

8 Yf' ? fmdhc! 6 ÅfYba Uf_h' _ÖbbhY'g]WÅ 'i a
k Y]hYfY', 'A cbUhY '\]bn]Y\Yb.'; fYmgWU`Y

; fUmgWU`Y' [Y\h'XUj cb'Ui gž'XUgg'XYf' ? fmdhc! 6 ÅfYba Uf_h'V]g
Yhk U'A Åfn'&\$&' 'UbXUi Yfb'k]fX'6]hWç]b'_ÖbbhY'k Y]hYfY') 'V]g
* 'A cbUhY'a]h'Y]bYf'5Vk Åfhg! 'cXYf'GY]hk ÅfhgVYk Y[i b[
Yf'YVYbž'\Y]» h'Yg]b'Y]bYa '6Yf]WÅh'8]Y'A Åf_hY'ZØf
? fmdhc k Å\fi b[Yb'\UVYb'g]WÅ']b'XYf'j Yf[Ub[YbYb'K cWÅY
Yf\c'hž'UVYf'XYf'X][]hU`Y'J Yfa Ò[Ybgj Yfk U'hYf'; fUmgWU`Y
=bj Ygha Ybhg' [Y\h'XUj cb'Ui gž'XUgg'XYf'6 ÅfYba Uf_h'k Y]hYfY
UWÅh'A cbUhY'UbXUi Yfb'_ÖbbhY'" ? fmdhc k Å\fi b[Yb'\UVYb
YVYbgc'k]Y'hfUX]h]cbY`Y'K]fhgWÅUZhg!'i bX':]bUbna Åf_hY
k YWÅgY'bXY'Nm_Ybž'gWÅf]YVYb'X]Y'; fUmgWU`Y!: cfgWÅYf'A Uhh
A Ul]a c'i bX'A]WÅUY`N\Uc']b'U'6Yf]WÅh'Ua 'A cbhU[
j YfÒZZYbh]WÅh'G]Y'j Yf[`]WÅYb'XYb'U_hi Y`Yb'Ni ghUbX'XYf
6fUbWÅY'a]h'ZfØ\YfYb'6 ÅfYba Uf_hnm_Yb'i bX
dfc[bcgh]n]YfhYbž'XUgg'Yg'k Y]hYfY'&) \$'HU[Y / Ua d^Y`d/

- ; fUmgWU`Y` [Y`h`XUj cb`Ui gž`XUgg`XYf`? fmdhc!6ÄfYba Uf_h V]g`Yhk U`A`Äfn`&\$&` `UbXUi Yfb`k`]fX
- 6]hWč]b`_ÖbbhY`k`Y]hYfY` `) `V]g`*`A`cbUhY`a`]h`Y]bYf`5Vk`Äfhg! cXYf`GY]hk`ÄfhgVYk`Y[i`b[`Yf`YVYbž`\Y]» h`Yg`]b`Y]bYa 6Yf]W`h

8]Y`A`Äf_hY`ZØf`? fmdhc`k`Ä\fi`b[Yb`\UVYb`g]W` `]b`XYf`j`Yf[Ub[YbYb K`cW`Y`Yf\c`hž`UVYf`XYf`X][]hU`Y`J`Yfa`Ö[Ybgj`Yfk`U`hYf`; fUmgWU`Y` ðj`Ygha`Ybhg`[Y`h`XUj cb`Ui gž`XUgg`XYf`6ÄfYba Uf_h`k`Y]hYfY`UW`h`A`cbUhY`UbXUi`Yfb`_ÖbbhY`"

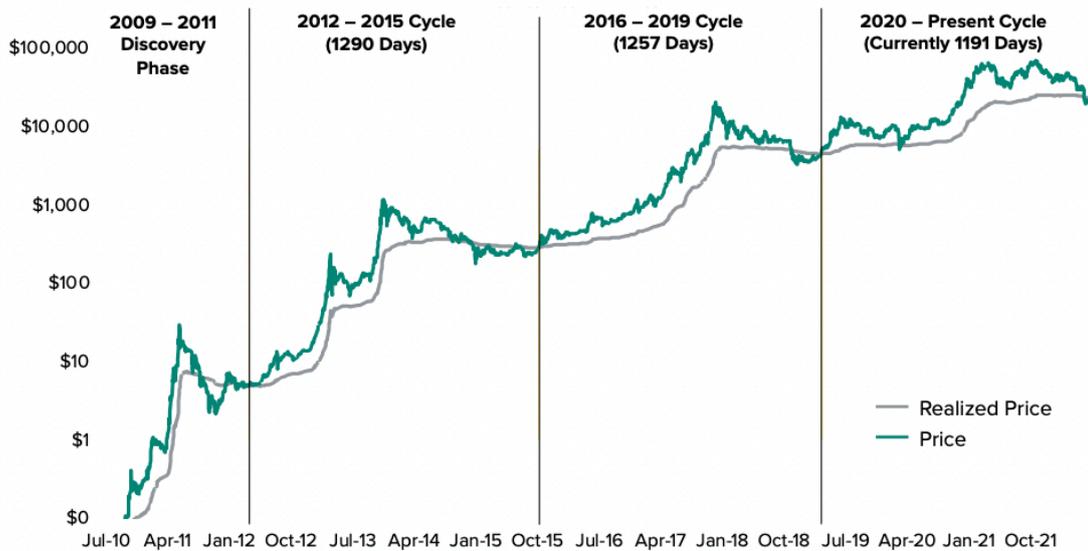
? fmdhc`k`Ä\fi`b[Yb`\UVYb`YVYbgc`k`]Y`hfUX]h]cbY`Y`K`]fhgW`UZhg! i`bX`:`]bUbna`Äf_hY`k`YW`gY`bXY`Nm`_Ybž`gW`f]YVYb`X]Y`; fUmgWU`Y! :`cfgW`Yf`A`Uhh`A`UI`]a`c`i`bX`A`]W`UY`N`Uc`]b`U`6Yf]W`h`Ua`A`cbhU[`j`YfÖZYbh]W`h`"

G]Y`j`Yf[`]W`Yb`XYb`U_hi`Y`Yb`Ni`ghUbX`XYf`6fUbW`Y`a`]h`ZfØ`YfYb`6ÄfYba Uf_hnm`_Yb`i`bX`dfc[bcgh]n]YfhYbž`XUgg`Yg`k`Y]hYfY`&)`\$`HU[Y`a`]h` \cW`k`Yfh][Yb`?`Ui`Z[Y`Y[Yb\Y]hYb` `[YVYb`_ÖbbhY`"

A`UI`]a`c`i`bX`N`Uc`gU[hYbž`XUgg`XYf`U_hi`Y`Y`6ÄfYba Uf_hnm`_i`g`Ua``%`" `š`b`]VY[Ubbž`U`g`XYf` fYU`]g]YfhY`DfY]g` `j`cb`6]hWč]b`f6H7Ł`i`bhYf`XYb`A`Uf`hdfY]g`Z]Y`"8Yf`fYU`]g]YfhY`DfY]g`k`]fX`UV[Y`Y]hYhž`]bXYa`X]Y`Gi`a`a`Y`U`Yf`6H7`ni` `]\fYa` `?`Ui`ZdfY]g`[YhY]`h`Xi`fW`X]Y`5bnU`\`XYf`]a` `l`a` `Ui`ZVYZ]bX`]W`Yb`6H7`VYfYW`bYh`k`]fX`"6]hWč]b`_Ubb`a`]h`k`Y]hYfYb` `) `V]g`*`A`cbUhYb`5Vk`Äfhg!`cXYf`GY]hk`ÄfhgVYk`Y[i`b[`fYW`bYbž`ZØ[hYb`g]Y`\]bni`"

8]Y`; fUmgWU`Y!:`cfgW`Yf`ghY`hYb`ZYfbYf`ZYghž`XUgg`? fmdhc!`A`Uf_hnm`_Yb`j`ca` `<Ö\Ydi`b_h]V]g`ni`a` `H]YZdi`b_h]Yhk`U`(` `š\`fY`XUi`Yfb`"8Yf`U_hi`Y`Y`Nm`_i`g` `XYf`&\$&\$`VY[Ubb` `]VYhfi`[`Ua``%&`" `š` `]`Yhk`U`%`%`-` ,` `HU[Y`"

FIGURE 2: BITCOIN MARKET CYCLES: PRICE VS. REALIZED PRICE³



E i Y`Y.; fUmgWU`Y`b j Ygha Ybhg`

æ` J Yf[`Y]W`ni` ZfØ\YfYb`Nm_`Yb`VfUi`W`hY`6]hWc]b`X]YgYg`A`U`Ua`
`Àb[ghYb`f`) &`HU[Yłž`i` a`gY]bYb`<`Ø\Ydi`b`_hni`YffY]W`Ybž`k`Ug`
]a`d`n]Yfhž`XUgg`X]Y`b`ÀW`ghY`F`U`mY`ni`F`Y`_c`f`X`Ø\Yb`bc`W``Àb[Yf`
XUi`Yfb`k`]fXž`gc`A`UI`]a`c`i`b`X`N`Uc`"

8`Yf`&\$&\$!Nm_`i`g`g`W`Y]bh`Y]bYb``Àb[YfYb`@Ui`Z]a`5`H<!6`YfY]W`
fB`nY]h`c`W`Ł`a`]h`nk`Y]j`Yf`Àb[YfhYb`Gd]hnYb`[Y\UVh`ni` \UVYbž`]a`
;`Y[YbgUhn`ni`XYa`ghUf`_Yb`5`bgh]Y[`i`b`X`5`V`ZU``]b`ZfØ\YfYb`
Nm_`Yb`ž`g`W`f]YVYb`g]Y``8`]Yg`_`Ò`bb`hY`Ui`Z`X]Y`k`U`W`g`Yb`XY`F`Y]Z`Y`
XYg`?`fmd`hca`Uf`_hYg`ni`f`Ø`W`ni`Z`Ø`f`Yb`gY]bž`X]Y`Yg`]b`ZfØ\YfYb`
Nm_`Yb`b]W`h`[`UV`"

A`Uf`_`hnm_`i`g`&\$&\$`Y]bY`G`hcfm`c`Z`@Yj`YfU[`Y`

@Ui`h;`fUmgWU`Y`\UVYb`X]Y`G`hUUh`g`Ui`g[UVYb`U`g`F`YU`_h]cb`Ui`Z`X]Y`
7`c`f`cb`Uj`]fi`g!DUb`XYa`]Y`X]Y`5`b`Y[Yf`X`Uni`j`Yf`Ub`U`gghž`a`]h`XYf`
<`Y`V`Y`k`]f`_i`b[`c`XYf`XYf`J`Y`fk`Y`b`Xi`b[`j`cb`:`f`Ya`X`_`Ud]hU`Z`Ø`f`XYb`
<`Ub`XY`ni`VY[]bb`Yb``5`V`Yf`]\fY`Dcg]h]cb`Yb`VY[Ub`b`Yb`g]W`
Ui`Zni`Ò`g`Ybž`b`U`W`X`Ya`X]Y`:`Y`XY`f`U`F`Y`g`Y`f`j`Y`X]Y`N]bg`Yb`ni`f`
6`Y`_`Àa`d`Z`b[`X`Y`f`b`Z`U`h]cb`Y`f`\`Ø`h`\`U`h`Y`ž`ghY`h`Y`g]Y`Z`Y`gh`"

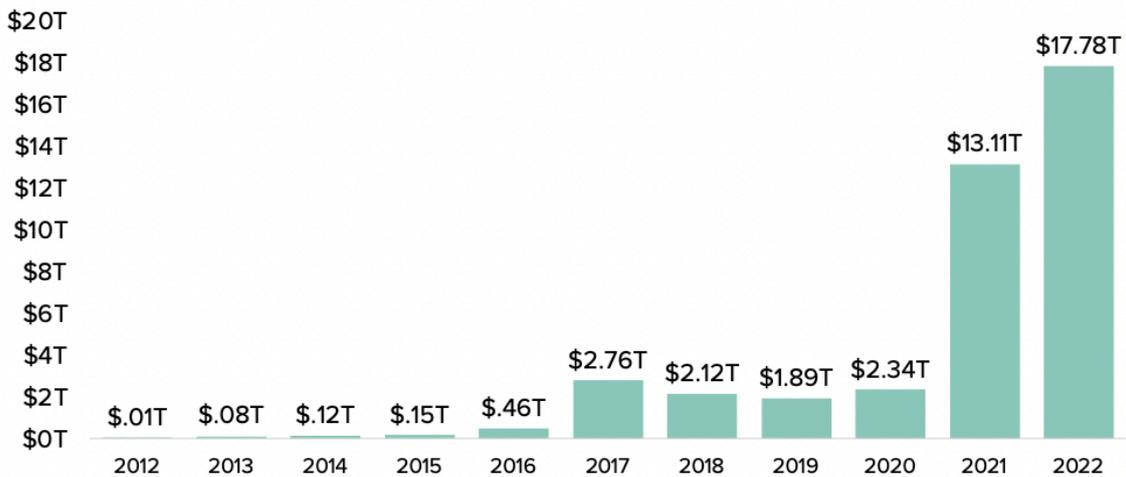
8`Yf`6`Yf]W`h`k`]Y`g`Ui`Z`X`Yb`Ni`g`Ua`a`Y`b`V`fi`W`X`Y`f`G`h`U`V`Y`W`c]b`

HYffUI G8 'fl GHŁž'X]Y 'J YfnÒ[Yfi b['VY]'XYf': i g]cb'j cb'9h\Yfyi a
i bX'Y]bYb'A Ub[Y''Ub'HfUbgdUfYbn'VY]'nYbhfU`g]YfhYb
:]bUbN[YVYfb'i bX'<YX[YZcbXg'U`g'; fØbXY'\]bž'X]Y'XYb
5i gj Yf_Ui Z'XYg'A Uf_hYg'j YfgW\ĀfZhYb''I bX'XcW\ '['Ui Vh
; fUmgWU'Yž'XUgg'YXYf'A Uf_hnm_'i g'X]Y'5b'U[Y_'UggY'ghĀf_Yf
a UWYb'k]fX"

8Yf'DfY]g'X][]hU'Yf'J Yfa Ò[YbGk YfhY'ghY''h'bi f'Y]bYb'HY]'XYg
VfY]hYfyb'^2 _cgmgHYa g'XUfž'XUg'g]W\]b'XYf'? fmdhc]bXi ghf]Y
Ybhk]W_Y'h ž'gW\ f]YVYb'X]Y': cfgW\ Yf"

K Ā\fybX'XYf'DfY]g'j cb'6]hWŁ]b'k Ā\fybX'XYf'A Uf_hi bg]W\Yf\Y]h
bYVYb'hfUX]h]cbY''Yb':]bUbNub'U[Yb'gW\k Ub_hYž'Zi b_h]cb]Yfh'XUg
ni [fi bXY''Y[YbXY'B Yhmk Yf_'k Y]hYf\]b'k]Y' [Yd'Ubhi bX']gh'Ui Z
XYa 'VYghYb'K Y[ž]b'X]YgYa 'Ű\ f'Y]bYb'K Yfh'j cb'ZUgh'% '6]''cbYb
I G!8c''Uf'ni 'j YfUfVY]hYbž'[Y[YbØVYf%' '6]''cbYb'I G!8c''Uf']a
Ű\ f'&\$&%"

FIGURE 8: BITCOIN NETWORK VALUE TRANSFERRED (USD)¹⁷



E i Y''Y.'; fUmgWU'Y'ϕj Ygha Ybhg'

< c`Yb'G]Y'g]W\ 'YXYb'5VYbX'X]Y'VYghYb'? fmdhc!
B Yi][_Y]hYb'i bX'9f_Yb b hb]ggY'XYg'HU[Yg']b'Ā fYb
DcghY]b[Ub["" "

8]Y'Dcgh!?' fmdhc!6ĀfYba Uf_h'_Ubb'g]W\ 'k Y]hYfy', 'A cbUHy
\]bn]Y\Yb.'; fUmgWU'Y'gh'_Y]bY'Z]bUbN]Y''Y'6YfUhi b["

8YhU]`g

6Ygi W\Yb`G]Y`i bg`Ui Z.`_fmdhc!bYk g"Uh