Response surface regressions for critical value bounds and approximate p-values in equilibrium correction models

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Supplementary Appendix

Appendix A Details on the computational methods

In the following, we present some computational aspects about the Monte Carlo simulations in Section 3 of the main paper. All computations are performed in *Stata* 16. The bulk of the computations, the Monte Carlo simulations, are performed in *Stata*'s integrated matrix language, *Mata*. As a byte-compiled language, *Mata* runs about 5 to 6 times slower than a high-performance, compiled language such as *C*. However, most *Mata* functions used in our simulations hook directly into compiled ones, such as *LAPACK* functions (Anderson et al., 1999), which decreases the speed disadvantage substantially. We estimate that our simulation runs about half as fast as pure *C* would. *Mata*, however, is much more user friendly than *C*. For example, an appropriate random number generation mechanism that has a sufficiently large period and that accommodates parallel computations is readily available. For that, we use random number streams based on the Mersenne Twister pseudo-random number generator. Overall, we believe that *Mata* provides a good balance between speed and high-level language features. We manually distribute the computational load on 38 cores, each of which running at 2.9 GHz. After the removal of any redundant calculations, such as repeated calculation of the same cross products, the average run time per single core is 2.9 days, with the longest one taking 5.1 days.

Storing the calculated statistics is a desirable computational aspect of the simulation. One of the advantages is that it isolates sequential steps that are computationally intensive. Once the statistics are saved, any subsequent operations can be done independently, without recalculating the results from the previous step over and over again, should either

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bugs or additional research ideas pop up. Storing the test statistics is also a prerequisite for density plots (Figures 1 to 3 in the main paper). However, the large number of calculated statistics, roughly 100 billion F-statistics and 60 billion t-statistics, poses several problems, the most serious one being storage. Using floating-point numbers with 8 digit precision (4 bytes per number), the (uncompressed) storage requirement for our application is 578 GB. While this is not technically infeasible, it is too much of a hindrance for practical research. Since floating-point numbers are typically not suited for eliciting sizeable compression gains,[1] our solution was to first round the calculated statistics to three digits after the decimal point. As we show further below, the effect of rounding on the RS regressions is absolutely negligible. After rounding, we further transformed the numbers in terms of first differences of sorted statistics and occurrence counts. The transformation is completely reversible, so that the original rounded 10 billion statistics per simulation design can be fully recovered. The resulting storage requirement is 43 GB, which decreases further to 9 GB when adding a conventional compression algorithm. This magnitude is easily manageable. The total disk saving is, compared to the original storage requirement, 92.6% after number transformations, and 98.4% after additional compression.

To see how the number transformation cuts down on disk space usage, suppose that the following is an extract of 10 simulated 4-byte floating-point numbers out of a single replication with 100,000 test statistics for a particular specification of $\{c, k, d, q, I\}$:[2]

$$\{\ldots, 3.001222, 3.001333, 3.001444, 3.001555, 3.001777, 3.002111, 3.002777, 3.002999, 3.003111, 3.003222, \ldots\}.$$

The untransformed and uncompressed storage requirement is $10 \cdot 4 = 40$ bytes. After rounding and multiplying by 1000, we obtain the numbers $\{3001, 3002, 3003\}$ with corresponding occurrence counts $\{3, 3, 4\}$. Since the occurrence counts can be larger than 1-byte integers in practice, each of these numbers that characterize the rounded and transformed data is stored as a 2-byte integer. The storage requirement in this example thus reduces to 12 bytes. Furthermore, what we actually store instead of the rounded numbers themselves are the first differences, along with the level of the first statistic for reversibility of the algorithm (up to rounding). That is, $\{3001, 3002, 3003\}$ becomes $\{3001, 1, 1\}$. The resulting data have many bit-level repeating patterns, so applying a conventional compression algorithm yields additional sizeable disk savings of 80%.

We emphasize that the effects of rounding to 3 digits after the decimal point are inconsequential for practical purposes. To substantiate this claim, we kept the unrounded

[1] Some basic experimentation (based on 10 million sorted 4-byte random draws from a $\mathcal{N}(5, 5)$ distribution) resulted in a compression gain of about 10% only, decreasing the estimated total disk requirement from 578 GB to 520 GB, which is still too much for practical purposes.

[2] For easier readability, these are stylized numbers, not actually obtained test statistics.

statistics for a subset of specifications ($k = 1$ only) and compared the predicted critical values from the response surface regressions in Appendix C for the rounded and unrounded statistics. 99.9999% of the predicted critical values remain unchanged at least for the first two digits after the decimal point. Less than 0.002% of the predicted critical values change at the 3rd digit after the decimal point (and only for very small sample sizes), and the vast majority of the critical values remain unchanged even for the first 6 digits after the decimal point.

Appendix B Alternative data-generating processes

The finite-sample distributions and CVs that we obtained in Section 3 of the main paper are based on the restricted VAR(1) DGP in equations (4) and (5). As a robustness check, we alternatively generate the disturbances $\boldsymbol{\epsilon}_t = (\epsilon_{yt}, \boldsymbol{\epsilon}'_{xt})'$ either from a first-order autoregressive (AR) process,

$$\boldsymbol{\epsilon}_t = \rho \boldsymbol{\epsilon}_{t-1} + \boldsymbol{\eta}_t, \tag{B.1}$$

or from a first-order moving-average (MA) process,

$$\boldsymbol{\epsilon}_t = \boldsymbol{\eta}_t + \rho \boldsymbol{\eta}_{t-1}, \tag{B.2}$$

where the elements of the vector $\boldsymbol{\eta}_t$ are independently drawn from the standard normal distribution. We choose $\rho = 0.4$ for the AR(1) error process and $\rho = 0.5$ for the MA(1) error process. Due to the computational complexity, we restrict our attention to a situation with $k = 1$ long-run forcing variable. Along the same lines as in Section 3.1, we obtain EDFs of the test statistics for various combinations of time periods T and lag orders q for all five cases (i)–(v). With these EDFs, we can then assess the finite-sample size distortions of the bounds test that is ignorant of the AR(1) or MA(1) error structure. For this purpose, we infer the actual p-values corresponding to the CVs from Section 3. Tables B.1 to B.8 present the sizes for both the F-statistic and the t-statistic, separately based on the finite-sample or the asymptotic CVs.

Overall, the size distortions remain relatively small when the regression model is augmented with sufficiently many lags to account for the serial dependence. To make this point, notice that the AR(1) process (B.1) for ϵ_{yt} translates into an AR(2) process for y_t:

$$y_t = y_{t-1} + \epsilon_{yt} = (1 + \rho) y_{t-1} - \rho y_{t-2} + \eta_{yt}.$$

Hence, augmenting the regression model by at least the second lag of y_t captures the serial correlation induced by the AR(1) shock process, which is a prerequisite for the validity of the bounds test (Assumption 2). Indeed, our results confirm that the size distortions can be substantial without such a lag augmentation, that is $q < 2$, and they can go either way. With a lag order of $q = 2$, the extent to which the bounds test is oversized for small sample sizes appears to be acceptable. Adding further lags does not yield improvements. With increasing sample size, the size distortions become smaller. They eventually become negligible for very large sample sizes, provided that $q \geq 2$.

It is less straightforward to deal with the MA(1) process (B.2) for ϵ_{yt} that translates into an AR(∞) process for y_t:

$$y_t = y_{t-1} + \epsilon_{yt} = (1+\rho)\sum_{i=1}^{\infty}(-\rho)^{i-1}y_{t-i} + \eta_{yt}.$$

With any finite-order approximation, the disturbance term will retain some serial correlation, thus violating Assumption 2. Hence, not surprisingly, the size distortions exceed those from the AR(1) shock process in most situations. While the approximation generally becomes better with a higher lag augmentation q, the distortions do not monotonically decrease over the whole spectrum. In particular for $q < 2$, the results are quite erratic. Even for very large sample sizes, the bounds test remains size distorted to a non-negligible extent unless the lag order is chosen sufficiently large, say $q \geq 8$. For smaller sample sizes, properly accounting for such MA shock dynamics may be infeasible because degree-of-freedom restrictions prevent the inclusion of sufficiently many lags.

In most of the considered scenarios with serially dependent disturbances, our finite-sample CVs from Section 3 still improve the inference over the asymptotic CVs, in particular for relatively small sample sizes. Nevertheless, there are a few instances in which the asymptotic CVs provide better approximations. However, this happens primarily when both the lag order and the sample size are large, in which case the size distortions are very small.

As a final remark, when aiming to run RS regressions for a DGP based on AR(1) shocks, one should discard all test statistics computed from a regression model with $q < 2$ for which the bounds test would be inconsistent. Otherwise, the quantiles of the distributions from those inconsistent tests would bias the RS coefficients. The same logic implies that consistent RS estimates based on finite-order autoregressive models cannot be obtained for a DGP with MA(1) shocks.

Appendix C Separate response surface regressions

In Section 3.2 of the main paper, we have obtained RS estimates for the F- and t-statistic that allow us to predict quantiles of the distributions for any number of long-run forcing variables. In the previous literature, these RS models were estimated separately for each variable count k of interest. In this appendix, we do the same for all $k \in [0, 10]$. While the resulting predictions are expected to be slightly more precise, we have seen in Figure 4 of the main paper that there is hardly any practically relevant difference compared to the joint model for all k.

In the following, we estimate separate RS models for each quadruplet $\{c, k, d, p\}$. Given the 100 meta replications, up to 19 choices of the time horizon T, and 8 different lag orders q, we have between 5,900 and 12,400 observations per estimation, accounting for the restriction that there shall be at least twice as many observations as parameters in equation (6).[3] The general RS model is given in equation (7), with the restrictions $\theta_{0,l} = 0$ for all $l > 0$ due to the asymptotic irrelevance of the short-run coefficients. We have chosen the polynomial orders $m = 3$ and $n = 1$. The latter provides a better fit than alternatively setting $n = 3$ together with the restrictions $\theta_{j,l} = 0$ whenever $j \neq l$ for $l > 0$, which has been done by Cheung and Lai (1995). Equation (7) thus reduces to

$$Q_k(T, q) = \theta_{0,0} + \sum_{j=1}^{3} \theta_{j,0} \frac{1}{[N(T, q)]^j} + \sum_{j=1}^{3} \theta_{j,1} \frac{H(q, k)}{[N(T, q)]^j} + u. \tag{C.1}$$

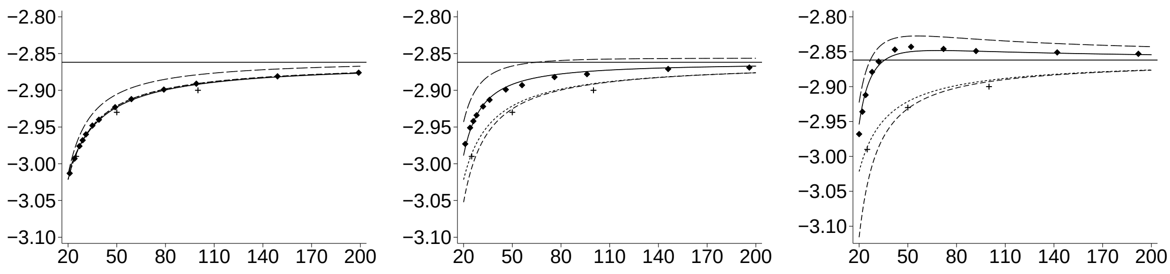
We report the ordinary least squares results for the quantiles corresponding to a size of 1%, 5%, and 10% in Tables C.1 to C.8.[4] These tables also contain the standard error (SE) of the intercept, robust to heteroskedasticity, as a measure of uncertainty about the asymptotic quantile. It is always smaller than 0.0041 for the F-statistic and below 0.0011 for the t-statistic. In most experimental designs, the standard error remains far below this magnitude. However, the reported standard errors are too small because they are conditional on the correct specification of the RS model, as emphasized by MacKinnon (1991).

The asymptotic CVs can be read off directly from the RS intercept $\theta_{0,0}$. Our estimates are close to the corresponding near-asymptotic CVs tabulated by Pesaran et al. (2001). The absolute difference is for the most part below 0.05, both for the F-statistic and the t-statistic. However, these asymptotic CVs are less useful in small samples. For a given number of variables in the level relationship, finite-sample CVs can be computed from the regression coefficients for any combination of the effective sample size and number of short-run coefficients.

Previously reported CVs typically do not take the lag augmentation in equation (6) into account and might thus be inaccurate in many empirically relevant situations, in particular when the sample size is relatively small. Figure 5 in the main paper illustrates the variation across lag orders. For $k = 0$, there is obviously no distinction possible between $I(0)$ and $I(1)$ variables in the level relationship. In this situation, the F-statistic in cases (ii) and (iv) is the one analyzed by Dickey and Fuller (1981). In cases (i), (iii), and (v), it equals the square of the t-statistic. The latter corresponds to the familiar augmented Dickey-Fuller unit-root test statistic. The asymptotic CVs obtained from our

[3]The largest number of observations is available for $k = 1$ in case (i), and the smallest number for $k = 10$ in cases (iv) and (v).

[4]Estimates for other quantiles are available upon request.



(a) $q = 1$ (b) $q = 4$ (c) $q = 8$

Figure C.1: RS from equation (C.1) for the t-statistic in case (iii) with $k = 0$ variables at the 5% significance level for selected lag orders q over a range of effective sample sizes $N(T, q)$. The diamonds are the CVs computed from the aggregate EDFs of the 10^7 t-statistics. The horizontal line represents the respective estimate of $\theta_{0,0}$ in Table C.7 and the solid curve the corresponding RS. The long-dashed curve is the RS from Cheung and Lai (1995), the medium-dashed curve from Ericsson and MacKinnon (2002), and the short-dashed curve from MacKinnon (2010). Crosses are tabulated CVs from Dickey (1976).

RS regressions closely match those reported in the previous literature.[5]

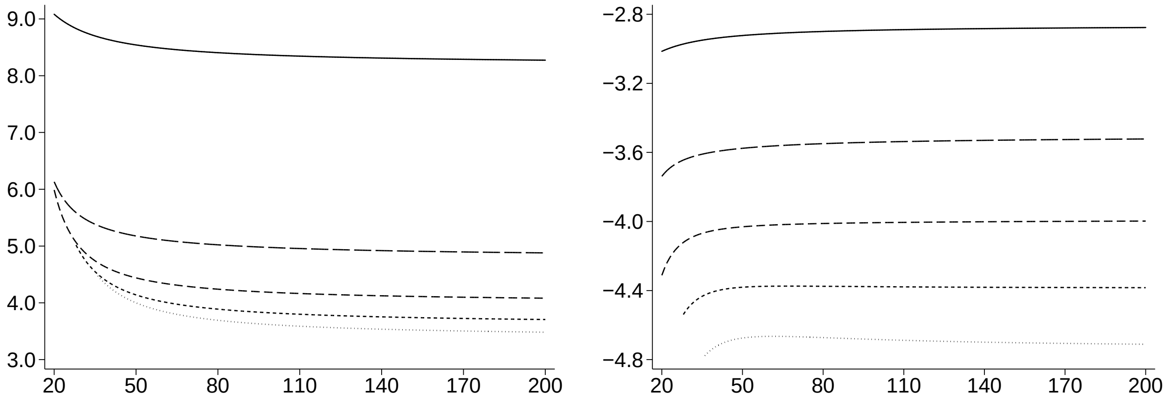
RS estimates for the original Dickey and Fuller (1979) test statistic, $q = 1$, have been previously obtained by MacKinnon (1991, 2010) and Ericsson and MacKinnon (2002).[6] Cheung and Lai (1995) go one step further by estimating a RS that allows the quantiles of the distribution to vary with the lag order. Figure C.1 compares these RS estimates to ours for case (iii) and three different lag orders at a size of 5%. For the test without lag augmentation, $q = 1$, our RS and the ones from MacKinnon (2010) and Ericsson and MacKinnon (2002) are visually indistinguishable and they all fit nicely through the quantiles from the aggregate EDFs obtained in Section 3.1 of the main paper.[7]

The advantage of our approach becomes apparent when we move to higher lag orders. Because the RS from MacKinnon (2010) does not accommodate the lag augmentation, it becomes too conservative. In fact, for higher lag orders the asymptotic critical value would provide a better approximation for most sample sizes than the MacKinnon (2010) surface or the tabulated CVs from Dickey (1976). By contrast, Figure C.1 confirms that our RS provides a very good fit to the CVs implied by our simulated aggregate EDFs. It also outperforms the RS from Cheung and Lai (1995) that is skewed towards zero, possibly due to the smaller number of replications in their simulation and a lower polynomial order in their RS regressions. Ericsson and MacKinnon (2002) indirectly account for the lag order by estimating the RS over the degrees-of-freedom adjusted sample size. However,

[5]See Table 1 in the main paper.

[6]Dickey (1976) obtains his CVs as predictions from RS regressions but he does not report the regression coefficients.

[7]MacKinnon (2010) is an updated version of MacKinnon (1991).



(a) F-statistic (b) t-statistic

Figure C.2: Upper-bound RS from equation (C.1) for the F- and t-statistic in case (iii) at the 5% significance level with $k \in \{0, 2, 4, 6, 8\}$ variables over a range of effective sample sizes $N(T, q)$ and with a lag order $q = 1$. The solid curve refers to $k = 0$. With increasing k, the curves have shorter dashes.

Figure C.1 clearly shows that this strategy is not appropriate for higher lag orders as the fit worsens even compared to MacKinnon (2010).

In the multivariable environment, the order of integration affects the distribution of the test statistic. Banerjee et al. (1998) and Ericsson and MacKinnon (2002) consider the t-statistic for cointegration testing under the assumption that all regressors are individually $I(1)$, the upper bound for the bounds test, but neither of them account for the lag augmentation. In this situation, when we vary k for a fixed lag order $q = 1$, the spread between the RS curves is largely driven by the asymptotic critical value that now depends on k. This is shown in Figure C.2 for both the F- and t-statistic. Importantly, the gap between the curves becomes systematically smaller with increasing k, which justifies our approach in Section 3.2 of the main paper to directly model the variation in k as part of a joint RS.

Appendix D Critical values and approximate p-values

To assess the precision of the empirical distribution functions obtained in our Monte Carlo simulation in Section 3.1 of the main paper, we can compute the coefficient of variation for the quantiles of interest based on the 100 meta replications with 100,000 replications each. For selected simulation designs, they are reported in Tables D.1 and D.2. Because the replications for a given design are independent, the coefficient of variation for the quantiles based on 10 million replications is expected to be one-tenth of the one for 100,000 replications.

Besides being useful on their own in an empirical analysis, the approximate p-values computed in Section 3.3 of the main paper can be used to assess the relevance of the differences between asymptotic and finite-sample CVs. Tables D.3 and D.4 present the approximate finite-sample p-values for a given sample size and variable count that correspond to the respective asymptotic CVs at a specified significance level. These p-values can be interpreted as the expected finite-sample size of the asymptotic test.

Finally, we present larger and colored versions of Figures 1 to 3 and 5 to 6 at the end of this document.

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Table B.1: p-values for finite-sample CVs with AR(1) shocks, F-statistic

	T	q	1%		5%		10%	
			$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
Case (i)								
	30	1	0.0609	0.0601	0.1605	0.1493	0.2430	0.2222
		2	0.0125	0.0136	0.0590	0.0634	0.1146	0.1218
		4	0.0131	0.0138	0.0616	0.0651	0.1193	0.1253
	80	1	0.0588	0.0628	0.1488	0.1448	0.2245	0.2120
		2	0.0115	0.0125	0.0546	0.0572	0.1069	0.1107
		4	0.0116	0.0124	0.0553	0.0574	0.1081	0.1112
		8	0.0120	0.0122	0.0566	0.0578	0.1104	0.1121
	1000	1	0.0519	0.0538	0.1299	0.1250	0.1963	0.1841
		2	0.0096	0.0094	0.0492	0.0489	0.0990	0.0988
		4	0.0096	0.0093	0.0492	0.0488	0.0990	0.0988
		8	0.0096	0.0093	0.0492	0.0486	0.0991	0.0986
Case (ii)								
	30	1	0.0574	0.0589	0.1438	0.1464	0.2142	0.2171
		2	0.0130	0.0143	0.0613	0.0665	0.1188	0.1277
		4	0.0140	0.0148	0.0656	0.0688	0.1258	0.1320
	80	1	0.0615	0.0678	0.1422	0.1506	0.2071	0.2156
		2	0.0119	0.0132	0.0560	0.0596	0.1089	0.1145
		4	0.0118	0.0129	0.0560	0.0593	0.1095	0.1143
		8	0.0121	0.0126	0.0575	0.0595	0.1119	0.1153
	1000	1	0.0577	0.0626	0.1345	0.1422	0.1967	0.2049
		2	0.0095	0.0091	0.0491	0.0483	0.0989	0.0980
		4	0.0095	0.0091	0.0490	0.0483	0.0990	0.0982
		8	0.0095	0.0090	0.0491	0.0483	0.0990	0.0982
Case (iii)								
	30	1	0.0201	0.0278	0.0667	0.0812	0.1140	0.1314
		2	0.0132	0.0143	0.0613	0.0657	0.1182	0.1255
		4	0.0143	0.0148	0.0655	0.0677	0.1245	0.1286
	80	1	0.0194	0.0309	0.0617	0.0809	0.1046	0.1264
		2	0.0116	0.0126	0.0553	0.0581	0.1079	0.1125
		4	0.0115	0.0124	0.0550	0.0578	0.1079	0.1121
		8	0.0119	0.0124	0.0563	0.0583	0.1097	0.1132
	1000	1	0.0175	0.0290	0.0561	0.0760	0.0960	0.1191
		2	0.0098	0.0095	0.0496	0.0490	0.0996	0.0989
		4	0.0097	0.0094	0.0496	0.0490	0.0996	0.0990
		8	0.0097	0.0093	0.0494	0.0488	0.0994	0.0988
Case (iv)								
	30	1	0.0291	0.0321	0.0846	0.0924	0.1357	0.1470
		2	0.0138	0.0148	0.0645	0.0691	0.1247	0.1324
		4	0.0153	0.0157	0.0698	0.0718	0.1329	0.1366
	80	1	0.0307	0.0380	0.0801	0.0935	0.1245	0.1414
		2	0.0123	0.0135	0.0574	0.0608	0.1116	0.1167
		4	0.0119	0.0130	0.0566	0.0600	0.1108	0.1160
		8	0.0120	0.0125	0.0573	0.0597	0.1122	0.1161
	1000	1	0.0279	0.0349	0.0727	0.0866	0.1134	0.1312
		2	0.0097	0.0094	0.0498	0.0489	0.1000	0.0990
		4	0.0097	0.0094	0.0496	0.0488	0.0997	0.0990
		8	0.0096	0.0093	0.0493	0.0487	0.0994	0.0986
Case (v)								
	30	1	0.0088	0.0142	0.0351	0.0484	0.0653	0.0845
		2	0.0138	0.0146	0.0635	0.0674	0.1219	0.1285
		4	0.0150	0.0152	0.0677	0.0689	0.1283	0.1303
	80	1	0.0073	0.0154	0.0279	0.0455	0.0519	0.0756
		2	0.0119	0.0129	0.0564	0.0592	0.1099	0.1141
		4	0.0115	0.0125	0.0555	0.0585	0.1089	0.1135
		8	0.0118	0.0124	0.0562	0.0586	0.1099	0.1137
	1000	1	0.0058	0.0143	0.0227	0.0412	0.0429	0.0681
		2	0.0099	0.0096	0.0501	0.0494	0.1005	0.0996
		4	0.0099	0.0096	0.0500	0.0493	0.1002	0.0995
		8	0.0098	0.0095	0.0496	0.0491	0.0998	0.0992

Note: Reported are the p-values obtained from the EDFs for a DGP with AR(1) shock process (B.1) that are associated with the finite-sample CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.2: p-values for asymptotic CVs with AR(1) shocks, F-statistic

	T	q	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	1	0.0860	0.0843	0.1858	0.1721	0.2644	0.2407
		2	0.0229	0.0266	0.0763	0.0835	0.1326	0.1419
		4	0.0273	0.0327	0.0840	0.0937	0.1420	0.1538
	80	1	0.0641	0.0665	0.1541	0.1481	0.2291	0.2143
		2	0.0133	0.0141	0.0577	0.0597	0.1100	0.1129
		4	0.0134	0.0143	0.0581	0.0604	0.1103	0.1138
		8	0.0139	0.0151	0.0586	0.0620	0.1109	0.1159
	1000	1	0.0521	0.0538	0.1301	0.1250	0.1964	0.1841
		2	0.0097	0.0094	0.0493	0.0488	0.0990	0.0987
		4	0.0096	0.0093	0.0492	0.0487	0.0989	0.0987
		8	0.0096	0.0093	0.0490	0.0484	0.0986	0.0983
Case (ii)								
	30	1	0.0926	0.0984	0.1789	0.1871	0.2436	0.2528
		2	0.0304	0.0378	0.0881	0.1048	0.1447	0.1677
		4	0.0360	0.0483	0.0945	0.1198	0.1494	0.1835
	80	1	0.0695	0.0748	0.1502	0.1581	0.2136	0.2222
		2	0.0148	0.0162	0.0606	0.0654	0.1130	0.1209
		4	0.0143	0.0164	0.0584	0.0655	0.1094	0.1207
		8	0.0139	0.0175	0.0555	0.0672	0.1035	0.1221
	1000	1	0.0581	0.0627	0.1348	0.1423	0.1970	0.2052
		2	0.0096	0.0091	0.0492	0.0484	0.0990	0.0981
		4	0.0095	0.0091	0.0489	0.0483	0.0986	0.0982
		8	0.0094	0.0090	0.0485	0.0482	0.0979	0.0979
Case (iii)								
	30	1	0.0338	0.0469	0.0829	0.1026	0.1277	0.1499
		2	0.0268	0.0331	0.0797	0.0931	0.1330	0.1508
		4	0.0315	0.0408	0.0845	0.1026	0.1358	0.1591
	80	1	0.0227	0.0350	0.0653	0.0851	0.1072	0.1298
		2	0.0141	0.0156	0.0584	0.0627	0.1095	0.1162
		4	0.0136	0.0156	0.0561	0.0621	0.1056	0.1148
		8	0.0132	0.0163	0.0530	0.0623	0.0996	0.1138
	1000	1	0.0177	0.0292	0.0563	0.0762	0.0961	0.1192
		2	0.0099	0.0095	0.0497	0.0491	0.0995	0.0989
		4	0.0098	0.0095	0.0495	0.0490	0.0991	0.0988
		8	0.0097	0.0094	0.0489	0.0487	0.0983	0.0983
Case (iv)								
	30	1	0.0583	0.0675	0.1186	0.1342	0.1674	0.1867
		2	0.0401	0.0494	0.1044	0.1235	0.1641	0.1893
		4	0.0498	0.0648	0.1153	0.1432	0.1728	0.2085
	80	1	0.0375	0.0455	0.0881	0.1026	0.1317	0.1501
		2	0.0169	0.0187	0.0653	0.0710	0.1191	0.1279
		4	0.0162	0.0191	0.0625	0.0711	0.1144	0.1276
		8	0.0159	0.0204	0.0593	0.0732	0.1078	0.1292
	1000	1	0.0282	0.0352	0.0731	0.0869	0.1137	0.1315
		2	0.0099	0.0095	0.0501	0.0492	0.1003	0.0993
		4	0.0099	0.0095	0.0498	0.0491	0.0996	0.0992
		8	0.0097	0.0094	0.0490	0.0488	0.0985	0.0986
Case (v)								
	30	1	0.0191	0.0304	0.0496	0.0696	0.0793	0.1048
		2	0.0339	0.0416	0.0907	0.1061	0.1446	0.1648
		4	0.0402	0.0512	0.0953	0.1153	0.1452	0.1703
	80	1	0.0094	0.0191	0.0310	0.0501	0.0548	0.0799
		2	0.0159	0.0177	0.0618	0.0669	0.1135	0.1212
		4	0.0148	0.0175	0.0580	0.0656	0.1072	0.1185
		8	0.0140	0.0180	0.0531	0.0645	0.0979	0.1149
	1000	1	0.0059	0.0145	0.0228	0.0414	0.0430	0.0683
		2	0.0101	0.0098	0.0504	0.0498	0.1005	0.0998
		4	0.0100	0.0098	0.0500	0.0495	0.0998	0.0995
		8	0.0098	0.0096	0.0491	0.0491	0.0985	0.0986

Note: Reported are the p-values obtained from the EDFs for a DGP with AR(1) shock process (B.1) that are associated with the asymptotic CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.3: p-values for finite-sample CVs with AR(1) shocks, t-statistic

	T	q	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	1	0.0218	0.0158	0.0660	0.0522	0.1094	0.0904
		2	0.0130	0.0134	0.0588	0.0610	0.1121	0.1164
		4	0.0133	0.0133	0.0606	0.0610	0.1148	0.1162
	80	1	0.0103	0.0113	0.0381	0.0384	0.0711	0.0690
		2	0.0116	0.0119	0.0538	0.0548	0.1050	0.1063
		4	0.0114	0.0121	0.0538	0.0556	0.1050	0.1077
		8	0.0115	0.0125	0.0538	0.0574	0.1050	0.1109
	1000	1	0.0004	0.0041	0.0048	0.0170	0.0163	0.0345
		2	0.0102	0.0096	0.0504	0.0495	0.1004	0.0998
		4	0.0102	0.0096	0.0503	0.0496	0.1000	0.1000
		8	0.0100	0.0096	0.0499	0.0496	0.0997	0.1001
Case (iii)								
	30	1	0.0102	0.0079	0.0368	0.0310	0.0664	0.0585
		2	0.0136	0.0139	0.0615	0.0630	0.1173	0.1200
		4	0.0141	0.0138	0.0635	0.0626	0.1202	0.1181
	80	1	0.0092	0.0070	0.0306	0.0252	0.0546	0.0468
		2	0.0120	0.0122	0.0553	0.0558	0.1073	0.1078
		4	0.0118	0.0122	0.0547	0.0564	0.1067	0.1090
		8	0.0117	0.0127	0.0550	0.0585	0.1072	0.1128
	1000	1	0.0080	0.0059	0.0264	0.0220	0.0471	0.0413
		2	0.0102	0.0096	0.0503	0.0497	0.1003	0.0999
		4	0.0101	0.0096	0.0503	0.0498	0.1002	0.1003
		8	0.0101	0.0096	0.0502	0.0500	0.1000	0.1007
Case (v)								
	30	1	0.0036	0.0036	0.0171	0.0175	0.0353	0.0364
		2	0.0139	0.0141	0.0632	0.0642	0.1205	0.1222
		4	0.0145	0.0140	0.0648	0.0627	0.1221	0.1181
	80	1	0.0023	0.0025	0.0104	0.0111	0.0215	0.0229
		2	0.0124	0.0125	0.0562	0.0564	0.1087	0.1089
		4	0.0119	0.0124	0.0554	0.0568	0.1077	0.1103
		8	0.0118	0.0127	0.0554	0.0589	0.1083	0.1139
	1000	1	0.0016	0.0018	0.0070	0.0082	0.0148	0.0173
		2	0.0102	0.0097	0.0503	0.0498	0.1004	0.1003
		4	0.0101	0.0097	0.0501	0.0500	0.1001	0.1006
		8	0.0100	0.0097	0.0498	0.0501	0.0999	0.1011

Note: Reported are the p-values obtained from the EDFs for a DGP with AR(1) shock process (B.1) that are associated with the finite-sample CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.4: p-values for asymptotic CVs with AR(1) shocks, t-statistic

	T	q	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	1	0.0270	0.0212	0.0697	0.0575	0.1094	0.0934
		2	0.0182	0.0208	0.0633	0.0688	0.1112	0.1197
		4	0.0206	0.0233	0.0659	0.0703	0.1123	0.1183
	80	1	0.0110	0.0121	0.0388	0.0397	0.0710	0.0704
		2	0.0125	0.0129	0.0546	0.0560	0.1042	0.1068
		4	0.0124	0.0127	0.0540	0.0549	0.1028	0.1046
		8	0.0126	0.0126	0.0532	0.0530	0.1003	0.1006
	1000	1	0.0004	0.0041	0.0048	0.0170	0.0163	0.0346
		2	0.0102	0.0096	0.0506	0.0495	0.1002	0.0998
		4	0.0102	0.0095	0.0503	0.0493	0.0998	0.0996
		8	0.0100	0.0094	0.0498	0.0488	0.0993	0.0987
Case (iii)								
	30	1	0.0158	0.0131	0.0429	0.0376	0.0701	0.0634
		2	0.0236	0.0259	0.0711	0.0767	0.1192	0.1270
		4	0.0260	0.0289	0.0705	0.0762	0.1135	0.1208
	80	1	0.0103	0.0080	0.0318	0.0270	0.0552	0.0488
		2	0.0138	0.0141	0.0568	0.0586	0.1063	0.1096
		4	0.0132	0.0136	0.0540	0.0562	0.1011	0.1050
		8	0.0126	0.0133	0.0499	0.0526	0.0928	0.0974
	1000	1	0.0080	0.0060	0.0265	0.0221	0.0471	0.0416
		2	0.0102	0.0097	0.0503	0.0498	0.1001	0.1001
		4	0.0101	0.0096	0.0501	0.0496	0.0997	0.0999
		8	0.0100	0.0094	0.0495	0.0490	0.0987	0.0988
Case (v)								
	30	1	0.0074	0.0078	0.0227	0.0244	0.0398	0.0427
		2	0.0289	0.0317	0.0789	0.0851	0.1267	0.1353
		4	0.0316	0.0346	0.0764	0.0821	0.1169	0.1243
	80	1	0.0029	0.0032	0.0113	0.0125	0.0223	0.0249
		2	0.0151	0.0156	0.0591	0.0614	0.1085	0.1127
		4	0.0141	0.0148	0.0547	0.0577	0.1008	0.1060
		8	0.0129	0.0138	0.0485	0.0521	0.0887	0.0947
	1000	1	0.0016	0.0018	0.0071	0.0082	0.0148	0.0174
		2	0.0103	0.0098	0.0504	0.0500	0.1002	0.1005
		4	0.0101	0.0097	0.0500	0.0498	0.0994	0.0999
		8	0.0099	0.0095	0.0491	0.0489	0.0979	0.0985

Note: Reported are the p-values obtained from the EDFs for a DGP with AR(1) shock process (B.1) that are associated with the asymptotic CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.5: p-values for finite-sample CVs with MA(1) shocks, F-statistic

	T	q	1%		5%		10%	
			$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
Case (i)								
	30	1	0.0422	0.0365	0.1256	0.1066	0.2011	0.1712
		2	0.0105	0.0139	0.0511	0.0619	0.1015	0.1180
		4	0.0116	0.0122	0.0561	0.0588	0.1100	0.1147
	80	1	0.0386	0.0350	0.1138	0.0990	0.1834	0.1589
		2	0.0119	0.0150	0.0544	0.0632	0.1055	0.1184
		4	0.0109	0.0116	0.0530	0.0548	0.1044	0.1073
		8	0.0112	0.0113	0.0541	0.0545	0.1065	0.1069
	1000	1	0.0319	0.0273	0.0964	0.0811	0.1583	0.1335
		2	0.0144	0.0161	0.0616	0.0675	0.1160	0.1257
		4	0.0102	0.0100	0.0510	0.0511	0.1017	0.1025
		8	0.0096	0.0093	0.0492	0.0485	0.0991	0.0985
Case (ii)								
	30	1	0.0366	0.0346	0.1061	0.1008	0.1690	0.1613
		2	0.0157	0.0185	0.0689	0.0775	0.1299	0.1429
		4	0.0131	0.0137	0.0616	0.0640	0.1189	0.1234
	80	1	0.0363	0.0357	0.1014	0.0978	0.1605	0.1546
		2	0.0167	0.0200	0.0695	0.0777	0.1294	0.1404
		4	0.0116	0.0125	0.0554	0.0581	0.1087	0.1124
		8	0.0113	0.0115	0.0545	0.0555	0.1072	0.1088
	1000	1	0.0325	0.0303	0.0940	0.0889	0.1511	0.1435
		2	0.0154	0.0167	0.0667	0.0704	0.1255	0.1310
		4	0.0101	0.0098	0.0512	0.0508	0.1028	0.1024
		8	0.0094	0.0090	0.0490	0.0482	0.0989	0.0980
Case (iii)								
	30	1	0.0165	0.0184	0.0586	0.0614	0.1039	0.1060
		2	0.0196	0.0217	0.0807	0.0868	0.1477	0.1563
		4	0.0141	0.0144	0.0641	0.0654	0.1219	0.1243
	80	1	0.0147	0.0176	0.0529	0.0570	0.0947	0.0981
		2	0.0206	0.0230	0.0818	0.0872	0.1481	0.1548
		4	0.0123	0.0129	0.0578	0.0595	0.1123	0.1149
		8	0.0111	0.0114	0.0538	0.0549	0.1058	0.1077
	1000	1	0.0127	0.0151	0.0479	0.0514	0.0877	0.0904
		2	0.0200	0.0206	0.0802	0.0819	0.1457	0.1480
		4	0.0113	0.0109	0.0552	0.0542	0.1086	0.1075
		8	0.0097	0.0094	0.0496	0.0489	0.0998	0.0989
Case (iv)								
	30	1	0.0198	0.0202	0.0649	0.0659	0.1103	0.1115
		2	0.0232	0.0252	0.0933	0.0990	0.1679	0.1760
		4	0.0152	0.0156	0.0688	0.0701	0.1304	0.1328
	80	1	0.0183	0.0198	0.0580	0.0605	0.0983	0.1012
		2	0.0265	0.0290	0.0983	0.1032	0.1724	0.1780
		4	0.0130	0.0139	0.0604	0.0628	0.1170	0.1203
		8	0.0111	0.0114	0.0540	0.0555	0.1068	0.1092
	1000	1	0.0154	0.0161	0.0511	0.0529	0.0888	0.0909
		2	0.0258	0.0256	0.0971	0.0967	0.1706	0.1701
		4	0.0119	0.0114	0.0575	0.0562	0.1125	0.1110
		8	0.0097	0.0093	0.0495	0.0488	0.0998	0.0988
Case (v)								
	30	1	0.0082	0.0102	0.0334	0.0383	0.0634	0.0704
		2	0.0267	0.0282	0.1027	0.1062	0.1808	0.1855
		4	0.0156	0.0158	0.0693	0.0697	0.1304	0.1310
	80	1	0.0063	0.0090	0.0268	0.0327	0.0523	0.0604
		2	0.0300	0.0317	0.1085	0.1111	0.1867	0.1893
		4	0.0135	0.0141	0.0622	0.0639	0.1197	0.1219
		8	0.0111	0.0114	0.0536	0.0550	0.1057	0.1082
	1000	1	0.0048	0.0073	0.0223	0.0280	0.0453	0.0530
		2	0.0304	0.0298	0.1087	0.1072	0.1869	0.1848
		4	0.0129	0.0124	0.0604	0.0590	0.1170	0.1150
		8	0.0099	0.0096	0.0500	0.0494	0.1005	0.0996

Note: Reported are the p-values obtained from the EDFs for a DGP with MA(1) shock process (B.2) that are associated with the finite-sample CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.6: p-values for asymptotic CVs with MA(1) shocks, F-statistic

	T	q	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	1	0.0621	0.0542	0.1483	0.1263	0.2213	0.1883
		2	0.0194	0.0264	0.0667	0.0812	0.1181	0.1373
		4	0.0245	0.0292	0.0770	0.0851	0.1315	0.1417
	80	1	0.0427	0.0376	0.1186	0.1018	0.1877	0.1610
		2	0.0137	0.0168	0.0575	0.0658	0.1086	0.1207
		4	0.0127	0.0135	0.0556	0.0577	0.1066	0.1099
		8	0.0130	0.0140	0.0560	0.0586	0.1070	0.1107
	1000	1	0.0320	0.0273	0.0966	0.0811	0.1584	0.1335
		2	0.0145	0.0161	0.0617	0.0675	0.1160	0.1256
		4	0.0102	0.0100	0.0510	0.0510	0.1016	0.1024
		8	0.0096	0.0092	0.0490	0.0484	0.0986	0.0982
Case (ii)								
	30	1	0.0636	0.0631	0.1368	0.1350	0.1967	0.1934
		2	0.0352	0.0459	0.0973	0.1187	0.1570	0.1846
		4	0.0337	0.0450	0.0890	0.1118	0.1415	0.1721
	80	1	0.0422	0.0404	0.1083	0.1041	0.1666	0.1606
		2	0.0203	0.0241	0.0749	0.0845	0.1339	0.1474
		4	0.0140	0.0160	0.0578	0.0642	0.1086	0.1188
		8	0.0129	0.0160	0.0526	0.0628	0.0990	0.1153
	1000	1	0.0327	0.0304	0.0943	0.0890	0.1513	0.1437
		2	0.0156	0.0167	0.0668	0.0705	0.1256	0.1311
		4	0.0101	0.0098	0.0511	0.0508	0.1025	0.1024
		8	0.0094	0.0090	0.0485	0.0480	0.0978	0.0977
Case (iii)								
	30	1	0.0286	0.0331	0.0739	0.0800	0.1172	0.1231
		2	0.0378	0.0466	0.1028	0.1192	0.1647	0.1845
		4	0.0309	0.0395	0.0827	0.0992	0.1330	0.1541
	80	1	0.0175	0.0205	0.0563	0.0607	0.0974	0.1012
		2	0.0246	0.0277	0.0859	0.0931	0.1499	0.1593
		4	0.0145	0.0162	0.0588	0.0639	0.1100	0.1176
		8	0.0124	0.0150	0.0506	0.0588	0.0959	0.1083
	1000	1	0.0128	0.0152	0.0480	0.0515	0.0878	0.0905
		2	0.0202	0.0207	0.0803	0.0820	0.1456	0.1480
		4	0.0114	0.0110	0.0551	0.0542	0.1082	0.1073
		8	0.0097	0.0094	0.0491	0.0487	0.0986	0.0984
Case (iv)								
	30	1	0.0428	0.0463	0.0949	0.1005	0.1395	0.1467
		2	0.0608	0.0735	0.1436	0.1655	0.2144	0.2410
		4	0.0492	0.0634	0.1133	0.1392	0.1694	0.2025
	80	1	0.0233	0.0248	0.0650	0.0679	0.1051	0.1090
		2	0.0347	0.0383	0.1096	0.1174	0.1821	0.1921
		4	0.0176	0.0202	0.0666	0.0742	0.1207	0.1322
		8	0.0147	0.0187	0.0559	0.0681	0.1026	0.1217
	1000	1	0.0156	0.0163	0.0515	0.0531	0.0891	0.0912
		2	0.0263	0.0259	0.0976	0.0972	0.1710	0.1707
		4	0.0121	0.0115	0.0576	0.0564	0.1124	0.1112
		8	0.0097	0.0094	0.0492	0.0489	0.0989	0.0988
Case (v)								
	30	1	0.0179	0.0231	0.0477	0.0569	0.0776	0.0892
		2	0.0593	0.0700	0.1400	0.1572	0.2094	0.2293
		4	0.0414	0.0521	0.0972	0.1161	0.1474	0.1709
	80	1	0.0083	0.0116	0.0300	0.0368	0.0554	0.0645
		2	0.0381	0.0412	0.1168	0.1228	0.1916	0.1988
		4	0.0172	0.0196	0.0649	0.0715	0.1179	0.1272
		8	0.0131	0.0166	0.0506	0.0607	0.0940	0.1093
	1000	1	0.0050	0.0074	0.0225	0.0282	0.0454	0.0532
		2	0.0309	0.0303	0.1091	0.1078	0.1870	0.1851
		4	0.0131	0.0126	0.0604	0.0592	0.1165	0.1150
		8	0.0099	0.0097	0.0495	0.0494	0.0992	0.0991

Note: Reported are the p-values obtained from the EDFs for a DGP with MA(1) shock process (B.2) that are associated with the asymptotic CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.7: p-values for finite-sample CVs with MA(1) shocks, t-statistic

	T	q	1%		5%		10%	
			$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
Case (i)								
	30	1	0.0162	0.0122	0.0569	0.0458	0.1009	0.0843
		2	0.0142	0.0186	0.0627	0.0758	0.1192	0.1385
		4	0.0123	0.0129	0.0575	0.0596	0.1108	0.1143
	80	1	0.0082	0.0086	0.0360	0.0348	0.0718	0.0673
		2	0.0176	0.0201	0.0704	0.0777	0.1294	0.1401
		4	0.0119	0.0128	0.0555	0.0580	0.1079	0.1118
		8	0.0108	0.0118	0.0521	0.0553	0.1027	0.1080
	1000	1	0.0009	0.0034	0.0104	0.0184	0.0302	0.0409
		2	0.0237	0.0224	0.0862	0.0867	0.1513	0.1543
		4	0.0126	0.0117	0.0576	0.0568	0.1109	0.1111
		8	0.0102	0.0097	0.0502	0.0499	0.1002	0.1006
Case (i)								
	30	1	0.0078	0.0063	0.0319	0.0275	0.0614	0.0547
		2	0.0225	0.0252	0.0881	0.0957	0.1574	0.1679
		4	0.0142	0.0143	0.0638	0.0639	0.1207	0.1202
	80	1	0.0066	0.0052	0.0270	0.0228	0.0528	0.0461
		2	0.0244	0.0268	0.0903	0.0964	0.1592	0.1669
		4	0.0130	0.0138	0.0590	0.0615	0.1139	0.1173
		8	0.0110	0.0119	0.0529	0.0561	0.1042	0.1094
	1000	1	0.0056	0.0043	0.0238	0.0205	0.0475	0.0427
		2	0.0242	0.0249	0.0904	0.0944	0.1597	0.1662
		4	0.0123	0.0119	0.0577	0.0579	0.1119	0.1132
		8	0.0101	0.0097	0.0504	0.0502	0.1005	0.1012
Case (i)								
	30	1	0.0029	0.0029	0.0153	0.0153	0.0333	0.0335
		2	0.0295	0.0311	0.1091	0.1128	0.1885	0.1929
		4	0.0156	0.0154	0.0681	0.0666	0.1272	0.1241
	80	1	0.0020	0.0021	0.0106	0.0110	0.0240	0.0247
		2	0.0345	0.0353	0.1167	0.1180	0.1967	0.1978
		4	0.0144	0.0149	0.0637	0.0652	0.1209	0.1236
		8	0.0111	0.0119	0.0533	0.0565	0.1051	0.1104
	1000	1	0.0014	0.0015	0.0080	0.0090	0.0192	0.0214
		2	0.0350	0.0336	0.1190	0.1181	0.2003	0.2003
		4	0.0137	0.0131	0.0624	0.0621	0.1195	0.1198
		8	0.0101	0.0098	0.0504	0.0507	0.1008	0.1019

Note: Reported are the p-values obtained from the EDFs for a DGP with MA(1) shock process (B.2) that are associated with the finite-sample CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table B.8: p-values for asymptotic CVs with MA(1) shocks, t-statistic

	T	q	1%		5%		10%	
			$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
Case (i)								
	30	1	0.0206	0.0169	0.0606	0.0509	0.1009	0.0873
		2	0.0198	0.0278	0.0675	0.0848	0.1182	0.1422
		4	0.0192	0.0226	0.0627	0.0686	0.1084	0.1164
	80	1	0.0088	0.0092	0.0367	0.0360	0.0716	0.0688
		2	0.0188	0.0214	0.0713	0.0792	0.1285	0.1408
		4	0.0129	0.0134	0.0557	0.0573	0.1057	0.1087
		8	0.0119	0.0119	0.0515	0.0510	0.0981	0.0977
	1000	1	0.0009	0.0034	0.0104	0.0184	0.0302	0.0411
		2	0.0238	0.0224	0.0864	0.0867	0.1510	0.1543
		4	0.0126	0.0116	0.0576	0.0564	0.1107	0.1107
		8	0.0101	0.0095	0.0501	0.0491	0.0998	0.0993
Case (iii)								
	30	1	0.0126	0.0108	0.0378	0.0339	0.0653	0.0597
		2	0.0372	0.0439	0.1004	0.1137	0.1598	0.1765
		4	0.0262	0.0297	0.0707	0.0777	0.1140	0.1230
	80	1	0.0076	0.0061	0.0283	0.0247	0.0535	0.0484
		2	0.0276	0.0303	0.0924	0.1004	0.1578	0.1693
		4	0.0146	0.0153	0.0583	0.0614	0.1080	0.1131
		8	0.0119	0.0124	0.0479	0.0503	0.0900	0.0942
	1000	1	0.0057	0.0043	0.0239	0.0206	0.0475	0.0430
		2	0.0244	0.0250	0.0904	0.0945	0.1595	0.1665
		4	0.0123	0.0119	0.0575	0.0576	0.1114	0.1127
		8	0.0101	0.0095	0.0498	0.0493	0.0992	0.0993
Case (v)								
	30	1	0.0062	0.0065	0.0207	0.0217	0.0379	0.0397
		2	0.0559	0.0622	0.1319	0.1428	0.1966	0.2100
		4	0.0335	0.0372	0.0801	0.0868	0.1219	0.1305
	80	1	0.0025	0.0027	0.0116	0.0127	0.0249	0.0270
		2	0.0406	0.0423	0.1215	0.1262	0.1963	0.2032
		4	0.0169	0.0177	0.0630	0.0662	0.1134	0.1189
		8	0.0121	0.0130	0.0466	0.0498	0.0858	0.0915
	1000	1	0.0014	0.0015	0.0081	0.0091	0.0192	0.0216
		2	0.0353	0.0340	0.1192	0.1186	0.2000	0.2006
		4	0.0138	0.0131	0.0623	0.0618	0.1188	0.1191
		8	0.0100	0.0096	0.0496	0.0494	0.0988	0.0993

Note: Reported are the p-values obtained from the EDFs for a DGP with MA(1) shock process (B.2) that are associated with the asymptotic CVs from Tables 2 to 5 for a given significance level. Only designs with lag order $k = 1$ are considered.

Table C.1: Response surface estimates, F-statistic, case (i)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	6.8861	29.007	-33.17	472.5	-0.690	-4.29	866.1	0.0017	0.987	0.091
		5%	4.1048	12.403	-93.93	902.0	-0.622	21.89	-9.0	0.0006	0.984	0.033
		10%	2.9626	7.552	-91.25	831.4	-0.441	20.63	-103.2	0.0004	0.978	0.020
	1	1%	4.7128	23.128	-2.71	1467.5	-0.377	-4.08	1005.9	0.0011	0.990	0.063
		5%	3.1044	9.779	-13.74	546.2	-0.315	3.96	262.9	0.0004	0.988	0.025
		10%	2.4077	5.906	-20.61	398.1	-0.256	4.33	112.0	0.0003	0.983	0.016
	2	1%	3.8484	21.832	-41.47	3249.5	-0.597	11.38	824.3	0.0009	0.994	0.048
		5%	2.6736	9.248	5.49	915.4	-0.459	10.87	163.3	0.0004	0.992	0.021
		10%	2.1501	5.639	2.90	494.5	-0.375	8.17	50.4	0.0002	0.989	0.014
	3	1%	3.3558	23.435	-102.79	4559.7	-0.448	-15.20	1507.4	0.0008	0.995	0.036
		5%	2.4139	11.215	-48.18	1678.5	-0.381	-6.99	632.3	0.0004	0.994	0.018
		10%	1.9872	7.232	-35.18	985.3	-0.328	-5.37	403.5	0.0002	0.991	0.014
	4	1%	3.0384	24.454	-140.32	5596.8	-0.391	-34.87	2320.0	0.0007	0.997	0.030
		5%	2.2441	11.880	-53.34	1921.3	-0.373	-16.05	1034.6	0.0004	0.995	0.016
		10%	1.8784	7.823	-36.76	1069.1	-0.335	-11.35	681.2	0.0003	0.993	0.013
	5	1%	2.8240	23.322	-119.17	6517.1	-0.527	-23.22	2459.0	0.0006	0.997	0.025
		5%	2.1237	12.209	-71.80	2620.3	-0.429	-14.38	1268.7	0.0003	0.996	0.015
		10%	1.7996	8.347	-59.56	1632.6	-0.376	-11.42	895.5	0.0003	0.994	0.012
	6	1%	2.6573	23.987	-205.38	9195.4	-0.563	-20.24	2859.6	0.0006	0.998	0.022
		5%	2.0319	12.416	-97.40	3621.8	-0.473	-9.72	1450.3	0.0003	0.998	0.012
		10%	1.7396	8.456	-72.70	2224.9	-0.418	-7.15	1020.6	0.0002	0.996	0.010
	7	1%	2.5193	27.096	-416.09	13827.1	-0.536	-29.94	3545.6	0.0007	0.998	0.023
		5%	1.9552	13.704	-168.11	5267.7	-0.460	-14.99	1837.8	0.0004	0.998	0.013
		10%	1.6884	9.411	-120.04	3268.2	-0.411	-11.08	1315.5	0.0003	0.996	0.010
	8	1%	2.4169	26.332	-412.30	15766.4	-0.577	-22.42	3772.8	0.0006	0.998	0.020
		5%	1.8957	13.802	-184.90	6387.4	-0.481	-12.28	2064.3	0.0003	0.998	0.012
		10%	1.6482	9.614	-136.19	4047.7	-0.428	-9.47	1512.9	0.0003	0.996	0.010
	9	1%	2.3267	27.268	-493.22	19028.9	-0.554	-27.32	4307.3	0.0007	0.998	0.019
		5%	1.8437	14.503	-230.12	7981.2	-0.473	-14.83	2386.5	0.0004	0.997	0.012
		10%	1.6128	10.302	-176.69	5233.7	-0.424	-11.76	1783.5	0.0003	0.995	0.010
	10	1%	2.2555	26.295	-464.72	20790.9	-0.561	-28.30	5151.7	0.0006	0.998	0.017
		5%	1.8016	14.338	-240.50	9318.4	-0.472	-18.45	3197.5	0.0004	0.997	0.011
		10%	1.5843	10.190	-188.28	6257.3	-0.426	-14.82	2479.6	0.0003	0.995	0.009
I(1)												
	0	1%	6.8861	29.007	-33.17	472.5	-0.690	-4.29	866.1	0.0017	0.987	0.091
		5%	4.1048	12.403	-93.93	902.0	-0.622	21.89	-9.0	0.0006	0.984	0.033
		10%	2.9626	7.552	-91.25	831.4	-0.441	20.63	-103.2	0.0004	0.978	0.020
	1	1%	5.8439	28.986	-38.14	2145.1	-0.189	5.78	1314.9	0.0013	0.993	0.070
		5%	4.0497	11.551	-9.73	592.1	-0.183	9.45	347.6	0.0005	0.993	0.026
		10%	3.2459	6.508	-12.25	369.5	-0.135	7.36	152.6	0.0003	0.991	0.016
	2	1%	5.1356	32.331	-183.80	5501.7	-0.045	17.60	1534.4	0.0012	0.995	0.062
		5%	3.7851	13.394	-37.22	1588.2	-0.101	16.33	393.6	0.0004	0.996	0.023
		10%	3.1601	7.773	-18.64	835.8	-0.086	11.70	174.2	0.0003	0.995	0.014
	3	1%	4.7056	29.271	8.14	5067.7	-0.058	36.46	1222.8	0.0008	0.997	0.042
		5%	3.5892	13.359	27.95	1508.0	-0.065	21.58	344.9	0.0003	0.998	0.017
		10%	3.0654	8.172	16.22	817.5	-0.051	14.11	165.8	0.0002	0.997	0.011
	4	1%	4.3923	31.927	-65.38	7546.4	0.099	16.30	2034.4	0.0009	0.998	0.039
		5%	3.4371	14.892	10.88	2352.0	0.013	13.98	675.7	0.0004	0.998	0.016
		10%	2.9831	9.177	13.79	1231.7	-0.003	10.32	351.3	0.0002	0.998	0.010
	5	1%	4.1791	29.608	86.70	7715.6	-0.063	43.88	1545.7	0.0008	0.998	0.033
		5%	3.3263	14.532	72.04	2453.2	-0.039	24.21	541.5	0.0003	0.999	0.014
		10%	2.9190	9.179	51.38	1273.6	-0.031	16.28	285.8	0.0002	0.998	0.009
	6	1%	3.9929	33.753	-93.76	12482.3	0.051	25.97	2236.4	0.0008	0.999	0.029
		5%	3.2301	16.312	26.22	4001.7	0.012	17.49	829.1	0.0003	0.999	0.012
		10%	2.8612	10.370	29.43	2128.4	0.005	12.11	469.1	0.0002	0.999	0.008
	7	1%	3.8439	38.721	-379.06	19522.0	0.062	18.30	2855.3	0.0009	0.999	0.030
		5%	3.1514	18.396	-63.46	6524.2	0.017	15.42	1063.6	0.0003	0.999	0.012
		10%	2.8132	11.588	-11.31	3451.1	0.005	11.79	591.4	0.0002	0.999	0.008
	8	1%	3.7320	38.296	-346.07	22386.6	0.041	24.54	2951.2	0.0008	0.999	0.025
		5%	3.0890	18.650	-48.52	7723.0	0.007	18.98	1100.8	0.0003	0.999	0.010
		10%	2.7738	11.973	-4.65	4203.8	0.000	13.89	618.2	0.0002	0.999	0.007
	9	1%	3.6359	38.180	-333.70	25833.4	0.049	26.28	3230.9	0.0008	0.999	0.024
		5%	3.0350	18.966	-39.56	9157.0	0.012	20.00	1242.4	0.0003	0.999	0.010
		10%	2.7392	12.317	1.47	5079.9	0.006	14.19	729.6	0.0002	0.999	0.007
	10	1%	3.5555	37.801	-231.51	27073.2	0.036	31.86	2778.7	0.0008	0.999	0.019
		5%	2.9885	19.275	-3.27	9917.0	0.008	22.29	1057.8	0.0003	0.999	0.008
		10%	2.7090	12.693	17.35	5697.5	0.002	16.05	604.3	0.0002	0.999	0.006

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.2: Response surface estimates, F-statistic, case (ii)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	6.3773	28.563	250.91	-1890.1	-0.808	-66.36	2110.5	0.0012	0.993	0.077
		5%	4.5826	12.527	85.99	-760.6	-1.074	-11.53	599.7	0.0005	0.990	0.032
		10%	3.7786	7.564	38.88	-384.6	-0.986	-2.38	287.7	0.0003	0.985	0.021
	1	1%	4.8775	26.452	60.73	2453.0	-1.157	8.46	1093.1	0.0009	0.995	0.050
		5%	3.5973	11.843	32.61	741.3	-1.002	12.08	263.9	0.0004	0.995	0.020
		10%	3.0151	7.136	18.34	421.7	-0.877	10.06	95.6	0.0002	0.994	0.013
	2	1%	4.0934	26.510	-21.63	4499.9	-0.953	-4.28	1471.9	0.0008	0.997	0.040
		5%	3.0838	11.926	20.57	1360.8	-0.854	5.28	432.7	0.0003	0.997	0.016
		10%	2.6176	7.363	17.73	694.1	-0.765	4.71	217.6	0.0002	0.996	0.010
	3	1%	3.6036	28.461	-157.68	7217.6	-0.787	-23.82	2109.3	0.0008	0.998	0.033
		5%	2.7619	13.183	-26.67	2264.0	-0.733	-7.40	819.8	0.0003	0.998	0.014
		10%	2.3689	8.293	-5.98	1142.3	-0.670	-4.72	500.7	0.0002	0.997	0.010
	4	1%	3.2776	26.585	-92.51	7569.3	-0.743	-24.93	2413.0	0.0007	0.998	0.027
		5%	2.5442	13.029	-11.61	2511.9	-0.685	-10.53	1059.9	0.0003	0.998	0.013
		10%	2.2001	8.465	-1.95	1338.9	-0.634	-7.13	685.3	0.0002	0.997	0.009
	5	1%	3.0368	27.933	-215.44	10713.3	-0.776	-27.90	2940.8	0.0006	0.999	0.023
		5%	2.3850	13.790	-60.51	3761.7	-0.695	-11.49	1352.1	0.0003	0.999	0.011
		10%	2.0765	9.131	-35.78	2130.8	-0.635	-7.85	906.1	0.0002	0.998	0.008
	6	1%	2.8484	29.686	-392.28	15246.8	-0.770	-25.40	3312.0	0.0007	0.999	0.023
		5%	2.2604	14.721	-128.37	5511.1	-0.676	-12.06	1635.4	0.0003	0.999	0.011
		10%	1.9801	9.869	-79.75	3205.6	-0.616	-9.13	1145.7	0.0002	0.998	0.008
	7	1%	2.7028	29.655	-419.40	17526.5	-0.758	-28.54	3743.6	0.0006	0.999	0.020
		5%	2.1622	15.323	-165.55	6843.6	-0.655	-15.96	1988.2	0.0003	0.999	0.011
		10%	1.9033	10.598	-118.18	4233.6	-0.593	-13.10	1459.1	0.0002	0.998	0.009
	8	1%	2.5836	29.210	-442.15	20163.6	-0.749	-23.73	4037.8	0.0006	0.999	0.018
		5%	2.0824	15.465	-192.55	8311.8	-0.643	-14.95	2288.3	0.0003	0.998	0.010
		10%	1.8416	10.746	-136.05	5174.6	-0.585	-12.38	1708.4	0.0002	0.998	0.008
	9	1%	2.4864	27.674	-379.96	21390.8	-0.733	-21.84	4640.2	0.0006	0.999	0.016
		5%	2.0169	14.906	-173.34	9121.3	-0.633	-14.74	2854.4	0.0003	0.998	0.009
		10%	1.7907	10.535	-137.54	5996.6	-0.575	-13.46	2263.0	0.0002	0.998	0.007
	10	1%	2.3959	30.691	-642.29	28741.3	-0.696	-33.44	5522.1	0.0006	0.999	0.017
		5%	1.9576	16.420	-290.09	12373.8	-0.612	-19.81	3281.1	0.0003	0.998	0.010
		10%	1.7455	11.388	-198.97	7811.4	-0.562	-15.61	2500.2	0.0003	0.998	0.008
I(1)												
	0	1%	6.3773	28.563	250.91	-1890.1	-0.808	-66.36	2110.5	0.0012	0.993	0.077
		5%	4.5826	12.527	85.99	-760.6	-1.074	-11.53	599.7	0.0005	0.990	0.032
		10%	3.7786	7.564	38.88	-384.6	-0.986	-2.38	287.7	0.0003	0.985	0.021
	1	1%	5.4619	32.558	21.92	3177.1	-0.367	13.17	1540.1	0.0009	0.997	0.052
		5%	4.1085	15.031	21.05	919.6	-0.364	14.20	447.6	0.0004	0.998	0.020
		10%	3.4854	9.447	5.38	548.7	-0.324	11.04	215.7	0.0002	0.997	0.013
	2	1%	4.9200	35.305	-94.69	6074.6	0.006	3.64	2286.1	0.0011	0.997	0.052
		5%	3.8154	16.615	-4.77	1815.1	-0.108	11.21	744.9	0.0004	0.998	0.020
		10%	3.2973	10.423	5.42	882.5	-0.115	9.00	401.9	0.0003	0.998	0.012
	3	1%	4.5642	36.761	-177.86	9526.1	-0.027	23.25	2112.2	0.0009	0.998	0.042
		5%	3.6171	17.327	-11.98	2894.1	-0.083	20.34	671.2	0.0004	0.999	0.016
		10%	3.1663	11.073	2.72	1507.9	-0.087	15.50	343.6	0.0002	0.999	0.010
	4	1%	4.3126	34.773	-48.37	10144.2	0.045	25.85	2309.5	0.0009	0.998	0.038
		5%	3.4710	17.260	31.55	3284.0	-0.031	21.36	778.6	0.0003	0.999	0.015
		10%	3.0679	11.236	29.99	1738.4	-0.039	15.78	418.9	0.0002	0.999	0.010
	5	1%	4.1110	38.085	-195.10	14609.3	0.080	12.94	2926.2	0.0008	0.999	0.032
		5%	3.3550	18.792	-6.26	4818.3	-0.003	16.01	1049.8	0.0003	0.999	0.013
		10%	2.9890	12.304	11.63	2593.2	-0.015	12.44	593.7	0.0002	0.999	0.008
	6	1%	3.9523	40.587	-375.56	20700.4	0.008	31.74	2700.5	0.0009	0.999	0.032
		5%	3.2624	19.797	-45.90	6816.0	-0.021	23.64	974.8	0.0004	0.999	0.013
		10%	2.9258	12.928	-2.47	3662.4	-0.022	17.29	549.4	0.0002	0.999	0.008
	7	1%	3.8298	40.167	-341.27	23610.3	-0.036	37.13	2802.9	0.0008	0.999	0.027
		5%	3.1882	20.125	-35.52	8121.8	-0.035	25.89	1047.0	0.0003	0.999	0.011
		10%	2.8742	13.345	-0.11	4537.3	-0.031	18.69	606.3	0.0002	0.999	0.007
	8	1%	3.7231	40.312	-346.42	27515.7	-0.026	44.47	2692.0	0.0008	0.999	0.023
		5%	3.1237	20.486	-27.92	9635.4	-0.026	29.30	1005.4	0.0003	0.999	0.010
		10%	2.8292	13.659	10.04	5373.5	-0.022	20.92	583.1	0.0002	0.999	0.007
	9	1%	3.6330	39.631	-221.70	28539.8	0.004	46.82	2234.3	0.0007	0.999	0.019
		5%	3.0686	20.643	19.90	10279.8	-0.010	30.66	781.8	0.0003	0.999	0.008
		10%	2.7903	13.974	32.55	5927.1	-0.013	22.19	423.2	0.0002	0.999	0.006
	10	1%	3.5467	44.623	-626.43	40848.1	0.049	25.99	3839.4	0.0008	0.999	0.021
		5%	3.0177	22.851	-131.15	15177.5	0.009	22.28	1474.9	0.0004	0.999	0.009
		10%	2.7549	15.311	-45.47	8674.7	0.001	17.24	847.7	0.0002	0.999	0.006

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.3: Response surface estimates, F-statistic, case (iii)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	11.7576	43.801	314.53	-3068.7	-4.020	-30.78	2879.2	0.0024	0.981	0.181
		5%	8.1887	16.570	77.53	-1057.4	-3.688	26.91	592.1	0.0011	0.947	0.091
		10%	6.5894	8.561	18.82	-404.0	-3.132	27.21	171.9	0.0008	0.895	0.063
	1	1%	6.8182	33.148	-21.23	3939.2	-2.009	42.06	1016.2	0.0012	0.994	0.071
		5%	4.9053	13.452	-17.49	1481.7	-1.602	31.93	106.7	0.0005	0.990	0.033
		10%	4.0347	7.370	-20.20	945.3	-1.356	23.80	-34.1	0.0004	0.981	0.023
	2	1%	5.1272	29.670	-42.30	4931.0	-1.169	-0.08	1736.3	0.0012	0.995	0.053
		5%	3.7839	12.297	9.78	1474.6	-1.022	9.31	486.4	0.0005	0.995	0.022
		10%	3.1636	6.956	12.51	719.5	-0.891	7.43	238.2	0.0003	0.992	0.015
	3	1%	4.2653	28.927	-124.62	7300.1	-1.007	-2.25	1787.7	0.0009	0.997	0.037
		5%	3.2112	12.253	2.35	2081.9	-0.865	5.67	566.2	0.0003	0.998	0.015
		10%	2.7187	7.246	9.58	1069.9	-0.764	5.16	291.2	0.0002	0.997	0.010
	4	1%	3.7416	26.222	-45.42	7497.9	-0.870	-7.33	2060.8	0.0007	0.998	0.029
		5%	2.8599	11.983	19.81	2308.6	-0.759	0.72	782.9	0.0003	0.998	0.012
		10%	2.4458	7.376	19.49	1194.1	-0.677	1.18	460.8	0.0002	0.998	0.008
	5	1%	3.3816	27.888	-188.17	10780.9	-0.843	-16.20	2621.0	0.0007	0.999	0.024
		5%	2.6201	12.949	-32.97	3547.4	-0.722	-4.22	1102.1	0.0003	0.999	0.010
		10%	2.2599	8.133	-11.02	1907.5	-0.645	-2.04	686.0	0.0002	0.999	0.007
	6	1%	3.1176	29.265	-352.03	15093.6	-0.816	-13.82	2919.3	0.0007	0.999	0.024
		5%	2.4446	13.732	-91.99	5169.4	-0.694	-3.89	1308.8	0.0003	0.999	0.010
		10%	2.1236	8.846	-50.11	2899.6	-0.617	-2.90	873.6	0.0002	0.999	0.007
	7	1%	2.9202	29.169	-386.21	17475.0	-0.796	-17.42	3337.6	0.0006	0.999	0.020
		5%	2.3111	14.292	-125.57	6426.6	-0.666	-7.89	1634.0	0.0003	0.999	0.009
		10%	2.0195	9.490	-81.72	3826.8	-0.591	-6.33	1145.4	0.0002	0.998	0.007
	8	1%	2.7633	28.542	-394.40	19794.3	-0.771	-13.83	3589.4	0.0006	0.999	0.018
		5%	2.2056	14.461	-150.67	7817.0	-0.646	-7.32	1892.8	0.0003	0.999	0.009
		10%	1.9375	9.745	-99.69	4716.6	-0.576	-6.33	1364.8	0.0002	0.998	0.007
	9	1%	2.6376	27.088	-330.82	20854.5	-0.746	-12.42	4042.0	0.0006	0.999	0.016
		5%	2.1204	14.116	-136.93	8609.2	-0.627	-8.60	2399.1	0.0003	0.999	0.008
		10%	1.8714	9.696	-103.66	5488.9	-0.562	-7.80	1826.8	0.0002	0.998	0.006
	10	1%	2.5253	30.117	-598.75	28309.7	-0.701	-25.66	5016.1	0.0006	0.999	0.016
		5%	2.0466	15.588	-252.19	11845.8	-0.603	-13.86	2847.0	0.0003	0.999	0.009
		10%	1.8147	10.637	-171.25	7412.8	-0.546	-10.74	2119.3	0.0002	0.998	0.007
I(1)												
	0	1%	11.7576	43.801	314.53	-3068.7	-4.020	-30.78	2879.2	0.0024	0.981	0.181
		5%	8.1887	16.570	77.53	-1057.4	-3.688	26.91	592.1	0.0011	0.947	0.091
		10%	6.5894	8.561	18.82	-404.0	-3.132	27.21	171.9	0.0008	0.895	0.063
	1	1%	7.7361	42.006	-48.65	4620.5	-0.964	39.39	1631.5	0.0013	0.996	0.074
		5%	5.7040	18.206	-34.80	1686.5	-0.842	29.63	360.6	0.0006	0.994	0.035
		10%	4.7676	10.617	-37.04	1071.6	-0.735	21.03	127.8	0.0004	0.988	0.026
	2	1%	6.2657	41.581	-132.26	6792.2	-0.062	1.81	2758.0	0.0014	0.997	0.066
		5%	4.7893	18.496	-23.88	1965.3	-0.203	9.39	927.7	0.0006	0.997	0.026
		10%	4.0952	11.049	-12.20	965.4	-0.213	6.71	519.3	0.0004	0.996	0.017
	3	1%	5.4933	40.260	-174.02	9965.6	-0.125	33.44	2197.2	0.0011	0.998	0.048
		5%	4.3033	18.064	-7.96	2877.9	-0.169	25.09	664.4	0.0004	0.998	0.019
		10%	3.7362	10.992	2.01	1472.0	-0.164	17.91	335.8	0.0003	0.998	0.012
	4	1%	5.0070	37.097	-36.64	10532.8	-0.020	35.25	2332.0	0.0010	0.998	0.043
		5%	3.9918	17.709	30.83	3365.1	-0.083	25.10	765.3	0.0004	0.998	0.017
		10%	3.5050	11.059	24.31	1799.3	-0.092	18.17	395.5	0.0003	0.998	0.011
	5	1%	4.6568	40.232	-197.90	15100.1	0.048	17.84	2996.9	0.0009	0.999	0.036
		5%	3.7701	19.129	-11.66	4964.0	-0.038	18.82	1029.8	0.0004	0.999	0.014
		10%	3.3406	12.035	5.51	2675.7	-0.050	14.18	565.9	0.0003	0.999	0.009
	6	1%	4.3981	42.316	-383.70	21321.1	-0.017	36.08	2738.4	0.0010	0.999	0.034
		5%	3.6053	20.028	-54.87	7017.9	-0.044	25.21	968.5	0.0004	0.999	0.014
		10%	3.2181	12.609	-8.42	3734.5	-0.043	17.72	539.3	0.0003	0.999	0.009
	7	1%	4.2043	41.493	-347.66	24223.4	-0.055	41.19	2821.9	0.0009	0.999	0.028
		5%	3.4786	20.171	-42.97	8327.8	-0.054	27.52	1032.7	0.0004	0.999	0.012
		10%	3.1236	12.880	-3.07	4586.0	-0.050	19.62	579.8	0.0003	0.999	0.008
	8	1%	4.0442	41.343	-342.95	27903.2	-0.039	47.25	2727.0	0.0008	0.999	0.025
		5%	3.3745	20.538	-39.26	9879.6	-0.038	29.84	1010.7	0.0003	0.999	0.010
		10%	3.0456	13.254	1.37	5497.8	-0.035	20.88	578.7	0.0002	0.999	0.007
	9	1%	3.9130	40.449	-223.32	29055.1	-0.007	49.64	2228.4	0.0008	0.999	0.020
		5%	3.2889	20.520	13.32	10454.1	-0.021	31.48	760.1	0.0003	0.999	0.009
		10%	2.9811	13.529	23.16	6072.7	-0.024	22.08	424.5	0.0002	0.999	0.006
	10	1%	3.7939	45.337	-630.92	41405.6	0.041	27.63	3873.1	0.0009	0.999	0.022
		5%	3.2135	22.649	-136.40	15327.1	0.000	22.97	1452.5	0.0004	0.999	0.009
		10%	2.9250	14.836	-55.06	8819.4	-0.008	17.02	840.8	0.0002	0.999	0.006

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.4: Response surface estimates, F-statistic, case (iv)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	8.2715	45.368	156.95	1104.2	-2.599	1.00	2553.6	0.0017	0.991	0.136
		5%	6.2603	20.927	73.41	-45.5	-2.193	27.75	649.7	0.0008	0.985	0.071
		10%	5.3361	13.037	41.78	-155.0	-1.813	23.77	289.3	0.0006	0.974	0.052
	1	1%	6.0691	40.676	-196.09	8307.9	-1.845	44.28	1472.3	0.0013	0.996	0.070
		5%	4.6672	18.948	-76.61	3112.6	-1.503	34.86	316.0	0.0006	0.994	0.035
		10%	4.0159	11.864	-53.59	1872.6	-1.291	25.68	109.6	0.0004	0.990	0.026
	2	1%	4.9700	32.002	28.82	6892.4	-1.381	24.48	1701.1	0.0011	0.996	0.056
		5%	3.8703	14.626	72.49	1881.4	-1.193	22.29	443.6	0.0005	0.996	0.026
		10%	3.3556	9.005	58.43	876.1	-1.067	17.43	181.2	0.0004	0.994	0.019
	3	1%	4.2899	32.194	-81.48	9793.4	-1.188	2.28	2133.6	0.0008	0.998	0.037
		5%	3.3805	14.888	39.41	2904.0	-1.062	11.07	649.8	0.0003	0.998	0.016
		10%	2.9508	9.239	46.13	1395.8	-0.962	9.76	317.8	0.0002	0.998	0.012
	4	1%	3.8363	29.663	-45.47	11216.2	-1.122	16.04	1703.2	0.0007	0.998	0.029
		5%	3.0504	14.133	59.44	3384.4	-0.969	12.93	574.4	0.0003	0.999	0.013
		10%	2.6775	9.052	54.40	1720.3	-0.879	9.47	310.6	0.0002	0.998	0.009
	5	1%	3.4990	33.519	-349.42	17358.3	-1.046	-5.11	2665.6	0.0008	0.999	0.027
		5%	2.8088	15.998	-61.10	5778.2	-0.905	1.15	1096.1	0.0003	0.999	0.011
		10%	2.4787	10.295	-14.61	3077.4	-0.825	1.43	670.2	0.0002	0.999	0.007
	6	1%	3.2500	32.122	-332.46	19276.0	-0.958	-9.60	3013.4	0.0007	0.999	0.022
		5%	2.6278	15.806	-63.41	6692.8	-0.844	-1.82	1335.5	0.0003	0.999	0.009
		10%	2.3289	10.433	-25.08	3757.1	-0.776	-0.98	868.4	0.0002	0.999	0.006
	7	1%	3.0547	32.338	-411.46	22791.7	-0.947	-12.78	3509.1	0.0006	0.999	0.018
		5%	2.4856	16.304	-110.59	8396.1	-0.822	-4.64	1675.7	0.0003	0.999	0.008
		10%	2.2114	10.942	-61.52	4910.4	-0.753	-3.33	1136.4	0.0002	0.999	0.006
	8	1%	2.8982	30.095	-282.52	22650.0	-0.906	-8.27	3594.0	0.0006	0.999	0.016
		5%	2.3706	16.047	-100.72	9208.5	-0.787	-4.63	1874.2	0.0003	0.999	0.008
		10%	2.1161	11.069	-69.36	5644.2	-0.719	-4.75	1353.0	0.0002	0.999	0.006
	9	1%	2.7620	32.263	-534.64	30388.3	-0.861	-13.29	4243.8	0.0006	0.999	0.017
		5%	2.2738	16.862	-189.42	12180.2	-0.754	-7.87	2369.1	0.0003	0.999	0.008
		10%	2.0368	11.529	-118.72	7409.4	-0.693	-7.05	1773.6	0.0002	0.999	0.006
	10	1%	2.6526	31.441	-483.99	31713.2	-0.825	-20.03	4870.8	0.0006	0.999	0.015
		5%	2.1932	17.167	-210.67	13643.4	-0.725	-12.17	2768.6	0.0003	0.999	0.007
		10%	1.9702	11.956	-145.07	8588.6	-0.669	-10.16	2076.6	0.0002	0.999	0.006
I(1)												
	0	1%	8.2715	45.368	156.95	1104.2	-2.599	1.00	2553.6	0.0017	0.991	0.136
		5%	6.2603	20.927	73.41	-45.5	-2.193	27.75	649.7	0.0008	0.985	0.071
		10%	5.3361	13.037	41.78	-155.0	-1.813	23.77	289.3	0.0006	0.974	0.052
	1	1%	6.6060	48.831	-265.71	9384.2	-0.683	33.25	2344.8	0.0013	0.997	0.071
		5%	5.1422	23.512	-101.97	3358.1	-0.580	27.04	750.2	0.0006	0.996	0.035
		10%	4.4555	15.259	-75.20	2005.9	-0.476	18.08	429.6	0.0004	0.994	0.026
	2	1%	5.7480	41.903	-23.86	8373.8	-0.156	26.33	2861.5	0.0013	0.997	0.066
		5%	4.5612	20.664	32.62	2507.7	-0.214	23.70	974.0	0.0006	0.997	0.028
		10%	3.9995	13.381	26.74	1229.3	-0.199	17.04	552.5	0.0004	0.997	0.019
	3	1%	5.2019	42.216	-110.87	12289.6	-0.149	36.14	2795.5	0.0009	0.998	0.047
		5%	4.1939	20.742	20.02	3901.9	-0.172	30.43	905.9	0.0004	0.999	0.021
		10%	3.7117	13.400	28.66	1992.0	-0.164	24.12	448.3	0.0003	0.998	0.014
	4	1%	4.8244	40.386	-61.19	14811.3	-0.134	63.10	1954.5	0.0009	0.999	0.037
		5%	3.9379	20.356	49.28	4855.9	-0.120	39.41	615.1	0.0004	0.999	0.016
		10%	3.5108	13.364	47.07	2560.4	-0.109	28.44	295.2	0.0003	0.999	0.011
	5	1%	4.5342	45.580	-410.16	23139.3	-0.087	44.95	2858.0	0.0010	0.999	0.037
		5%	3.7453	22.292	-52.28	7688.6	-0.083	31.95	998.2	0.0004	0.999	0.015
		10%	3.3609	14.566	-4.64	4146.5	-0.077	23.96	529.9	0.0003	0.999	0.010
	6	1%	4.3158	45.126	-387.85	26370.4	0.010	37.21	3175.7	0.0009	0.999	0.030
		5%	3.5973	22.479	-39.53	9017.6	-0.037	29.64	1109.3	0.0004	0.999	0.013
		10%	3.2455	14.822	4.73	4955.4	-0.044	22.89	585.1	0.0003	0.999	0.009
	7	1%	4.1432	45.963	-454.86	31239.6	-0.005	32.98	3585.1	0.0008	0.999	0.025
		5%	3.4789	23.439	-76.27	11201.6	-0.026	25.14	1388.9	0.0003	0.999	0.011
		10%	3.1529	15.579	-17.89	6300.8	-0.029	19.08	791.7	0.0002	0.999	0.007
	8	1%	4.0086	41.720	-162.37	30071.9	-0.043	55.35	3040.6	0.0008	0.999	0.023
		5%	3.3853	22.067	35.67	11134.6	-0.042	35.86	1153.1	0.0003	0.999	0.010
		10%	3.0792	14.850	51.52	6278.3	-0.037	26.05	648.6	0.0002	0.999	0.007
	9	1%	3.8775	47.162	-580.08	42431.9	0.015	44.75	3188.1	0.0009	0.999	0.022
		5%	3.2997	24.296	-104.24	15767.2	-0.020	34.03	1031.2	0.0004	0.999	0.010
		10%	3.0128	16.389	-34.07	9126.5	-0.020	24.49	586.8	0.0002	0.999	0.007
	10	1%	3.7806	44.720	-352.68	42306.7	0.022	41.88	3720.0	0.0008	0.999	0.020
		5%	3.2316	23.813	-30.71	16345.4	-0.006	29.92	1467.5	0.0004	0.999	0.009
		10%	2.9596	16.232	7.87	9619.1	-0.012	22.39	853.3	0.0002	0.999	0.006

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.5: Response surface estimates, F-statistic, case (v)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	15.6661	74.326	185.28	1134.7	-8.647	84.05	3250.2	0.0041	0.976	0.326
		5%	11.6363	31.368	45.45	26.0	-6.872	89.91	465.8	0.0020	0.942	0.174
		10%	9.7826	17.984	-1.60	85.5	-5.714	65.18	42.7	0.0015	0.893	0.125
	1	1%	8.6562	53.948	-379.71	11568.8	-3.167	70.23	1735.5	0.0021	0.992	0.114
		5%	6.5523	23.843	-186.95	4642.9	-2.554	49.07	331.5	0.0010	0.985	0.061
		10%	5.5736	14.244	-143.35	2980.7	-2.215	34.89	94.3	0.0007	0.973	0.046
	2	1%	6.3322	35.942	71.06	7016.3	-1.929	38.20	1843.3	0.0015	0.994	0.078
		5%	4.8632	15.100	98.99	1661.6	-1.640	30.74	416.0	0.0007	0.992	0.039
		10%	4.1745	8.570	72.97	692.0	-1.461	23.06	144.4	0.0005	0.987	0.029
	3	1%	5.1473	33.420	-25.66	9923.6	-1.595	26.60	1823.4	0.0010	0.997	0.048
		5%	4.0045	14.362	72.87	2717.5	-1.362	25.16	400.4	0.0005	0.996	0.024
		10%	3.4646	8.259	66.42	1268.2	-1.218	20.49	104.8	0.0003	0.995	0.018
	4	1%	4.4292	30.202	8.61	11241.5	-1.368	35.20	1277.5	0.0009	0.998	0.035
		5%	3.4823	13.470	90.67	3212.2	-1.151	24.76	247.1	0.0004	0.998	0.017
		10%	3.0329	7.991	81.63	1480.6	-1.033	18.72	31.6	0.0003	0.997	0.012
	5	1%	3.9382	33.480	-291.79	17251.8	-1.218	10.65	2245.5	0.0009	0.999	0.031
		5%	3.1283	15.204	-27.72	5545.2	-1.026	10.84	780.9	0.0004	0.999	0.013
		10%	2.7412	9.253	12.14	2832.8	-0.922	8.89	402.4	0.0002	0.999	0.009
	6	1%	3.5894	32.101	-289.38	19268.7	-1.073	2.27	2614.2	0.0007	0.999	0.024
		5%	2.8753	14.944	-25.71	6349.4	-0.926	6.37	997.7	0.0003	0.999	0.010
		10%	2.5320	9.410	4.26	3444.7	-0.841	5.75	571.4	0.0002	0.999	0.007
	7	1%	3.3261	32.476	-387.00	22972.3	-1.024	-4.96	3163.8	0.0007	0.999	0.020
		5%	2.6836	15.580	-81.21	8123.6	-0.874	1.16	1371.1	0.0003	0.999	0.009
		10%	2.3736	10.009	-33.11	4567.6	-0.792	1.50	865.1	0.0002	0.999	0.006
	8	1%	3.1220	29.735	-237.28	22458.5	-0.970	1.06	3175.6	0.0006	0.999	0.017
		5%	2.5338	15.076	-56.82	8673.2	-0.828	2.35	1507.3	0.0003	0.999	0.008
		10%	2.2498	9.984	-29.63	5096.5	-0.750	1.18	1024.2	0.0002	0.999	0.006
	9	1%	2.9487	32.177	-505.26	30302.4	-0.905	-5.67	3733.9	0.0007	0.999	0.018
		5%	2.4102	16.194	-160.17	11804.1	-0.782	-1.76	1923.3	0.0003	0.999	0.008
		10%	2.1485	10.693	-89.06	6959.6	-0.712	-1.96	1376.9	0.0002	0.999	0.005
	10	1%	2.8127	30.927	-428.13	31087.6	-0.860	-12.36	4378.8	0.0006	0.999	0.015
		5%	2.3101	16.252	-162.93	12893.0	-0.747	-6.26	2342.5	0.0003	0.999	0.007
		10%	2.0659	10.979	-104.57	7930.3	-0.683	-5.16	1696.6	0.0002	0.999	0.005
I(1)												
	0	1%	15.6661	74.326	185.28	1134.7	-8.647	84.05	3250.2	0.0041	0.976	0.326
		5%	11.6363	31.368	45.45	26.0	-6.872	89.91	465.8	0.0020	0.942	0.174
		10%	9.7826	17.984	-1.60	85.5	-5.714	65.18	42.7	0.0015	0.893	0.125
	1	1%	9.4750	66.075	-476.52	12984.8	-1.536	44.52	2963.8	0.0021	0.995	0.115
		5%	7.2743	30.434	-219.31	4865.5	-1.326	30.57	957.3	0.0010	0.991	0.062
		10%	6.2407	18.918	-164.74	2978.2	-1.162	16.70	586.3	0.0007	0.982	0.048
	2	1%	7.3803	49.966	-34.95	9113.2	-0.400	25.26	3484.2	0.0016	0.997	0.083
		5%	5.7917	23.622	19.78	2584.7	-0.465	20.03	1252.1	0.0007	0.996	0.037
		10%	5.0387	14.695	9.34	1237.0	-0.449	11.77	762.3	0.0005	0.994	0.026
	3	1%	6.2940	47.011	-107.74	13017.7	-0.341	45.99	3032.6	0.0011	0.998	0.056
		5%	5.0276	22.224	14.72	4027.5	-0.355	34.96	971.7	0.0005	0.998	0.024
		10%	4.4209	13.813	15.90	2078.8	-0.337	25.77	502.5	0.0003	0.998	0.017
	4	1%	5.6219	43.967	-67.37	15641.9	-0.244	70.04	2112.5	0.0010	0.999	0.042
		5%	4.5531	21.531	29.63	5187.2	-0.229	41.53	688.3	0.0004	0.999	0.018
		10%	4.0373	13.738	21.94	2827.2	-0.215	28.43	363.3	0.0003	0.998	0.012
	5	1%	5.1520	48.476	-432.34	24208.2	-0.161	50.04	3014.0	0.0011	0.999	0.040
		5%	4.2263	23.054	-70.55	8031.9	-0.160	34.14	1036.3	0.0004	0.999	0.017
		10%	3.7752	14.550	-21.44	4339.2	-0.153	24.65	562.6	0.0003	0.999	0.011
	6	1%	4.8144	47.416	-412.67	27477.2	-0.050	42.41	3271.5	0.0010	0.999	0.032
		5%	3.9886	22.941	-57.83	9392.1	-0.094	31.57	1137.4	0.0004	0.999	0.014
		10%	3.5841	14.600	-8.73	5126.3	-0.101	23.68	602.5	0.0003	0.999	0.009
	7	1%	4.5571	47.936	-480.20	32263.8	-0.041	34.96	3737.7	0.0009	0.999	0.027
		5%	3.8062	23.746	-94.01	11559.6	-0.065	25.76	1437.3	0.0004	0.999	0.011
		10%	3.4373	15.312	-33.66	6506.2	-0.071	19.52	805.3	0.0002	0.999	0.008
	8	1%	4.3606	43.406	-195.70	31296.4	-0.069	56.32	3201.0	0.0008	0.999	0.024
		5%	3.6654	22.182	21.09	11441.9	-0.073	36.07	1202.7	0.0004	0.999	0.011
		10%	3.3232	14.571	32.56	6541.5	-0.067	25.12	701.2	0.0002	0.999	0.007
	9	1%	4.1825	48.359	-600.56	43489.0	-0.012	47.45	3237.3	0.0009	0.999	0.023
		5%	3.5433	24.402	-124.68	16165.6	-0.045	33.89	1104.6	0.0004	0.999	0.010
		10%	3.2261	16.025	-51.12	9362.4	-0.047	23.90	633.9	0.0003	0.999	0.007
	10	1%	4.0482	45.769	-376.57	43345.4	0.004	43.04	3829.1	0.0009	0.999	0.021
		5%	3.4468	23.757	-48.23	16730.4	-0.027	29.87	1518.3	0.0004	0.999	0.009
		10%	3.1482	15.832	-10.54	9884.0	-0.033	21.62	899.3	0.0003	0.999	0.006

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.6: Response surface estimates, t-statistic, case (i)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	-2.5569	-4.208	15.88	-143.0	0.525	-11.75	-9.9	0.0003	0.977	0.015
		5%	-1.9354	-1.831	27.31	-240.7	0.478	-11.44	57.9	0.0002	0.920	0.008
		10%	-1.6131	-0.947	30.34	-272.0	0.435	-10.35	64.4	0.0001	0.816	0.006
	1	1%	-2.5598	-3.972	16.13	-395.3	0.265	-14.18	19.1	0.0003	0.983	0.014
		5%	-1.9371	-1.668	27.05	-347.4	0.245	-9.22	53.6	0.0001	0.947	0.007
		10%	-1.6144	-0.768	29.75	-332.7	0.239	-6.85	49.1	0.0001	0.756	0.006
	2	1%	-2.5597	-4.117	27.69	-722.2	0.170	-13.64	1.2	0.0003	0.984	0.014
		5%	-1.9371	-1.717	32.11	-465.2	0.163	-6.99	26.8	0.0002	0.948	0.007
		10%	-1.6145	-0.798	35.26	-418.4	0.173	-4.21	17.4	0.0001	0.772	0.006
	3	1%	-2.5620	-3.446	-6.04	-507.3	0.133	-14.35	28.4	0.0003	0.982	0.013
		5%	-1.9386	-1.364	17.47	-352.4	0.136	-6.90	36.3	0.0002	0.940	0.007
		10%	-1.6157	-0.522	27.02	-351.9	0.151	-3.68	19.0	0.0001	0.779	0.005
	4	1%	-2.5617	-3.483	-7.05	-663.9	0.095	-11.81	-41.3	0.0003	0.982	0.013
		5%	-1.9388	-1.360	19.04	-432.2	0.114	-5.57	11.3	0.0002	0.941	0.007
		10%	-1.6161	-0.503	31.85	-446.0	0.141	-3.08	10.4	0.0001	0.805	0.005
	5	1%	-2.5633	-3.205	-24.37	-638.0	0.095	-13.27	-4.7	0.0004	0.980	0.013
		5%	-1.9394	-1.248	13.74	-422.8	0.106	-5.26	17.6	0.0002	0.933	0.007
		10%	-1.6163	-0.439	31.86	-466.2	0.129	-2.03	-0.1	0.0002	0.797	0.005
	6	1%	-2.5628	-3.330	-20.81	-907.3	0.075	-11.81	-43.8	0.0004	0.982	0.013
		5%	-1.9395	-1.258	15.82	-516.7	0.096	-4.42	3.3	0.0002	0.939	0.007
		10%	-1.6166	-0.415	35.82	-550.2	0.125	-1.46	-5.0	0.0002	0.826	0.005
	7	1%	-2.5627	-3.484	-10.99	-1331.8	0.074	-12.61	-28.3	0.0004	0.984	0.013
		5%	-1.9398	-1.207	17.19	-636.1	0.096	-5.11	28.1	0.0002	0.947	0.007
		10%	-1.6170	-0.317	37.36	-617.2	0.123	-1.54	4.4	0.0002	0.831	0.005
	8	1%	-2.5625	-3.613	-6.22	-1680.2	0.065	-11.44	-71.0	0.0004	0.980	0.013
		5%	-1.9399	-1.236	21.38	-784.2	0.091	-4.53	21.3	0.0002	0.933	0.007
		10%	-1.6170	-0.327	43.94	-750.3	0.117	-0.61	-11.2	0.0002	0.838	0.005
	9	1%	-2.5629	-3.480	-13.49	-1902.7	0.060	-11.61	-74.4	0.0004	0.977	0.012
		5%	-1.9401	-1.224	26.30	-977.3	0.088	-4.23	10.6	0.0002	0.919	0.007
		10%	-1.6174	-0.260	49.68	-904.8	0.118	-0.88	-2.6	0.0002	0.847	0.005
	10	1%	-2.5637	-3.195	-38.63	-1757.7	0.064	-14.02	101.2	0.0005	0.970	0.012
		5%	-1.9405	-1.135	23.59	-1020.9	0.089	-5.15	81.1	0.0003	0.896	0.007
		10%	-1.6176	-0.209	55.22	-1048.9	0.120	-1.58	48.4	0.0002	0.837	0.005
I(1)												
	0	1%	-2.5569	-4.208	15.88	-143.0	0.525	-11.75	-9.9	0.0003	0.977	0.015
		5%	-1.9354	-1.831	27.31	-240.7	0.478	-11.44	57.9	0.0002	0.920	0.008
		10%	-1.6131	-0.947	30.34	-272.0	0.435	-10.35	64.4	0.0001	0.816	0.006
	1	1%	-3.2087	-6.116	16.41	-440.1	0.348	-14.50	-44.5	0.0003	0.989	0.016
		5%	-2.5921	-2.682	18.85	-286.8	0.332	-9.50	36.9	0.0002	0.971	0.009
		10%	-2.2632	-1.507	19.53	-244.9	0.327	-7.13	48.8	0.0001	0.908	0.008
	2	1%	-3.6149	-8.415	63.62	-1148.6	0.263	-6.33	-298.1	0.0003	0.992	0.016
		5%	-3.0021	-3.560	39.33	-515.0	0.314	-2.14	-140.1	0.0002	0.974	0.010
		10%	-2.6726	-1.884	33.91	-350.0	0.348	-0.09	-106.6	0.0002	0.924	0.010
	3	1%	-3.9435	-7.653	-8.82	-554.4	0.369	-12.78	-269.8	0.0003	0.993	0.015
		5%	-3.3267	-2.982	13.70	-230.5	0.422	-3.88	-194.7	0.0002	0.975	0.010
		10%	-2.9950	-1.241	22.98	-170.5	0.468	-0.54	-187.9	0.0002	0.945	0.010
	4	1%	-4.2176	-8.581	21.42	-1273.0	0.458	-14.93	-368.3	0.0004	0.994	0.015
		5%	-3.5999	-3.037	39.77	-670.0	0.551	-7.93	-209.0	0.0002	0.976	0.011
		10%	-3.2669	-0.972	50.91	-563.8	0.617	-5.36	-176.9	0.0002	0.956	0.012
	5	1%	-4.4580	-9.596	60.46	-2109.0	0.505	-10.05	-627.9	0.0004	0.993	0.016
		5%	-3.8365	-3.780	103.62	-1537.3	0.593	-0.20	-516.4	0.0003	0.964	0.013
		10%	-3.5014	-1.643	129.94	-1549.1	0.663	3.30	-508.4	0.0003	0.947	0.014
	6	1%	-4.6765	-10.307	110.40	-3242.2	0.589	-10.37	-825.7	0.0005	0.993	0.016
		5%	-4.0556	-3.335	135.63	-2145.5	0.720	-4.67	-590.2	0.0004	0.966	0.015
		10%	-3.7201	-0.701	154.91	-1980.9	0.806	-2.55	-548.2	0.0004	0.958	0.015
	7	1%	-4.8775	-10.716	164.12	-4608.5	0.673	-12.36	-1025.2	0.0005	0.993	0.017
		5%	-4.2561	-2.647	165.00	-2764.6	0.815	-7.47	-711.1	0.0004	0.964	0.015
		10%	-3.9195	0.307	181.64	-2432.1	0.903	-4.79	-674.9	0.0004	0.962	0.017
	8	1%	-5.0638	-11.260	233.58	-6236.6	0.731	-7.46	-1454.5	0.0006	0.991	0.019
		5%	-4.4404	-2.714	242.71	-4060.7	0.875	-1.18	-1153.7	0.0005	0.959	0.017
		10%	-4.1031	0.547	261.94	-3655.5	0.972	0.66	-1088.7	0.0005	0.965	0.019
	9	1%	-5.2420	-10.902	284.99	-7900.3	0.831	-13.21	-1597.7	0.0007	0.988	0.020
		5%	-4.6167	-2.095	307.66	-5375.1	0.994	-7.72	-1206.8	0.0006	0.960	0.020
		10%	-4.2782	1.286	338.58	-5004.0	1.096	-5.68	-1141.8	0.0007	0.967	0.021
	10	1%	-5.4083	-10.564	353.95	-10059.2	0.889	-8.89	-2472.8	0.0008	0.984	0.020
		5%	-4.7823	-0.988	383.87	-7318.7	1.057	-3.47	-2196.4	0.0008	0.962	0.020
		10%	-4.4437	2.869	410.55	-6827.7	1.169	-2.88	-2139.0	0.0008	0.971	0.021

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.7: Response surface estimates, t-statistic, case (iii)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	-3.4298	-6.407	-33.99	363.4	0.678	-3.29	-279.2	0.0003	0.982	0.024
		5%	-2.8618	-2.921	-10.66	163.6	0.672	-6.08	-78.4	0.0002	0.948	0.015
		10%	-2.5671	-1.687	-3.02	75.6	0.628	-5.27	-29.2	0.0001	0.901	0.012
	1	1%	-3.4289	-6.968	19.26	-744.2	0.529	-15.93	-79.4	0.0003	0.989	0.018
		5%	-2.8606	-3.065	20.83	-446.0	0.530	-10.01	17.6	0.0002	0.965	0.012
		10%	-2.5662	-1.608	20.54	-350.1	0.535	-6.99	29.0	0.0002	0.934	0.010
	2	1%	-3.4264	-6.949	15.21	-761.1	0.363	-4.12	-352.4	0.0004	0.989	0.017
		5%	-2.8592	-2.764	12.08	-294.5	0.421	-0.80	-170.3	0.0002	0.973	0.010
		10%	-2.5651	-1.212	12.48	-175.1	0.459	0.98	-126.1	0.0002	0.960	0.008
	3	1%	-3.4304	-5.873	-12.65	-864.0	0.415	-13.77	-138.2	0.0003	0.991	0.014
		5%	-2.8622	-1.825	-7.42	-242.6	0.464	-6.61	-33.7	0.0002	0.980	0.008
		10%	-2.5678	-0.298	-3.04	-98.8	0.505	-3.79	-12.0	0.0002	0.975	0.007
	4	1%	-3.4311	-5.486	-14.90	-1180.9	0.406	-13.74	-151.2	0.0004	0.991	0.014
		5%	-2.8627	-1.487	-1.27	-461.5	0.471	-6.88	-22.8	0.0002	0.983	0.008
		10%	-2.5685	0.049	7.50	-309.5	0.522	-4.20	3.8	0.0002	0.985	0.006
	5	1%	-3.4303	-5.588	2.26	-1746.4	0.392	-11.21	-203.3	0.0004	0.992	0.013
		5%	-2.8624	-1.214	4.19	-654.4	0.462	-5.54	-27.7	0.0002	0.984	0.007
		10%	-2.5682	0.472	10.16	-401.2	0.513	-2.90	4.9	0.0002	0.986	0.006
	6	1%	-3.4299	-5.664	24.17	-2460.6	0.389	-10.22	-214.6	0.0004	0.993	0.013
		5%	-2.8625	-1.055	16.72	-938.4	0.464	-3.87	-53.5	0.0002	0.987	0.007
		10%	-2.5683	0.704	22.38	-594.6	0.515	-0.61	-35.7	0.0002	0.989	0.006
	7	1%	-3.4309	-4.900	2.40	-2633.6	0.389	-11.30	-187.7	0.0004	0.991	0.012
		5%	-2.8625	-0.519	12.95	-1054.3	0.458	-3.53	-54.7	0.0002	0.984	0.007
		10%	-2.5685	1.393	14.59	-566.8	0.513	-1.07	-5.4	0.0002	0.988	0.006
	8	1%	-3.4302	-4.944	20.60	-3327.2	0.377	-7.37	-315.4	0.0004	0.989	0.012
		5%	-2.8628	-0.272	20.87	-1274.2	0.458	-0.86	-121.3	0.0002	0.985	0.007
		10%	-2.5685	1.578	32.32	-849.5	0.513	2.39	-105.9	0.0002	0.990	0.006
	9	1%	-3.4312	-4.504	11.06	-3603.3	0.383	-7.65	-263.4	0.0005	0.987	0.012
		5%	-2.8634	0.072	32.04	-1636.4	0.464	0.34	-196.8	0.0003	0.985	0.007
		10%	-2.5693	2.001	43.50	-1107.1	0.520	4.00	-215.3	0.0002	0.990	0.006
	10	1%	-3.4311	-4.413	37.43	-4697.5	0.387	-7.87	-270.7	0.0005	0.988	0.012
		5%	-2.8639	0.554	32.44	-1818.3	0.473	-1.61	-73.9	0.0003	0.983	0.007
		10%	-2.5702	2.696	34.78	-1011.3	0.534	0.48	-8.8	0.0002	0.990	0.006
I(1)												
	0	1%	-3.4298	-6.407	-33.99	363.4	0.678	-3.29	-279.2	0.0003	0.982	0.024
		5%	-2.8618	-2.921	-10.66	163.6	0.672	-6.08	-78.4	0.0002	0.948	0.015
		10%	-2.5671	-1.687	-3.02	75.6	0.628	-5.27	-29.2	0.0001	0.901	0.012
	1	1%	-3.7946	-8.801	25.80	-865.6	0.497	-16.36	-123.1	0.0003	0.991	0.020
		5%	-3.2137	-4.210	29.77	-541.7	0.497	-10.06	-3.9	0.0002	0.968	0.014
		10%	-2.9079	-2.444	28.88	-427.2	0.503	-6.86	14.4	0.0002	0.915	0.013
	2	1%	-4.0898	-10.487	36.27	-991.9	0.345	-0.59	-571.5	0.0004	0.993	0.019
		5%	-3.5028	-4.917	34.39	-437.0	0.422	2.97	-330.0	0.0002	0.976	0.014
		10%	-3.1905	-2.826	35.79	-296.2	0.473	4.95	-271.7	0.0002	0.937	0.013
	3	1%	-4.3537	-10.595	20.72	-1212.6	0.476	-10.60	-492.0	0.0004	0.995	0.017
		5%	-3.7597	-4.511	25.89	-398.6	0.552	-2.35	-325.9	0.0003	0.979	0.013
		10%	-3.4420	-2.273	35.81	-254.6	0.609	1.42	-305.0	0.0003	0.949	0.013
	4	1%	-4.5863	-11.376	55.98	-2114.6	0.563	-13.31	-614.7	0.0004	0.995	0.016
		5%	-3.9871	-5.069	88.66	-1322.9	0.672	-4.64	-434.7	0.0003	0.980	0.013
		10%	-3.6659	-2.635	105.95	-1174.8	0.747	-0.98	-408.3	0.0003	0.961	0.014
	5	1%	-4.7978	-12.197	107.85	-3323.7	0.638	-13.88	-787.4	0.0004	0.995	0.016
		5%	-4.1950	-4.819	125.38	-1997.6	0.763	-7.91	-506.8	0.0003	0.976	0.014
		10%	-3.8711	-1.971	141.16	-1737.3	0.850	-5.67	-444.0	0.0004	0.955	0.015
	6	1%	-4.9900	-13.800	211.26	-5264.8	0.677	-4.87	-1274.9	0.0005	0.994	0.018
		5%	-4.3847	-5.602	217.35	-3311.0	0.815	2.65	-1002.5	0.0005	0.971	0.017
		10%	-4.0587	-2.484	235.35	-2944.4	0.909	5.68	-965.7	0.0005	0.960	0.018
	7	1%	-5.1725	-13.776	258.03	-6723.9	0.748	-7.03	-1522.6	0.0005	0.993	0.018
		5%	-4.5634	-5.084	270.09	-4365.0	0.879	2.40	-1271.1	0.0005	0.961	0.017
		10%	-4.2347	-1.768	296.22	-3994.7	0.971	5.76	-1231.3	0.0005	0.958	0.018
	8	1%	-5.3434	-14.576	355.72	-8917.2	0.796	3.55	-2274.5	0.0006	0.989	0.020
		5%	-4.7318	-5.387	379.56	-6257.8	0.945	13.12	-2036.5	0.0006	0.962	0.019
		10%	-4.4018	-1.888	416.08	-5909.8	1.046	16.93	-2031.9	0.0006	0.965	0.021
	9	1%	-5.5096	-13.655	406.04	-11046.5	0.888	3.46	-3243.4	0.0007	0.988	0.020
		5%	-4.8956	-4.225	468.39	-8574.8	1.052	14.41	-3230.7	0.0007	0.969	0.019
		10%	-4.5643	-0.481	515.60	-8317.9	1.161	18.28	-3328.3	0.0008	0.973	0.021
	10	1%	-5.6647	-13.584	494.11	-13541.1	0.974	-4.83	-3052.0	0.0008	0.986	0.022
		5%	-5.0505	-2.647	486.54	-9153.0	1.163	-1.09	-2579.5	0.0008	0.962	0.022
		10%	-4.7186	1.656	515.07	-8392.8	1.282	-0.24	-2500.2	0.0009	0.970	0.023

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table C.8: Response surface estimates, t-statistic, case (v)

	k	α	$\theta_{0,0}$	$\theta_{1,0}$	$\theta_{2,0}$	$\theta_{3,0}$	$\theta_{1,1}$	$\theta_{2,1}$	$\theta_{3,1}$	SE($\theta_{0,0}$)	$\bar{R}^2$	RMSE
I(0)												
	0	1%	-3.9593	-9.247	-16.43	-69.7	1.181	-20.17	-226.2	0.0004	0.978	0.036
		5%	-3.4115	-4.592	-4.00	9.7	1.031	-15.24	-39.1	0.0003	0.945	0.024
		10%	-3.1278	-2.876	0.61	4.2	0.924	-10.76	-6.4	0.0002	0.897	0.019
	1	1%	-3.9526	-10.601	77.73	-1780.1	0.745	-17.81	-237.7	0.0004	0.988	0.025
		5%	-3.4062	-5.283	61.42	-1034.8	0.728	-9.78	-88.3	0.0003	0.965	0.018
		10%	-3.1235	-3.196	52.93	-765.1	0.721	-5.38	-67.2	0.0002	0.936	0.015
	2	1%	-3.9568	-8.357	-21.24	-768.6	0.608	-11.65	-389.9	0.0004	0.990	0.021
		5%	-3.4089	-3.540	-4.49	-237.9	0.648	-4.29	-197.9	0.0003	0.975	0.014
		10%	-3.1257	-1.632	1.62	-88.7	0.679	-0.52	-161.2	0.0002	0.963	0.012
	3	1%	-3.9604	-7.530	-20.43	-1367.8	0.675	-21.84	-174.8	0.0004	0.992	0.017
		5%	-3.4120	-2.576	-7.88	-463.4	0.714	-12.04	-26.4	0.0002	0.982	0.011
		10%	-3.1287	-0.556	-3.24	-204.6	0.749	-7.77	2.4	0.0002	0.978	0.009
	4	1%	-3.9589	-7.418	-3.63	-2064.6	0.641	-20.68	-102.6	0.0004	0.994	0.015
		5%	-3.4108	-2.480	18.02	-959.8	0.700	-8.95	-43.7	0.0002	0.989	0.009
		10%	-3.1277	-0.454	27.32	-659.1	0.747	-4.19	-41.7	0.0002	0.990	0.008
	5	1%	-3.9585	-7.369	26.23	-3002.7	0.635	-18.39	-171.3	0.0004	0.995	0.014
		5%	-3.4114	-1.789	19.44	-1183.5	0.705	-8.95	-18.1	0.0002	0.991	0.008
		10%	-3.1284	0.407	24.52	-727.3	0.754	-4.62	4.9	0.0002	0.991	0.007
	6	1%	-3.9587	-6.850	26.38	-3548.1	0.629	-17.35	-174.5	0.0004	0.994	0.013
		5%	-3.4120	-1.224	25.66	-1450.9	0.712	-8.27	-8.4	0.0002	0.992	0.007
		10%	-3.1292	1.070	29.98	-863.9	0.769	-4.02	10.3	0.0002	0.993	0.006
	7	1%	-3.9578	-6.669	45.24	-4375.5	0.606	-11.63	-319.6	0.0004	0.993	0.012
		5%	-3.4112	-0.741	34.81	-1751.7	0.690	-3.73	-98.4	0.0002	0.990	0.007
		10%	-3.1283	1.688	35.78	-988.0	0.748	-0.11	-50.9	0.0002	0.993	0.006
	8	1%	-3.9585	-5.911	29.48	-4655.2	0.601	-9.42	-411.5	0.0004	0.992	0.012
		5%	-3.4113	-0.384	55.58	-2244.7	0.692	-0.17	-227.4	0.0003	0.991	0.007
		10%	-3.1283	1.991	66.05	-1503.0	0.751	4.10	-198.4	0.0002	0.994	0.006
	9	1%	-3.9587	-5.875	77.52	-6253.6	0.612	-9.56	-376.2	0.0004	0.993	0.012
		5%	-3.4121	0.150	72.51	-2753.1	0.701	1.53	-326.1	0.0003	0.992	0.007
		10%	-3.1296	2.741	75.56	-1744.7	0.766	5.19	-303.4	0.0002	0.994	0.007
	10	1%	-3.9602	-4.842	44.54	-6241.2	0.622	-11.42	-282.2	0.0005	0.991	0.012
		5%	-3.4130	1.036	62.96	-2780.5	0.716	-1.70	-130.6	0.0003	0.991	0.007
		10%	-3.1306	3.660	74.27	-1817.9	0.785	1.27	-75.4	0.0003	0.994	0.007
I(1)												
	0	1%	-3.9593	-9.247	-16.43	-69.7	1.181	-20.17	-226.2	0.0004	0.978	0.036
		5%	-3.4115	-4.592	-4.00	9.7	1.031	-15.24	-39.1	0.0003	0.945	0.024
		10%	-3.1278	-2.876	0.61	4.2	0.924	-10.76	-6.4	0.0002	0.897	0.019
	1	1%	-4.2418	-12.846	95.03	-2002.7	0.638	-14.53	-333.1	0.0004	0.990	0.027
		5%	-3.6829	-6.653	69.33	-1070.6	0.625	-5.71	-177.8	0.0003	0.970	0.019
		10%	-3.3894	-4.298	61.51	-788.1	0.630	-1.23	-153.5	0.0002	0.932	0.017
	2	1%	-4.4948	-12.254	6.09	-1047.7	0.500	-3.70	-699.3	0.0004	0.993	0.023
		5%	-3.9235	-6.365	33.83	-497.5	0.565	4.63	-478.2	0.0003	0.979	0.016
		10%	-3.6221	-3.983	43.76	-357.1	0.615	8.39	-427.7	0.0002	0.951	0.016
	3	1%	-4.7214	-12.908	33.67	-1934.8	0.633	-13.64	-671.9	0.0004	0.996	0.018
		5%	-4.1424	-6.246	59.49	-986.2	0.712	-4.21	-442.7	0.0003	0.984	0.014
		10%	-3.8350	-3.557	71.41	-753.8	0.774	0.15	-401.1	0.0003	0.959	0.014
	4	1%	-4.9231	-14.582	122.27	-3639.3	0.665	-9.36	-948.8	0.0004	0.996	0.017
		5%	-4.3383	-7.415	158.74	-2385.8	0.772	3.17	-825.8	0.0003	0.983	0.015
		10%	-4.0262	-4.714	186.67	-2208.2	0.850	8.98	-845.6	0.0004	0.970	0.015
	5	1%	-5.1121	-15.556	198.13	-5341.8	0.740	-10.10	-1172.3	0.0005	0.996	0.018
		5%	-4.5233	-7.034	197.97	-3145.7	0.861	-0.42	-909.9	0.0004	0.980	0.016
		10%	-4.2080	-3.827	218.10	-2736.1	0.950	3.76	-872.0	0.0004	0.961	0.017
	6	1%	-5.2901	-15.962	263.30	-7069.1	0.819	-10.65	-1482.6	0.0005	0.995	0.018
		5%	-4.6978	-6.851	269.56	-4434.0	0.969	-1.87	-1182.2	0.0005	0.977	0.017
		10%	-4.3795	-3.385	295.63	-3974.6	1.069	2.05	-1148.7	0.0005	0.968	0.018
	7	1%	-5.4566	-16.188	327.41	-8850.8	0.860	-7.10	-1886.9	0.0006	0.993	0.019
		5%	-4.8602	-6.349	334.61	-5764.0	1.020	-0.75	-1483.9	0.0005	0.967	0.018
		10%	-4.5392	-2.567	362.43	-5187.4	1.123	2.10	-1410.4	0.0006	0.962	0.019
	8	1%	-5.6127	-17.739	485.09	-12195.2	0.893	7.82	-2789.5	0.0007	0.989	0.021
		5%	-5.0112	-8.190	549.32	-9415.6	1.048	19.33	-2507.6	0.0007	0.964	0.021
		10%	-4.6876	-4.466	602.43	-9098.0	1.155	23.97	-2499.4	0.0007	0.965	0.023
	9	1%	-5.7684	-16.425	522.27	-14231.8	0.981	7.95	-3879.7	0.0008	0.990	0.021
		5%	-5.1658	-5.727	554.46	-10236.2	1.161	18.11	-3688.4	0.0008	0.971	0.021
		10%	-4.8410	-1.525	598.85	-9582.1	1.276	22.53	-3767.5	0.0008	0.973	0.023
	10	1%	-5.9124	-16.863	667.39	-18050.8	1.060	1.36	-3750.5	0.0009	0.985	0.023
		5%	-5.3073	-5.748	726.45	-14028.0	1.261	6.08	-3227.6	0.0010	0.964	0.024
		10%	-4.9812	-1.209	775.61	-13362.7	1.386	7.81	-3159.2	0.0010	0.969	0.025

Note: The RS regression model is equation (C.1). The dependent variable is the simulated α-quantile of the test statistic. Separate regressions are run for each number k of individually $I(0)$ or $I(1)$ variables $\mathbf{x}_t$ in equation (6). SE($\theta_{0,0}$) denotes the heteroskedasticity-robust standard error of the intercept, $\bar{R}^2$ the adjusted coefficient of determination, and RMSE the root mean square error.

Table D.1: Coefficient of variation, F-statistic

	T	k	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	0	0.0082	0.0082	0.0065	0.0065	0.0059	0.0059
		2	0.0067	0.0066	0.0045	0.0042	0.0038	0.0034
		4	0.0064	0.0060	0.0039	0.0035	0.0032	0.0031
	80	0	0.0083	0.0083	0.0070	0.0070	0.0060	0.0060
		2	0.0066	0.0060	0.0037	0.0036	0.0035	0.0030
		4	0.0056	0.0048	0.0033	0.0030	0.0030	0.0024
		8	0.0044	0.0043	0.0030	0.0027	0.0027	0.0021
	1000	0	0.0075	0.0075	0.0062	0.0062	0.0051	0.0051
		2	0.0058	0.0050	0.0038	0.0029	0.0033	0.0027
		4	0.0053	0.0038	0.0035	0.0024	0.0030	0.0024
		8	0.0044	0.0030	0.0028	0.0020	0.0024	0.0015
Case (ii)								
	30	0	0.0065	0.0065	0.0038	0.0038	0.0029	0.0029
		2	0.0056	0.0058	0.0036	0.0033	0.0030	0.0027
		4	0.0064	0.0063	0.0036	0.0033	0.0028	0.0026
	80	0	0.0054	0.0054	0.0036	0.0036	0.0030	0.0030
		2	0.0052	0.0051	0.0031	0.0030	0.0026	0.0027
		4	0.0046	0.0044	0.0027	0.0027	0.0023	0.0021
		8	0.0043	0.0038	0.0024	0.0024	0.0022	0.0019
	1000	0	0.0055	0.0055	0.0034	0.0034	0.0029	0.0029
		2	0.0049	0.0045	0.0027	0.0023	0.0023	0.0022
		4	0.0041	0.0035	0.0025	0.0022	0.0022	0.0020
		8	0.0035	0.0030	0.0020	0.0020	0.0020	0.0015
Case (iii)								
	30	0	0.0069	0.0069	0.0042	0.0042	0.0033	0.0033
		2	0.0068	0.0057	0.0039	0.0035	0.0033	0.0027
		4	0.0060	0.0068	0.0036	0.0034	0.0029	0.0028
	80	0	0.0061	0.0061	0.0042	0.0042	0.0035	0.0035
		2	0.0053	0.0054	0.0032	0.0032	0.0031	0.0030
		4	0.0047	0.0045	0.0028	0.0028	0.0028	0.0023
		8	0.0046	0.0040	0.0024	0.0026	0.0022	0.0020
	1000	0	0.0056	0.0056	0.0035	0.0035	0.0030	0.0030
		2	0.0052	0.0047	0.0029	0.0029	0.0025	0.0026
		4	0.0042	0.0037	0.0026	0.0023	0.0024	0.0020
		8	0.0037	0.0031	0.0023	0.0020	0.0020	0.0016
Case (iv)								
	30	0	0.0061	0.0061	0.0034	0.0034	0.0027	0.0027
		2	0.0060	0.0056	0.0034	0.0032	0.0030	0.0025
		4	0.0054	0.0062	0.0034	0.0034	0.0026	0.0027
	80	0	0.0052	0.0052	0.0035	0.0035	0.0028	0.0028
		2	0.0055	0.0045	0.0030	0.0031	0.0024	0.0022
		4	0.0042	0.0039	0.0026	0.0028	0.0023	0.0021
		8	0.0039	0.0036	0.0025	0.0021	0.0020	0.0017
	1000	0	0.0045	0.0045	0.0027	0.0027	0.0024	0.0024
		2	0.0039	0.0043	0.0025	0.0022	0.0020	0.0020
		4	0.0040	0.0035	0.0025	0.0021	0.0021	0.0017
		8	0.0036	0.0028	0.0022	0.0018	0.0020	0.0014
Case (v)								
	30	0	0.0067	0.0067	0.0034	0.0034	0.0029	0.0029
		2	0.0061	0.0063	0.0037	0.0034	0.0030	0.0027
		4	0.0056	0.0066	0.0036	0.0036	0.0028	0.0027
	80	0	0.0056	0.0056	0.0040	0.0040	0.0029	0.0029
		2	0.0056	0.0043	0.0029	0.0032	0.0026	0.0025
		4	0.0046	0.0039	0.0026	0.0029	0.0023	0.0023
		8	0.0041	0.0039	0.0027	0.0020	0.0021	0.0018
	1000	0	0.0047	0.0047	0.0028	0.0028	0.0024	0.0024
		2	0.0043	0.0040	0.0026	0.0022	0.0021	0.0020
		4	0.0040	0.0035	0.0025	0.0022	0.0021	0.0018
		8	0.0038	0.0027	0.0022	0.0018	0.0020	0.0015

Note: The coefficient of variation is computed as the ratio of the standard deviation to the mean over the 100 meta replications for the empirical quantiles that correspond to the respective significance level and simulation design. Only designs with a lag order $q = 1$ are considered.

Table D.2: Coefficient of variation, t-statistic

	T	k	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	0	0.0046	0.0046	0.0040	0.0040	0.0031	0.0031
		2	0.0050	0.0036	0.0040	0.0023	0.0036	0.0020
		4	0.0048	0.0037	0.0043	0.0024	0.0036	0.0021
	80	0	0.0044	0.0044	0.0040	0.0040	0.0032	0.0032
		2	0.0041	0.0034	0.0038	0.0020	0.0033	0.0018
		4	0.0048	0.0027	0.0035	0.0019	0.0035	0.0018
		8	0.0051	0.0031	0.0034	0.0016	0.0036	0.0015
	1000	0	0.0042	0.0042	0.0031	0.0031	0.0032	0.0032
		2	0.0043	0.0029	0.0031	0.0021	0.0031	0.0019
		4	0.0044	0.0027	0.0031	0.0017	0.0031	0.0016
		8	0.0044	0.0023	0.0032	0.0013	0.0033	0.0013
Case (iii)								
	30	0	0.0035	0.0035	0.0021	0.0021	0.0017	0.0017
		2	0.0037	0.0036	0.0023	0.0020	0.0019	0.0015
		4	0.0042	0.0032	0.0025	0.0020	0.0021	0.0017
	80	0	0.0031	0.0031	0.0021	0.0021	0.0018	0.0018
		2	0.0030	0.0030	0.0021	0.0019	0.0017	0.0017
		4	0.0033	0.0026	0.0020	0.0017	0.0019	0.0015
		8	0.0035	0.0027	0.0023	0.0016	0.0019	0.0013
	1000	0	0.0028	0.0028	0.0017	0.0017	0.0015	0.0015
		2	0.0030	0.0025	0.0017	0.0016	0.0015	0.0015
		4	0.0029	0.0020	0.0018	0.0016	0.0014	0.0012
		8	0.0030	0.0019	0.0018	0.0012	0.0015	0.0011
Case (v)								
	30	0	0.0033	0.0033	0.0017	0.0017	0.0015	0.0015
		2	0.0034	0.0033	0.0023	0.0018	0.0016	0.0017
		4	0.0036	0.0035	0.0023	0.0020	0.0019	0.0017
	80	0	0.0028	0.0028	0.0020	0.0020	0.0015	0.0015
		2	0.0026	0.0023	0.0020	0.0017	0.0015	0.0015
		4	0.0027	0.0024	0.0019	0.0015	0.0016	0.0014
		8	0.0030	0.0025	0.0019	0.0014	0.0017	0.0013
	1000	0	0.0024	0.0024	0.0014	0.0014	0.0012	0.0012
		2	0.0023	0.0021	0.0014	0.0013	0.0012	0.0011
		4	0.0023	0.0019	0.0014	0.0013	0.0012	0.0012
		8	0.0026	0.0018	0.0014	0.0011	0.0012	0.0009

Note: The coefficient of variation is computed as the ratio of the standard deviation to the absolute value of the mean over the 100 meta replications for the empirical quantiles that correspond to the respective significance level and simulation design. Only designs with a lag order $q = 1$ are considered.

Table D.3: Finite-sample p-values for asymptotic CVs, F-statistic

	T	k	1% $I(0)$	1% $I(1)$	5% $I(0)$	5% $I(1)$	10% $I(0)$	10% $I(1)$
Case (i)								
	30	0	0.0141	0.0131	0.0572	0.0553	0.1075	0.1053
		2	0.0222	0.0258	0.0716	0.0769	0.1239	0.1286
		4	0.0334	0.0436	0.0895	0.1034	0.1435	0.1571
	80	0	0.0109	0.0101	0.0516	0.0499	0.1015	0.0995
		2	0.0126	0.0130	0.0551	0.0559	0.1058	0.1064
		4	0.0151	0.0173	0.0601	0.0646	0.1116	0.1166
		8	0.0211	0.0302	0.0702	0.0861	0.1223	0.1405
	1000	0	0.0100	0.0100	0.0501	0.0499	0.1001	0.0998
		2	0.0101	0.0101	0.0502	0.0502	0.1003	0.1002
		4	0.0102	0.0103	0.0505	0.0508	0.1006	0.1009
		8	0.0105	0.0110	0.0511	0.0522	0.1012	0.1027
Case (ii)								
	30	0	0.0186	0.0168	0.0660	0.0632	0.1176	0.1146
		2	0.0285	0.0347	0.0811	0.0927	0.1331	0.1473
		4	0.0413	0.0575	0.0988	0.1240	0.1510	0.1802
	80	0	0.0118	0.0105	0.0537	0.0512	0.1041	0.1012
		2	0.0138	0.0145	0.0573	0.0598	0.1078	0.1116
		4	0.0166	0.0201	0.0622	0.0704	0.1130	0.1239
		8	0.0223	0.0342	0.0709	0.0934	0.1213	0.1494
	1000	0	0.0101	0.0099	0.0502	0.0499	0.1002	0.0998
		2	0.0102	0.0101	0.0503	0.0504	0.1003	0.1005
		4	0.0103	0.0104	0.0506	0.0511	0.1006	0.1013
		8	0.0106	0.0111	0.0511	0.0526	0.1010	0.1033
Case (iii)								
	30	0	0.0170	0.0160	0.0608	0.0594	0.1097	0.1083
		2	0.0247	0.0303	0.0733	0.0834	0.1230	0.1349
		4	0.0367	0.0508	0.0906	0.1121	0.1410	0.1651
	80	0	0.0120	0.0112	0.0530	0.0517	0.1024	0.1010
		2	0.0132	0.0141	0.0554	0.0580	0.1049	0.1084
		4	0.0157	0.0189	0.0598	0.0671	0.1096	0.1190
		8	0.0214	0.0319	0.0687	0.0883	0.1186	0.1426
	1000	0	0.0101	0.0101	0.0502	0.0500	0.1001	0.1000
		2	0.0102	0.0102	0.0503	0.0504	0.1002	0.1004
		4	0.0103	0.0104	0.0505	0.0509	0.1004	0.1011
		8	0.0106	0.0111	0.0510	0.0524	0.1009	0.1028
Case (iv)								
	30	0	0.0235	0.0217	0.0751	0.0725	0.1283	0.1257
		2	0.0341	0.0418	0.0896	0.1032	0.1419	0.1586
		4	0.0478	0.0667	0.1067	0.1358	0.1580	0.1920
	80	0	0.0132	0.0120	0.0567	0.0545	0.1078	0.1054
		2	0.0150	0.0162	0.0596	0.0631	0.1103	0.1155
		4	0.0177	0.0220	0.0638	0.0737	0.1143	0.1276
		8	0.0233	0.0362	0.0719	0.0966	0.1215	0.1528
	1000	0	0.0102	0.0101	0.0504	0.0501	0.1005	0.1002
		2	0.0103	0.0103	0.0505	0.0506	0.1005	0.1008
		4	0.0104	0.0105	0.0507	0.0513	0.1007	0.1016
		8	0.0107	0.0112	0.0511	0.0528	0.1009	0.1034
Case (v)								
	30	0	0.0213	0.0204	0.0686	0.0673	0.1186	0.1173
		2	0.0292	0.0361	0.0800	0.0919	0.1293	0.1437
		4	0.0424	0.0588	0.0969	0.1220	0.1456	0.1747
	80	0	0.0134	0.0127	0.0558	0.0547	0.1056	0.1045
		2	0.0142	0.0155	0.0571	0.0606	0.1065	0.1115
		4	0.0165	0.0205	0.0607	0.0697	0.1100	0.1219
		8	0.0221	0.0336	0.0687	0.0907	0.1175	0.1451
	1000	0	0.0102	0.0102	0.0504	0.0503	0.1004	0.1002
		2	0.0102	0.0103	0.0504	0.0505	0.1003	0.1006
		4	0.0104	0.0105	0.0505	0.0511	0.1004	0.1012
		8	0.0107	0.0112	0.0509	0.0525	0.1007	0.1029

Note: Reported are the approximate finite-sample p-values obtained from equation (11) that are associated with the asymptotic CVs for a given significance level. Only designs with lag order $q = 1$ are considered.

Table D.4: Finite-sample p-values for asymptotic CVs, t-statistic

	T	k	1%		5%		10%	
			$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
Case (i)								
	30	0	0.0131	0.0116	0.0534	0.0515	0.1004	0.0991
		2	0.0144	0.0170	0.0544	0.0564	0.0995	0.0997
		4	0.0157	0.0206	0.0552	0.0582	0.0988	0.0969
	80	0	0.0107	0.0099	0.0508	0.0505	0.1000	0.1011
		2	0.0110	0.0116	0.0510	0.0517	0.0995	0.0999
		4	0.0114	0.0128	0.0512	0.0518	0.0989	0.0974
		8	0.0119	0.0121	0.0513	0.0438	0.0976	0.0801
	1000	0	0.0100	0.0100	0.0500	0.0501	0.1000	0.1002
		2	0.0100	0.0101	0.0501	0.0501	0.0999	0.1000
		4	0.0101	0.0101	0.0501	0.0500	0.0999	0.0997
		8	0.0101	0.0101	0.0500	0.0492	0.0998	0.0978
Case (iii)								
	30	0	0.0169	0.0152	0.0612	0.0594	0.1106	0.1094
		2	0.0179	0.0202	0.0581	0.0608	0.1011	0.1031
		4	0.0182	0.0237	0.0545	0.0614	0.0923	0.0985
	80	0	0.0116	0.0109	0.0530	0.0536	0.1031	0.1056
		2	0.0118	0.0125	0.0516	0.0533	0.0991	0.1013
		4	0.0119	0.0137	0.0500	0.0529	0.0949	0.0978
		8	0.0114	0.0125	0.0458	0.0435	0.0858	0.0785
	1000	0	0.0101	0.0100	0.0502	0.0503	0.1002	0.1006
		2	0.0101	0.0101	0.0501	0.0502	0.0999	0.1002
		4	0.0101	0.0102	0.0499	0.0501	0.0995	0.0997
		8	0.0100	0.0101	0.0495	0.0491	0.0986	0.0976
Case (v)								
	30	0	0.0207	0.0188	0.0683	0.0665	0.1189	0.1178
		2	0.0211	0.0238	0.0620	0.0658	0.1035	0.1073
		4	0.0207	0.0268	0.0560	0.0647	0.0907	0.1003
	80	0	0.0125	0.0119	0.0553	0.0563	0.1061	0.1095
		2	0.0126	0.0135	0.0527	0.0552	0.0995	0.1031
		4	0.0124	0.0145	0.0498	0.0539	0.0931	0.0981
		8	0.0113	0.0129	0.0432	0.0434	0.0796	0.0772
	1000	0	0.0101	0.0101	0.0503	0.0505	0.1004	0.1010
		2	0.0101	0.0102	0.0501	0.0504	0.0999	0.1003
		4	0.0101	0.0103	0.0498	0.0502	0.0993	0.0998
		8	0.0100	0.0101	0.0492	0.0490	0.0979	0.0973

Note: Reported are the approximate finite-sample p-values obtained from equation (11) that are associated with the asymptotic CVs for a given significance level. Only designs with lag order $q = 1$ are considered.

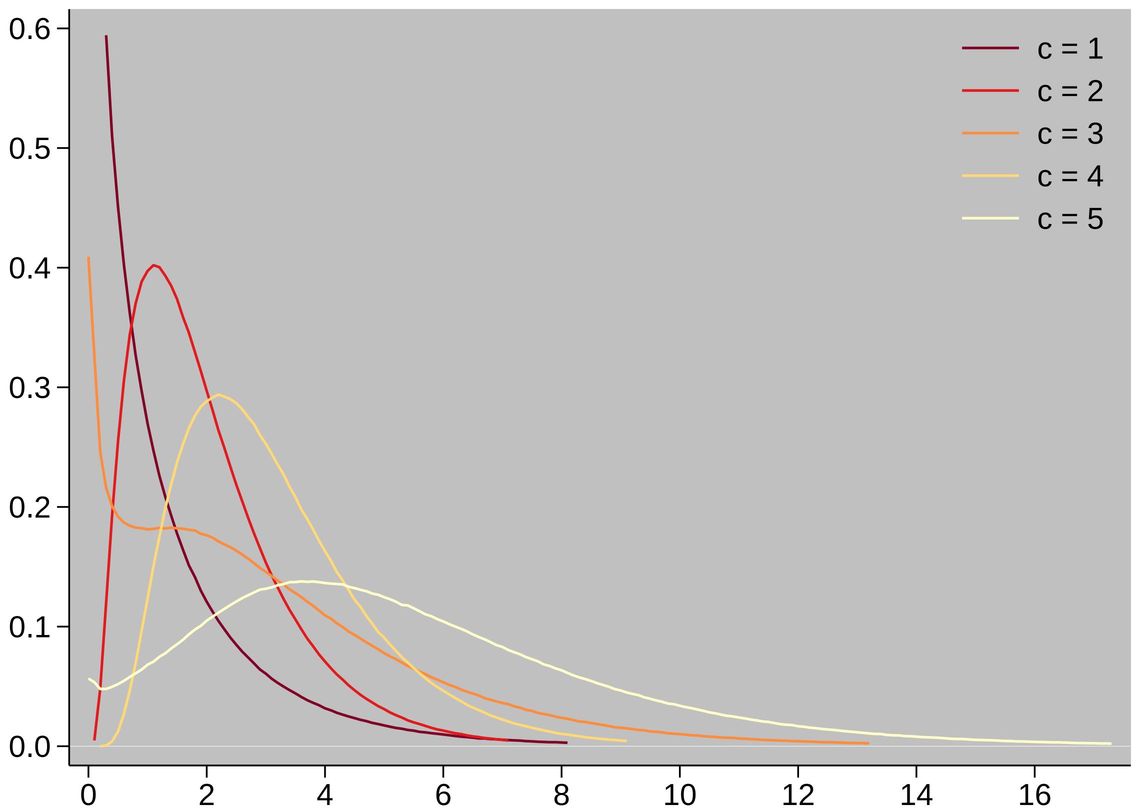

Figure D.1: Probability density functions obtained from the 10^7 simulated F-statistics for cases (i)-(v) with sample size $T = 1000$, $k = 0$ variables, and lag order $q = 1$.

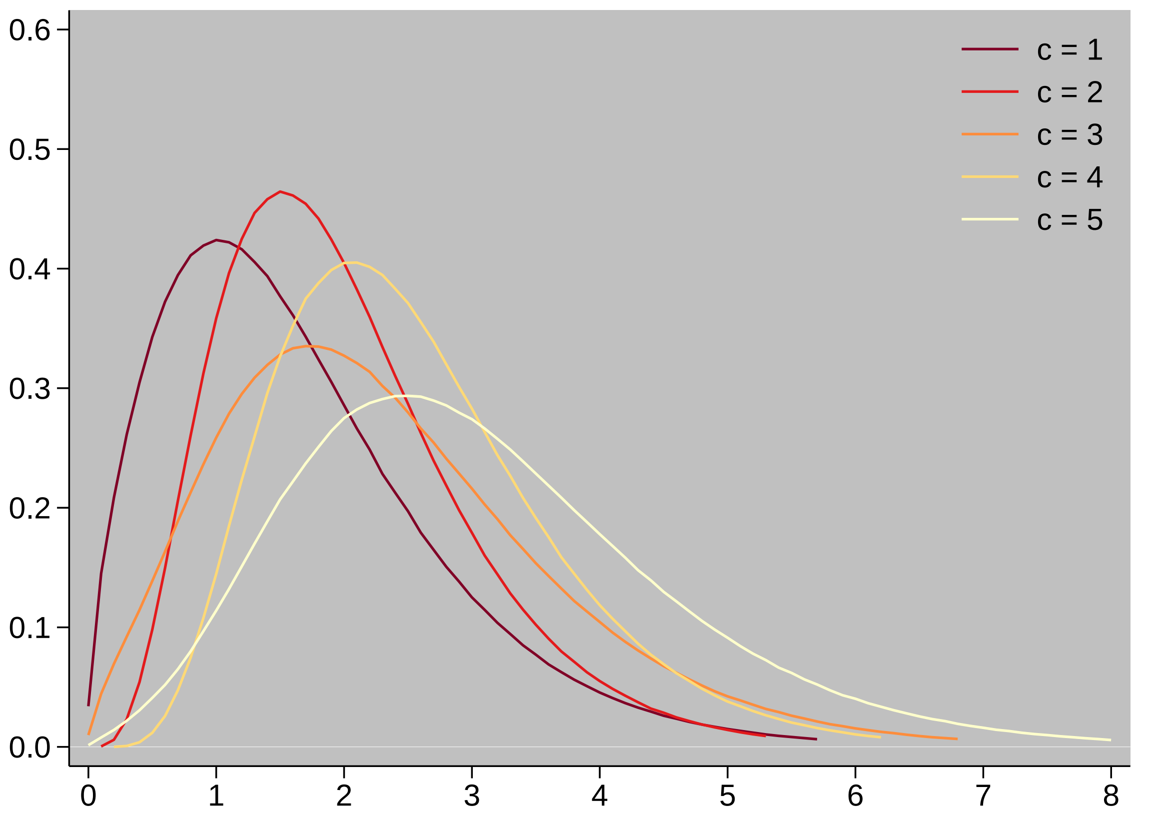

Figure D.2: Upper-bound probability density functions obtained from the 10^7 simulated F-statistics for cases (i)-(v) with sample size $T = 1000$, $k = 2$ variables, and lag order $q = 1$.

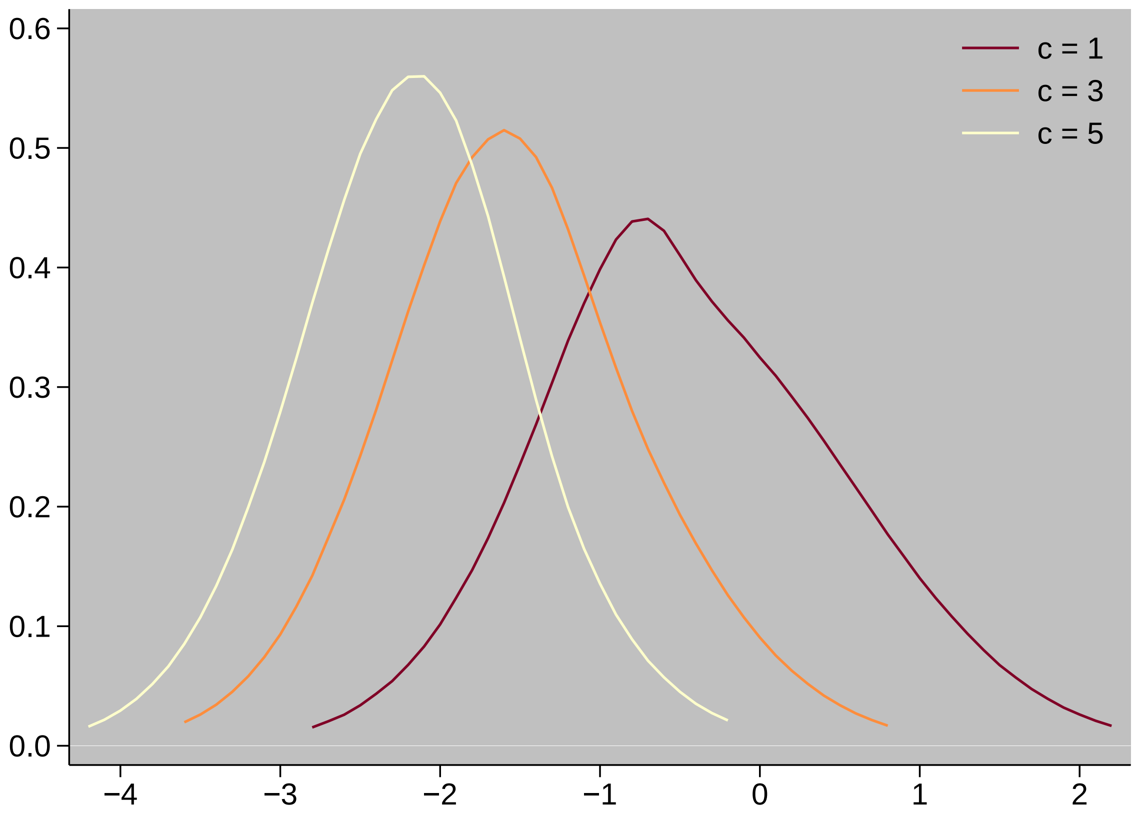

Figure D.3: Probability density functions obtained from the 10^7 simulated t-statistics for cases (i)-(v) with sample size $T = 1000$, $k = 0$ variables, and lag order $q = 1$.

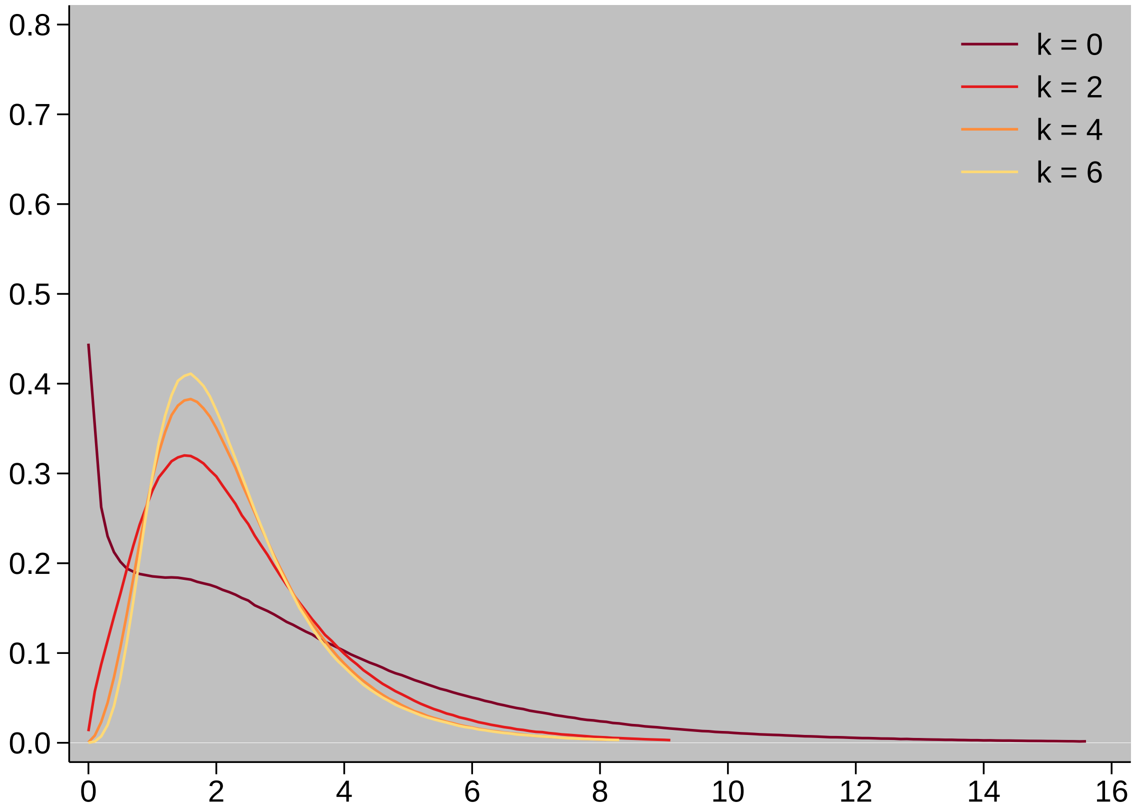

Figure D.4: Upper-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

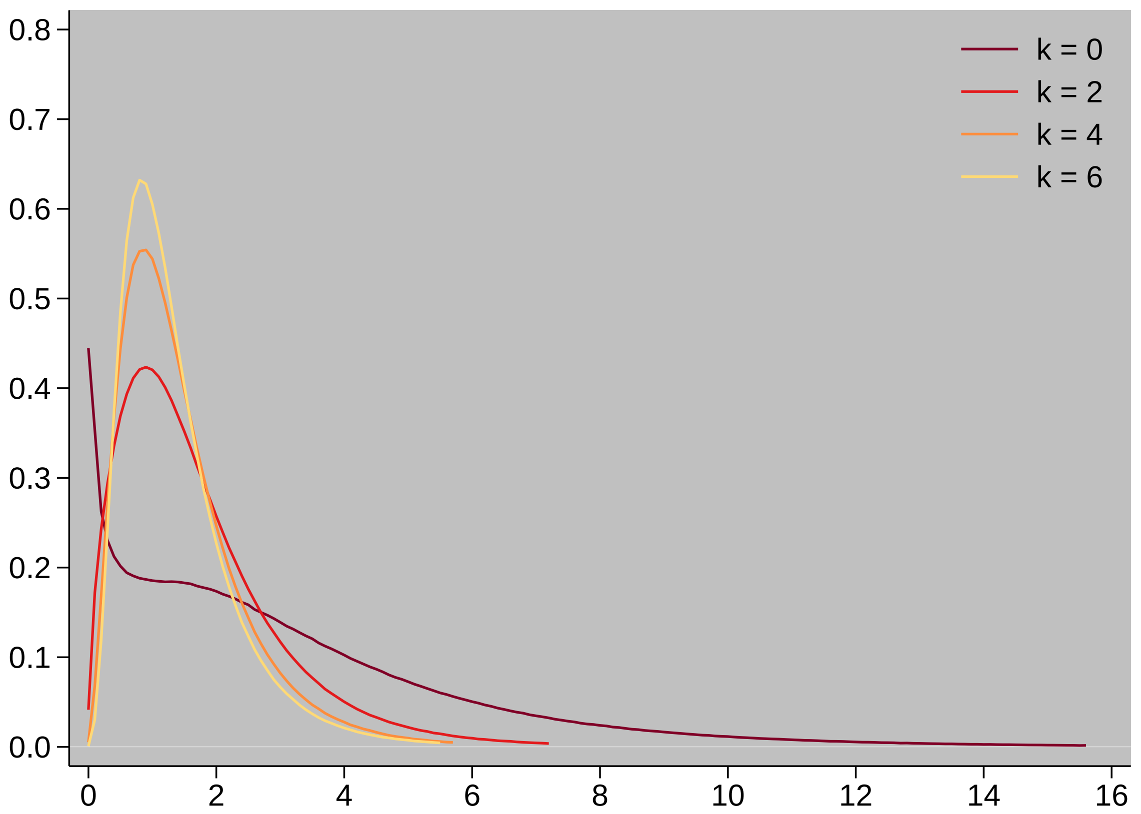

Figure D.5: Lower-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

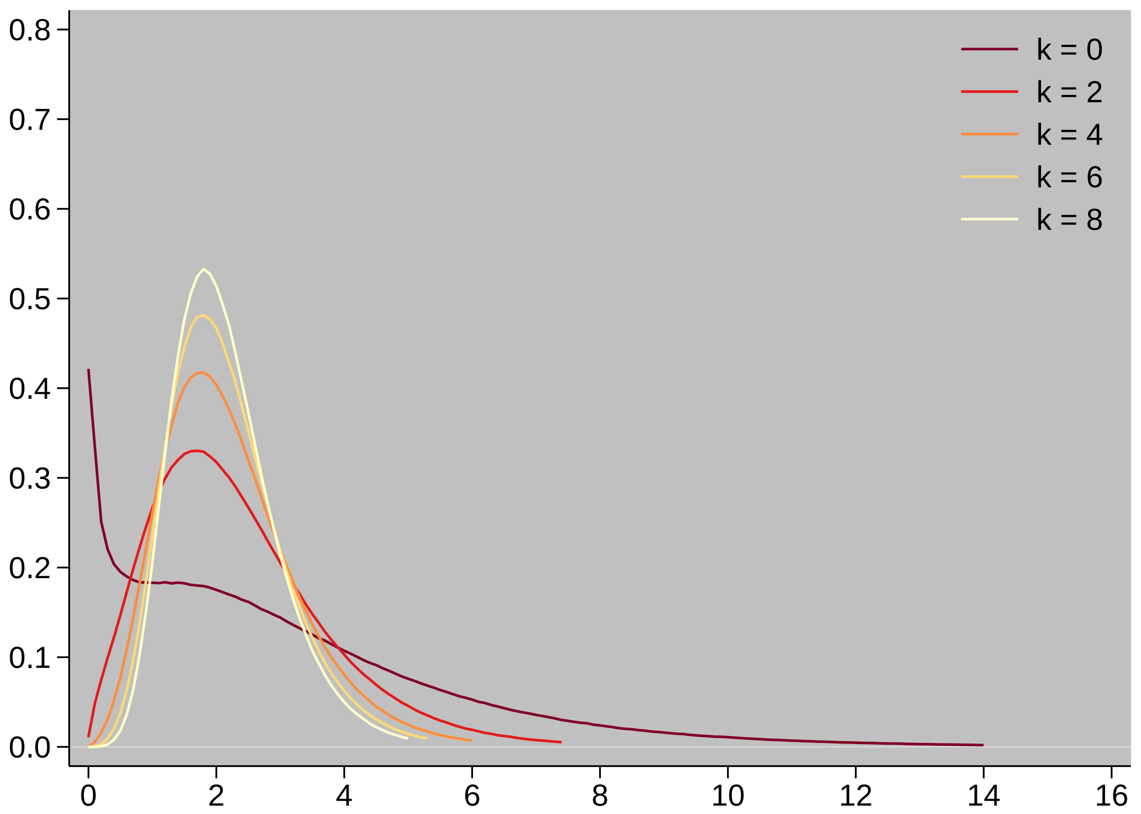

Figure D.6: Upper-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

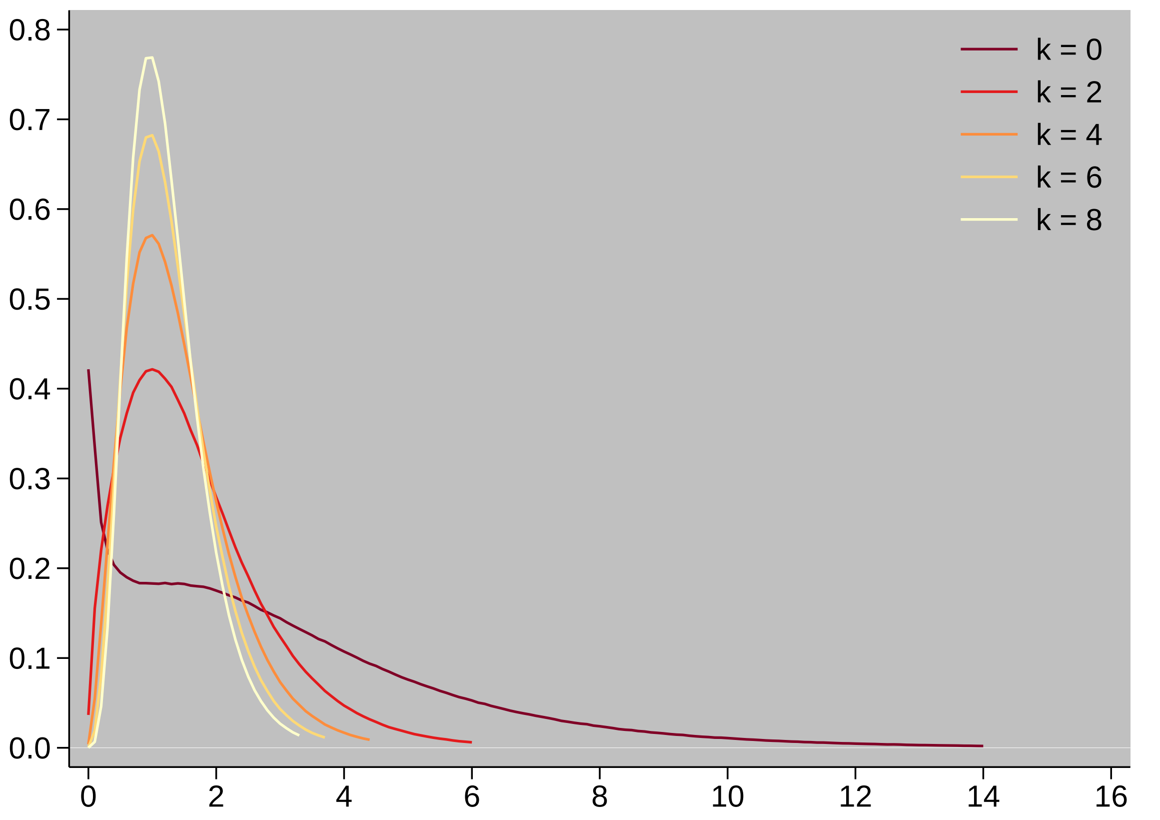

Figure D.7: Lower-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

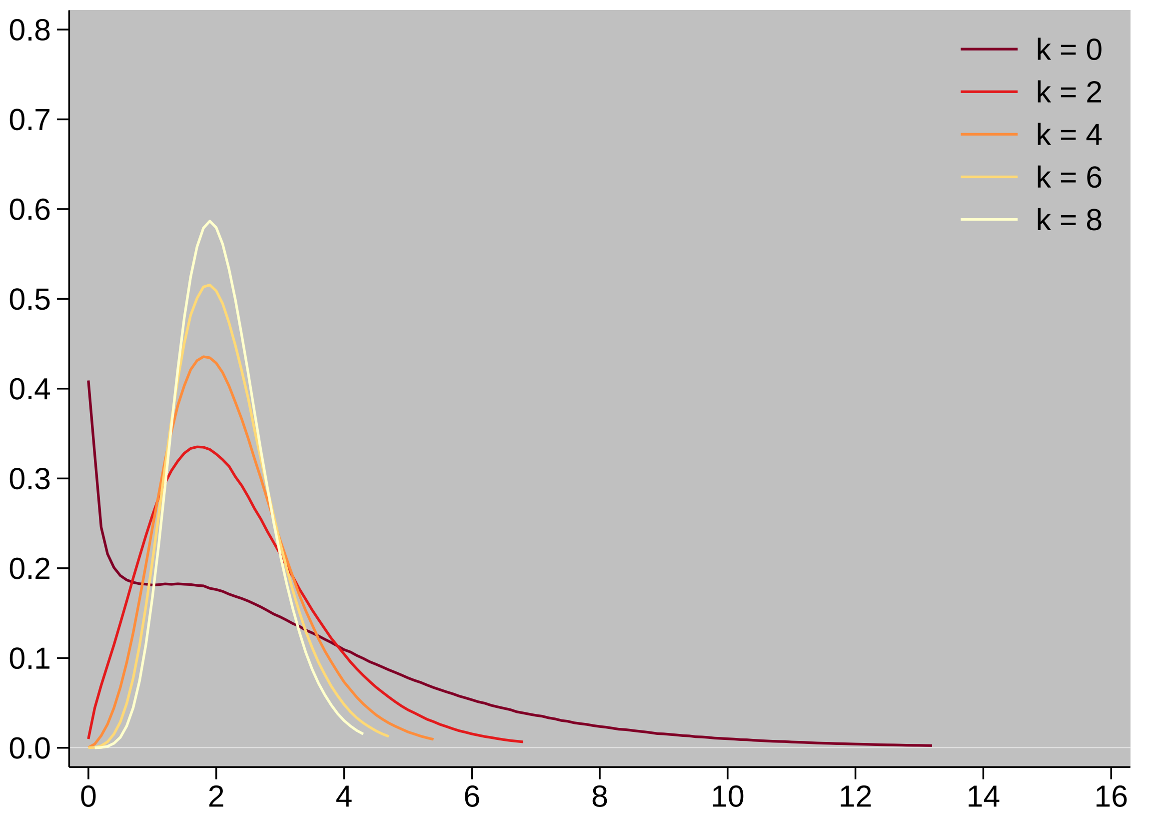

Figure D.8: Upper-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 1000$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

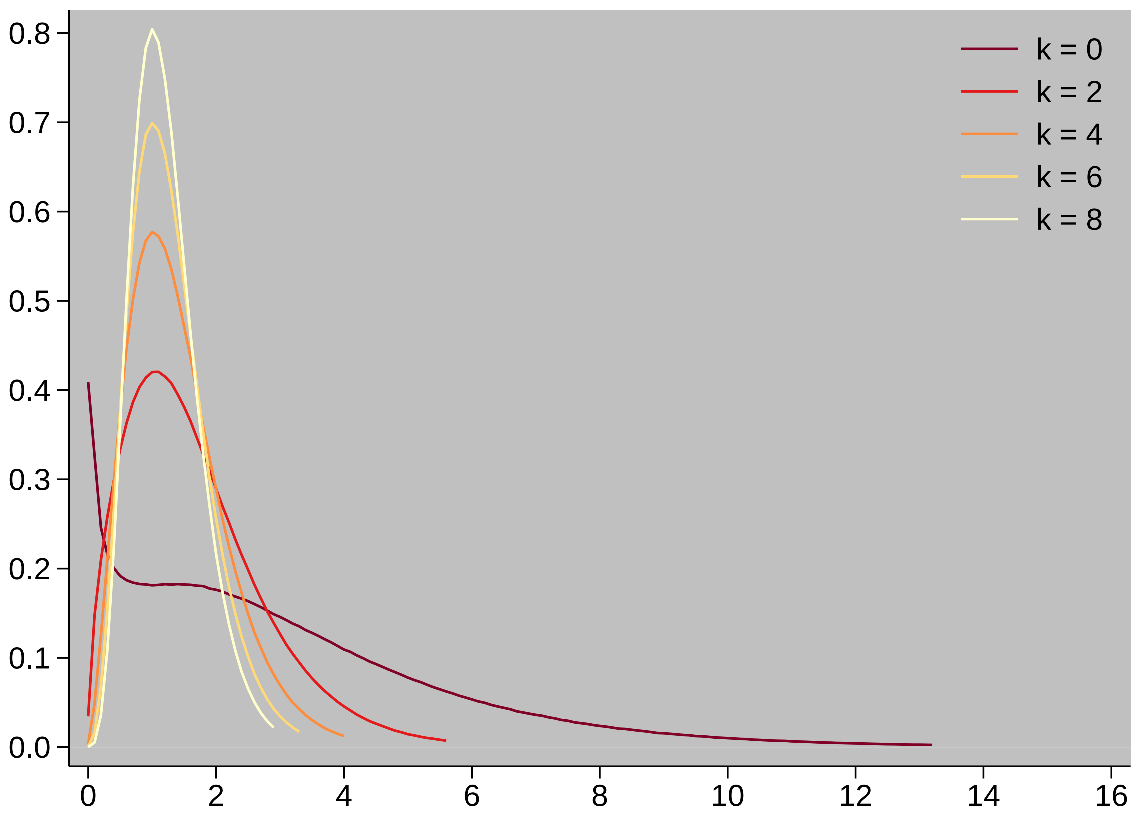

Figure D.9: Lower-bound probability density functions obtained from the 10^7 simulated F-statistics in case (iii) with sample size $T = 1000$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

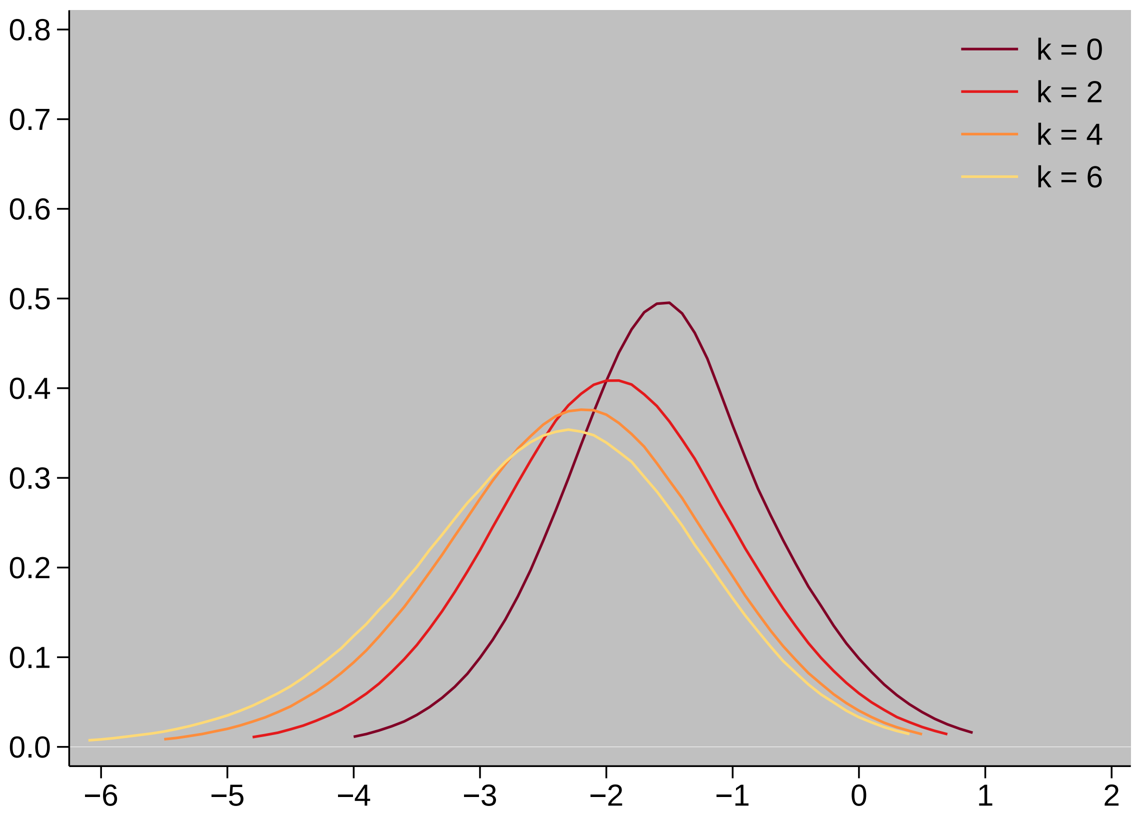

Figure D.10: Upper-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

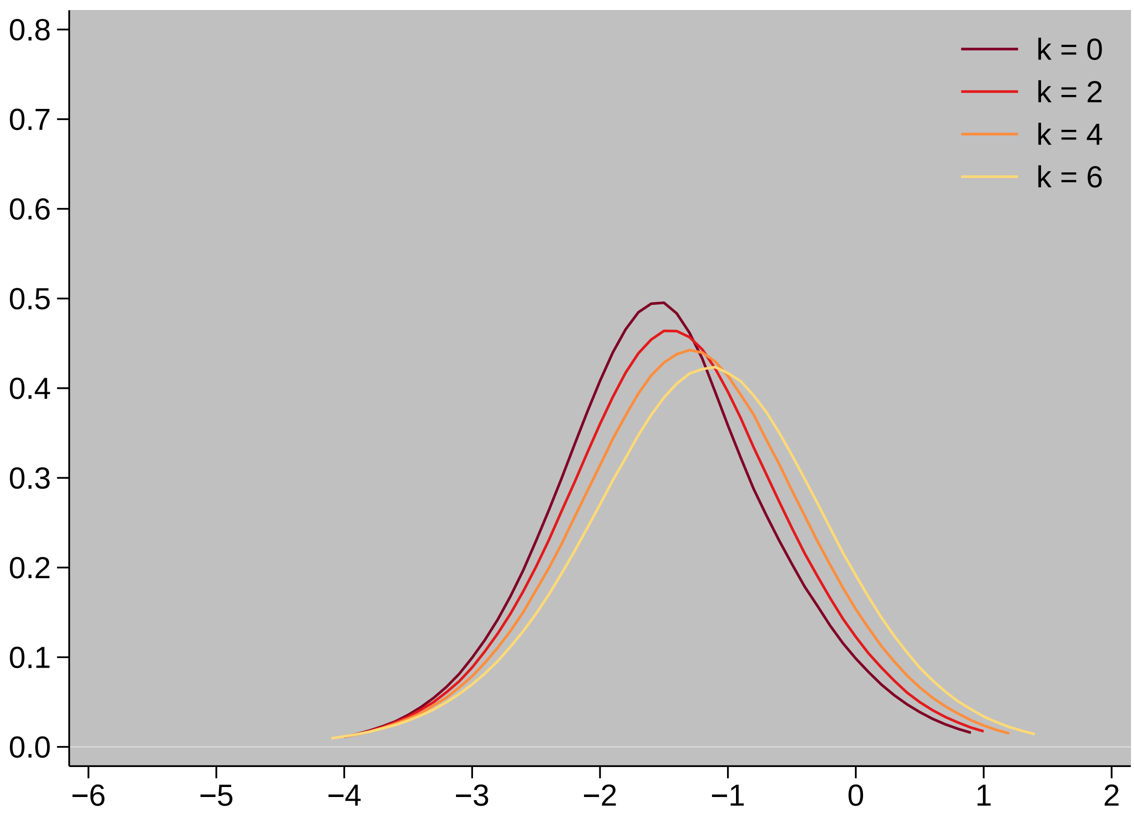

Figure D.11: Lower-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

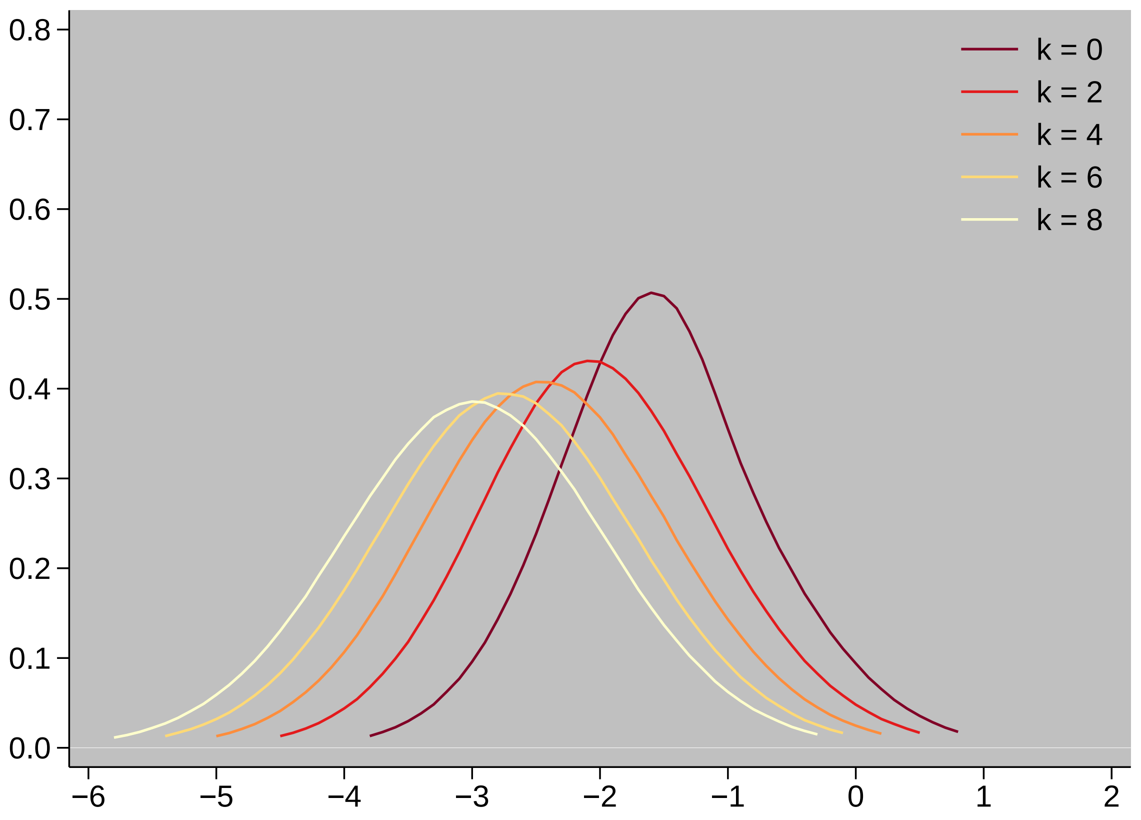

Figure D.12: Upper-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

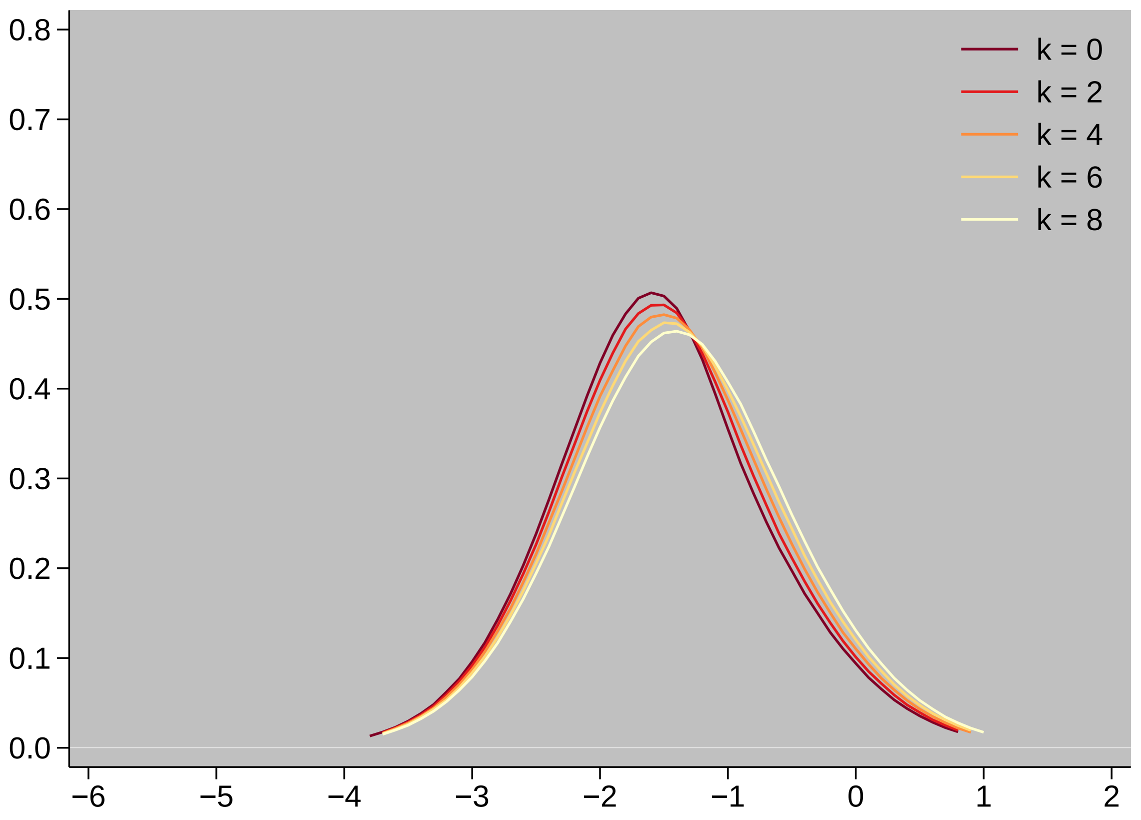

Figure D.13: Lower-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

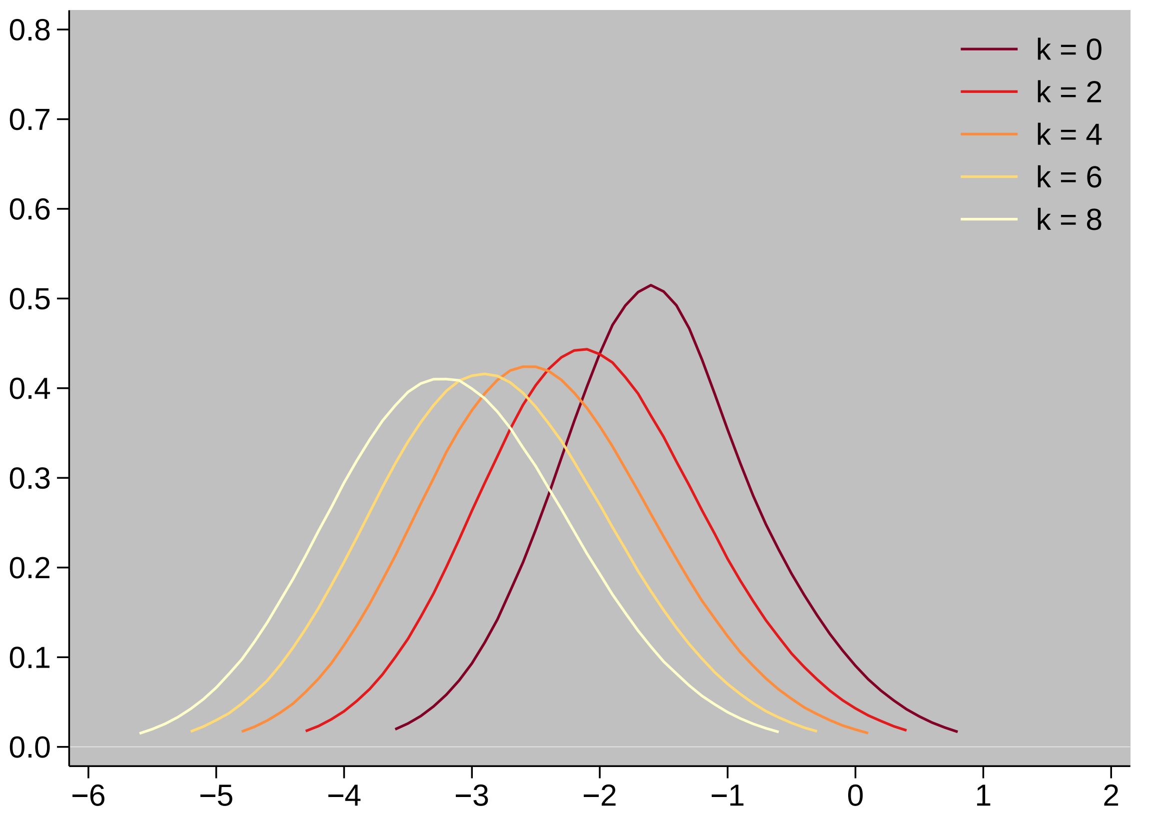

Figure D.14: Upper-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 1000$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

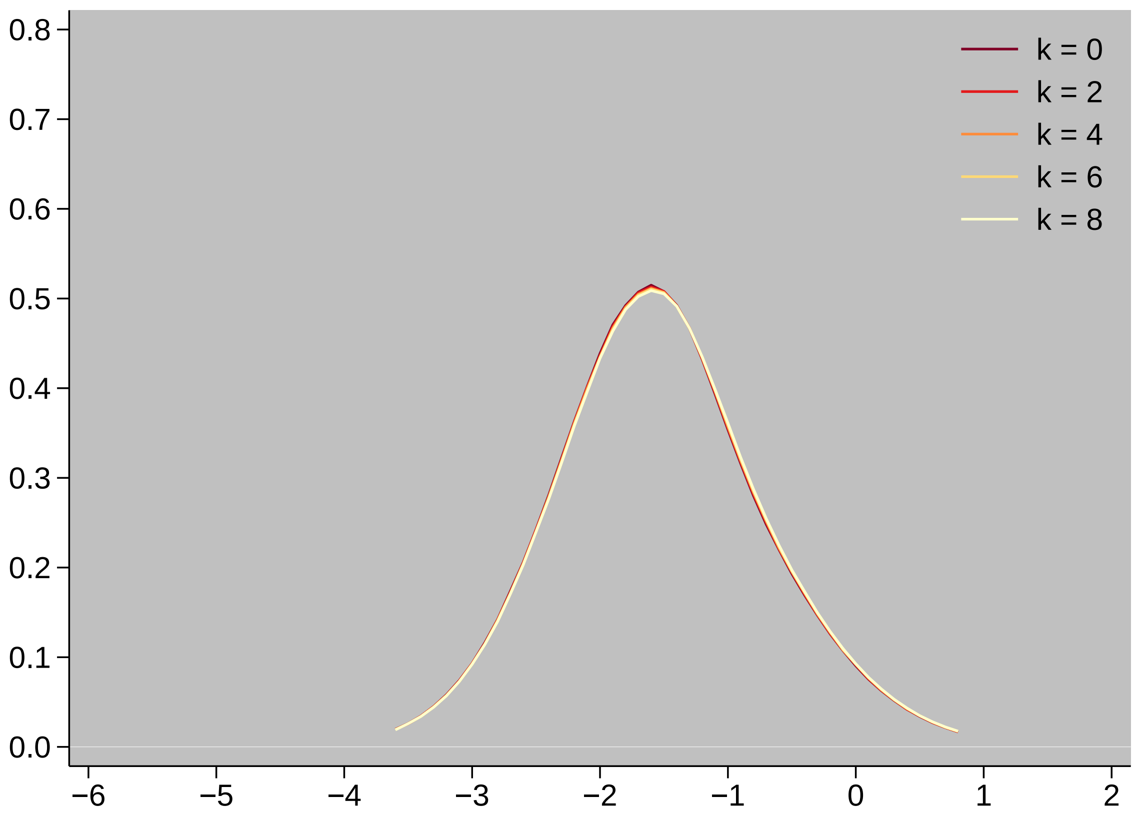

Figure D.15: Lower-bound probability density functions obtained from the 10^7 simulated t-statistics in case (iii) with sample size $T = 1000$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

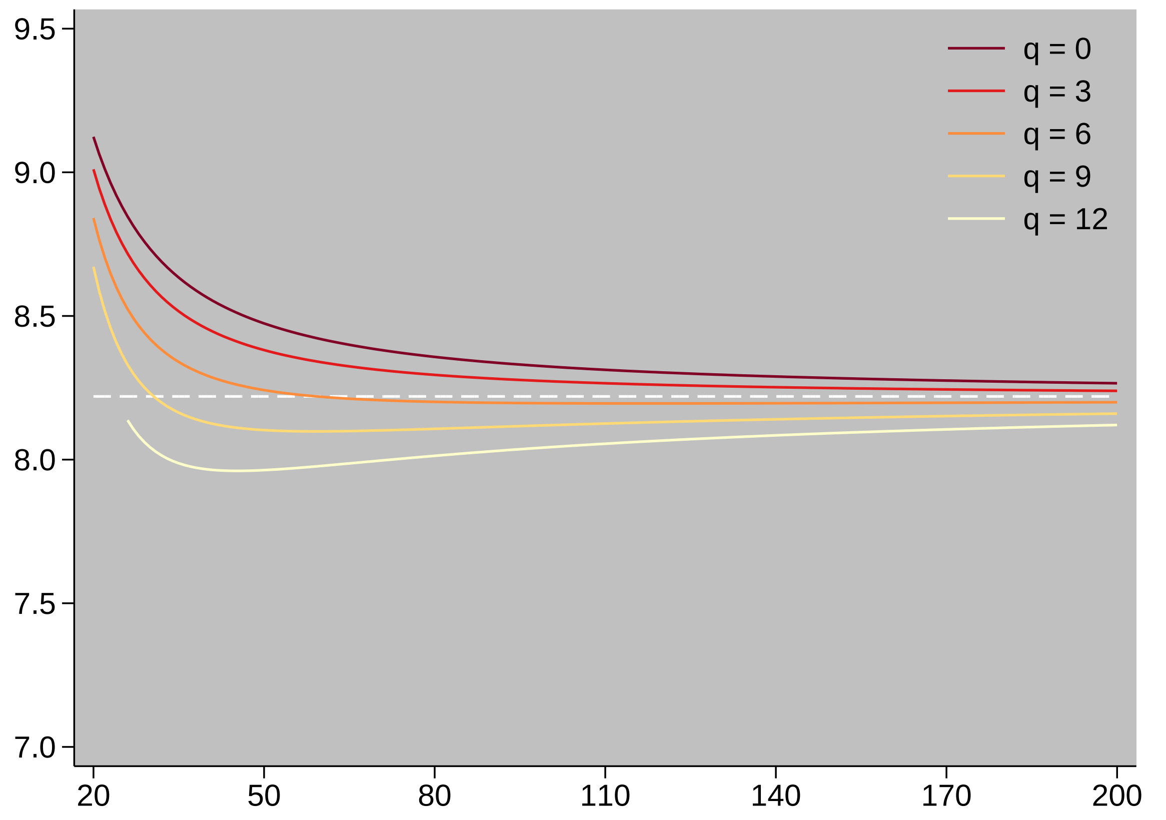

Figure D.16: RS from equation (9) for the F-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 0$ variables and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

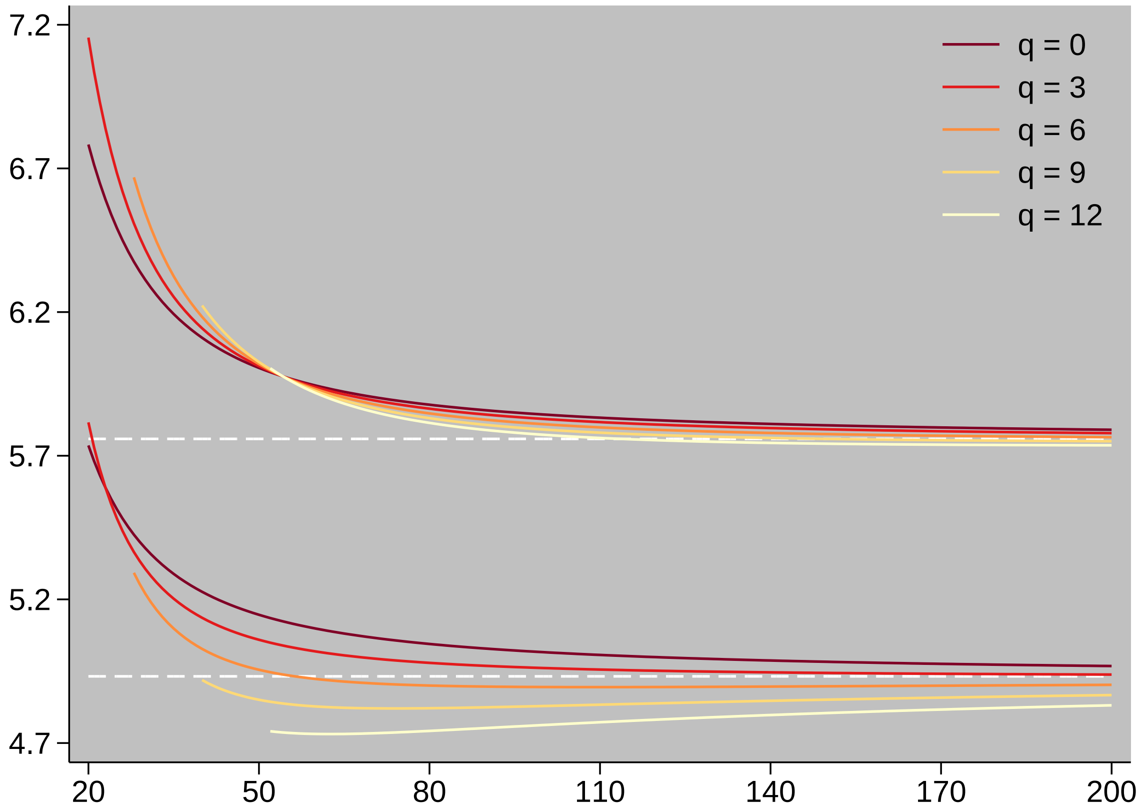

Figure D.17: Upper-bound and lower-bound (closer to zero) RS from equation (9) for the F-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 1$ variable and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

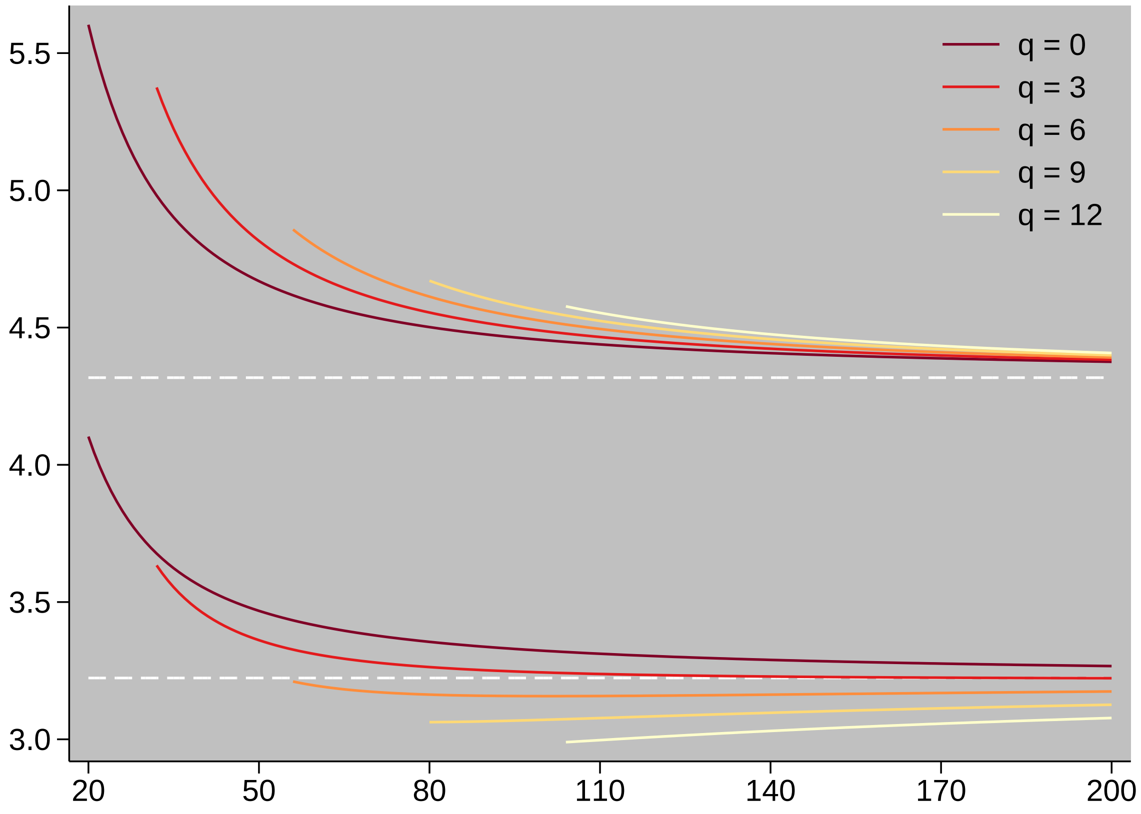

Figure D.18: Upper-bound and lower-bound (closer to zero) RS from equation (9) for the F-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 3$ variables and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

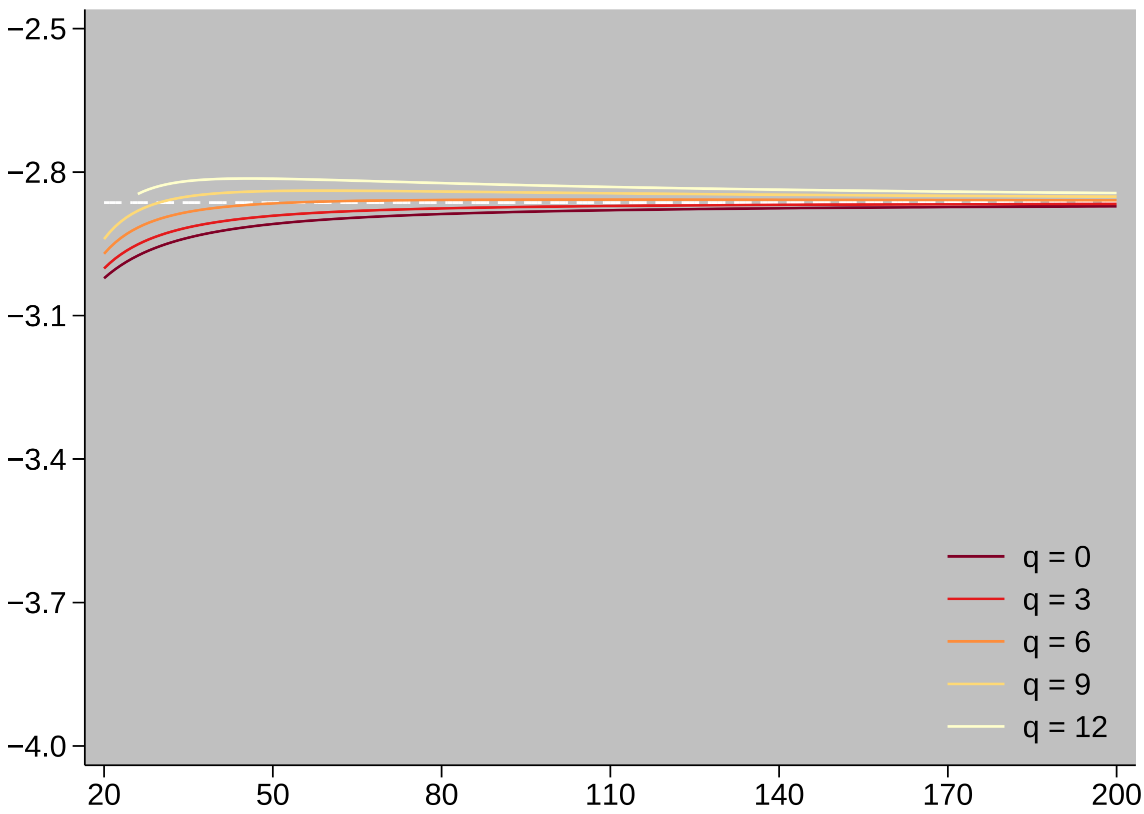

Figure D.19: RS from equation (9) for the t-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 0$ variables and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

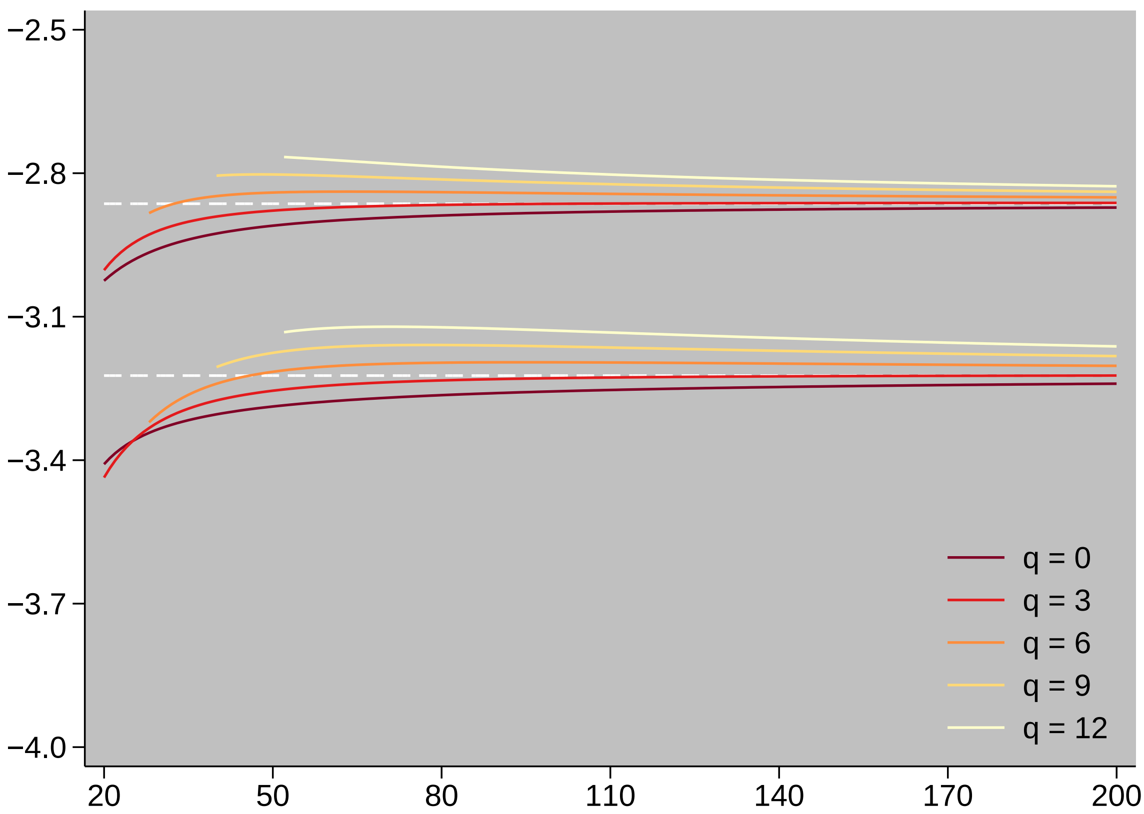

Figure D.20: Upper-bound and lower-bound (closer to zero) RS from equation (9) for the t-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 1$ variable and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

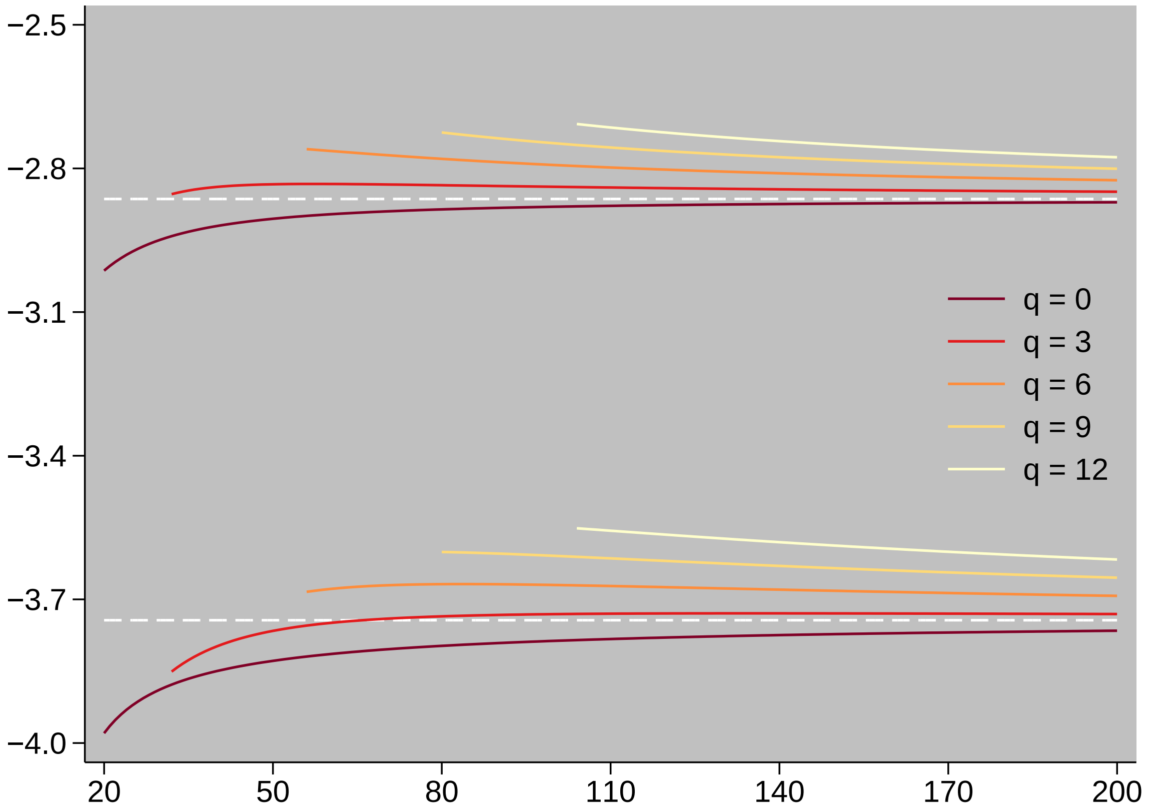

Figure D.21: Upper-bound and lower-bound (closer to zero) RS from equation (9) for the t-statistic in case (iii) at the 5% significance level over a range of effective sample sizes $N(T, q)$ with $k = 3$ variables and lag order $q \in \{0, 3, 6, 9, 12\}$. The white dashed line indicates the asymptotic critical value.

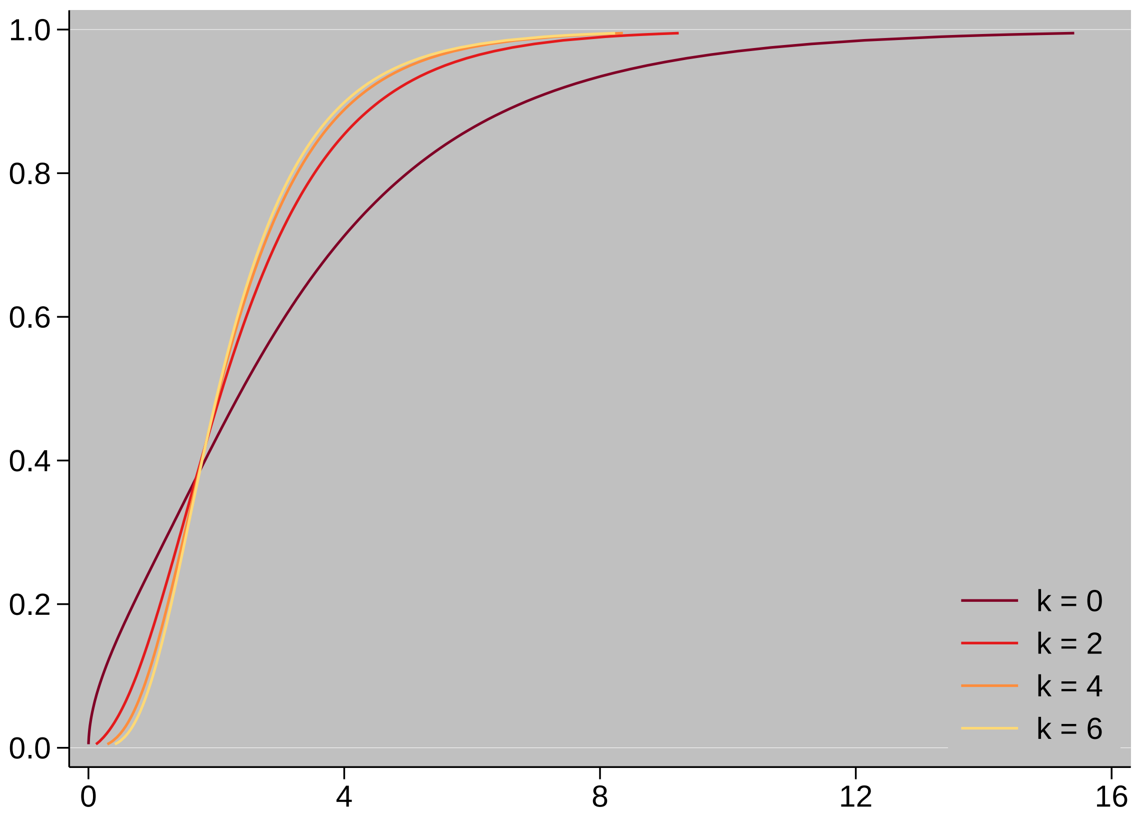

Figure D.22: Implied upper-bound cumulative distribution functions from equation (9) for the F-statistic in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

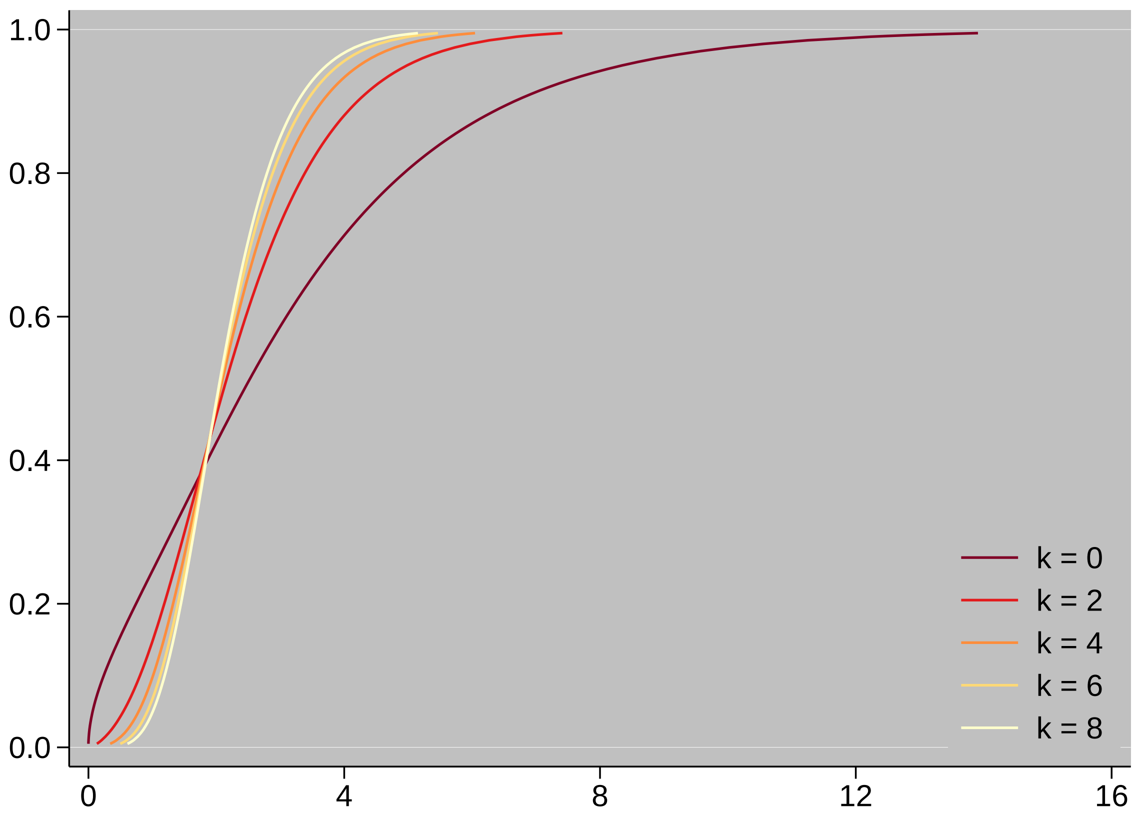

Figure D.23: Implied upper-bound cumulative distribution functions from equation (9) for the F-statistic in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

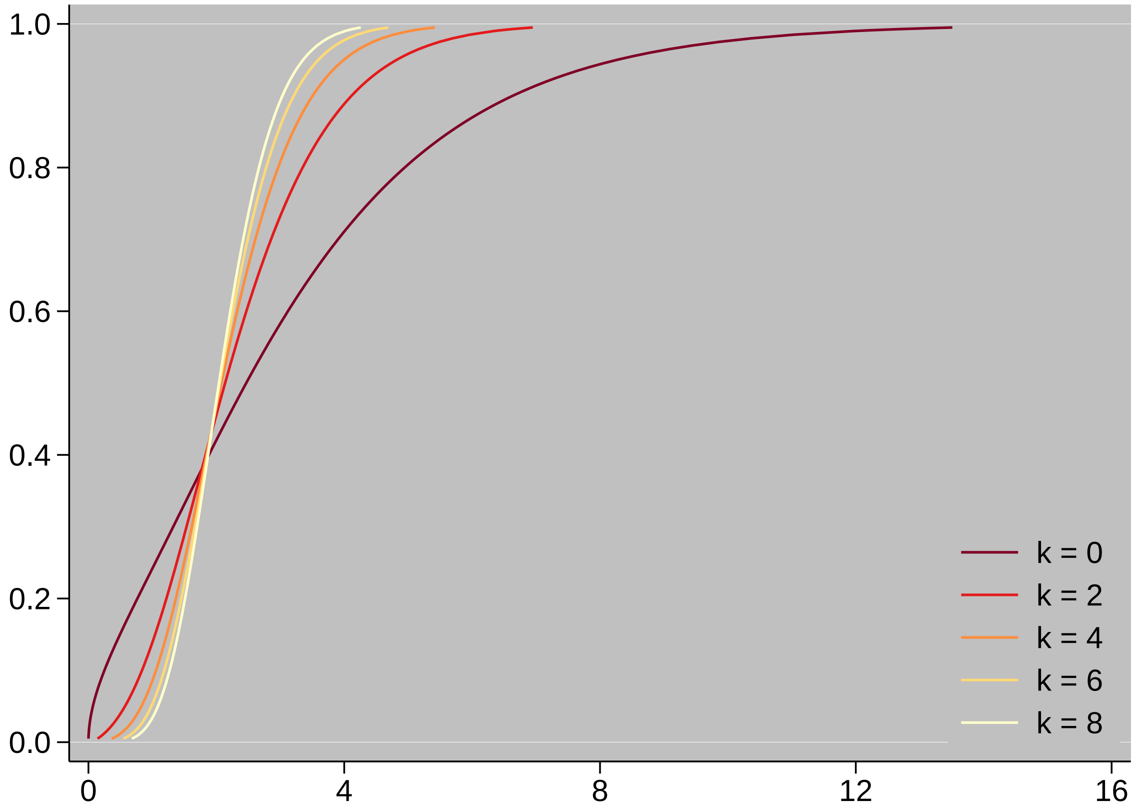

Figure D.24: Implied asymptotic upper-bound cumulative distribution functions from equation (9) for the F-statistic in case (iii) with $k \in \{0, 2, 4, 6, 8\}$ variables.

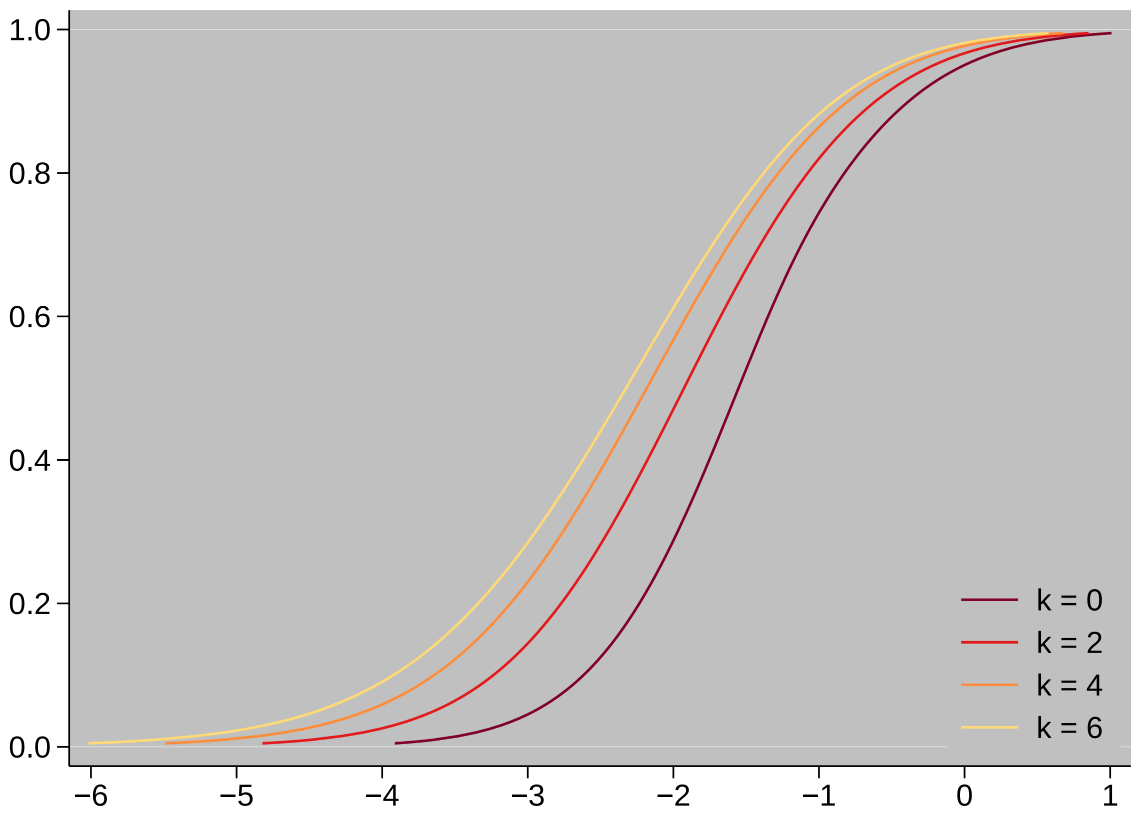

Figure D.25: Implied upper-bound cumulative distribution functions from equation (9) for the t-statistic in case (iii) with sample size $T = 30$, $k \in \{0, 2, 4, 6\}$ variables, and lag order $q = 1$.

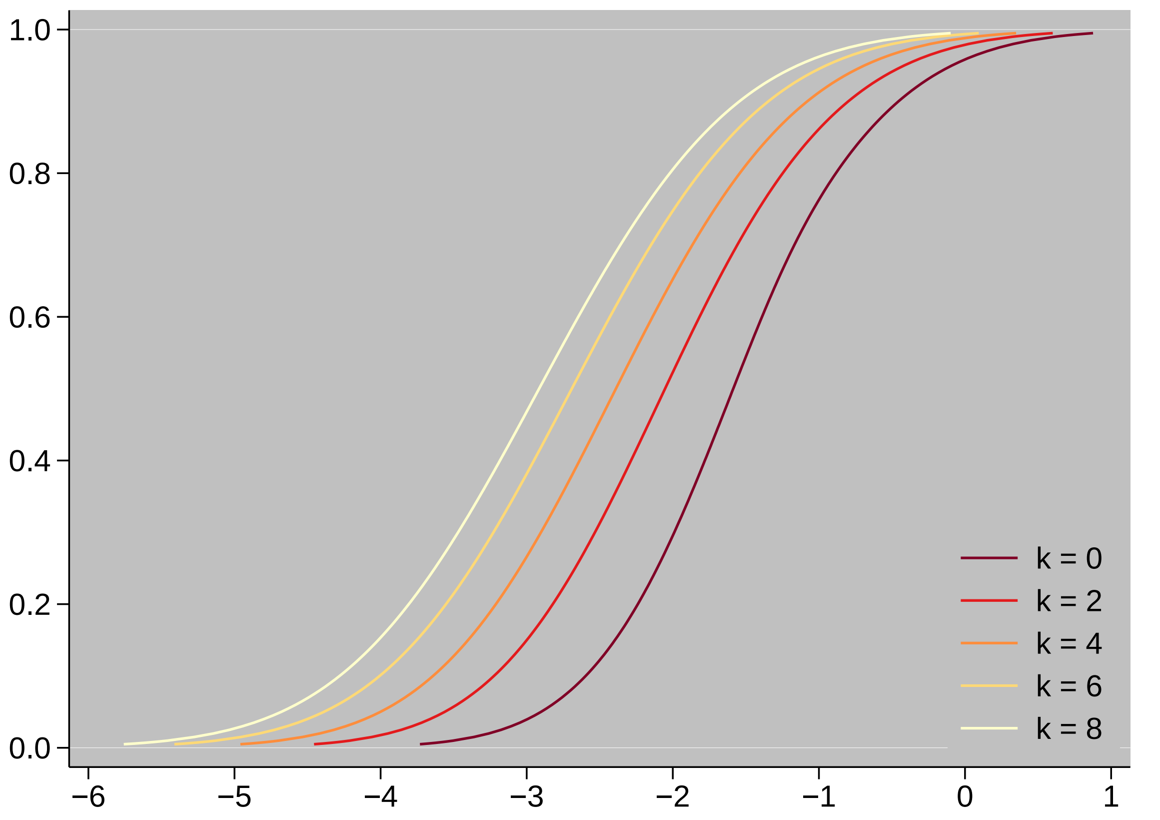

Figure D.26: Implied upper-bound cumulative distribution functions from equation (9) for the t-statistic in case (iii) with sample size $T = 80$, $k \in \{0, 2, 4, 6, 8\}$ variables, and lag order $q = 1$.

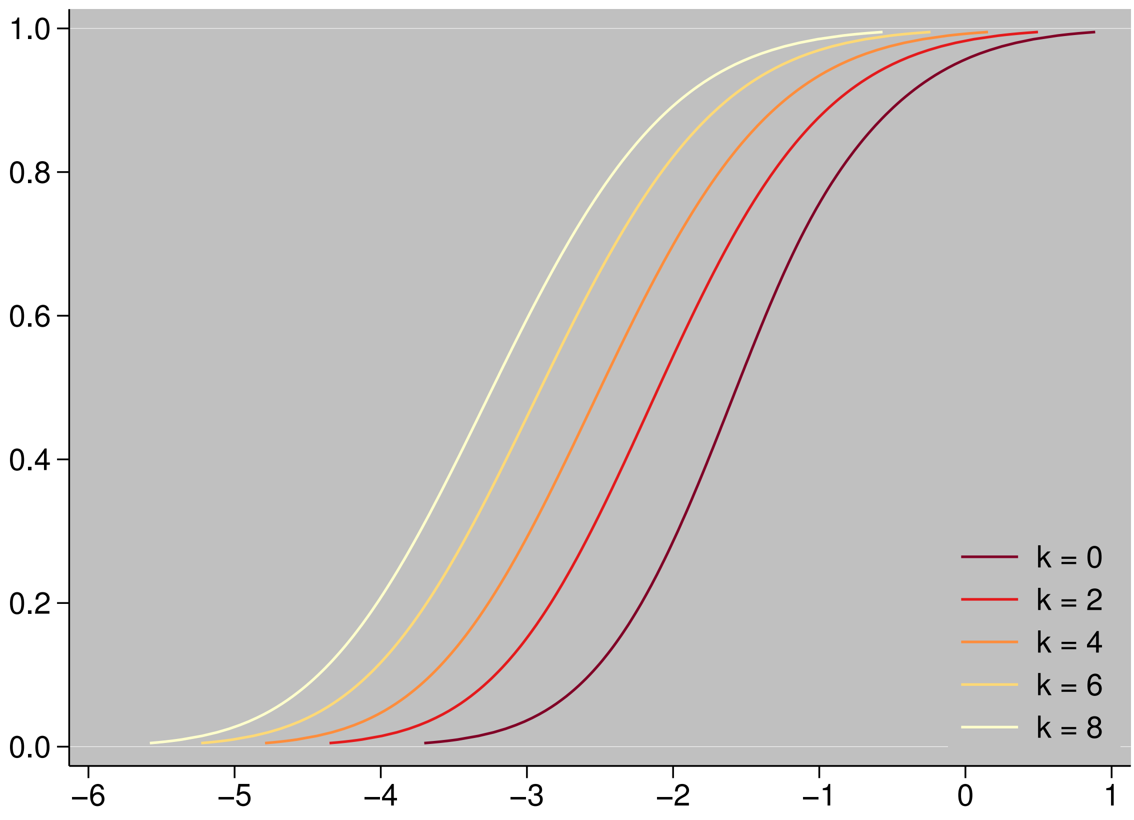

Figure D.27: Implied asymptotic upper-bound cumulative distribution functions from equation (9) for the t-statistic in case (iii) with $k \in \{0, 2, 4, 6, 8\}$ variables.