

# LAMPIRAN

## LAMPIRAN I

Data Harga Penutupan Saham Harian Microsoft Corporation (MSFT)

Periode 1 Desember 2017 Sampai Dengan 26 Januari 2018

( Data Saham Dalam Bentuk Dolar )

<b>Nama Perusahaan</b>	<b>Tanggal</b>	<b>Harga Penutupan</b>	<b>tingkat pengembalian Ln(Pt/Pt-1)</b>
MSFT	1-Dec-17	84.26	
MSFT	4-Dec-17	81.08	-0.0385
MSFT	5-Dec-17	81.59	0.0063
MSFT	6-Dec-17	82.78	0.0145
MSFT	7-Dec-17	82.49	-0.0035
MSFT	<b>8-Dec-17</b>	<b>84.16</b>	0.0200
MSFT	11-Dec-17	85.23	0.0126
MSFT	12-Dec-17	85.58	0.0041
MSFT	13-Dec-17	85.35	-0.0027
MSFT	14-Dec-17	84.69	-0.0078
MSFT	<b>15-Dec-17</b>	<b>86.85</b>	0.0252
MSFT	18-Dec-17	86.38	-0.0054
MSFT	19-Dec-17	85.83	-0.0064
MSFT	20-Dec-17	85.52	-0.0036
MSFT	21-Dec-17	85.50	-0.0002
MSFT	<b>22-Dec-17</b>	<b>85.51</b>	0.0001
MSFT	26-Dec-17	85.40	-0.0013
MSFT	27-Dec-17	85.71	0.0036
MSFT	28-Dec-17	85.72	0.0001
MSFT	<b>29-Dec-17</b>	<b>85.54</b>	-0.0021

MSFT	2-Jan-18	85.95	0.0048
MSFT	3-Jan-18	86.35	0.0046
MSFT	4-Jan-18	87.11	0.0088
MSFT	<b>5-Jan-18</b>	<b>88.19</b>	0.0123
MSFT	8-Jan-18	88.28	0.0010
MSFT	9-Jan-18	88.22	-0.0007
MSFT	10-Jan-18	87.82	-0.0045
MSFT	11-Jan-18	88.08	0.0030
MSFT	<b>12-Jan-18</b>	<b>89.60</b>	0.0171
MSFT	16-Jan-18	88.35	-0.0140
MSFT	17-Jan-18	90.14	0.0201
MSFT	18-Jan-18	90.10	-0.0004
MSFT	<b>19-Jan-18</b>	<b>90.00</b>	-0.0011
MSFT	22-Jan-18	91.61	0.0177
MSFT	23-Jan-18	91.73	0.0013
MSFT	24-Jan-18	91.82	0.0010
MSFT	25-Jan-18	92.33	0.0055
MSFT	<b>26-Jan-18</b>	<b>94.04</b>	0.0184

## LAMPIRAN II

Data harga opsi saham Microsoft corporation (MSFT)  
Pengamatan tanggal 1 desember 2017 sampai 26 januari 2018

8 des 17		
Contract Name	Last Trade Date	Strike
CALL forDecember 8, 2017		
MSFT171208C00070000	2017-11-28 11:24AM EST	70.00
MSFT171208C00071500	2017-11-02 1:23PM EST	71.50
MSFT171208C00072500	2017-11-30 3:50PM EST	72.50
MSFT171208C00073000	2017-12-01 11:52PM EST	73.00
MSFT171208C00073500	2017-11-30 3:50PM EST	73.50
MSFT171208C00074000	2017-12-05 1:53PM EST	74.00
MSFT171208C00074500	2017-12-04 1:29PM EST	74.50
MSFT171208C00075000	2017-12-05 9:58AM EST	75.00
MSFT171208C00075500	2017-12-05 9:54AM EST	75.50
MSFT171208C00076000	2017-12-04 9:45AM EST	76.00
MSFT171208C00076500	2017-12-01 12:37PM EST	76.50
MSFT171208C00077000	<b>2017-12-07 3:11PM EST</b>	<b>77.00</b>
MSFT171208C00077500	2017-12-06 11:44AM EST	77.50
MSFT171208C00078000	2017-12-06 3:59PM EST	78.00
MSFT171208C00078500	<b>2017-12-07 2:56PM EST</b>	<b>78.50</b>
MSFT171208C00079000	<b>2017-12-07 3:11PM EST</b>	<b>79.00</b>
MSFT171208C00079500	<b>2017-12-07 2:36PM EST</b>	<b>79.50</b>
MSFT171208C00080000	<b>2017-12-07 3:37PM EST</b>	<b>80.00</b>
MSFT171208C00080500	<b>2017-12-07 3:45PM EST</b>	<b>80.50</b>
MSFT171208C00081000	<b>2017-12-07 3:59PM EST</b>	<b>81.00</b>

MSFT171208C00081500	2017-12-07 1:22PM EST	81.50
MSFT171208C00082000	2017-12-07 3:56PM EST	82.00
MSFT171208C00082500	2017-12-07 3:59PM EST	82.50
MSFT171208C00083000	2017-12-07 3:59PM EST	83.00
MSFT171208C00083500	2017-12-07 3:59PM EST	83.50
MSFT171208C00084000	2017-12-07 3:56PM EST	84.00
MSFT171208C00084500	2017-12-07 2:06PM EST	84.50
MSFT171208C00085000	2017-12-07 3:57PM EST	85.00
MSFT171208C00085500	2017-12-07 2:55PM EST	85.50
MSFT171208C00086000	2017-12-07 11:48AM EST	86.00
MSFT171208C00086500	2017-12-07 11:32AM EST	86.50
MSFT171208C00087000	2017-12-04 3:53PM EST	87.00
MSFT171208C00087500	2017-12-06 11:01AM EST	87.50
MSFT171208C00088000	2017-12-04 3:30PM EST	88.00
MSFT171208C00088500	2017-11-28 10:03AM EST	88.50
MSFT171208C00089000	2017-11-03 10:51PM EST	89.00
MSFT171208C00090000	2017-12-04 3:57PM EST	90.00
MSFT171208C00091000	2017-11-30 10:53AM EST	91.00
MSFT171208C00091500	2017-11-17 11:59PM EST	91.50
MSFT171208C00095000	2017-11-01 12:35PM EST	95.00
<b>PutsforDecember 8, 2017</b>		
Contract Name	Last Trade Date	Strike
MSFT171208P00065000	2017-10-31 11:10AM EST	65.00
MSFT171208P00070000	2017-11-17 11:44PM EST	70.00
MSFT171208P00071500	2017-12-04 3:57PM EST	71.50
MSFT171208P00072000	2017-11-17 11:44PM EST	72.00
MSFT171208P00072500	2017-11-17 10:33AM EST	72.50

MSFT171208P00073000	2017-12-06 10:31AM EST	73.00
MSFT171208P00073500	2017-11-03 2:07PM EST	73.50
MSFT171208P00074000	2017-11-30 10:10AM EST	74.00
MSFT171208P00074500	2017-12-05 9:50AM EST	74.50
MSFT171208P00075000	2017-12-05 3:18PM EST	75.00
MSFT171208P00075500	2017-12-04 3:20PM EST	75.50
MSFT171208P00076000	<b>2017-12-07 10:35AM EST</b>	<b>76.00</b>
MSFT171208P00076500	2017-11-29 9:32AM EST	76.50
MSFT171208P00077000	<b>2017-12-07 11:17AM EST</b>	<b>77.00</b>
MSFT171208P00077500	<b>2017-12-07 10:30AM EST</b>	<b>77.50</b>
MSFT171208P00078000	<b>2017-12-07 3:07PM EST</b>	<b>78.00</b>
MSFT171208P00078500	<b>2017-12-07 1:37PM EST</b>	<b>78.50</b>
MSFT171208P00079000	<b>2017-12-07 11:03AM EST</b>	<b>79.00</b>
MSFT171208P00079500	<b>2017-12-07 2:10PM EST</b>	<b>79.50</b>
MSFT171208P00080000	<b>2017-12-07 3:45PM EST</b>	<b>80.00</b>
MSFT171208P00080500	<b>2017-12-07 2:58PM EST</b>	<b>80.50</b>
MSFT171208P00081000	<b>2017-12-07 3:59PM EST</b>	<b>81.00</b>
MSFT171208P00081500	<b>2017-12-07 3:51PM EST</b>	<b>81.50</b>
MSFT171208P00082000	<b>2017-12-07 3:59PM EST</b>	<b>82.00</b>
MSFT171208P00082500	<b>2017-12-07 3:59PM EST</b>	<b>82.50</b>
MSFT171208P00083000	<b>2017-12-07 3:36PM EST</b>	<b>83.00</b>
MSFT171208P00083500	<b>2017-12-07 2:31PM EST</b>	<b>83.50</b>
MSFT171208P00084000	<b>2017-12-07 3:59PM EST</b>	<b>84.00</b>
MSFT171208P00084500	<b>2017-12-07 3:53PM EST</b>	<b>84.50</b>
MSFT171208P00085000	<b>2017-12-07 3:56PM EST</b>	<b>85.00</b>
MSFT171208P00085500	<b>2017-12-07 2:23PM EST</b>	<b>85.50</b>
MSFT171208P00086000	<b>2017-12-07 3:59PM EST</b>	<b>86.00</b>

MSFT171208P00086500	<b>2017-12-07 1:00PM EST</b>	<b>86.50</b>
MSFT171208P00087000	<b>2017-12-07 10:59AM EST</b>	<b>87.00</b>
MSFT171208P00087500	2017-12-01 1:31PM EST	87.50
MSFT171208P00088000	2017-12-04 10:47AM EST	88.00
MSFT171208P00088500	2017-12-04 10:47AM EST	88.50
MSFT171208P00089000	2017-12-01 10:25AM EST	89.00
MSFT171208P00090000	2017-12-04 9:50AM EST	90.00
MSFT171208P00091000	2017-12-05 9:47AM EST	91.00
MSFT171208P00091500	2017-11-29 4:35PM EST	91.50
MSFT171208P00092000	2017-12-04 4:32PM EST	92.00
MSFT171208P00094000	2017-11-29 4:35PM EST	94.00
MSFT171208P00095000	2017-11-29 4:35PM EST	95.00
MSFT171208P00110000	2017-11-16 1:57PM EST	110.00
MSFT171208P00125000	2017-11-03 10:52PM EST	125.00

## 15 des 17

<b>Contract Name</b>	<b>Last Trade Date</b>	<b>Strike</b>
CALL for December 15, 2017		
MSFT171215C00042500	2017-11-16 1:22PM EST	42.50
MSFT171215C00045000	2017-11-16 1:22PM EST	45.00
MSFT171215C00047500	2017-11-14 2:27PM EST	47.50
MSFT171215C00050000	2017-11-30 3:55PM EST	50.00
MSFT171215C00055000	2017-11-14 3:55PM EST	55.00
MSFT171215C00060000	<b>2017-12-12 1:31PM EST</b>	<b>60.00</b>
MSFT171215C00062500	2017-11-17 3:49PM EST	62.50
MSFT171215C00065000	<b>2017-12-12 9:30AM EST</b>	<b>65.00</b>

MSFT171215C00067500	2017-12-06 10:30AM EST	67.50
MSFT171215C00070000	<b>2017-12-12 2:55PM EST</b>	<b>70.00</b>
MSFT171215C00071000	<b>2017-12-04 1:19PM EST</b>	<b>71.00</b>
MSFT171215C00072500	<b>2017-12-12 3:40PM EST</b>	<b>72.50</b>
MSFT171215C00073000	2017-11-24 12:49PM EST	73.00
MSFT171215C00073500	<b>2017-12-12 10:45AM EST</b>	<b>73.50</b>
MSFT171215C00074000	2017-12-04 4:32PM EST	74.00
MSFT171215C00074500	2017-12-01 11:52PM EST	74.50
MSFT171215C00075000	<b>2017-12-12 10:58AM EST</b>	<b>75.00</b>
MSFT171215C00075500	2017-12-08 10:00AM EST	75.50
MSFT171215C00076000	2017-11-29 4:35PM EST	76.00
MSFT171215C00076500	2017-11-29 4:35PM EST	76.50
MSFT171215C00077000	2017-12-06 9:50AM EST	77.00
MSFT171215C00077500	<b>2017-12-12 10:41AM EST</b>	<b>77.50</b>
MSFT171215C00078000	2017-12-07 11:27AM EST	78.00
MSFT171215C00078500	2017-12-07 10:12AM EST	78.50
MSFT171215C00079000	2017-12-08 10:03AM EST	79.00
MSFT171215C00079500	<b>2017-12-12 3:50PM EST</b>	<b>79.50</b>
MSFT171215C00080000	<b>2017-12-12 3:56PM EST</b>	<b>80.00</b>
MSFT171215C00080500	<b>2017-12-12 3:59PM EST</b>	<b>80.50</b>
MSFT171215C00081000	<b>2017-12-12 3:50PM EST</b>	<b>81.00</b>
MSFT171215C00081500	<b>2017-12-12 3:59PM EST</b>	<b>81.50</b>
MSFT171215C00082000	<b>2017-12-12 2:57PM EST</b>	<b>82.00</b>
MSFT171215C00082500	<b>2017-12-12 3:57PM EST</b>	<b>82.50</b>
MSFT171215C00083000	<b>2017-12-12 3:50PM EST</b>	<b>83.00</b>
MSFT171215C00083500	<b>2017-12-12 3:59PM EST</b>	<b>83.50</b>



MSFT171215C00084000	2017-12-12 3:40PM EST	84.00
MSFT171215C00084500	2017-12-12 3:49PM EST	84.50
MSFT171215C00085000	2017-12-12 3:58PM EST	85.00
MSFT171215C00085500	2017-12-12 3:59PM EST	85.50
MSFT171215C00086000	2017-12-12 3:58PM EST	86.00
MSFT171215C00086500	2017-12-12 3:59PM EST	86.50
MSFT171215C00087000	2017-12-12 2:15PM EST	87.00
MSFT171215C00087500	2017-12-12 3:09PM EST	87.50
MSFT171215C00088000	2017-12-12 2:53PM EST	88.00
MSFT171215C00088500	2017-12-06 10:00AM EST	88.50
MSFT171215C00089000	2017-12-08 9:30AM EST	89.00
MSFT171215C00089500	2017-12-11 3:18PM EST	89.50
MSFT171215C00090000	2017-12-12 1:56PM EST	90.00
MSFT171215C00090500	2017-12-08 11:51PM EST	90.50
MSFT171215C00091000	2017-12-01 10:06AM EST	91.00
MSFT171215C00091500	2017-12-05 10:55AM EST	91.50
MSFT171215C00092500	2017-11-30 10:09AM EST	92.50
MSFT171215C00095000	2017-11-22 11:34AM EST	95.00
MSFT171215C00100000	2017-11-24 9:44AM EST	100.00
MSFT171215C00110000	2017-11-03 10:51PM EST	110.00
PutsforDecember 15, 2017		
Contract Name	Last Trade Date	Strike
MSFT171215P00042500	2017-10-19 11:06AM EST	42.50
MSFT171215P00045000	2017-10-03 10:51AM EST	45.00
MSFT171215P00047500	2017-10-27 12:05PM EST	47.50
MSFT171215P00050000	2017-10-27 12:17PM EST	50.00
MSFT171215P00055000	2017-11-09 10:59AM EST	55.00

MSFT171215P00060000	2017-12-11 12:03PM EST	60.00
MSFT171215P00062500	2017-12-11 3:08PM EST	62.50
MSFT171215P00065000	2017-11-27 10:36AM EST	65.00
MSFT171215P00067500	2017-12-04 9:57AM EST	67.50
MSFT171215P00069000	2017-11-24 12:49PM EST	69.00
MSFT171215P00070000	2017-12-07 3:07PM EST	70.00
MSFT171215P00071000	2017-12-07 6:50PM EST	71.00
MSFT171215P00071500	2017-12-11 11:31AM EST	71.50
MSFT171215P00072000	2017-12-08 11:25AM EST	72.00
MSFT171215P00072500	2017-12-08 2:51PM EST	72.50
MSFT171215P00073000	2017-12-04 11:11AM EST	73.00
MSFT171215P00074000	2017-12-05 1:42PM EST	74.00
MSFT171215P00074500	2017-11-27 2:45PM EST	74.50
MSFT171215P00075000	<b>2017-12-12 2:28PM EST</b>	<b>75.00</b>
MSFT171215P00075500	2017-12-04 2:37PM EST	75.50
MSFT171215P00076000	2017-12-08 3:59PM EST	76.00
MSFT171215P00076500	2017-12-11 10:12AM EST	76.50
MSFT171215P00077000	<b>2017-12-12 9:30AM EST</b>	<b>77.00</b>
MSFT171215P00077500	<b>2017-12-12 1:56PM EST</b>	<b>77.50</b>
MSFT171215P00078000	2017-12-11 10:10AM EST	78.00
MSFT171215P00078500	2017-12-11 10:42AM EST	78.50
MSFT171215P00079000	<b>2017-12-12 3:57PM EST</b>	<b>79.00</b>
MSFT171215P00079500	<b>2017-12-12 10:03AM EST</b>	<b>79.50</b>
MSFT171215P00080000	<b>2017-12-12 3:50PM EST</b>	<b>80.00</b>
MSFT171215P00080500	<b>2017-12-12 9:31AM EST</b>	<b>80.50</b>
MSFT171215P00081000	<b>2017-12-12 2:28PM EST</b>	<b>81.00</b>

MSFT171215P00081500	2017-12-12 12:16PM EST	81.50
MSFT171215P00082000	2017-12-12 2:38PM EST	82.00
MSFT171215P00082500	2017-12-12 3:43PM EST	82.50
MSFT171215P00083000	2017-12-12 3:54PM EST	83.00
MSFT171215P00083500	2017-12-12 3:54PM EST	83.50
MSFT171215P00084000	2017-12-12 3:59PM EST	84.00
MSFT171215P00084500	2017-12-12 3:59PM EST	84.50
MSFT171215P00085000	2017-12-12 3:57PM EST	85.00
MSFT171215P00085500	2017-12-12 3:59PM EST	85.50
MSFT171215P00086000	2017-12-12 3:56PM EST	86.00
MSFT171215P00086500	2017-12-12 3:50PM EST	86.50
MSFT171215P00087000	2017-12-12 11:56AM EST	87.00
MSFT171215P00087500	2017-12-12 3:50PM EST	87.50
MSFT171215P00088000	2017-12-12 3:50PM EST	88.00
MSFT171215P00088500	2017-12-12 3:50PM EST	88.50
MSFT171215P00089000	2017-12-12 3:51PM EST	89.00
MSFT171215P00090000	2017-12-12 2:57PM EST	90.00
MSFT171215P00090500	2017-12-08 10:14AM EST	90.50
MSFT171215P00091000	2017-12-13 1:08AM EST	91.00
MSFT171215P00091500	2017-12-08 10:14AM EST	91.50
MSFT171215P00092000	2017-12-13 1:08AM EST	92.00
MSFT171215P00092500	2017-11-14 11:52AM EST	92.50
MSFT171215P00095000	2017-11-14 11:51AM EST	95.00
MSFT171215P00100000	2017-12-08 2:33PM EST	100.00
MSFT171215P00105000	2017-10-30 12:53PM EST	105.00

## 22 des 17

Contract Name	Last Trade Date	Strike
CALL for December 22, 2017		
MSFT171222C00060000	<b>2017-12-07 10:39AM EST</b>	<b>60.00</b>
MSFT171222C00075000	2017-12-01 3:47PM EST	75.00
MSFT171222C00076000	2017-12-01 11:52PM EST	76.00
MSFT171222C00077000	2017-11-14 9:44AM EST	77.00
MSFT171222C00077500	2017-12-05 2:29PM EST	77.50
MSFT171222C00078000	2017-12-04 11:02AM EST	78.00
MSFT171222C00078500	2017-11-20 1:16PM EST	78.50
MSFT171222C00079000	<b>2017-12-07 6:50PM EST</b>	<b>79.00</b>
MSFT171222C00079500	2017-12-06 10:29AM EST	79.50
MSFT171222C00080000	<b>2017-12-07 3:45PM EST</b>	<b>80.00</b>
MSFT171222C00080500	<b>2017-12-07 2:17PM EST</b>	<b>80.50</b>
MSFT171222C00081000	<b>2017-12-07 11:59AM EST</b>	<b>81.00</b>
MSFT171222C00081500	<b>2017-12-07 9:59AM EST</b>	<b>81.50</b>
MSFT171222C00082000	<b>2017-12-07 2:40PM EST</b>	<b>82.00</b>
MSFT171222C00082500	<b>2017-12-07 3:50PM EST</b>	<b>82.50</b>
MSFT171222C00083000	<b>2017-12-07 3:58PM EST</b>	<b>83.00</b>
MSFT171222C00083500	<b>2017-12-07 1:47PM EST</b>	<b>83.50</b>
MSFT171222C00084000	<b>2017-12-07 3:45PM EST</b>	<b>84.00</b>
MSFT171222C00084500	<b>2017-12-07 3:15PM EST</b>	<b>84.50</b>
MSFT171222C00085000	<b>2017-12-07 3:57PM EST</b>	<b>85.00</b>
MSFT171222C00085500	<b>2017-12-07 1:52PM EST</b>	<b>85.50</b>
MSFT171222C00086000	<b>2017-12-07 11:36AM EST</b>	<b>86.00</b>
MSFT171222C00086500	<b>2017-12-07 10:38AM EST</b>	<b>86.50</b>
MSFT171222C00087000	<b>2017-12-07 9:30AM EST</b>	<b>87.00</b>

MSFT171222C00087500	<b>2017-12-07 11:02AM EST</b>	<b>87.50</b>
MSFT171222C00088000	<b>2017-12-07 11:40AM EST</b>	<b>88.00</b>
MSFT171222C00088500	<b>2017-12-07 11:40AM EST</b>	<b>88.50</b>
MSFT171222C00089000	2017-12-05 1:20PM EST	89.00
MSFT171222C00089500	<b>2017-12-07 10:53AM EST</b>	<b>89.50</b>
MSFT171222C00090000	2017-12-04 10:23AM EST	90.00
MSFT171222C00091000	2017-12-06 3:46PM EST	91.00
MSFT171222C00091500	2017-12-06 1:34PM EST	91.50
MSFT171222C00095000	2017-11-21 9:36AM EST	95.00
MSFT171222C00100000	2017-11-14 11:21AM EST	100.00
MSFT171222C00110000	2017-11-03 10:51PM EST	110.00
PutsforDecember 22, 2017		
Contract Name	Last Trade Date	Strike
MSFT171222P00060000	2017-11-14 3:37PM EST	60.00
MSFT171222P00065000	2017-12-06 1:18PM EST	65.00
MSFT171222P00070000	2017-12-06 12:57PM EST	70.00
MSFT171222P00075000	<b>2017-12-07 3:36PM EST</b>	<b>75.00</b>
MSFT171222P00076000	2017-12-07 3:45PM EST	76.00
MSFT171222P00076500	2017-12-06 12:43PM EST	76.50
MSFT171222P00077000	2017-12-06 9:55AM EST	77.00
MSFT171222P00077500	2017-12-06 12:15PM EST	77.50
MSFT171222P00078000	<b>2017-12-07 1:27PM EST</b>	<b>78.00</b>
MSFT171222P00078500	<b>2017-12-07 10:59AM EST</b>	<b>78.50</b>
MSFT171222P00079000	<b>2017-12-07 1:41PM EST</b>	<b>79.00</b>
MSFT171222P00079500	<b>2017-12-07 3:45PM EST</b>	<b>79.50</b>
MSFT171222P00080000	<b>2017-12-07 3:36PM EST</b>	<b>80.00</b>
MSFT171222P00080500	<b>2017-12-07 12:18PM EST</b>	<b>80.50</b>

MSFT171222P00081000	<b>2017-12-07 3:01PM EST</b>	<b>81.00</b>
MSFT171222P00081500	<b>2017-12-07 11:36AM EST</b>	<b>81.50</b>
MSFT171222P00082000	<b>2017-12-07 3:21PM EST</b>	<b>82.00</b>
MSFT171222P00082500	<b>2017-12-07 12:38PM EST</b>	<b>82.50</b>
MSFT171222P00083000	<b>2017-12-07 11:37AM EST</b>	<b>83.00</b>
MSFT171222P00083500	<b>2017-12-07 1:13PM EST</b>	<b>83.50</b>
MSFT171222P00084000	<b>2017-12-07 3:45PM EST</b>	<b>84.00</b>
MSFT171222P00084500	<b>2017-12-07 10:53AM EST</b>	<b>84.50</b>
MSFT171222P00085000	2017-12-05 10:17AM EST	85.00
MSFT171222P00085500	2017-12-01 11:52PM EST	85.50
MSFT171222P00086000	<b>2017-12-07 10:53AM EST</b>	<b>86.00</b>
MSFT171222P00086500	2017-12-01 11:52PM EST	86.50
MSFT171222P00087000	2017-12-01 1:25PM EST	87.00
MSFT171222P00087500	2017-12-04 4:32PM EST	87.50
MSFT171222P00088000	2017-12-04 11:25AM EST	88.00
MSFT171222P00088500	2017-11-15 9:35AM EST	88.50
MSFT171222P00089000	<b>2017-12-05 3:14PM EST</b>	<b>89.00</b>
MSFT171222P00091000	2017-11-17 11:44PM EST	91.00

## 29 des 17

Contract Name	Last Trade Date	Strike
CALL for December 29, 2017		
MSFT171229C00070000	2017-12-22 11:53PM EST	70
MSFT171229C00072500	2017-12-22 11:53PM EST	72.5
MSFT171229C00073000	2017-12-22 11:53PM EST	73
MSFT171229C00073500	2017-12-22 11:53PM EST	73.5
MSFT171229C00075000	<b>2017-12-28 3:46PM EST</b>	<b>75</b>
MSFT171229C00076000	2017-12-19 9:48AM EST	76
MSFT171229C00076500	2017-12-21 9:35AM EST	76.5
MSFT171229C00077000	2017-12-22 11:53PM EST	77
MSFT171229C00077500	2017-12-27 1:45PM EST	77.5
MSFT171229C00078000	<b>2017-12-28 12:51PM EST</b>	<b>78</b>
MSFT171229C00078500	<b>2017-12-28 10:10AM EST</b>	<b>78.5</b>
MSFT171229C00079000	2017-12-21 9:35AM EST	79
MSFT171229C00079500	2017-12-21 9:39AM EST	79.5
MSFT171229C00080000	<b>2017-12-28 11:47AM EST</b>	<b>80</b>
MSFT171229C00080500	<b>2017-12-28 11:29AM EST</b>	<b>80.5</b>
MSFT171229C00081000	<b>2017-12-28 3:15PM EST</b>	<b>81</b>
MSFT171229C00081500	2017-12-22 3:07PM EST	81.5
MSFT171229C00082000	<b>2017-12-28 2:01PM EST</b>	<b>82</b>
MSFT171229C00082500	<b>2017-12-28 3:52PM EST</b>	<b>82.5</b>
MSFT171229C00083000	<b>2017-12-28 3:44PM EST</b>	<b>83</b>
MSFT171229C00083500	<b>2017-12-28 3:50PM EST</b>	<b>83.5</b>
MSFT171229C00084000	<b>2017-12-28 3:50PM EST</b>	<b>84</b>
MSFT171229C00084500	<b>2017-12-28 3:47PM EST</b>	<b>84.5</b>

MSFT171229C00085000	<b>2017-12-28 3:59PM EST</b>	<b>85</b>
MSFT171229C00085500	<b>2017-12-28 3:52PM EST</b>	<b>85.5</b>
MSFT171229C00086000	<b>2017-12-28 3:59PM EST</b>	<b>86</b>
MSFT171229C00086500	<b>2017-12-28 3:59PM EST</b>	<b>86.5</b>
MSFT171229C00087000	<b>2017-12-28 3:50PM EST</b>	<b>87</b>
MSFT171229C00087500	<b>2017-12-28 3:47PM EST</b>	<b>87.5</b>
MSFT171229C00088000	<b>2017-12-28 11:26AM EST</b>	<b>88</b>
MSFT171229C00088500	2017-12-22 3:55PM EST	88.5
MSFT171229C00089000	2017-12-27 1:48PM EST	89
MSFT171229C00089500	2017-12-19 3:21PM EST	89.5
MSFT171229C00090000	<b>2017-12-28 11:00AM EST</b>	<b>90</b>
MSFT171229C00090500	2017-12-20 11:58AM EST	90.5
MSFT171229C00091000	2017-12-15 3:43PM EST	91
MSFT171229C00091500	2017-12-19 10:46AM EST	91.5
MSFT171229C00092500	2017-12-15 11:33AM EST	92.5
MSFT171229C00095000	2017-12-15 9:30AM EST	95
PutsforDecember 29, 2017		
<b>Contract Name</b>	<b>Last Trade Date</b>	<b>Strike</b>
MSFT171229P00070000	2017-12-22 11:53PM EST	70
MSFT171229P00075000	2017-12-19 12:58PM EST	75
MSFT171229P00076500	2017-12-22 11:53PM EST	76.5
MSFT171229P00077000	2017-12-22 3:10PM EST	77
MSFT171229P00077500	2017-12-27 9:38AM EST	77.5
MSFT171229P00078000	2017-12-27 3:24PM EST	78
MSFT171229P00078500	2017-12-26 1:11PM EST	78.5
MSFT171229P00079000	2017-12-27 9:32AM EST	79
MSFT171229P00079500	2017-12-26 3:43PM EST	79.5



MSFT171229P00080000	2017-12-27 1:48PM EST	80
MSFT171229P00080500	2017-12-28 12:21PM EST	80.5
MSFT171229P00081000	2017-12-22 2:16PM EST	81
MSFT171229P00081500	2017-12-27 2:55PM EST	81.5
MSFT171229P00082000	2017-12-28 10:37AM EST	82
MSFT171229P00082500	2017-12-28 3:42PM EST	82.5
MSFT171229P00083000	2017-12-28 3:44PM EST	83
MSFT171229P00083500	2017-12-28 2:49PM EST	83.5
MSFT171229P00084000	2017-12-28 10:58AM EST	84
MSFT171229P00084500	2017-12-28 3:09PM EST	84.5
MSFT171229P00085000	2017-12-28 3:59PM EST	85
MSFT171229P00085500	2017-12-28 3:56PM EST	85.5
MSFT171229P00086000	2017-12-28 3:50PM EST	86
MSFT171229P00086500	2017-12-28 3:50PM EST	86.5
MSFT171229P00087000	2017-12-28 3:50PM EST	87
MSFT171229P00087500	2017-12-28 1:00PM EST	87.5
MSFT171229P00088000	2017-12-28 11:18AM EST	88
MSFT171229P00088500	2017-12-28 3:50PM EST	88.5
MSFT171229P00089000	2017-12-28 12:09PM EST	89
MSFT171229P00089500	<b>2017-12-29 7:13AM EST</b>	<b>89.5</b>
MSFT171229P00090000	2017-12-21 3:27PM EST	90
MSFT171229P00091000	2017-12-15 11:56PM EST	91
MSFT171229P00091500	2017-12-15 11:56PM EST	91.5
MSFT171229P00092500	2017-12-12 3:50PM EST	92.5
MSFT171229P00095000	2017-12-21 11:06AM EST	95
MSFT171229P00100000	2017-12-15 11:56PM EST	100
MSFT171229P00105000	2017-12-15 11:56PM EST	105

**5-Jan-18**

<b>Contract Name</b>	<b>Last Trade Date</b>	<b>Strike</b>
CALL for Januari 5, 2018		
MSFT180105C00075000	2017-12-04 3:21PM EST	75.00
MSFT180105C00077000	2017-12-05 2:42PM EST	77.00
MSFT180105C00077500	2017-12-06 11:28AM EST	77.50
MSFT180105C00078000	2017-12-04 3:21PM EST	78.00
MSFT180105C00078500	2017-12-04 2:32PM EST	78.50
MSFT180105C00079000	2017-12-01 11:52PM EST	79.00
MSFT180105C00079500	2017-12-06 10:37AM EST	79.50
MSFT180105C00080000	2017-12-06 10:09AM EST	80.00
MSFT180105C00080500	2017-12-05 10:10AM EST	80.50
MSFT180105C00081000	2017-12-07 9:53AM EST	81.00
MSFT180105C00081500	2017-12-07 11:02AM EST	81.50
MSFT180105C00082000	2017-12-07 10:23AM EST	82.00
MSFT180105C00082500	2017-12-07 11:27AM EST	82.50
<b>MSFT180105C00083000</b>	<b>2017-12-07 3:17PM EST</b>	<b>83.00</b>
MSFT180105C00083500	2017-12-07 12:02PM EST	83.50
MSFT180105C00084000	2017-12-07 11:00AM EST	84.00
MSFT180105C00084500	2017-12-06 12:28PM EST	84.50
MSFT180105C00085000	2017-12-07 2:57PM EST	85.00
MSFT180105C00085500	2017-12-07 1:40PM EST	85.50
MSFT180105C00086000	2017-12-07 11:40AM EST	86.00
MSFT180105C00086500	2017-12-07 2:31PM EST	86.50
MSFT180105C00087000	2017-12-07 1:56PM EST	87.00
MSFT180105C00087500	2017-12-04 12:35PM EST	87.50
MSFT180105C00088000	2017-12-07 9:42AM EST	88.00

MSFT180105C00088500	2017-12-04 3:45PM EST	88.50
MSFT180105C00089000	2017-12-06 1:56PM EST	89.00
MSFT180105C00090000	2017-12-04 3:14PM EST	90.00
MSFT180105C00090500	2017-11-29 4:05PM EST	90.50
MSFT180105C00091000	2017-11-30 2:49PM EST	91.00
PutsforJanuary 5, 2018		
Contract Name	Last Trade Date	Strike
<b>MSFT180105P00075000</b>	<b>2017-12-07 3:49PM EST</b>	<b>75.00</b>
MSFT180105P00076000	2017-12-07 6:50PM EST	76.00
MSFT180105P00077000	2017-12-07 2:31PM EST	77.00
MSFT180105P00077500	2017-12-06 9:48AM EST	77.50
MSFT180105P00078000	2017-12-07 11:59AM EST	78.00
MSFT180105P00078500	2017-12-07 12:00PM EST	78.50
MSFT180105P00079000	2017-12-07 2:40PM EST	79.00
MSFT180105P00079500	2017-12-06 11:26AM EST	79.50
MSFT180105P00080000	2017-12-07 11:30AM EST	80.00
MSFT180105P00080500	2017-12-06 10:41AM EST	80.50
MSFT180105P00081000	2017-12-07 1:22PM EST	81.00
MSFT180105P00081500	2017-12-07 2:29PM EST	81.50
MSFT180105P00082000	2017-12-07 2:27PM EST	82.00
MSFT180105P00082500	2017-12-07 11:24AM EST	82.50
MSFT180105P00083000	2017-12-07 12:01PM EST	83.00
MSFT180105P00083500	2017-12-07 11:58AM EST	83.50
MSFT180105P00084000	2017-12-06 9:59AM EST	84.00
MSFT180105P00084500	2017-11-28 2:41PM EST	84.50
MSFT180105P00085000	2017-12-01 3:25PM EST	85.00
MSFT180105P00085500	2017-12-04 11:54AM EST	85.50

MSFT180105P00086000	2017-12-01 11:52PM EST	86.00
MSFT180105P00086500	2017-11-29 4:05PM EST	86.50
MSFT180105P00087000	2017-12-01 11:52PM EST	87.00
MSFT180105P00087500	2017-12-04 10:39AM EST	87.50
MSFT180105P00088000	2017-12-01 11:52PM EST	88.00
MSFT180105P00088500	2017-12-07 11:30AM EST	88.50
MSFT180105P00089000	2017-12-04 10:00AM EST	89.00
MSFT180105P00089500	2017-12-04 4:33PM EST	89.50
MSFT180105P00095000	2017-12-07 6:50PM EST	95.00

## 12-Jan-18

Contract Name	Last Trade Date	Strike
CALL for Januari 12, 2018		
<b>MSFT180112C00050000</b>	<b>2018-01-12 7:13AM EST</b>	<b>50.00</b>
MSFT180112C00070000	2018-01-08 11:01AM EST	70.00
MSFT180112C00075000	2018-01-11 12:35PM EST	75.00
MSFT180112C00076000	2018-01-02 10:37AM EST	76.00
MSFT180112C00077000	2018-01-02 10:47AM EST	77.00
MSFT180112C00077500	2017-12-15 11:56PM EST	77.50
MSFT180112C00078000	2017-12-21 10:09AM EST	78.00
MSFT180112C00078500	2018-01-08 3:28PM EST	78.50
MSFT180112C00079000	2018-01-10 9:44AM EST	79.00
MSFT180112C00079500	2017-12-19 10:43AM EST	79.50
MSFT180112C00080000	2018-01-11 3:12PM EST	80.00
MSFT180112C00080500	2018-01-02 3:53PM EST	80.50
MSFT180112C00081000	2018-01-04 11:31AM EST	81.00

MSFT180112C00081500	2018-01-11 9:35AM EST	81.50
MSFT180112C00082000	2018-01-11 3:59PM EST	82.00
MSFT180112C00082500	2018-01-05 1:39PM EST	82.50
MSFT180112C00083000	2018-01-11 12:28PM EST	83.00
MSFT180112C00083500	2018-01-11 9:52AM EST	83.50
MSFT180112C00084000	2018-01-11 2:29PM EST	84.00
MSFT180112C00084500	2018-01-11 3:13PM EST	84.50
MSFT180112C00085000	2018-01-11 3:03PM EST	85.00
MSFT180112C00085500	2018-01-11 2:01PM EST	85.50
MSFT180112C00086000	2018-01-11 3:59PM EST	86.00
MSFT180112C00086500	2018-01-11 3:59PM EST	86.50
MSFT180112C00087000	2018-01-11 3:59PM EST	87.00
MSFT180112C00087500	2018-01-11 3:59PM EST	87.50
MSFT180112C00088000	2018-01-11 3:59PM EST	88.00
MSFT180112C00088500	2018-01-11 3:58PM EST	88.50
MSFT180112C00089000	2018-01-11 3:43PM EST	89.00
MSFT180112C00089500	2018-01-11 3:22PM EST	89.50
MSFT180112C00090000	2018-01-11 1:17PM EST	90.00
MSFT180112C00090500	2018-01-10 10:34AM EST	90.50
MSFT180112C00091000	2018-01-09 2:22PM EST	91.00
MSFT180112C00092000	2018-01-11 10:19AM EST	92.00
MSFT180112C00092500	2017-12-29 3:44PM EST	92.50
MSFT180112C00094000	2018-01-12 7:13AM EST	94.00
MSFT180112C00095000	2017-12-15 11:56PM EST	95.00
MSFT180112C00100000	2018-01-05 11:48PM EST	100.00
PutsforJanuary 12, 2018		
Contract Name	Last Trade Date	Strike

MSFT180112P00070000	2018-01-04 3:18PM EST	70.00
MSFT180112P00075000	2017-12-21 9:53AM EST	75.00
MSFT180112P00077000	2018-01-10 10:48AM EST	77.00
MSFT180112P00077500	2018-01-03 10:12AM EST	77.50
MSFT180112P00078000	2018-01-02 12:29PM EST	78.00
MSFT180112P00078500	2017-12-26 9:36AM EST	78.50
MSFT180112P00079000	2018-01-10 10:28AM EST	79.00
MSFT180112P00079500	2018-01-11 3:40PM EST	79.50
MSFT180112P00080000	2018-01-05 2:30PM EST	80.00
MSFT180112P00080500	2018-01-08 11:39AM EST	80.50
MSFT180112P00081000	2018-01-09 10:28AM EST	81.00
MSFT180112P00081500	2018-01-11 3:40PM EST	81.50
MSFT180112P00082000	2018-01-11 9:31AM EST	82.00
MSFT180112P00082500	2018-01-11 1:17PM EST	82.50
MSFT180112P00083000	2018-01-11 3:37PM EST	83.00
MSFT180112P00083500	2018-01-11 3:58PM EST	83.50
MSFT180112P00084000	2018-01-11 3:36PM EST	84.00
MSFT180112P00084500	2018-01-11 2:43PM EST	84.50
MSFT180112P00085000	2018-01-11 3:59PM EST	85.00
MSFT180112P00085500	2018-01-10 1:30PM EST	85.50
MSFT180112P00086000	2018-01-11 12:28PM EST	86.00
MSFT180112P00086500	2018-01-11 3:12PM EST	86.50
MSFT180112P00087000	2018-01-11 3:58PM EST	87.00
MSFT180112P00087500	2018-01-11 3:58PM EST	87.50
MSFT180112P00088000	2018-01-11 3:59PM EST	88.00
MSFT180112P00088500	2018-01-11 3:59PM EST	88.50
MSFT180112P00089000	2018-01-11 1:44PM EST	89.00

MSFT180112P00089500	2018-01-11 3:55PM EST	89.50
MSFT180112P00090000	2018-01-11 3:55PM EST	90.00
MSFT180112P00090500	2018-01-11 3:55PM EST	90.50
<b>MSFT180112P00091000</b>	<b>2018-01-12 7:13AM EST</b>	<b>91.00</b>
MSFT180112P00092000	2018-01-05 11:48PM EST	92.00
MSFT180112P00092500	2018-01-09 9:30AM EST	92.50
MSFT180112P00095000	2018-01-10 9:53AM EST	95.00
<b>MSFT180112P00097000</b>	<b>2018-01-12 7:13AM EST</b>	<b>97.00</b>
<b>MSFT180112P00100000</b>	<b>2018-01-12 7:13AM EST</b>	<b>100.00</b>
MSFT180112P00105000	2018-01-05 11:48PM EST	105.00

## 19-Jan-18

Contract Name	Last Trade Date	Strike
CALL for Januari 19, 2018		
MSFT180119C00023000	2017-11-24 10:31AM EST	23.00
MSFT180119C00025000	2017-11-24 9:57AM EST	25.00
MSFT180119C00028000	2017-11-24 10:45AM EST	28.00
MSFT180119C00030000	2017-11-28 12:59PM EST	30.00
MSFT180119C00033000	2017-11-24 9:59AM EST	33.00
MSFT180119C00035000	<b>2017-12-12 3:31PM EST</b>	<b>35.00</b>
MSFT180119C00038000	2017-11-24 10:28AM EST	38.00
MSFT180119C00040000	<b>2017-12-11 11:56AM EST</b>	<b>40.00</b>
MSFT180119C00042000	2017-11-15 11:59AM EST	42.00
MSFT180119C00045000	<b>2017-12-11 1:11PM EST</b>	<b>45.00</b>
MSFT180119C00047000	<b>2017-12-08 1:08PM EST</b>	<b>47.00</b>
MSFT180119C00050000	<b>2017-12-12 2:09PM EST</b>	<b>50.00</b>

MSFT180119C00052500	<b>2017-12-12 9:30AM EST</b>	<b>52.50</b>
MSFT180119C00055000	<b>2017-12-12 12:56PM EST</b>	<b>55.00</b>
MSFT180119C00057500	<b>2017-12-06 10:33AM EST</b>	<b>57.50</b>
MSFT180119C00060000	<b>2017-12-12 10:00AM EST</b>	<b>60.00</b>
MSFT180119C00062500	2017-12-11 11:32AM EST	62.50
MSFT180119C00065000	<b>2017-12-12 3:15PM EST</b>	<b>65.00</b>
MSFT180119C00067500	<b>2017-12-12 2:36PM EST</b>	<b>67.50</b>
MSFT180119C00070000	<b>2017-12-12 3:31PM EST</b>	<b>70.00</b>
MSFT180119C00072500	<b>2017-12-12 2:37PM EST</b>	<b>72.50</b>
MSFT180119C00075000	<b>2017-12-12 3:47PM EST</b>	<b>75.00</b>
MSFT180119C00077500	<b>2017-12-12 3:51PM EST</b>	<b>77.50</b>
MSFT180119C00080000	<b>2017-12-12 3:59PM EST</b>	<b>80.00</b>
MSFT180119C00082500	<b>2017-12-12 3:59PM EST</b>	<b>82.50</b>
MSFT180119C00085000	<b>2017-12-12 3:59PM EST</b>	<b>85.00</b>
MSFT180119C00087500	<b>2017-12-12 3:57PM EST</b>	<b>87.50</b>
MSFT180119C00090000	<b>2017-12-12 3:51PM EST</b>	<b>90.00</b>
MSFT180119C00092500	<b>2017-12-12 3:49PM EST</b>	<b>92.50</b>
MSFT180119C00095000	<b>2017-12-12 3:19PM EST</b>	<b>95.00</b>
MSFT180119C00100000	<b>2017-12-11 3:01PM EST</b>	<b>100.00</b>
MSFT180119C00105000	<b>2017-11-27 5:18PM EST</b>	<b>105.00</b>
MSFT180119C00110000	<b>2017-12-07 10:14AM EST</b>	<b>110.00</b>
PutsforJanuary 19, 2018		
Contract Name	Last Trade Date	Strike
MSFT180119P00023000	2017-06-23 1:07PM EST	23.00
MSFT180119P00025000	2017-08-25 1:33PM EST	25.00
MSFT180119P00028000	2017-10-17 2:53PM EST	28.00
MSFT180119P00030000	2017-10-12 2:28PM EST	30.00



MSFT180119P00033000	2017-10-27 8:37AM EST	33.00
MSFT180119P00035000	2017-10-11 1:01PM EST	35.00
MSFT180119P00038000	2017-11-03 12:29PM EST	38.00
MSFT180119P00040000	2017-11-24 12:15PM EST	40.00
MSFT180119P00042000	<b>2017-12-12 10:39AM EST</b>	<b>42.00</b>
MSFT180119P00045000	<b>2017-12-07 12:41PM EST</b>	<b>45.00</b>
MSFT180119P00047000	<b>2017-12-05 2:59PM EST</b>	<b>47.00</b>
MSFT180119P00050000	<b>2017-12-04 11:02AM EST</b>	<b>50.00</b>
MSFT180119P00052500	<b>2017-12-12 2:54PM EST</b>	<b>52.50</b>
MSFT180119P00055000	<b>2017-12-12 9:31AM EST</b>	<b>55.00</b>
MSFT180119P00057500	<b>2017-12-12 9:31AM EST</b>	<b>57.50</b>
MSFT180119P00060000	<b>2017-12-12 1:26PM EST</b>	<b>60.00</b>
MSFT180119P00062500	<b>2017-12-12 2:17PM EST</b>	<b>62.50</b>
MSFT180119P00065000	<b>2017-12-12 12:18PM EST</b>	<b>65.00</b>
MSFT180119P00067500	<b>2017-12-12 3:03PM EST</b>	<b>67.50</b>
MSFT180119P00070000	<b>2017-12-12 3:50PM EST</b>	<b>70.00</b>
MSFT180119P00072500	<b>2017-12-12 2:17PM EST</b>	<b>72.50</b>
MSFT180119P00075000	<b>2017-12-12 3:57PM EST</b>	<b>75.00</b>
MSFT180119P00077500	<b>2017-12-12 3:59PM EST</b>	<b>77.50</b>
MSFT180119P00080000	<b>2017-12-12 3:59PM EST</b>	<b>80.00</b>
MSFT180119P00082500	<b>2017-12-12 3:58PM EST</b>	<b>82.50</b>
MSFT180119P00085000	<b>2017-12-12 3:50PM EST</b>	<b>85.00</b>
MSFT180119P00087500	<b>2017-12-12 3:54PM EST</b>	<b>87.50</b>

**26-Jan-18**

<b>Contract Name</b>	<b>Last Trade Date</b>	<b>Strike</b>
CALL for Januari 26, 2018		
MSFT180126C00070000	2018-01-25 3:30PM EST	70
MSFT180126C00075000	2018-01-23 11:34AM EST	75
MSFT180126C00076000	2017-12-29 1:48PM EST	76
MSFT180126C00076500	2017-12-22 11:53PM EST	76.5
MSFT180126C00077500	2018-01-25 12:42PM EST	77.5
MSFT180126C00078000	2017-12-22 11:53PM EST	78
MSFT180126C00078500	2018-01-23 12:47PM EST	78.5
MSFT180126C00079000	2018-01-24 1:18PM EST	79
MSFT180126C00079500	2018-01-16 9:52AM EST	79.5
MSFT180126C00080000	2018-01-25 12:42PM EST	80
MSFT180126C00080500	2018-01-24 12:04PM EST	80.5
MSFT180126C00081000	2018-01-16 10:36AM EST	81
MSFT180126C00081500	2018-01-24 2:09PM EST	81.5
MSFT180126C00082000	2018-01-25 3:59PM EST	82
MSFT180126C00082500	2018-01-22 3:53PM EST	82.5
MSFT180126C00083000	2018-01-25 3:58PM EST	83
MSFT180126C00083500	2018-01-25 3:58PM EST	83.5
MSFT180126C00084000	2018-01-25 11:10AM EST	84
MSFT180126C00084500	2018-01-22 3:35PM EST	84.5
MSFT180126C00085000	2018-01-25 3:57PM EST	85
MSFT180126C00085500	2018-01-25 2:38PM EST	85.5
MSFT180126C00086000	2018-01-25 3:10PM EST	86
MSFT180126C00086500	2018-01-25 3:58PM EST	86.5
MSFT180126C00087000	2018-01-25 3:10PM EST	87

MSFT180126C00087500	2018-01-25 2:47PM EST	87.5
MSFT180126C00088000	2018-01-25 3:33PM EST	88
MSFT180126C00088500	2018-01-25 3:59PM EST	88.5
MSFT180126C00089000	2018-01-25 3:58PM EST	89
MSFT180126C00089500	2018-01-25 3:59PM EST	89.5
MSFT180126C00090000	2018-01-25 3:59PM EST	90
MSFT180126C00091000	2018-01-25 3:56PM EST	91
MSFT180126C00091500	2018-01-25 3:58PM EST	91.5
MSFT180126C00092000	2018-01-25 3:58PM EST	92
MSFT180126C00092500	2018-01-25 3:59PM EST	92.5
MSFT180126C00093000	2018-01-25 3:59PM EST	93
MSFT180126C00093500	2018-01-25 3:59PM EST	93.5
MSFT180126C00094000	2018-01-25 3:47PM EST	94
MSFT180126C00095000	2018-01-25 3:39PM EST	95
MSFT180126C00096000	2018-01-25 9:30AM EST	96
MSFT180126C00096500	<b>2018-01-26 6:37AM EST</b>	<b>96.5</b>
MSFT180126C00097000	2018-01-25 2:34PM EST	97
MSFT180126C00098000	2018-01-24 1:28PM EST	98
MSFT180126C00100000	2018-01-25 9:44AM EST	100
PutsforJanuary 26, 2018		
Contract Name	Last Trade Date	Strike
MSFT180126P00070000	2018-01-03 10:35AM EST	70
MSFT180126P00075000	2018-01-05 9:33AM EST	75
MSFT180126P00076000	2018-01-04 11:23AM EST	76
MSFT180126P00076500	2018-01-08 2:21PM EST	76.5
MSFT180126P00077000	2018-01-16 9:32AM EST	77
MSFT180126P00077500	2018-01-16 2:44PM EST	77.5

MSFT180126P00078000	2018-01-16 9:40AM EST	78
MSFT180126P00078500	2018-01-16 9:31AM EST	78.5
MSFT180126P00079000	2018-01-18 10:57AM EST	79
MSFT180126P00079500	2018-01-19 11:10AM EST	79.5
MSFT180126P00080000	2018-01-25 11:17AM EST	80
MSFT180126P00080500	2018-01-10 2:54PM EST	80.5
MSFT180126P00081000	2018-01-22 10:54AM EST	81
MSFT180126P00081500	2018-01-11 3:20PM EST	81.5
MSFT180126P00082000	2018-01-22 9:34AM EST	82
MSFT180126P00082500	2018-01-19 1:02PM EST	82.5
MSFT180126P00083000	2018-01-22 9:59AM EST	83
MSFT180126P00083500	2018-01-24 1:04PM EST	83.5
MSFT180126P00084000	2018-01-25 1:15PM EST	84
MSFT180126P00084500	2018-01-25 1:08PM EST	84.5
MSFT180126P00085000	2018-01-25 11:36AM EST	85
MSFT180126P00085500	2018-01-25 11:02AM EST	85.5
MSFT180126P00086000	2018-01-25 3:05PM EST	86
MSFT180126P00086500	2018-01-23 2:16PM EST	86.5
MSFT180126P00087000	2018-01-25 1:55PM EST	87
MSFT180126P00087500	2018-01-24 10:28AM EST	87.5
MSFT180126P00088000	2018-01-25 9:44AM EST	88
MSFT180126P00088500	2018-01-25 1:20PM EST	88.5
MSFT180126P00089000	2018-01-25 3:19PM EST	89
MSFT180126P00089500	2018-01-25 3:59PM EST	89.5
MSFT180126P00090000	2018-01-25 3:35PM EST	90
MSFT180126P00091000	2018-01-25 3:57PM EST	91
MSFT180126P00091500	2018-01-25 3:54PM EST	91.5

MSFT180126P00092000	2018-01-25 3:58PM EST	92
MSFT180126P00092500	2018-01-25 3:58PM EST	92.5
MSFT180126P00093000	2018-01-25 3:32PM EST	93
MSFT180126P00093500	2018-01-25 3:18PM EST	93.5
MSFT180126P00094000	2018-01-25 3:57PM EST	94
MSFT180126P00095000	2018-01-25 3:57PM EST	95
MSFT180126P00096000	<b>2018-01-26 6:37AM EST</b>	<b>96</b>
MSFT180126P00096500	<b>2018-01-26 6:37AM EST</b>	<b>96.5</b>
MSFT180126P00097000	<b>2018-01-26 6:37AM EST</b>	<b>97</b>
MSFT180126P00100000	2018-01-12 11:58PM EST	100
MSFT180126P00101000	2018-01-19 11:58PM EST	101
MSFT180126P00102000	<b>2018-01-26 6:22AM EST</b>	<b>102</b>
MSFT180126P00105000	<b>2018-01-26 6:37AM EST</b>	<b>105</b>
MSFT180126P00110000	<b>2018-01-26 6:37AM EST</b>	<b>110</b>
MSFT180126P00130000	<b>2018-01-26 6:37AM EST</b>	<b>130</b>

### LAMPIRAN III

## Hasil perhitungan opsi call dan opsi put menggunakan metode Black Schooles

### 8 desember 2017

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	$HOJ = E(e^{rt}) - P + HOB$
P	84.16	20.85922	1.000	20.85594	1.000	5.554	-6.256
E call	81.00						
r	1.5						
t	0.02						
$\sigma$	0.0231						
e	2.71823	2.5595	0.995	2.556	0.995		
$\sigma^2$	0.0005						
E put	86.00						
Ln(P/E) call	0.0383						
Ln(P/E) put	-0.0216						

### 15 Desember 2017

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	$HOJ = E(e^{rt}) - P + HOB$
P	86.85	13.9532	1.000	13.951	1.000	3.877	-7.754
E call	85.50						
r	1.5						
t	0.02						
$\sigma$	0.01304						
e	2.71823	13.9532	1.000	13.951	1.000		
$\sigma^2$	0.00017						
E put	85.50						
Ln(P/E) call	0.0157						
Ln(P/E) put	0.0157						
$\sigma\sqrt{t}$	0.0018						

### 22 Desember 2017

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	$HOJ = E(e^{rt}) - P + HOB$
P	85.51	18.2691	1.000	18.269	1.000	4.896	-8.820
E call	83.00						
r	1.5						
t	0.02						
$\sigma$	0.0030						
e	2.71823	14.6102	1.000	14.610	1.000		
$\sigma^2$	0.000009						
E put	84.00						
Ln(P/E) call	0.0298						
Ln(P/E) put	0.0178						
$\sigma\sqrt{t}$	0.0004						

## 29 Desember 2017

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	HOI = E(e <sup>rt</sup> ) - P + HOB
P	85.54	5.7574	1.000	5.757	1.000	1.526	-0.139
E call	86.50						
r	1.5						
t	0.02						
σ	0.0025						
e	2.71823	-4.6588	0.000	-4.659	0.000		
σ <sup>2</sup>	0.000006						
E put	89.50						
Ln(P/E) call	-0.0112						
Ln(P/E) put	-0.0453						
σ√t	0.0004						

## 5 Januari 2018

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	HOI = E(e <sup>rt</sup> ) - P + HOB
P	88.19	27.697	1.000	27.697	1.000	6.901	-6.947
E call	83.00						
r	1.5						
t	0.01						
σ	0.0037						
e	2.71823	2.9602	0.998	2.960	0.998		
σ <sup>2</sup>	0.000013						
E put	90.00						
Ln(P/E) call	0.0607						
Ln(P/E) put	-0.0203						
σ√t	0.0004						

## 12 Januari 2018

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	HOI = E(e <sup>rt</sup> ) - P + HOB
P	89.60	187.3829	1.000	187.382	1.000	41.037	-51.966
E call	50.00						
r	1.5						
t	0.02						
σ	0.0083						
e	2.71823	39.9952	1.000	39.994	1.000		
σ <sup>2</sup>	1.0000						
E put	81.00						
Ln(P/E) call	0.5833						
Ln(P/E) put	0.1009						
σ√t	0.0012						

## 19 Januari 2018

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	HOJ = $E/(e^{rt}) - P + HOB$
P	90.00	45.1513	1.000	45.149	1.000	12.300	-24.599
E call	80.00						
r	1.5						
t	0.02						
$\sigma$	0.0141						
e	2.71823	45.1513	1.000	45.149	1.000	12.300	-24.599
$\sigma^2$	0.0002						
E put	80.00						
Ln(P/E) call	0.1178						
Ln(P/E) put	0.1178						
$\sigma\sqrt{t}$	0.0020						

## 26 Januari 2018

simbol	nominal	$d1 = \frac{\ln(P/E) + (r + 0.5\sigma^2)t}{\sigma\sqrt{t}}$	N(d1)	$d2 = d1 - \sigma\sqrt{t}$	N(d2)	$HOB = P[N(d1)] - \frac{E}{e^{rt}} [N(d2)]$	HOJ = $E/(e^{rt}) - P + HOB$
P	94.04	2.7058	0.997	2.705	0.997	0.750	-1.500
E call	96.05						
r	1.5						
t	0.02						
$\sigma$	0.0086						
e	2.71823	2.7058	0.997	2.705	0.997	0.750	-1.500
$\sigma^2$	0.000075						
E put	96.05						
Ln(P/E) call	-0.0211						
Ln(P/E) put	-0.0211						
$\sigma\sqrt{t}$	0.0012						



## LAMPIRAN IV

### Perhitungan opsi call dan opsi put menggunakan metode Monte Carlo Hasil S(T)

tanggal jatuh tempo	$\sigma$		strike	saham	waktu jatuh tempo	suku bunga	rt	$\sigma^2/2$	s(t)	max s(t)k call	max ks(t) put
8 des 17	0.02314	0.00054	81.00	84.16	0.02	1.5	0.03000	0.00027	7.541	610.85	648.56
15 des 17	0.01304	0.00017	85.50	86.85	0.02	jumlah simulasi	$e^{-rt}$	0.00009	7.784	665.52	665.52
22 des 17	0.00296	0.00001	83.00	85.51	0.02	50000	2.68823	0.00000	7.664	636.14	643.80
29 des 17	0.00253	0.00001	86.50	85.54	0.02	jumlah step	erorr	0.00000	7.667	663.20	686.20
5-Jan-18	0.00367	0.00001	83.00	88.19	0.01	50	2.71828	0.00001	0.000	0.00	0.00
12-Jan-18	0.00827	0.00007	50.00	89.60	0.02	e		0.00003	0.000	0.00	0.00
19-Jan-18	0.01410	0.00020	80.00	90.00	0.02	2.71823		0.00003	8.067	645.32	645.32
26-Jan-16	0.00864	0.00007	96.05	94.04	0.02			0.00004	8.429	809.57	809.57

### Hasil opsi beli dan opsi jual tanggal 8 desember 2017 sampai dengan 26 januari 2018

tanggal	$\sigma^2$	strike call	strike put	t	HOB	PUT
8 des 17	0.0005	81.00	86.00	0.02	592.80	629.39
15 des 17	0.0002	85.50	85.50	0.02	645.85	645.85
22 des 17	0.0000	83.00	84.00	0.02	617.34	624.78
29 des 17	0.0000	86.50	89.50	0.02	643.60	665.92
5-Jan-18	0.0000	83.00	90.00	0.01	0.00	0.00
12-Jan-18	0.0001	50.00	91.00	0.02	0.00	0.00
19-Jan-18	0.0002	80.00	80.00	0.02	626.25	626.25
26-Jan-16	0.0001	96.05	96.05	0.02	785.64	785.64

**Lampiran V**  
**Simulasi Monte Carlo**

8-Dec-17	call	put
10	164.21	174.35
100	16.42	17.43
1000	1.64	1.74
10000	0.16	0.17
100000	0.02	0.02
1000000	0.00	0.00

15-Dec-17	call	put
10	178.91	178.91
100	17.89	17.89
1000	1.79	1.79
10000	0.18	0.18
100000	0.02	0.02
1000000	0.00	0.00

22-Dec-17	call	put
10	171.01	173.07
100	17.10	17.31
1000	1.71	1.73
10000	0.17	0.17
100000	0.02	0.02
1000000	0.00	0.00

29-Dec-17	call	put
10	178.28	184.47
100	17.83	18.45
1000	1.78	1.84
10000	0.18	0.18
100000	0.02	0.02
1000000	0.00	0.00

5-Jan-18	call	put
10	0.000	0.000
100	0.000	0.000
1000	0.000	0.000
10000	0.000	0.000
100000	0.000	0.000
1000000	0.000	0.000

12-Jan-18	call	put
10	0.000	0.000
100	0.000	0.000
1000	0.000	0.000
10000	0.000	0.000
100000	0.000	0.000
1000000	0.000	0.000

19-Jan-18	call	put
10	173.48	173.48
100	17.35	17.35
1000	1.73	1.73
10000	0.17	0.17
100000	0.02	0.02
1000000	0.00	0.00

26-Jan-18	call	put
10	217.63	217.63
100	21.76	21.76
1000	2.18	2.18
10000	0.22	0.22
100000	0.02	0.02
1000000	0.00	0.00

## LAMPIRAN VI

### Standar erorr Black Schooles dan Monte Carlo

#### Black Schooles

HOB	HOJ	eror C	eror P
5.554	-6.256	0.00030%	-0.00034%
3.877	-7.754	0.00007%	-0.00013%
4.896	-8.820	0.00000%	-0.00001%
1.526	-0.139	0.00000%	0.00000%
6.901	-6.947	0.00001%	-0.00001%
41.037	-51.966	0.00028%	-0.00036%
12.300	-24.599	0.00024%	-0.00049%
0.750	-1.500	0.00001%	-0.00001%

#### Monte Carlo

tanggal	$\sigma^2$	strike call	strike put	t	HOB	PUT	eror C	eror P
8 des 17	0.0005	81.00	86.00	0.02	592.80	629.39	0.032%	0.034%
15 des 17	0.0002	85.50	85.50	0.02	645.85	645.85	0.011%	0.011%
22 des 17	0.0000	83.00	84.00	0.02	617.34	624.78	0.001%	0.001%
29 des 17	0.0000	86.50	89.50	0.02	643.60	665.92	0.000%	0.000%
5-Jan-18	0.0000	83.00	90.00	0.01	0.00	0.00	0.000%	0.000%
12-Jan-18	0.0001	50.00	91.00	0.02	0.00	0.00	0.000%	0.000%
19-Jan-18	0.0002	80.00	80.00	0.02	626.25	626.25	0.012%	0.012%
26-Jan-16	0.0001	96.05	96.05	0.02	785.64	785.64	0.006%	0.006%