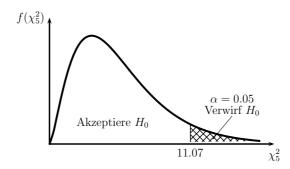
Tabelle: $\chi^2_{(q)}$ -Verteilung

| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | | | |
|--|-----|-----------------|-----------------|----------------|----------------|-----------------|-----------------|------------------|
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | q | $\alpha = 0.99$ | $\alpha = 0.95$ | $\alpha = 0.9$ | $\alpha = 0.1$ | $\alpha = 0.05$ | $\alpha = 0.01$ | $\alpha = 0.005$ |
| 3 0.115 0.352 0.584 6.251 7.815 11.345 12.838 4 0.297 0.711 1.064 7.779 9.488 13.277 14.860 5 0.554 1.145 1.610 9.236 11.070 15.086 16.750 6 0.872 1.635 2.204 10.645 12.592 16.812 18.548 7 1.239 2.167 2.833 12.017 14.067 18.475 20.278 8 1.646 2.733 3.490 13.362 15.507 20.090 21.955 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 | 1 | 0.000 | 0.004 | 0.016 | 2.706 | 3.841 | 6.635 | 7.879 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 2 | 0.020 | 0.103 | 0.211 | 4.605 | 5.991 | 9.210 | 10.597 |
| 5 0.554 1.145 1.610 9.236 11.070 15.086 16.750 6 0.872 1.635 2.204 10.645 12.592 16.812 18.548 7 1.239 2.167 2.833 12.017 14.067 18.475 20.278 8 1.646 2.733 3.490 13.362 15.507 20.090 21.955 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 | 3 | 0.115 | 0.352 | 0.584 | 6.251 | 7.815 | 11.345 | 12.838 |
| 6 0.872 1.635 2.204 10.645 12.592 16.812 18.488 7 1.239 2.167 2.833 12.017 14.067 18.475 20.278 8 1.646 2.733 3.490 13.362 15.507 20.090 21.955 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 | 4 | 0.297 | 0.711 | 1.064 | 7.779 | 9.488 | 13.277 | 14.860 |
| 7 1.239 2.167 2.833 12.017 14.067 18.475 20.278 8 1.646 2.733 3.490 13.362 15.507 20.090 21.955 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 <tr< td=""><td>5</td><td>0.554</td><td>1.145</td><td>1.610</td><td>9.236</td><td>11.070</td><td>15.086</td><td>16.750</td></tr<> | 5 | 0.554 | 1.145 | 1.610 | 9.236 | 11.070 | 15.086 | 16.750 |
| 8 1.646 2.733 3.490 13.362 15.507 20.090 21.955 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 < | 6 | 0.872 | 1.635 | 2.204 | 10.645 | 12.592 | 16.812 | 18.548 |
| 9 2.088 3.325 4.168 14.684 16.919 21.666 23.589 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191< | 7 | 1.239 | 2.167 | 2.833 | 12.017 | 14.067 | 18.475 | 20.278 |
| 10 2.558 3.940 4.865 15.987 18.307 23.209 25.188 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 | 8 | 1.646 | 2.733 | 3.490 | 13.362 | 15.507 | 20.090 | 21.955 |
| 11 3.053 4.575 5.578 17.275 19.675 24.725 26.757 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 <td>9</td> <td>2.088</td> <td>3.325</td> <td>4.168</td> <td>14.684</td> <td>16.919</td> <td>21.666</td> <td>23.589</td> | 9 | 2.088 | 3.325 | 4.168 | 14.684 | 16.919 | 21.666 | 23.589 |
| 12 3.571 5.226 6.304 18.549 21.026 26.217 28.300 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 </td <td>10</td> <td>2.558</td> <td>3.940</td> <td>4.865</td> <td>15.987</td> <td>18.307</td> <td>23.209</td> <td>25.188</td> | 10 | 2.558 | 3.940 | 4.865 | 15.987 | 18.307 | 23.209 | 25.188 |
| 13 4.107 5.892 7.042 19.812 22.362 27.688 29.819 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 | 11 | 3.053 | 4.575 | 5.578 | 17.275 | 19.675 | 24.725 | 26.757 |
| 14 4.660 6.571 7.790 21.064 23.685 29.141 31.319 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 | 12 | 3.571 | 5.226 | 6.304 | 18.549 | 21.026 | 26.217 | 28.300 |
| 15 5.229 7.261 8.547 22.307 24.996 30.578 32.801 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 <td>13</td> <td>4.107</td> <td>5.892</td> <td>7.042</td> <td>19.812</td> <td>22.362</td> <td>27.688</td> <td>29.819</td> | 13 | 4.107 | 5.892 | 7.042 | 19.812 | 22.362 | 27.688 | 29.819 |
| 16 5.812 7.962 9.312 23.542 26.296 32.000 34.267 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928< | 14 | 4.660 | 6.571 | 7.790 | 21.064 | 23.685 | 29.141 | 31.319 |
| 17 6.408 8.672 10.085 24.769 27.587 33.409 35.718 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113< | 15 | 5.229 | 7.261 | 8.547 | 22.307 | 24.996 | 30.578 | 32.801 |
| 18 7.015 9.390 10.865 25.989 28.869 34.805 37.156 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.33 | 16 | 5.812 | 7.962 | 9.312 | 23.542 | 26.296 | 32.000 | 34.267 |
| 19 7.633 10.117 11.651 27.204 30.144 36.191 38.582 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42. | 17 | 6.408 | 8.672 | 10.085 | 24.769 | 27.587 | 33.409 | 35.718 |
| 20 8.260 10.851 12.443 28.412 31.410 37.566 39.997 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43 | 18 | 7.015 | 9.390 | 10.865 | 25.989 | 28.869 | 34.805 | 37.156 |
| 21 8.897 11.591 13.240 29.615 32.671 38.932 41.401 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 19 | 7.633 | 10.117 | 11.651 | 27.204 | 30.144 | 36.191 | 38.582 |
| 22 9.542 12.338 14.041 30.813 33.924 40.289 42.796 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 20 | 8.260 | 10.851 | 12.443 | 28.412 | 31.410 | 37.566 | 39.997 |
| 23 10.196 13.091 14.848 32.007 35.172 41.638 44.181 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 21 | 8.897 | 11.591 | 13.240 | 29.615 | 32.671 | 38.932 | 41.401 |
| 24 10.856 13.848 15.659 33.196 36.415 42.980 45.559 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 22 | 9.542 | 12.338 | 14.041 | 30.813 | 33.924 | 40.289 | 42.796 |
| 25 11.524 14.611 16.473 34.382 37.652 44.314 46.928 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 23 | 10.196 | 13.091 | 14.848 | 32.007 | 35.172 | 41.638 | 44.181 |
| 26 12.198 15.379 17.292 35.563 38.885 45.642 48.290 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 24 | 10.856 | 13.848 | 15.659 | 33.196 | 36.415 | 42.980 | 45.559 |
| 27 12.879 16.151 18.114 36.741 40.113 46.963 49.645 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | | 11.524 | 14.611 | | 34.382 | 37.652 | 44.314 | 46.928 |
| 28 13.565 16.928 18.939 37.916 41.337 48.278 50.993 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 26 | 12.198 | 15.379 | 17.292 | 35.563 | 38.885 | 45.642 | 48.290 |
| 29 14.256 17.708 19.768 39.087 42.557 49.588 52.336 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 27 | 12.879 | 16.151 | 18.114 | 36.741 | 40.113 | 46.963 | 49.645 |
| 30 14.953 18.493 20.599 40.256 43.773 50.892 53.672 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 28 | 13.565 | 16.928 | 18.939 | 37.916 | 41.337 | 48.278 | 50.993 |
| 40 22.164 26.509 29.051 51.805 55.758 63.691 66.766 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 29 | 14.256 | 17.708 | 19.768 | 39.087 | 42.557 | 49.588 | 52.336 |
| 50 29.707 34.764 37.689 63.167 67.505 76.154 79.490 | 30 | 14.953 | 18.493 | 20.599 | 40.256 | 43.773 | 50.892 | 53.672 |
| | 40 | 22.164 | 26.509 | 29.051 | 51.805 | 55.758 | 63.691 | 66.766 |
| 60 37.485 43.188 46.459 74.397 79.082 88.379 91.952 | 50 | 29.707 | 34.764 | 37.689 | 63.167 | 67.505 | 76.154 | 79.490 |
| | _60 | 37.485 | 43.188 | 46.459 | 74.397 | 79.082 | 88.379 | 91.952 |

Interpretation: α bezeichnet die Wahrscheinlichkeit bei Gültigkeit der Nullhypothese einen größeren Wert vorzufinden als den angegebenen, und q sind die Freiheitsgrade einer $\chi^2_{(q)}$ -verteilten Zufallsvariablen.

Beispiel: Für einen Test mit einem Signifikanzniveau von 5% ($\alpha=0.05$) und 5 Freiheitsgraden (q=5) ist der kritische Wert $\chi^2_c=11.07$. Das heißt, $P(\chi^2_{(5)}>11.07)=0.05$.



Quelle: Diese Tabelle wurde mit der EViews-Funktion @qchisq erzeugt.