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Πανεπιστήμιο



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Abstract

This paper examines the political economy of hybrid threats in the Eastern Mediterranean, focusing on how non-conventional forms of coercion intersect with economic structures, sectoral vulnerabilities, and state behavior. Through a comparative analysis of Greece, Turkey, and Egypt, the study demonstrates that hybrid threats operate primarily by exploiting economic dependence, strategic assets, and institutional asymmetries rather than through direct military confrontation. Key sectors such as energy, maritime trade, tourism, and migration management emerge as critical pressure points where hybrid strategies generate significant economic and political costs. The findings reveal distinct national responses shaped by economic capacity and strategic orientation: Greece emphasizes alliance-based deterrence, Turkey adopts an assertive and autonomous hybrid posture, and Egypt prioritizes regime stability and asset protection. Overall, the paper argues that hybrid threats reshape fiscal priorities and regional cooperation, reinforcing a cycle of securitization and economic vulnerability. Understanding hybrid threats through a political economy lens is therefore essential for addressing contemporary security challenges in the Eastern Mediterranean.

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(Er en & Çelikpala,

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/* #CE! CE/0 01 02 . CE0! +! . 1 1 " . . #2 M X G U H P Z H Q W
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0CE 2! CE0 2 . 2 0.CE 2*)CE&! 2 " CE!. .2)2&2.)2. "
1# 0" 0 . .1# 120" 2. / . 1 . /0/ . 0CE !0 2. (CE)H 2. 20"

ü .3 ! 0 22 \$.12 . #1 &1)2 2." 2 # /)6 W R F S K D # W L F 'HEV
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02. * 2 " ü#!&CE.' " üCE 2! CE "p .122\$#10. #1 CE # CE!. .2 CE 0
üCE 2! CE 0&10 202! 2. CE! 1 & . 1 #CE 2 02.)2 . # * . .
.2. CE! 1 *DXVVLDQ2.02 / ./ 1 .0&! * 2. 0 1 # CE 2.
.! 2 \$&! " .!. 0" #CE)"0p .&22)1 \$0 0CE ! 0 &" !0. 12 . .
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/# .!. & .! 2 + 0)2& / . 20!. 10 \$+!0" 0 # % 02. 2)2
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.1# 02! @ "2..! 2 1 . 0 CE CE . 2CE02 #CE) 01 .CE2...
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ò . 12 \$0 2 CE /0 \$0 2*\$0 2 " .CE. 2 * CE "21)".1 ."/#0" .
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/ ! !&1 2& 0& . 2 1# 12!..22 /)2 1\$! 2 # \$! # " # 0OE+"
/ . \$0 ! 1 2 # /)1 # \$! # " OE! OE0 . 0 1& .2+ 0 ! 2 2 " OE! 1/ 0"
/# OE! 0 # . 0 1\$*02. . ! OE!) 01 / 1 &1)2 2.
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!.30 & / . \$0 ! 1 " /)1 # \$! # " . 12 / 1 \$ MÖRYD O D2/ L'Wü ÜHW

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/. 0 1)" .OE 20 0 . ! 0! . 0 2 "OE/* 22. " . \$! .2 / 2 10
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. \$. * 0 1 / .2 " 0" 0 #% 01 10 0 &20!)2\$! "*" . 1#
/* #0 1\$*0 2 OE .)2 2. .30!0 #)2 2." . ! 10& !0#12)2 2." p
0 . 12.2 .2 12.1 . OE . /)2 2. OE2 # 1# /#2 .2.Ü 0
J 0OE 2) 0 !#) 0 #L21 "/ ! !&1 #2 \$! # " OE! 3 0&
12. 0! # .) 0 . 0OE 2) . 0! / !.\$#OE!) 01 # 0 &20! * \$! # "
UROORYHULU2LV2N)OE 0 2 OE 2 ! 2 " / .13. 0 2 1# 0OE 1\$0/
0OE OE20 . . 2 0 \$ 2 " / 1 " 2 #. OE* \$2 . OE . 1 .65i'6)
ü#&OE.' üOE 2! OE0 (60 (:6 ü 1# /# # 2020! 12 " . 12 \$.12
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2! 1 2 " . 0 .)2 2." 2 .OE *2)1 1 2& .) 0 !2 1 " .OE) 2 0 OE0 !
! 1 p 0 OE0 ! . 02 2 . 2 OE. / .. #OE120C#%0 * .
/ . \$0 ! 1 # \$!)OE"# 12. 0!)222!. 020 0# ' " \$! .2 OE 12&2 " 1# 0
. 12 0 0!) !) 2& 0 .OE0++ 2!0 + 0OE # 1 0 2 #! 0 &" !
\$. 1)" &! 1 " .! 2.*2. OE!. # 0! % 0". 1.2+ 20."
0OE 0 . OE# 2. / .3. . OE! 1.! 12 '6\$E .01 !.0. 12 *"
OE .OE .1 .12 " ! 2 .OE 2 1 . 0 .1\$2#122"0! . / .1* /01 0 2 / . \$0 ! 1
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p &1)2 2. 2 # /)1 # \$! # " . 12.2. . OE 0 .!2+ 0 .OE) /#
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.!* #1. 1 .1 2 OE . 1 .#2) . 2/0 1 *01 . 2 " 0 1& 2&1 " OE! &
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&12 " /# .2)2 20" CE # CE! 1 !#CE 2 1. % . 0CE 2! CE # 2
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#CE /0 .2. .! . ü 1\$#2 1 ú. & 0#HHS+ û 2*
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2)\$ " . 1 CE)" 2 # CE!.).2 # 003. . CE0! ! %0 2 " *\$,0" CE)0"#"
\$! 1 CE * 2.)LQ7HFK . . .CE 2#CE+10 2 CE&" \$! 1 2& 0! .

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ü 1. & 2 \$0 . . 2 ! .2
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p \$! .2 20\$)LQ7HFK 02. @&" / 0OE 12) . 2 0 0 OE #
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ù . #2)20!.)LQ7HFK3 !02. 10 . 2) 0" \$! .2 " #OE !01 0
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12)\$ " 2 " \$! .2 " 20\$. " / ./ 0 . .OE OE 1 0
02.1\$.2 1)" . .#2 .2 OE 1 \$! .2 + / ./ .1 + . #OE
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20\$ 2 " 1* " .2 #OE 12 ! .OE 3 10& .1) 0 . 10 10 " +1
LHWKREQ# / . !3+ 2. .OE) 0'H7R*UH 12)1 \$0 ! 2 .OE 2*OE&1
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2 " \$. " 1 " . 0 /)20!. 2& 20\$ + . " . 0 1\$#2 "
2 # " OE0! ! 1 * " .#2 * 2 # OE! 2*OE # 0OE 2! OE 2." 12. 1#12 .2. .
.OE)0/ . . .OE! 1.!) # 2 0 2 #! . 2 # " \$&! " . .1 2. 10 .)
! 10 0 2& OE! 2 !& 0D@OEHDWLO . 1* \$! . #OE 12
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/0/ . . .OE! 1.!) # /# . 2 1# OE0! 3 ! 2 # " 1& / ./ .1 + 0 OE.

¹⁶ . OE0 !. 1#12 H[2SHUW V0VWH0EV ! .2. 0 2! + #OE 12+ OE # 0OE *
OE! .2. 0 / ./ .12) 2!)OE \$! 1 OE + 2." +1 .OE) 0 / * " +120 . OE!
2 . !+OE 1# 12 2. 0OE 1 " 1#12 .2+1. NQRZOEHDVHG
V\VWHPOE! ! .2. .1 1 . 10 1# CELOQJHVEHQVHHG SURPj@B#^a"
/!.12 !)2 2. OE # 0OE / + # . * 0 . 0OE #1 OE! 2& . . 2 0OE
\$! 1 OE * +1 .)\$.OE + " OE H7R3UH.

1#11&!0# " 0 CE0 ! ." . . 0 2 #! * \$&! " 2 . 0 2& CE! 2
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1 " / 0#!* # 2.)! . 2 # % 3 . * 02.1\$.2 1 * . +" 2. 1#12 .
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0 CE0 0! 2XSWHND O . 20 0#2. . \$!) . # 0! 10 " 10 CE.)1 0
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/)1 # 2 . . 0 CE # 0CE 2.\$* 0 1 . 2 10& 2CE"#2& /CE! 0
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0 CE)/ . . CE! 10 " CE # CE0! ! # 2 !#) CE!)/ # \$,.CE) 2#" 2 1
0! 10 " 0 . # 0 . #120!0 10 1*&2! 1) 20 2 0/)" CE # #CE / + 0
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. ! 12. 0!)2 2. 0 1 . 2 " 2# CE0 0" 1 /!.12 !)2 2.
!.!./0 .2. ! 10&)CE&" ! .2 CE 12&2 ! 1 2 # . ! 1 !0#12
2 CE. / &RYLG .2./0 * # CE)1 ! !. CE ! * CE 10 " . 0 .CE & *
0CE ! #" 2 .2.)CE&" \$! .2.IR!UHJQKDKQJH VZDSV)!;0VZDSV
) ! 2 \$! .2 CE 12&2) 1*12 . p .! " CE!) 0% + ! 10&
/ . 20! . .CE. 2 2 CE!) 1 . +" 1CE . 0 3 1 2 #" / . !3+ 02. 1;
!. " . 0CE /! 10 " 02. * CE + 02. 2+\$&! " . #CE !\$0
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10 . 1# 0 ! CE0!,CEV&UQDRVQDQV .!./ 1 . /0 20"
)CE&" û0 2 " ! .2 CE 12&2)6,*V.2!0û0 2 " ! .2 CE 12&2 + # +
)& ,V1#\$ 1# \$ # 2 " 0 " 02. " 2 # 0CE0 /#2 * .2 " 0 . *
2!&2)2 20" CE0! ! 2." 2 .)2 2 2 #" . 0 2 CE # CE 10 " 10 1#
. 2 02+CE 1 .#2+ 2&1 CE0!.CE. 20 CE! 10 10 " CE # . CE * /0

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2 . \$. " 1 " #CE0!20! *1.#2) 22 2!)CE 0/!. + 02. . .
CE0! 11)20! &" .1 02 . CE!) 10% + \$0GDVHUCR
\$! .2)" 2 ." ! 1 02. 10 / ./ .1 . #1 .12 * 02.1\$.2 1
. / 0 2. .CE) 2 0 1& 2&1 2 " 20\$ 2 " 1* " 2& 0 & /0/
/ ./!.12 + 20\$+ CE2 CE 1 " . CE!./ 1 . \$! .2 2 .
12 ! 2. 10 12 ! /0/ . . CE! . ! 1 0" #CE 10 " .CE /0 *
. . . 2.CE ! * 12 /# . . . 0 .!2+ 0 3*1 2 " 1* \$! " CE.
. " \$, . CE + 2."©2. . /0/ a.ELGDWD 20\$0/ "CE! 13 !0
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ù)!)CE&'5DQGRPUHFW &ODV*ULDGHUHQW %RRVWCEQU*0DFKLQH
0 2 CE # 1* 02. CE!)2#CE. CE # CE!./ 1 . " / ./#5.2IEH . 1#
/HNKDO . &" 0 2 *2 # 0 1\$* # 2 .)2 2. 2& !. 1 + . 0 2 CE
CE . *" /* #" 0 2 12 CE * 2 \$! 1 CE)!& . . #CE 12 ! # 12
\$! .2 " .CE 3 10 " .! . 2. 1* \$! . 1#12 .2. CE2
CE ! 3 ! +, QWHUDIFWLDYHILJDFKIORO R.JLHV!3+ # 2 2!)CE 0 2 CE
. . #2 " CE !!03 02.3 ! 2. 12. / 2 120 \$ 1& 0! . 0 &
7DEOHDXRZH%, . 30WKRQ 0 / .30!) 0 CE ! * . .2. *
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p ù CE2# 2& *! & 0\$)&& ü! . 0 .
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. ©0 . /0/ a.ELJ G.DEV D0 * ! 1 1# 20 012 2 " 1* \$! "
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/0/ & . 2. CE . 0 1\$* # 2 % 20 ! & (L&Q DCE 3/HY&Q

17 !. " /# . " 1# 12 * CE0/ 0 2 " CE # 0 02 0 1#12 .2. 2& CE
1# CE0! 3 ! /0 0 . /# .2) . .CE / 0 0 .! 0 . 1& !. + CE! 10 10&
CE0! 11)20!. 3#1 . . 20\$ 1#12 .20 " 02. *0CE&!/ 02. 2+
\$.!. 2 ! 2. 0 0 +" .CE) !.)2 2. 0 . 2 / .12 0 2. !. 1#12 .2.
/ " 02. 02. . . CE! " 2 0 1 / 12. !. 1#12 .2. . ! . .
02. 2 CE !0 . CE! . 10 CE. * 10 . . 0CE /! 10 " / ./ 02. *
2& 02. 2+ 0 . CE CE0! CE 0" . 1#SD]D.CE!) 0CE20"

p . CE 1 20\$ ELJ+G D&D' . CE.! /0 . 0)!# 1%0GDW&D JPLQLQ
. 12 /# .2 2 1#12 .2 2! 1 . CE.! . * 1 2 # \$! .2 CE 12&2
. +" . 2 . ! CE!) 0% . .CE 2! CE \$! .2 CE 12&2 + ! 10& ù30
/0/ . CE.! \$ # CE! . 20\$ 0! . 0 . . 2 0CE CE1220&2 2 *# \$!
/* # 0 1\$* 2." 2 . CE 12 . 2 . ! 0 . . 2 CE2 CE 1
/ ./ .1 + ù302 ! # 12 CE . 1 2 " % 3 . " . " \$! .2 CE 12
. 12.2. CE0! 11)20! 12 \$0# . . ! " . +" #CE0! ."02&2 # " CE
CE.! / 1 . + CE! 10 10& CE # .1 2. 10 0 . 0 . . CE!)2#CE.
2 03.! 0 .2 0# & . / .3 ! CE & 0CE CE2DQJHVED. 2 +

* 3& . 0 . 120) ©1)\$. 10/ 0 . . CE0/ CE # . .CE2*110
. ! # " 1\$0/ .1 # " . 03.!) 2. 10 1* . /0/ & 0 *! # " 12
CE!) 0% UHJUHV\LRQ.) 1 . 2 . / CE 1 1#12F/OCEVWHULQJ a
\$WKH\ p CE!) 0% .3 ! 2 . CE2# 21&! 0 /01 . 0 1 CE)
2 0 2 1 0 2 + 2 + 2.) 1 2 / ./ .1 . .2 2. " 0)" . 2
CE0! 11)20!0" 0 2& CE! / . 0 !. & .2 !+ . . / CE 1 1#12./
/ . !01 0)" 0 202. # 1#) # /OCE & #10 /O X V W 2 H U V + 1 2 0 2 .
12 \$0 . 0 2)" 0 /." . CE.! #1 # \$HIE D20!D0
ù . #2)20!. \$. 1 \$0 2 /# .2)2 2. . .CE . *CE20 / " .
0 & 1#) & /0/ & . \$E 10 2. . 2 / #! . ©2 .& #CE #
.CE) #CE !\$ 2. 1* . /0/ & +120 . CE! CE # . 0 2 * .CE 20
. 2 01 0 2 " CE.! / 1 . " 12.2 12 " 0)/ # " CE 0" 012 #
1# CE0!.1 2& . 2 #CE 0#10) CE10 0)" /0 .2 " \$. 1
12 \$0*0 12 0 2 &1 2 " CE!) 0% " . .2 1# CE0 . . 0 2. 2
2 .)2 2 2 # " . CE.! # .)CE 120" CE! %0 " 10 /0/ . 0 2)" /0
.#2 CE # /0 \$! 1 CE .2 2 0 CE. /0#1QW#H#UQRVLRVQDQDGE
. 2 0/ . / . 20!5D2QGRP)ROUHVW\$ # 1 . 2 #%)20! . ! 0
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¹⁸ p 0)!# /0/ & 1# 12 . ! . & . 1#12 .2 / ./ .1 . . #1 " 0 202
1* 02& 1#) & /0/ 0&12)\$ 2 0 2 CE 1) . 2 0 . & #!& \$! 1 & .
0! 0*1 & CE! 2*CE& 2. CE . / * . 2. . #CE 12 ! # .CE 20 01 .2 2 / ./
.CE 3 10& 0 . 2 01 0 2 " CE.! / 1 . " 12.2 12 " CE! 10 10 " 0)!# /0
12 2 " . . #% " +1 " 0 0CE 0 2! 2. GDVWIDLOY/HQ.GLVF+RY/HU\
CE! (CE 20 2 / .2*CE&1 #CE 10& 0 2& CE! 2 !& ù 2 2& " #CE 10 "
CE! *CE2 # 1. .CE) 2 . #1 2& &DQGHV &XVWHUV

/ + 2." 10 .OE! 0 " OE! %0 " 2)1 !.\$#OE!) 01 .)1 . . ! OE!) 01 .
2& 2 @KDS'OHCE # 0OE 2! OE0 2 OE 1 2 OE 1 2 " !. " 1# " 0
/* .2. . 0!.OE0*10 2 /#1 . .2.) 1 " 2 # 2!)OE # 0 2 OE 2. 1
OE.! # 2. .OE 20 1 .2 2 #" . 2 " . /0 " 2& 02. 2+ OE # /
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p ü 1\$#2 51HLQIRUFHHPHQW /HOEUZOLQJ 5/OE! 1 1 \$. " "
1 " .2 2 OE . OE!." 2 !." DJHQW 0OE /! 0 2 OE0! 2 #
. 2." .OE 3 10 " . OE! 1.!) 2." 2 OE 2 2 # 10 2&
. .2! 3 /)2 1 'UHZD OEG # 1# 0 ¶.#2? 2 2!)OE 1& 2 " 0 OE. /0#1 " 0
0#3# * " OE! 2 !. . 12.2. OGE 2 # \$. * . \$. 1 % " 2 12& .OE 3 10
#OE) / .3 !02 " . 02. .) 0 0" 1# <OE" . !ü" . #2)20!. .
OE!) . 0 1\$#2 " UHL'QIRUFHHPHQW OHDUO&LCOE) ! 1 . 0 0 +/
1#12.2 2. OE . OE0! /!.B #1 2 . 0OE /!.1 " 02. * 2 # OE! 2 !. .
OE0! 2)" 2 # ü!\$ 2 OE Q Y L U R Q P H Q W . 12 0 &20!) 1*12 . 0
2 OE . 0OE /! OE! 2 !." . 0 2)" 2 # OE # 0 0 1102. . 1 .
OE! 2 !." ! 1 02.OE 1. \$! 12 10 . 1# 0 ! VW.D W M E 1.
OE0! ! 30 2 2! \$ #1. 1# 2 # OE0! 2 ")OE&" .#2 02. . 2
02 2 0 2 01 ." 0 ! 0 ." 2 OE0! OE.! \$0 12 OE! 2 !. . 1
UHZDUOE OE 0 3! 02. 10 .! 2 !3 . 0 2 #! 0 &"
. .2! 3 /)2 1 " . 2 .) 1 2 " 0 12 20 .OE)3.1 " p 1# OE0! 3 ! 2
. ! 02. .OE) 2 CES R Ø L F \ / 2 .) . 2 1# !2 1 OE # . 2 12 \$ 0
/# .2 .2 12.1 10 . OE0! 11)20!0" 0 ! 0 0" OE! 1/ ! 2." OE . 0
0OE 0 0 10 0 /0/ .2 12.1 .! . 0 2!) !) 12 0 1\$#
/ ./! .2 0 . 2 "Y D O X H O E . 0 3! 0 2 . . 0) O2 0 2.
OE # OE!) 0 2. . .OE 10 OE! 2 !." 03)1 . # 10 . 1# 0 !
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¹⁹ 2 6"KDSOH\ . OE # OE! !\$02. .OE) 2 1# 0! .2 6 K D S O H E . &
OE! 13 ! # . .#12 !) OE . 1 . 2 .OE) / 1 2& OE! %0& 0)" 2 # 12. 0
\$.! . 2 ! 12 0 .13. 2." 2)1 2 / . 1* # #OE)%) 0" 2 " OE . "
. 0OE /! 10 " 02. * \$!. 2 ! 12 +)1 . 2 / .3 0 . ü#2 / " 0 . /
.2 . . .OE 1.3 10 2 " OE0! OE 0" !. " 1\$ 10 " OE # ! 1 2. 1
\$! .2 OE 12&2 * 12!0" 1OE&" !.")0OE /!.1 02. * 2& 1 G H D Ø H Ø
2& * &)\$ 0#1 " 2& 0CES Q G D VHRDOR

p . 0CE /!.1 2& CE!.CE & 12 \$0 & 0CE 2! CE0 12 CE! 2 !. . .
. 13 .2 " 0 2 12 CE + 2." 12./ . 2 12!.2 2 # 0 12)\$ 2 0
1# " . 2. 6DKMUDO p 5/1# 12 / ./ . .1 #CE .2 !. 2 "
\$, CE # 0CE 0 2!+ 02. 12 1 1& . 0CE /!.1 " 0)\$ CE20!
0 12 CE 1 2 " 1# " . 2. " . .CE 20 0 . 0 . . ! & C
12 0 1 ." CE 2 " % " /./ \$ + .CE 3 10& p 2 12 CE 2
CE # / 0 12 12 /# .2 1&!0#2 . 2. 2 CE ./ 112 #01#1 *
. . 0) 0 # !/ #" .2 2 / ! 0 . 2 " . 0CE /!.1 " 0KXQCE DGJH
6HPPOHU # .) # . 5/.CE 20 0 . 20\$ \$. " 1 " CE # 012
0 2 12 CE 1 2 " /./ .1 ." % " .CE 3 10& .10 ./# CE0! 2. !.
03.! 2 " 1\$0 . / . 2 !&" 0 #12 . +" 0 2 # /)1 #
0 .!2 2. .CE) /./ \$ " CE 2 " .CE 3 10 " . .CE) 2 . 0CE /!.1
. !) CE0!

p . 1 'HHS /GDQJ 1# 12 . CE! #CE CE0/ 2 " \$. " 1
ODFKLQH /HDUQLQCE 0/ 0/! 02. 12 \$! 1 . ! & 20\$ 2+ 0#!&
/ 2*& 1HXUDO 1HWZRUWCEV 1CE 0CE CE0/. 0CE0 0! .1 ." " ." .CE) 2 #
/# . . .CE2#11#"0 / #" 2 " 20\$ 2 " 1' "\$0 CE! 10 *10
1 . 2) 0!0# 2) . 20\$) 0 / .3 ! 2. 20 0#2. . \$!) . 0
CE!./ 1 . " 0)/ #" \$. " 1 " 6XCE&RUW 9HFWRU 0DFKLQHV 690
1 CE! 13 !0 #1 CE20 0 2 .2. 02. * 2& CE & .#2 .2 CE C
\$.!. 2 ! 12 + \$&! " 2 . \$0 ! 2 " CE! 0CE0 0! .1 ." #%
0 0#1 " 10 CE . . CE *CE . 1* . /0/ & . +" . .CE 20
0 CE. /0#1 10 CE0! 0 02. #") #" /0/ +XDCJWDO p .
1 .CE 20 0 . 1\$#!) . . #2) 0! . 0 . 2 0 2 1* 02& .
1#12 2&)CE&" .#2 CE # 0 02 2. 12 CE . 1 ." 2 " ù #1 " ú &
'6\$.!\$ 20 2 . " 1 " 0CE 2! CE # 2 20 CE 1 !. + 1\$

20 . 0\$ 2 0#!& û1H2XUDO 1HWZRUWUNV#CE 12 2 . 2 " 0\$ 2 "
1* " \$,CE # * 2. 2 22)CE CE0 0 2 #! 0 . !+CE \$CE 203.* "
. #CE 1* 2 " \$. " 1 " . 1# 12 * 2 1 2& 20\$ + . " 1 "
. !3 2 #" 0 . 0 CE 0#1 . .CE) 2 . !+CE 0 3. . .CE! # 2 2!
CE CE!. .2 0#!+ 0" 0CE & * 02. * 2 #" . 0#!& / 2#. / . 2 # .
.)2 20" 1 " \$! 1 CE * 2. 1#\$. CE 1* 020" 0! .1 0" ! 12 0
.)2 2. . 0 #) . .CE) CE0! CE . .1.3 /0/ / . 2#.. CE!!&* .
0 2 CE # CE!)2#CE. . . . *CE2 # 2 10 " CE # 0 . #CE0! CE0! CE 0"
. 2 3 * !&CE . #CE 12 1#12 .2. ò . 0 CE. /0# 0#!&) /
. 0&! @ / 9'12 .2 !. CE ! 3 !# CE . \$0 0 CE4D#D2D =DUGDUL

02. * . ! + / 1 + . \$! .2 OE 12&2 @DKMDO 2+
 // \$.!. 2 ! 2. .OE) 2 .)2 2 2 #" . . . # .#2) .
.2 . \$.!. !2 12 .OE) 2. /0/ . \$&! " 2 . 0 2& OE! 2 !& #OE
2 / 2 #" 1& OE #0OE OE0/& 0#!& + .!\$ 20 2 + . \$ 0* #
.3 ! . OE!)2#OE. . 0OE0 0! 2. 2. /0/ . 12./ . 02.2! OE 2." .OE
OE!.2 ! 0" OE ! 3 ! 0" 10 . OE 1* 020" . .3 ! 0" 0")OE&"
12. 0!)2 2. OE 12 OE2)" /# " 1& 2 " . OE 1 " 2& . .OE!
OE! * 0 & 0OE OE /& p OE! 1 1 .#2 0 . / . 20!.)2Q7HFK . 03.!
)OE # " .OE 3 10 " OE! *OE2 # .OE) OE *OE 0" . /# . " .
02. * OE .OE + OE!.) 2& . 2. /0/ . \$.!. 2 ! 2. .OE) # % 02
+XDQHMDO

p ü 1\$#2 1 ú. & 0#!& +'HCH S2 5&HLPIHROJWH/H D'UQLQJ.
#OE .2 ! . 2/# OE . \$! 1 OE 0 . 0#!& / 2#. OE! 0 # .
OE 1* 02. . # % " / 12.1 " OE!XQG D2G JH 6HPPOH5J .OE 20 0
. 2.\$ &" . .OE2#11) 0 / 2 " 20!\$* 2 " OE " 0 1& .2+ 0 12 \$0
.OE) /* 0 0 +/ OE0/ . 2 0 1\$52)OE # 1." OE! 2 !." . . 0 1& 2 "
/ ./ .1 ." / " . 13 .2 " . . 0 / ./ \$ " .OE 3 10 " 0 12)\$ 2
." 1# !2 1 " . 2. " . 2 1 '/ OE . . OE 0 . 0#!&
/ 2#. . 2 . .OE!. 12.1 . 0OE0 0! .1 . /0/ & # % " OE #OE)2 2.
2 # 1# /#.1 '5/ . 12 /# .2 2 0 1 1* 02& 1# OE0! 3 !+ . 12!.2
10 OE0! 2. 0 # %)) 0..)2 2." /# . 3*1 . 0) /0/ &
#OE0! . 2." 1#\$ 2 " /# .2)2 20" 2& OE!. / 1 . + 20\$/ .+ 20 1 "
1 . 2 " /# .2)2 20" 12 0 2 . 0OE #1 OE #/ 12.2& . !
OE! 2& # 0 ! . 0OE22! OE.)!3&1 OE 2 + 0 OE .OE * " 12)S
. + " /* .2. . 0 . \$ 12 OE 0 2.#2)\$! . .OE 10 " 10 ! 1 0" .
02. 2 ")OE&" 2 /)1 \$! " OE &! 1)" . 2 OE!. &) 0) #OE
.1 2 " . 2 120)\$ 10!" . 0 # OE 2 " 10 .) 12)\$ üOE OE
.)! OE # \$! 1 OE 0 6)REW" \$&WLRWLF 6\$& # 1& 1# 0\$ *"
. 0OE /!.1 " ©.2!) OE0! a OE! 1.!) 0 10 1 . 02. "
2& 1# + 0 2!#OE. OE . 2 /# . . 2 . 0 .)2 2. 2 " OE! . 2
." . 2." #OE)% . 2 /! 10 " . !+ . 02. " OE!5V/ +
0 . / . 20!. .OE 20 01 .2 12 1* % !. 2 2& . 12 .

OE .OE + 1 !! OE + ¹²¹\$! #+" 0#. 1 2 OE 0 2. 2 . 10 OE!. 2! #"
1\$02 2. 0 2 / .3 ! 02. * 0OE 2 # . ~~U#~~ . * .&!OE 2#2." "" OE)20
. . OE!. 0 10 12. 0! OE !0 . . OE)20 ~~UJ~~ 802. . +0 1120
+1 0" . ! 1.2.01"2 1²⁰ "ü#2 /)2 '2/ 20OE 2! OE 0 2 20 OE 1 2)1
12. 0!+ 2! \$ + \$! #")1 . 2 0 2! OE OE!" /#1 0 0 " +1
.KXQGDGJH 6HPPOHU

b OE2 OE 1 /0/ & .OE 20 0 .) . ! 1 0! . 0 12 1* \$!
. #1 . +" 0OE 2! OE 0 2 1# OE2 . .2. 2 OE!. #1 .1 1* 02&
! 1 OE + 2." 0! . 0 . OE!. #1 .1 " . . #1 " /0/ 7D&OH)OEX2" 2
3RZHU %,OE2 OE 1 /0/ & \$0 . /0 \$ 0 10 !\$0 ! 02 . 0 0OE
0#3#ø." . \$! .2 " % " .OE 3 10& / &" 10 OE0! 2. OE #
.OE) 0 #") #" . OE #OE)2 2. /0/ & 1GDVKERD&JGV
/ ./!.12 + . . *10& / 0# * 02. 01 " 0 2 OE 1)& 2.10& OE!
OE!.2 ! 10& OE # .OE # .OE) 2 0OE !.2 *1. /# . .!. & / .
0 1\$* 2." 2 . ! 0 . 2 1# 30 . . 2 . ! % .OE 3 10&
OE2 OE 1 #OE 12 ! 0 .1 " \$! .2 " 0 2 #! 0")OE&"
OE0 #1 . + 12 \$0 & .) 1 0OE0 /#2 " .OE)/ 1 " . OE!) 0%
ÿ/ . 20! 1 .1 . .OE 2 . 12 / . \$0 ! 1 /* # 0)20!. . +"
.OE 0) 1 . OE!. * 1 \$! .2 OE 12&2 + . OE 12&2 + /* & 1
\$!) 1# 2." 12 0 2 12 OE 1 12!.2 + 12 .OE 20 01 .2 .2
. 12 0# # ! 1 2& \$! .2 + .OE 3 10& 0 2 #" 12!.2 *"
! . 1 + 0 2 #! 0")OE&" . \$ 0#1 12.2 12 1 .D2QR+PD.OE 1
GM/HFWLREQ &12 . #1 . 0OE 0 0! .1 . 3#11DWXU+D10."/DQJXDJH
3URFHVAV1L/QJ0 1& .2+ 2. OE 10 OE .23)! 3RZ)OEL%27DEOHDX
OE! 13 ! 2." 1\$#! " . . #2 " /# .2)2 20" \$&! " 2 . 0 0
OE! !. 2 12 + +10& . 0! . 0 . .#2 0OE 2! OE # 12 #" \$! .2
. . #2 " . 2. 120 \$. 0 2 OE # OE!)2#OE. . OE! OE # 0 0 0 "
. * OE 12&2 *" /* #" . . . \$ 0* # OE .OE 20 01 .2 0 /0

²¹ * 3& . 0 20&! . 2& /* 1 !! OE + \$!©.#"a . . ©. a 2 \$ " OE #
! 1 02. 2 12 . 1 !! OE . 0&!0 2. + #2)12..0+"OE * 0 0 + \$! "
OE # ! 1.02 2 12 . 1 !! OE . 0 0! OE 0 .OE 12. 0! OE 2 " /# 0 " / -
OE0!. 2 !& .OE) 1 .OE) 2 +1 OE !0 . 2 OE0! OE 2&1 2 " . " 1 !! OE ." \$
. 0 OE 2. . ! " !.)2 20")OE&" .OE)210" .#2!10 "/12#
ULVN SUJHRBD . . 1 0 . .VOE S'SLQJ 6SHPLQOVHV <RXQJ
²² ú OE0 03 © ü 2 \$0'6\$ +0 " !./ \$ " 2& 0 / +
. 1 &2 " OE!. *1." 0! .1 ."

.! . .# .) 0 \$! 1 OE & 0 \$ # 10 1\$0/) OE!. .2) \$!) /
2 OE!. * 1 .1 + /0 2+ .CEH\ B HUIRUPDQFH.3QVGJCEBWRUV
2. 0 . " ! " .CE /)10 " \$.!2 3# . & . 0 OE1 DE/D/N /* #

b ù . ü 2'6\$ 0 2 ! 1 2 " 0\$ 2 "
1* "

. OE . 1 . . #1 " &1)2 2." \$! #" 2 # û . 2 " ü#!&CE.' " üCE 2! OE
10 1# .2 " 02! " OE! 10 10 " CE 0" \$ # CE "*" CE0!
.OE 2#CE+1 # CE0!10E 100" 02. * 2& 02. 2+ . +" .1 2. 12 12.
2 #) # \$! #" OE! " üü CE! 0 # . 0 2 0 . 2 \$! " CE!.
. ! \$!) . ò ." .! " CE!. 2." 12 .) 1 2& . . *10& &1)2
OE . 1 0)" CE *OE!. #2 * * . \$! .2 * CE0! 2
0 . 0 1& 2&1 2& 02! 10& /* # 12)1 12 " #CE !\$ #10"
OE! 10 10 " /0 .OE 2#CE+ 2. 0OE!.+" .! \$!) 0" 2 10 " .
02. " 2 " ."+ 2/" 0 /0\$ &" 10 013. 0" 0 2 10 " &1)2
2 . 2 02+OE 1 .#2+ 2& ./# . + /* .2. . \$! 1 OE * 20\$
1 " CE 0" 0OE 2! CE # 2 . #1 0 & . CE #/ 12.2& 1#)
. 2 1* % !+ 1\$ 10& 02. * 2& 02DIL2+ /HNKD0 .
0 2 2 # 2 CE #! 0 # ." . + 2 " +. ." 0 2.10 2
!.\$#CE!) 01 " CE!) 0% " 2*#3 ÜQIRZFDVWIL&Q 2 " . CE 1 " 0 & .
020! 0 + 10&/ & CE 0" OE0! . # .! 12 \$
\$! .2 " 02. 2 " . 0 20 /0/ . 0OE \$0 ! .2 + 0!0# +
/& . #CE /& 1# CE !.1 . 12 CE .2 0 0 .)2 CE!. / 1 .
02! " / 0 . . 0OE!. 0 " . 2 0OE0 0! .1 . 0 & . 020! 0
/0/ & . 10 .#2 " 2 " CE0! CE2+10 " OE! ! 02. # 2 1 CE CE!
. \$. 12 + CE! 10 10&)CE&" 2UDQ\$R.P/IRU#VWV!& / 2#.
%DQFKHW &RXHIIH

/ \$. " 1 " . CE * 2. . . CE0! 11)20! 12
\$! .2 / &" 12 CE . 1 OE! 2& 0 2 12 CE 1 " ü /
OE! 10 10/ EDVHG RSWDBL!J]DWLZRQ12 / . \$0 ! 1# 0OE 2! CE 2." 2
0 2 OE 1) 1* 02& CE! 2*CE& . /# 2 0OE /# & 2 10& 0 2)" 0
/ 12.1 " 1#) & \$! .2 + /0/ & .! . 1# # 12 0 2
OE! 0OE2 " .! 0 ." . +" 1& 2 " 0 1 "/.CE). 121!2.2/0/# .2
0 2 1 0 2 + .CE /)10& 02. 2)2 2." 1# . . .2 + 1 2 +

! 1 & \$! .2 + 02. 2+ CE!.CE & CE! %0 " 0 1& .2+
/ ./ .1 0" 0 2 12 CE 1 " \$.!2 3# . # 0 12)\$ 22" .0. 0 2) CE "
.CE)/ 1 " . /) 0 # /6'D#M\DO 2 CE . 1 '0\$"
)CE&" .#2 \$0 / . !3& 0 .CE) / 0 0 " 01 "*")CE&" 2 û 0 " 1
.)1 . ! CE0 . . ü#!&CE.' 0 2! (&% CE@ .1& 2&1 0! . 0 &
)LQ7H\FK2. . 0 1\$*10 #1 &/+" 2 " #3 12 0 0" . . #2 " CE! 10 10
20\$ " \$. " 1 " CE! * . 1# CE !+1 # 2. CE!./'6\$ #CE /0
1& 2 " .#2 .2 CE 1 " / ./ .1 +VW\CE#WV2 QJH V2 \$.12 " CE! "
0CE 2 & . .! + 02. 2+ . +" . 0 2 1 2& CE 12&2
VRYHUHLJQ ERQG 2V\$UHD*G# \$+!." ùCE) 2 CE 0#! '//# .2)2 2.
. 0CE0 0! 02. 0 #") #" /CE!. &2 1)0 \$!) CE !0 . 0 1\$*10 2
. ! CE!. * 1 /* & 0CE 2! CE 2." 2 2.\$*20! CE! 1.! 2&
0#. 1 1 ." .V&UHV\W#H\MV CE * 2. 12 . #1 &1)2 2." \$! #"
1# CE0 . 0 1& 2&1 CE! +& .20\$ 1 " 12 0#!*20! . . #2)
CE . 1 26\$ CE !0 . 0 1\$*10 2 . CE 12 . 2& CE! %0& . 0 +1
#CE 0 2 1 " \$! .2 CE 12&2 + . 1 !! CE + . . 1# 0 10 CE
.CE 20 01 .2 \$!. " . / " CE 2 +X'D Q\DO
ù . #2)20!6\$1# 12 0 3*10&" . . !) . \$! .2) /# .
2 . . .1 02. 10 CE! " . . & 0 2 + 0 0 + . 12 20
/* # 1. 10 12 \$.12 CE.0!)CE # !.)2 20" . .12 0 . :
. !+ CE. # . ! 12) !) ùCE. 20 2 0 CE) 1 CE! + 1\$02 0
/)1 # \$! #" 2& / 1 + !+ 2& 0CE 2 & 2 # !# *
0 # 1 " . V&UHD.G# " .2 .CE 2 1 2 # /* # 1& / ./ .1 + /
. !. & .2.12 10&WUHV V W H O E V 2 Q J 12)\$ 2 . ! 0 2 CE 1) 2& /
0 .#2 2 .20* # 1 /* . 2. . 1# 0 #1 .12 0 1& 2&1 20\$
1 " 12. #3 12 0 12 1#. 0 CE CE 20X W B\DO 0 1# 30 . 0 2
#CE !\$ #1. !.3 . 1\$02 0 2. 1#12 .2. . ! 'H D E U O /ZCE U Q L Q J
V\WHPV ! 10 " \$! #" . / 1 .12 0 . 2. 2 . \$. " "
0CE 2! CE # 2 . \$ 0#1 + . ! ±\$! .2 CE 12&2 + 1\$ 10& .
2 0 1& 2&1 0 #) # 020! 0 + /0/ & #CE0! . 2." 2 #" CE0!
.1 + 02! + CE! 10 10& .! . 12 CE . 1 (2&8% ... *10& .
2 \$! .2 CE 12&2. 0!)2 2. . 2 /# 02 0/1E D V \G VRYHUHLJQ U
P R G H O E V ! * . 1# # 12 CE ! 120! .2.) 1 2& \$. 1 + 1& 2&

0 & 0 1)CE&" .# 10 " 0CE 2 & *301 0&CE 2 " 0 2 10 "
&1)2 2. 2 #1 / #)\$! #" . 12 " . ! " !.2 +) &
p 03.! !& & *1\$,&. 0/ 10 1# /#.1) 0 CE! . 0! . 0 .
CE2 CE 1 " /0/ & /* .2. . . . 10 '6\$1 .120\$ 2 0" .#2 "
0CE 2! CE # 2 /# . 0CE0 0!)1 .# 0. ! # + . / 1 +
/0/ & 0 1\$* 2." 2 .! 0 . 2& CE! %0& CE # .3 ! * .1 " CE!
&1)2 2." \$! #")CE&" 2. 0 . " ! " 2. 0CE 2) . !#
2)12 " 0 #CE ! 2 1 " #2' # üCE CE CE .23)! 0" . #1 " /0/ &)CE 8
3RZHU .%,27DEOHDK& .2+ 2." 0CE0 0! .1 . 3#1 1/3 #11#" 2
/# .2)2 2. . . ! 0 2 CE 1) +1 & 2 10& 12 /# . 2 # \$!
.CE) 1 2& /0 2+ \$! ù#" CE)" 2. .CE /0 2)! . 0CE /0 &1 2 " .)
0 #CE ! 2 1 " 2 # \$! #" #CE) /#1 0 . ! 10 ! . .!
CE & 0 \$ # 10 1\$0/) CE!. .2) \$!) CE !0 . 0 1\$*10 2 1# 0\$
! 1 & /0 2+ &1)CE&2.") " \$! #" CE! " ùü 2 CE!&2 0 " .CE 2 0
. 0" . . \$! .2 /)2 1 " .) " 0 #CE ! 2 1 " \$! #" CE! " 1 /. 0CE 2!
01 .) 1 0 . . 2 + 10 .! & CE 2 " . 2 2.\$0 . CE! 1.! 1
/ . \$0 ! 1 " \$! #"# 10 0" .# " . 0 .)2 2." . 02. 1D2 D2N2."
üCE CE 10 . 2 01 0 2 " CE!./ 1 . " "CE! 10 CE 10 " " 21" 2. 1#\$
10 12.2 " #CE 10 " . CE0! ! 1 . 1* E.L 00/W.D & 2 *2.03 2 2
/# . . 0 .2 0# . #1 10 1\$0/) CE!. .2) \$!) . #63\$ 12 0 . CE
2. CE . .1 2. 10 .! " CE! " /0 20" \$! #" . . . *10 "
VWUHV V 0VHV WV. 0 1\$# * 1 . 2 1& 2 " . CE 1 ! 0 + & . 02
1#) & /0/ & p \$! 1 2 #" /* .2. . #CE 12 ! 0 2 02 .1 .CE)
0 0CE CE2 CE . 1 . 10 12 \$0# 0" . / .3 ! CE 0" 12!.2 "
. \$! .2 CE 12&2 " 0CE CE20 ." 0CE 2! CE 2." 12 "1.!)/ # " !.\$ "
0 . !&" 2 " CE 2 " 2 #" . . 0 1\$* # 2 .! <D Q HW D2 . 0!)2 2.

0! ! 1 . ! 10 " 2 " ü 1& 2&\$1 " 2 "
12 . ! ù #1 . 12 ú &1)2 2.
! #"

p .CE 20 01 .2)2 2. 2& &E 0/10 '/100 .!2 2. 10 0 .) .CE) ! 1 #"
CE.! 20")CE&" CE)2 2. 2& / . 1 & /0/ & !
\$.! . 2 ! 12 + . + " . .)" 0! 0 #1Q WY 2 U S"U 2 H W DCE LIO L) W\ &

2 & \$ODPMDO p 0! 0#1)2 2. ! 02. &" /)2 2. 0)" #CE
2 # CE # 0CE 2! CE0 10 . 0 / .30!) 0 3 ! . . .2. 0 2 #" .1
. 2 #" \$. 1 "*" CE # . ! # . .CE)3.1 CE . CE%!X V02P D CE) .#2
HWDO " 0 2 *2 # 0 2 \$! .2 !0# . . 0 2. . 012 10
12 0 2 &1 2 " CE! 0CE2 " .! 0 ." . . 12 0 1\$#1 2 " 0CE0
. 0 2)2 2UREXVV2QH\$M1 CE * 0 & 2 & p . .#2CE)CE! *CE20
2 0)")2 2. 1* \$! . . ! 1#12 .2. / &" 2. . 0#!& /
0 2 #! * @:*.! #2^ . 12+ 2." /#1\$0! 2 .2.) 1 2& #CE 0 0
\$. 1 + CE # / * 10 1# 0! 0" CE! %0 " p 0 % / .3 0 .
CE0! ! 10 2 \$! 1)2 2. 2& 2 & 10 CE0! 2.)CE # .CE. 20 2.
2& .CE 3 10& 0 + CE.! . .# 0 2 /# 013. & .)CE 12&
üCE CE . 0 2)2 2. 2& 2 & . 12.2. . ! 12 10 .
\$! .2 + . !+ CE # \$.! . 2! 02. .CE) / .! 0 " / . # 10 " .
0)2. 2 . 0 \$. . 0 2)2 2. 0 / \$02. . CE.! #1 1 # 1 .! "
#CE) 1# 0" . 0 .)\$QD"HWDO #CE /0 .\$. . 0/ \$ #
0 CE. /0# 0 10 12 ! /0/ . CE # . 2 12 \$ * 10 CE0!)/ #" \$. " 02
0 2 *2 # 2. #CE /0 .2. .#2 0 / \$02. . .CE 2# \$ # . #CE 12 ! #
2 % .CE 3 10& 10 1# 0" 2 " " *301 " !\$! ".2 CE 12&2
. CE! 20 # 2 .2 / . \$0 ! 1 . ! CE!) 01LQDQF/LD& 6WDEL
%RDUG p # / ü ù!\$ û 1 " û 1\$0 CE1. "1 2 " 0!.CE0 ."
2 # 2 .2 " 2 " 0 % " / .3 0 ." . /# .2)2 2." 0!.2.0) .1" 2 "
1# 12 " 2& \$,)/& CE2# 0 . . 2) 03.! CE!) 0% " 2 # ùü
. CE 0 0! 0*1 . 2 . \$. "H[SODLQDE-0210/ . 0 2 & 0
. ! 0 . . / .3 0 . 12 " " CE! %0 "CE)# 0\$0 . .CE2* 0 .
03.! . 2 . #1 2 " 0CE /!.1 " 0 02. 2 " /0/ & 12 " CE!
©.*!& #2^+ EOB RN PRGHCE2 CE + 2." 2 0CE /!.1 2& 02. 2
/ . \$! 0 1& .2+ 2." 0 .#2) 2 2!)CE 2 20\$ "2. ! 1* "
CE! %0 " / .13. 2.") &" CE.! . / 1 . .2(&'CE 12 1*

)LQDQFLDO 6WDECE0LW.\ %RDUG 0 202. # 2 1 ./ .3. +
0\$ 2 " 1* " 2*EOD#FN1ER[\$! .2 CE 12&2 " "2.. CE . 120! * 2.
0CE.! "*" 0! 0#1)2 2." . 0 ODXG)2W2DE/L\$02W\ . / 10 10 1#12
/ \$#1 13. 2& . 0! % + 1# \$! 1 0" .#2 " 013. 0" .CE 3 1
.1 2. 10 .12. 0 " . .1 0"" 1#01\$CE21001 . 2 #CE 0 2 1 2 # /
10 CE0!)/ #" 0#3 ! ." 2 0 1\$#1 2 " 02. 2)2 2." . 2 /#1\$!0 .

CE.! .1 " 1# 0CE 2. /# .! *P D E O C E Y/H# U L V N
\$! .2 CE 12&2 12. 0)!!DQZ.F.LDO 6WDELOLWÜCE%RD&UG . CE2#
20\$ + CE # 0CE 2! CE # 12. 2 . . CE.! # 12. 0! . .)CE 12. 1
1# + .CE 20 0 .CE.! 2 2 CE! (CE) 01 . 2 .13. 03.! 2 #" 2
. 12.2. . . .)21020 1# 0! .1 . 02. * 0!0# 2+ . 0CE. 0 .2 + 2 "
CE! 0 # 200\$. "/ . 0# # !. 2. 0 2. CE!)2#CE. \$! .2
/ . # ! 1 " / .3 0 ." . / 1 ." 1# 2." 21 12 +1 .
. CE 1 2 \$#PDLHWDO

CE 0! 1 .2.

p /# . 0 2& \$! .2 CE 12&2 + . !+ 1# 0CE 02. .# 0" .CE.
0CE CE2 " .)2 20" 2& # 0! 2 + .!\$+ 2 CE . 1 .#2) !# 12
. . CE * ! 0! _!0 . CE 1 " \$! .2 CE 12&2 * /* #)CE&"
CE.! /0 . 2. 0 . /0/ . 0 .CE+20! 12)\$ 2 .! 120! 0 2 1 2&
1\$02 2. 0 2 /# . 2 # /)1 # \$! #" . 2 CE.! * 1
. ! + . \$! .2 CE 12/02 2++ CE # 0CE !0 # 2 &1)2 2 2
20\$ " \$. " 01 \$! 1 CE * 2. #! &" &" .)! CE # CE.! #
CE! 0CE2) .CE 2 01 . 0 2 0 1& 2&1 2 #" &12)1 12. 0CE 1 . CE
ú &1)2 2." ! #" . CE.! ! 0 CE0! CE0! 11)20!0" 0 20" . 2 02&CE
0! . 0 \$, &" ©.*!. #2^a 2.) 1 " . + " /0 0 * CE+" .2. # 12
.CE 2 01 . *20 CE+" " 02. 2 " . 0CE /! * 02. * 2 #" 1
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/ .)!3&1 12!.2 + 2" CE . 12 / . \$0 ! 1 !.2 * /* #
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/ . !3+ 2." . CE 1# 0 2) . . 0 2) CE . 1 . ! " / . #
CE0!.1 .2 . CE 1 DILQ70R&K\$*0 2 /# .2)2 2. 2& /)1 & .!\$+

. 2& / 0 + 01 + . OE.! # * . . . * 2 /# . 2 # /)1
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ùOE) OE 2 1 OE 0 1& 2&1 0! . 0 & \$! .2 . "#20\$."
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. .OE)30# 20" OE0! ! 2." 2 \$+! 0 . . 2 + OE! 10 10& . 2
#1 .12 " / !.2 " / . * 0#"1 " 0 .#2 0OE !0 0 . 2 OE
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03 . ü ù yù ùÿ ûþ ÿ ü

ü 1. &

/ 3 !0" \$,&" 0! . 0)LQ7H.FOK 2 * / . 20! 1 .1 .)2. 03.!) 2. 1
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0OE ")OE&" .2. OE)!& 12)\$0#1 / 1 + OE.!0 10&
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OE 2 .OE)3.1 OE.! #1 02. &" 20\$) .OE 2 01 . #OE 1 * .
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% " .OE 3 10& 2 OE @ 20 .OE)12.10 + 0# * 02.2 OE 02. .OE) 2
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0 1& .2+ # . 12 " . . " OE!./ \$ " OE 2 2 # " / 12.1 1
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ùOE) 2. 1. 2 " /0 .02 ." 2 # / .OE 12+ 02. . 1#12 .2
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OE 2 " %X'UQKDP p 0 3 0 0* 0! OE. 1 OE 1 .2 0 " 1#12
OE 10 " 12. 0 ! 2 #OE \$!0+ 2 " 2. . . .OE! 1.!)1 # 2 " 12!.2
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ú.1) \$!. 2 ! 12) 2 " 0 . . /#1 ." OE.)12 ." "\$! ."2 OE OE2 &
3 !02. . \$0 0 1\$*10 2 #! !.\$. 2 " \$! .2 OE 12&2 " 13. !." .
. . \$0 #OE 0*10 2. 0 . 012+2. %RQH I H*OG10 "2
2!)OE .#2) 0 0 +" OE 2)" \$!. 2 !10 &&12E.OE0/ 2 # \$! .2 " . 2
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1* \$! 0" !3 " / . # ! 1 " \$!. 2 ! 2. .OE) . 1#12 .2
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2 " 02.2)OE 1 " .OE) 2 / . ! 2 0#\$!0 . 2& 0 0 & # 0! 10& OE!
OE! . ! 1 & .) 2 1 1 " OE 2 " 0)" OE # OE0! !
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OE 0" OE.! #1 2. &" .OE 2 01 . . 2 0 0 + . . . 2 2& .)
1# 0 / 2 " OE 2* 1 " .! . . OE.! #1 02. &" . .#2)
.#2 !!#) 0 OE0/ 21 +120 . .OE!0!* OE 20OE. 2)2' \$.! 2 !." 2&
01 + OE . 1 & OE # 1# ! 2 * . !# #1.#2) .2! "2!)OE 2 .2.
)OE&" !.01 . " 1\$ 10 " 1 " !# 10 " / &2 OE 10 " .OE 1
OE0/ 2 " OE 2 " / . \$ " . 0OE. .OE! 1/ ! 2. &" 20\$. .OE)30#
#OE 0*0 2 OE 1 & + . 0! .2 + / 0 / 10&1 üOE OE!))
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% " .OE 3 10& 1& 2 " 02.3 ! " ! 1 & .! / 2 2& 10 . 0
20\$!.2 *" #OE0!0 *" 01 *" p / .1OE ! 2 " 0 #1 . .#2 " /#
02 OE 1) 2 " OE 2 " 0# * " . .OE /# . + 0 2 # " \$. 1 * " / !.2
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p 02 2 ! 1 2 # !.\$ 20 2 2 " ü#!&!+ 2"! 1OE 20OE0! \$OE 2 & 1
20\$!.2 OE 1 " 2 " " / . # ! 1 " . 2.#2)\$! " .OE OE 2 OE
+ .OE 3 10& 2 . .#2 !3 #OE0!0 " 20\$!.2 " 0 #1 .
©12. 0!)2^2. ©2. & 12)^2 2. ©02.!!* 1 0 2 #! * &" 20\$ /0 20"
OE 2 " . / 1 " .OE 1OE.1 .OE) 2 " & "/ .12OE 0 2 . " 2 #"
. /#1 . 01 OE © 1 + /0 2+)OE&ÜLVN LQGLFDWRUV ILVFDO UXOH
FDSLWDO1#XIIHÜV12 1OE .#2 " 2 " 02.2)OE 1 " ,. OE ! *10 . 0 C
. .)2 . 12 OE0! OE2&1 2 " ! 1 " 2 # 12 ü#!& + 2 /)
\$! " 02 2!0%.) !0" @300" 10'OE . 2 10 01 * " . ! " .
#OE \$! &1. 2. #OE 0 .0.. # .2 2 /# 2 . 0 .)2 2. .
1# 0OE.) 0 ¶.#OE)12 " .OE 1# / 2 " 2. .OE) 1# " / " 12 ! " C
. ./ . " /D]]DUDWR " 0 2 *2 # ! 1 . /0 0 2 .1# 02! . 02. * .
. / !.2 .")OE#!+2 #OE0! 1\$*0 . + " . 2 . ./ 2. 2 " #! !.\$.
0 0 . 1+ .2. 12 # " 20\$!.2 *" \$. 1 * " 2 # 0#!&1#12 .2 " ù#2)
. . .)2 2. . 2 / . \$0 ! 1 2 " \$! .2 OE 12&2 " . / 1 " .12 C
#OE ! \$ 01) OE . 1 /0 / 020 0OE.! 0 " \$. 1 * " 1# " / 1
\$. 1 / 1&1 ")OE&" ü#!&OE.')" \$. 1)" 2. 0!)2 2." . OE
1# / . 0 .#12 ! * ")! # " OE! 1FIR Q G L W DER @ DOEL W \ . 1# 0 !
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0\$!.2 ù) 1 2 . . 2 ÿ1\$*"
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%DUU\ #OE 12 ! 0)2 20\$. /0 .OE 20 0 #/ 20! 1 . 0
2& OE! 2 !& OE 2 " 0OE " 1\$02 12.0. 2 !22) 02! 1 .

. 3 1 2 1 p OE 2 1# 0OE+" /0 .1 0 2.) 1& 01 + .
20\$ + / .2 0& V.OED QGD UZG VOE!&2) . &" 2 " #OE / " . 2. 2

OE . 1# ! 2 * OE0/ . 1# 2 1 * .1* .OE #10"1 * .! . 0 1\$#1
2 " 20\$ &1 ." . 2 " 0OE 12 " 01 1 " / 0 10 !3 " 20

OE 1 ")OE # .OE 3 10 " OE.! #1 2. &" 20\$. . 0
.OE OE 2 OE 0" " 0 2 *2 # OE " \$! 1 /)L QZ.HOF!K2 0 & 12

'6\$/0 0 . 0 &20! OE! " 2. 2 . . 0 1& .2& 12 / 2 #" 2
0 2 #! . 3 !0 " OE # 0 \$ # 2 " OE!./ \$ " 2 " OE!. 2! #" .

OE! 1 +10 " / 0 0 " !. 1 01) 1 " 12. OE . 1 . . #1 "
&1)2 2." / 1 # \$! #" .OE 2 * / .OE!. .20#2) OE 0 2 . .

30 02+ @20\$ a +11. 2 " &1)2 2." .OE !*OE20 12 OE!. .2)2 2. 0
OE 2) OE0! 0\$) 0 . +" OE!./ \$ "OE \$#2 0OE 2) . /* #" / * 1

/ .3 !02 " 0 2 10 " . 1# .) # . 10 / .3 ! OE #")! #" / . 0 1
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&" 0 /# 0 *1 12 ./# . .OE0 OE2 #4 "1# !*10& /@.2OE" 2a)
0! . 0 2 OE . 1 .#2) . 1 . 2) 2 . 2 " OE 2 " 1 % " 0 . #

OE! 1 & 12 / .)2 20\$. OE !0 . 0 2 #! 10 &" \$. 1)
02! .1 * .) .3#OE" 2& OE 2 + . 2 OE!. 10& ù . \$0 #OE 12

\$. " OE ! * . .2.002#3#0 " 1* 2 #" /0 1# 12 0 0 " 2 #
\$.!. 2 ! 12) . OE! *OE20 &" .OE 2 01 . 0)" 0#!*20! # 1#) #

OE!. 2 + .OE 3 10&\$.!2. &2 + / 0! .1 + OE # 1# ! 2 * 2 #")! #" .
)! . 2 " 0 2 #! ." 2 #" 12)1 2 2 # 0 / #" 0OE \$0 ! .2. /0 .
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.#2) . .# *OE!.!2DUU\ p . OE 1 0! .)L@7HF2K . #1

© +1 a# . / .! !+# 2 01) OE0! 0 2)" 2 # OE # . 2.
.OE 3 10 " " OE 2 " ù#2) /* .2. . \$0 &" 1# OE0 . 2
1# 0 ! & OE 2 + OE !0 10&)OE&" 2)2 2. 02!!# 10 " / &

p ùOE 2#\$. 2& & 2!2 !) 0% 2 "
! .2 OE 12&2 " ! 1 " 2 #

p #! .!\$ 0 .1 0&! . /0 OE! 0OE0 *20 0&! *10 OE . 2 0
1#12 " \$! .2 OE 12&2 " ! 1 " 2 2 # 0 # ")OE&" .#2 2 #
)2 \$! .2 OE 12&2" /". 2 # 0 0 0 " \$. 1 "*" .#2 !!* 1 ")2 2
OE0! #1 . + 12 \$0 & / . !3+ 2. .OE 20 01 .2 .)2 1# 0\$ "
/ .3 ! OE 1 2& \$! .2 + OE! ') 2& 0 1\$*0 2 .OE / 2)2 2. 2
. 2 " / .!OE 2 # /* /# [:HVWHUKRI! 3& . 0 2%RRNVWDEHU

\$! .2 OE 12&2 ! 1 2 # /0 1# 12 .OE +" .OE 2 01 . 12!0 +
. 0OE.! "*" !# 12 * 0OE OE2 * OE . 1 # . 3. 1 ." 0#!*20! "
0 OE0/& "20 0 2! " .2 % " 2 # \$! .2 OE 12&2 * 1#12 .2 " p 1
OE! 1 1 OE! (OE 20)2 . ! " OE ! * . .OE / * &" 12.2 OE!
#OE 1 . 1#12 .2. .2 . . 2#OE OE 1 1& #OE /0 2& OE #
0 ! "2 " 01 " & " \$! " . 1# OE0! 3 ! " OE #OE)
OE!. .2 " . " OE! 0 # . 0 .13. 1 # . .2 / . \$0 ! 1
OE! 0OE2 . ! 0 . üOE OE!)1 02. 2 #OE !\$ OE . 1 1 1 " \$!
OE 2 " .1 0OE OE 1 2 " 02! 10 " /* # OE 0" 1#\$ OE! 13 !
0OE 3. 0 . 0 2*OE&1 0OE 12 " . ! 0 ." 12 / ./ .1 . / . \$0 ! 1 " 2
2. 1* \$! . 1#12 .2. 0 \$ # . 0OE OE20 ." / # /#1. 3.1 10
0 2 #! " OE2#\$ " 0 " ! " . " 13. !)20! " .) 1 " 2 # . ! OE!) 01
. 2 " 1# " .OE)/ 1 " 0 .#2) 2 \$!2!OE \$. \$0
/ . !3+10 . 0 . !02 ³ 1!\$#!)OE . 2 .OE) &1 0OE !#" /* &
\$&!)" &" . OE! 13 !0 . 2 12 \$. .OE 20 01 .2 0! . 0 . .2 .2.) 1 2
1#12 + OE! 1'D&QtHOVVRQ

p \$! .2 OE 12&2 ! 1 2 # .2 /0 0 2.)! . 2 " 20\$!.2 " 0
OE 1 2 OE . OE!)2#OE. / . \$0 #1 "2. /OE . 0 \$. OE. & 0 .2 2
OE! * 0 /0 .02 . 1& 2 " / \$#1 " / & \$! .2 + OE!
VHFXULW2]DWL202. " \$! 1 " #OE /0 2D&O 2WVEV # 29D5 2 "

23 © 9D5! 02. &" 12 . . 0) 0 . 0)" \$.!2 3# . # . . /0/ 0OE
0 OE 12 1* " . . 1# 0 ! \$! a 6)WXO] 2.