T pval	Mean Controls	Std. Diffs	Var Ratio	T pval pval	Mean Controls	Std. Diffs	Var Var Ratio	T pval
Prior Conservative Identification	0.41	0.42	-0.02	1.00	0.86	0.41	0	1.00	1	0.40	0.04	1.01	0.76
Prior Labour Identification	0.34	0.31	0.07	1.04	0.53	0.34	0	1.00	1	0.36	-0.06	0.97	0.66
Prior Liberal Identification	0.13	0.15	-0.08	0.89	0.40	0.13	0	1.00	1	0.14	-0.01	0.98	0.93
White	0.99	0.98	0.09	0.60	0.29	0.99	0	1.00	1	0.98	0.02	0.92	0.91
Working-Class	0.72	0.58	0.39	0.84	0.00	0.72	0	1.00	1	0.72	-0.01	1.01	0.92
Parents Voted Labour	0.44	0.35	0.24	1.08	0.03	0.44	0	1.00	1	0.44	-0.01	1.00	0.96
Prior Ideological Moderation	0.65	0.65	-0.02	0.97	0.88	0.65	0	1.00	1	0.65	0.01	1.01	0.95
Prior Labour Vote	0.39	0.32	0.20	1.09	0.07	0.39	0	1.00	1	0.40	-0.03	0.99	0.83
Prior Conservative Vote	0.39	0.40	-0.04	0.99	0.68	0.39	0	1.00	1	0.37	0.04	1.01	0.76
Prior Liberal Vote	0.16	0.19	-0.12	0.87	0.24	0.16	0	1.00	1	0.16	-0.01	0.99	0.96
Prior Labour Party Support	0.49	0.46	0.11	1.02	0.31	0.49	0	0.96	1	0.49	-0.03	0.97	0.82
Prior Conservative Party Support	0.52	0.52	0.01	1.00	0.90	0.52	0	0.99	1	0.51	0.05	1.00	0.73
Prior Political Knowledge	0.55	0.67	-0.49	1.14	0.00	0.55	0	1.01	1	0.55	0.00	0.99	0.99
Prior Television Viewer	0.22	0.29	-0.22	0.83	0.02	0.22	0	1.00	1	0.21	0.03	1.03	0.84
Prior Daily Newspaper Reader	0.93	0.66	0.82	0.30	0.00	0.93	0	1.00	1	0.93	0.01	0.98	0.94
Prior Ideology	0.55	0.54	0.11	0.85	0.27	0.55	0	1.00	1	0.55	-0.01	1.02	0.93
Authoritarianism	0.58	0.57	0.09	1.29	0.44	0.58	0	1.47	1	0.58	-0.01	1.44	0.96
Prior Trade Union Member	0.22	0.24	-0.07	0.94	0.47	0.22	0	1.00	1	0.22	0.01	1.01	0.96
Prior Coping Mortgage	0.71	0.68	0.08	0.46	0.33	0.71	0	0.51	1	0.71	0.00	0.45	0.99
Prior Education	0.75	0.64	0.42	0.81	0.00	0.75	0	1.09	1	0.75	0.00	1.09	1.00
Prior Income	1.20	1.25	-0.03	1.07	0.81	1.20	0	1.06	1	1.20	0.00	1.06	0.99
Prior Age	0.51	0.61	-0.14	0.39	0.06	0.51	0	1.25	1	0.51	0.00	1.14	0.99
Male	0.45	0.56	-0.29	1.01	0.01	0.45	0	1.00	1	0.45	0.02	1.00	0.86
North West	0.12	0.09	0.16	1.34	0.16	0.12	0	1.00	1	0.13	-0.04	0.93	0.76
Yorks	0.08	0.07	0.03	1.08	0.76	0.08	0	1.00	1	0.07	0.04	1.09	0.78
West Midlands	0.08	0.08	-0.03	0.94	0.76	0.08	0	1.00	1	0.07	0.02	1.05	0.88
East Midlands	0.07	0.07	-0.01	0.97	0.90	0.07	0	1.00	1	0.07	-0.01	0.98	0.95
East Anglia	0.01	0.03	-0.16	0.44	0.05	0.01	0	1.00	1	0.01	0.00	1.03	0.97
SW England	0.07	0.08	-0.05	0.90	0.63	0.07	0	1.00	1	0.07	0.01	1.03	0.93
SE England	0.17	0.17	0.00	1.00	1.00	0.17	0	1.00	1	0.16	0.04	1.06	0.76
Greater London	0.11	0.07	0.23	1.57	0.06	0.11	0	1.00	1	0.12	-0.04	0.93	0.78
Wales	0.06	0.03	0.17	1.64	0.17	0.06	0	1.00	1	0.05	0.06	1.18	0.68
Scotland	0.17	0.26	-0.29	0.74	0.00	0.17	0	1.00	1	0.17	-0.01	0.99	0.95
Profession: Large Employer	0.11	0.16	-0.17	0.76	0.07	0.11	0	1.00	1	0.12	-0.01	0.99	0.96
Profession: Small Employer	0.02	0.05	-0.17	0.50	0.03	0.02	0	1.00	1	0.02	0.00	1.00	1.00
Profession: Self Employed	0.29	0.41	-0.33	0.86	0.00	0.29	0	1.00	1	0.29	0.01	1.01	0.93
Profession: Employee	0.05	0.04	0.06	1.21	0.59	0.05	0	1.00	1	0.05	0.02	1.05	0.91
Profession: Temporary Worker	0.45	0.28	0.55	1.24	0.00	0.45	0	1.00	1	0.46	0.00	1.00	0.98
Profession: Junior	0.04	0.05	-0.08	0.77	0.41	0.04	0	1.00	1	0.04	-0.02	0.93	0.88
Note: Cta Differ Cterlerline Life.		11	- D - 4:-	- t	E				1 4 0 0 0 0 1				

Table VI: Covariate Balance in News Media Persuasion Data

		Raw	/ Data			E	ntropy F	alancing			PS Weig	zhtine	
	Mea	ns	Std.	Var	H	Mean	Std.	Var	T pval	Mean	Std.	Var	H
	Treated	Controls	Diffs	$\mathbf{Ratio}$	pval	Controls	Diffs	Ratio	pval	Controls	Diffs	Var Ratio	pval
No. of Cable Channels 2000	4.45	2.47	1.91	2.00	0.00	4.45	0	1.00		4.51	-0.05	0.95	0.24
No. of Cable Channels 2000 Sq.	22.37	7.40	1.78	4.75	0.00	22.37	0	1.14	1	23.06	-0.06	1.06	0.22
Population 2000	1.15	0.92	0.10	0.98	0.01	1.15	0	1.00	1	1.18	-0.01	0.97	0.77
Population 2000 Sq.	11.84	11.53	0.00	0.17	0.95	11.84	0	0.29	1	12.23	0.00	0.14	0.96
No. of Potential Cable Subscribers 2000	16.36	5.74	1.01	5.72	0.00	16.36	0	1.00	1	13.12	0.22	2.11	0.00
No. of Potential Cable Subscribers 2000 Sq.	875.80	139.28	0.57	42.33	0.00	875.80	0	4.61	1	459.82	0.20	12.99	0.00
Fraction w. HS Degree 2000	0.36	0.37	-0.18	1.20	0.00	0.36	0	1.00	1	0.36	-0.06	1.11	0.20
Fraction w. HS Degree 2000 Sq.	0.14	0.15	-0.14	1.20	0.00	0.14	0	1.03	1	0.14	-0.04	1.15	0.43
Fraction w. Some College 2000	0.26	0.26	0.05	0.97	0.14	0.26	0	1.00	1	0.26	0.04	0.91	0.36
Fraction w. Some College 2000 Sq.	0.07	0.07	0.05	0.95	0.18	0.07	0	0.87	1	0.07	0.02	0.70	0.61
Fraction w. College Degree 2000	0.22	0.19	0.33	1.31	0.00	0.22	0	1.00	1	0.21	0.09	1.13	0.05
Fraction w. College Degree 2000 Sq.	0.07	0.05	0.29	1.48	0.00	0.07	0	0.98	1	0.06	0.10	1.13	0.04
Fraction Male 2000	0.49	0.49	-0.09	0.86	0.01	0.49	0	1.00	1	0.49	0.04	1.00	0.36
Fraction Male 2000 Sq.	0.24	0.25	-0.09	0.85	0.01	0.24	0	1.07	1	0.24	0.04	1.06	0.39
Fraction Black 2000	0.03	0.03	-0.05	0.70	0.11	0.03	0	1.00	1	0.03	0.02	1.23	0.60
Fraction Black 2000 Sq.	0.01	0.01	-0.08	0.61	0.01	0.01	0	0.96	1	0.01	0.04	1.30	0.36
Fraction Hispanic 2000	0.03	0.03	0.08	0.98	0.02	0.03	0	1.00	1	0.03	0.02	0.95	0.61
Fraction Hispanic 2000 Sq.	0.01	0.01	0.01	0.82	0.86	0.01	0	1.07	1	0.01	-0.01	0.96	0.87
Fraction Employed 2000	0.61	0.61	0.02	0.96	0.53	0.61	0	1.00	1	0.60	0.18	0.97	0.00
Fraction Employed 2000 Sq.	0.38	0.38	0.02	0.96	0.60	0.38	0	1.02	1	0.37	0.19	1.03	0.00
Unemployment Rate 2000	0.05	0.05	-0.03	1.03	0.39	0.05	0	1.00	1	0.05	-0.13	0.91	0.00
Unemployment Rate 2000 Sq.	0.00	00.00	-0.01	1.71	0.88	0.00	0	1.40	1	0.00	-0.07	1.46	0.14
Fraction Married 2000	0.61	0.61	-0.04	1.19	0.32	0.61	0	1.00	1	0.61	0.00	1.02	0.93
Fraction Married 2000 Sq.	0.38	0.38	-0.02	1.17	0.54	0.38	0	1.04	1	0.38	0.00	1.02	0.96
Median Income 2000	4.44	3.99	0.35	1.47	0.00	4.44	0	1.00	1	4.25	0.13	1.22	0.01
Median Income 2000 Sq.	24.03	18.90	0.32	2.02	0.00	24.03	0	1.02		21.63	0.13	1.29	0.01
Fraction Urban 2000	0.54	0.37	0.53	1.08	0.00	0.54	0 0	1.00		0.53	0.03	1.00	0.54
Fraction Urban 2000 Sq.	0.49	0.32	0.54	1.18	0.00	0.49	⊃ ⊂	10.1		0.48	0.03	1.02	0.50
Population 2000-1990	0.08	0.07	0.03	07.1	0.38	0.08	-	00.1		0.06	0.08	1.41	0.09
Fopulation 2000-1990 Sq.	GT-0	0.00	0.03	67.0	0.47	0. LU		1.13		01.0	0.04	1.25	0.30
Fraction W. IIJ Degree 2000-1990 Evertion Dr Domon 2000 1000 Cc	10.0-	0.00	11.0-	0.97	0.00	10.00		1.00		10.00	-0.02	10.1 0 00	0.53
Fraction w. ILS Degree ZOUU-1990 D4. Fraction w. Some College 2000-1990	0.00	0.00	0.00		0.00	0.00		1 00		0.00	0.03	1111	40.0 77 0
Fraction w. Some College 2000-1990 So.	0.00	0.00	-0.16	0.67	0.00	0.00		0.92		0.00	0.04	1.11	0.45
Fraction w. College Degree 2000-1990	0.04	0.04	0.16	1.14	0.00	0.04	0	1.00		0.04	0.05	1.12	0.27
Fraction w. College Degree 2000-1990 Sq.	0.00	0.00	0.15	1.40	0.00	0.00	0	1.09	1	0.00	0.08	1.20	0.11
Fraction Male 2000-1990	0.00	0.00	-0.05	0.97	0.16	0.00	0	1.00	1	0.00	0.02	1.29	0.75
Fraction Male 2000-1990 Sq.	0.00	00.00	-0.01	0.75	0.82	0.00	0	1.05	1	0.00	0.06	1.89	0.21
Fraction Black 2000-1990	0.00	0.00	-0.04	0.93	0.28	0.00	0	1.00	1	0.00	-0.01	1.23	0.86
Fraction Black 2000-1990 Sq.	0.00	0.00	-0.02	0.83	0.66	0.00	0	1.05		0.00	0.04	1.84	0.39
Fraction Hispanic 2000-1990	0.01	0.01	0.14	1.35	0.00	0.01	0 0	1.00		0.01	0.04	1.06	0.43
Fraction Hispanic 2000-1990 Sq.	0.00	0.00	01.0	1.63	0.02	0.00	0 0	1.04 1.00		0.00	0.02	1.33 1.16	0.63
Fraction Employed Zuvu-1990 Eroction Employed 2000_1990 Sc	1000	10.0	- 0.03	1.03	0.53	10.0		0.05		10.0	0.06	1.10	0.94 0 10
Inemployee 2000-1330 34.	-0.01	-0.01	20.0	0.02	0.03	0.00		1 00		-0.01	-0.07	1 05	0.16
Unemployment Rate 2000-1990 Sq.	0.00	0.00	-0.02	0.47	0.52	0.00	, 0	0.56	•	0.00	0.02	0.83	0.74
Fraction Married 2000-1990	-0.02	-0.02	0.05	0.95	0.14	-0.02	0	1.00	-	-0.02	0.05	1.11	0.29
Fraction Married 2000-1990 Sq.	0.00	0.00	-0.02	0.57	0.57	0.00	0	0.83	1	0.00	0.02	0.85	0.67
Median Income 2000-1990	1.32	1.23	0.17	1.30	0.00	1.32	0	1.00	1	1.24	0.15	1.30	0.00
Median Income 2000-1990 Sq.	2.45	2.05	0.15	1.58	0.00	2.45	0	0.98	1	2.07	0.14	1.68	0.00
Fraction Urban 2000-1990 $\Sigma_{2222}$ II when 2000 1000 S	0.08	0.08	-0.03	1.01	0.49	0.08	0 0	1.00		0.09	-0.04	1.01	0.37
Fraction Urban 2000-1990 oq.	00.0	00	0.00	T.US	0.90	000		7.UZ		00	00	1.04	0.94
Note: Std. Diffs: Standardized difference in n	ieans. Var ra	tio: Ratio e	of variance	ss. T-pval	: p-valu	e from diffe	rence of	means t-t	est				

Table VII: Covariate Balance in Fox News Data

		F	val	.77	.56	.71	.83	.56	.46	.64	.73	.79	.73	.31	.65	.93	.62	.83	.63	.57	.41	.81	.51	ĺ
		1	o d	33	4	7	0	2	7 0	9	9	50	1	0 8	0 8	8	7	50	0	50	1	0	2	
	ghting	Va	Var Rati	1.0	0.9	0.7	0.8	1.2	1.5	0.6	1.4	1.0	1.1	0.7	1.3	0.9	0.9	1.0	1.1	1.0	0.9	1.0	1.3	
a	PS Wei	Std.	Diffs	0.06	-0.11	-0.07	-0.04	0.11	0.15	-0.09	0.07	0.05	0.07	-0.20	0.09	-0.02	-0.10	0.04	0.10	0.11	-0.16	0.05	0.13	
tes Dat		Mean	Controls	1916.22	1996.00	0.04	0.02	0.10	0.04	0.03	0.01	0.20	0.13	0.15	0.04	0.21	0.42	0.18	0.19	0.33	0.33	0.34	0.07	neans t-test
andida		T pval	pval		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	erence of r
tive C	alancing	Var	$\mathbf{Ratio}$	1.12	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	from diffe
servat	tropy B	Std.	$\operatorname{Diffs}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	p-value
in Cons	En	Mean	Controls	1916.57	1995.48	0.03	0.02	0.12	0.06	0.02	0.02	0.21	0.14	0.11	0.05	0.20	0.38	0.19	0.22	0.37	0.28	0.36	0.10	es. T-pval:
ance j		E	pval	0.13	0.60	0.27	0.20	0.55	0.43	0.50	0.50	0.88	0.03	0.50	0.27	0.00	0.18	0.00	0.03	0.28	0.57	0.60	0.01	f varianc
s Bal		Var	Ratio	0.87	0.98	0.50	0.39	0.85	0.70	0.58	2.25	1.03	0.64	0.81	0.59	4.93	0.95	0.66	1.76	1.11	0.94	0.96	5.22	Ratio o
variate	Data	Std.	$\operatorname{Diffs}$	-0.29	0.10	-0.21	-0.24	-0.11	-0.15	-0.13	0.13	0.03	-0.41	-0.13	-0.21	0.75	-0.26	-0.59	0.42	0.21	-0.11	-0.10	0.49	Var ratio:
III: Co	Raw	ns	Controls	1918.34	1995.03	0.06	0.05	0.15	0.08	0.03	0.01	0.20	0.26	0.14	0.08	0.03	0.47	0.38	0.11	0.30	0.31	0.39	0.02	ce in means.
<b>Fable V</b>		Mea	Treated	1916.57	1995.48	0.03	0.02	0.12	0.06	0.02	0.02	0.21	0.14	0.11	0.05	0.20	0.38	0.19	0.22	0.37	0.28	0.36	0.10	zed differenc
				Year of Birth	Year of Death	Female	Teacher	Barrister	Solicitor	Doctor	Civil Servant	Local Politician	Business	White Collar	Journalist	Schooling: Eton	Schooling: Public	Schooling: Regular	Schooling: Not reported	University: Oxbridge	University: Degree	University: Not reported	Aristocrat	Note: Std. Diffs: Standardi.





Figure 1: Covariate Balance: QQ plots of Continuous Covariates

Note: QQ plots of pretreatment earnings in 1975 and 1974, age, and education. The black dots represent empirical QQ estimates for the raw data. The gray dots represent QQ estimates for the matched data. The superimposed 45-degree line indicates identical distributions for the treatment and control group.

Figure 2: Histogram for Selected Covariates in Fox News Data



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	Unadjusted O MahaDist Matching Genetic Matching A PS Matching A PS Weighting A Entropy Balancing	Unadjusted O MahaDist Matching Genetic Matching A PS Matching A PS Weighting Entropy Balancing
No. of Cable Channels 2000 Sq. Population 2000 Sq. Population 2000 Sq. No. of Potential Cable Subscribers 2000 Sq. Fraction w. HS Degree 2000 Sq. Fraction w. HS Degree 2000 Sq. Fraction w. Some College 2000 Sq. Fraction w. College Degree 2000 Sq. Fraction Male 2000 Sq. Fraction Male 2000 Sq. Fraction Male 2000 Sq. Fraction Black 2000 Sq. Fraction Hispanic 2000 Sq. Fraction Employed 2000 Sq. Fraction Employed 2000 Sq. Fraction Employed 2000 Sq. Fraction Maried 2000 Sq. Fraction Van 2000 Sq. Fraction Warke 2000-1990 Sq. Fraction W. HS Degree 2000-1990 Sq. Fraction w. Some College 2000-1990 Sq. Fraction Male 2000-1990 Sq. Fraction Male 2000-1990 Sq. Fraction Male 2000-1990 Sq. Fraction Male 2000-1990 Sq. Fraction Black 2000-1990 Sq. Fraction Black 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Employed 2000-1990 Sq. Fraction Employed 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Employed 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Hispanic 2000-1990 Sq. Fraction Married 2000-1990 Sq. Fractio		
	standardized difference in means	p-value: difference of means test

Figure 3: Covariate Balance in Fox News Data

Note: Left panel shows plot of covariate-by-covariate standardized bias in the unadjusted data and after the various preprocessing methods. The standardized bias measures the difference in means between the treatment and control group (scaled by the standard deviation). Zero bias indicates identical means, dots to the right (left) of zero indicate a higher mean among the treatment (control) group. The right panel shows the p-value for a covariate-by-covariate t-test for the differences in means after the unadjusted data and after the various preprocessing methods.





Note: Density of estimated treatment effects across one million randomly samples model specifications in the unadjusted data (dashed line) and the data preprocessed with entropy balancing (solid line).

Figure 5: Covariate Balance in Fox News Data - Using Only the Raw Covariates (Standardized Bias)



standardized difference in means

Note: Covariate-by-covariate standardized bias in the unadjusted data and after the various preprocessing methods. The standardized bias measures the difference in means between the treatment and control group (scaled by the standard deviation). Zero bias indicates identical means, dots to the right (left) of zero indicate a higher mean among the treatment (control) group.



Figure 6: Covariate Balance in Fox News Data - Using only the Raw Covariates (p-values)

Note: p-values for a covariate-by-covariate t-test for the differences in means in the unadjusted data and after the various preprocessing methods.



Figure 7: Covariates Balance in British MPs Data (Standardized Bias)

Note: Covariate-by-covariate standardized bias in the unadjusted data and after the various preprocessing methods. The standardized bias measures the difference in means between the treatment and control group (scaled by the standard deviation). Zero bias indicates identical means, dots to the right (left) of zero indicate a higher mean among the treatment (control) group.



Figure 8: Covariates Balance in British MPs Data (p-values)

Note: p-values for a covariate-by-covariate t-test for the differences in means after the unadjusted data and after the various preprocessing methods.