

5HSRUW 1R 3 1&3 5 5HY 1 &
5HSRUW 'DWH 0DUFK

6ROYD\)RUPHUO\ \$GYDQFHG &RF
070 &) 5: . 3: \$6)DEUL
/+ FXUH F\FOH FRPSDUHG WR 0
(TXLYDOHQF\ 6WDWLVLWLFDO \$0

)\$\$ 6SHFLDO 3URMHFW 1XPEHU 63 : , 4

1&\$03 'RFXPHQW 1&3 53 5HY 1 &

5HSRUW 'DWH 0DUFK

9€ € ~ % † r0

5HSRUW 1R 3 1&3 5 5HY 1 &
5HSRUW 'DWH 0DUFK

3UHSDUHG E\

(OL]DEHWK &ODUNVRQ

5HYLHZHG E\

-RQDWKDQ 7LVDFN

.DWKHUL

\$SSURYHG E\

5R\DO /RYLQJIRVV

0DUFK

1&3 53

5HY 1 &

7\$%/(2) &217(176

0DUFK

1&3 53

5HY 1 &

/LVW RI 7DEOHV

7DEOH 7HWW \$EIRVSHRQD
7DEOH (QYLURQ@HWWRDQV &\$EEUHYLDWLRQV
7DEOH 2QH VLGHWWRB@HEDQFLPLDQVY@XHDVSOH PHDQ
7DEOH 2QH VLGHWWRB@HEDQFLPLDQVY@XHDVSOH PHDQ
7DEOH)DHL@HWV 6FDOH
7DEOH 6XPPDU@RQFTXHWV 5HVXOWV
7DEOH :DUSV@BR@UH@H@Q@W@
7DEOH :DUSV@BR@UH@H@Q@W@
7DEOH :DUSV@BR@UH@H@Q@W@

0DUFK

1&3 53

5HY 1 &

,QWURGXFWRQ

7KLV UHSRUW FRQVWLWXWHV WKH WRTXNDXOIRVRRUO\ \$GYDQFHG
&RPSRVLWHV *URXS 070 5: &). 3: \$6)DEULFXVH F\FOH
FRPSDUHG WRTXNDXOIRVRRUO\ WLRQ SDQHOO+ SERGXFFHGOXVLRQ
VDPH PDWHULDO 7KHQDWPLRQDWXOIRVRRUO\ SHHQW\JHQWDDKH
ZLWK)\$\$ RYHUVLJKVSHFKDQX3KR)S\$FW 1XPEHQG OOV: ,PHHW
WKH UHTXLUHPHQWV 3RQWDDQGLQGLQSHUSDW6J 3URKHHG&UH

0DUFK

1&3 53

5HY 1 &

RQ WKH UDZ PDWHUWLBOLVDDQEDQXZDFDQGLSJRHTXVLSRPMQW D

(QYLURQPHQWDO &RSGLDWLRQH 7\$E	EUHYLDWLRQ
&ROG 7HP SHUDWXUHÍ 'U\)	&7'
5RRP 7HP SHUDWXUH 'U\)	ž)
(OHYDWHG 7HP SHUDWXU)	(7'
(OHYDWHG 7HP SHUDWXU)	(7:
(OHYDWHG 7HP SHUDWXUH :HW ž)	(7:

7DEOH (QYLURQPHQWDO &RSGLDWLRQH 7\$E EUHYLDWLRQV

7HVWV ZLWK D HQXIPDEMHUOLPEWHV LDKMHL RDK HQGDV D S/H

³4XDVL ,VRWURSLF´

³6RIW´

³+DUG´

(; 2+7 LV DQ RSHQ WRWV WLMQW LTRDVL LVRWURSLF

:LWK D R E D E L S U L W \ R H R Q T X L R Y D O R D I E G X W H V W G X H W R U D O
FKDQFH DORQH DVINZKR D O C H I S G W H Q / G R H T X H L Y P D Q H W W L O O E H
SUHVXPHG SURY L D H G X W K D V D U W K E R W V H Y H U H

6WUHQJWK DQG 0RGXOXV 7HVWV

)RU VWUHQJWK WHHV S U Y B D X H O \ Z R I Q T H H Q X I G Y B Q O Q E H W O P S O I
VKRZV ORZHU VWUH Q W K R Y D L Q X Q V O W F H O O D I O L F B W L R Q B D W H U U
DV D μ R Q H V L G H G † K \ S R W K H V L V W H V W H G L D J K H U R E Y O I O X H W K R U X
W K H \ P D \ L Q G L F D V E H H V Z G H I Q H W K G F M Z R T P X L W B O I H O F V I V X P I S I O H
P H D Q D Q G V D P S O H P D Q I P K R P Y S D O X H G V D J D L Q H V I S H M F W H H O L Y Q L O P X H
I R U W K R V H V W D W I E R W P S K W H Z K L E R P D W H W H T X D O H M L X F O W W L R Q

7KH H[SHFWHG YDOXH V D Q H W R P S X D V Z H G H O H O Q T O V E I O G L Q
DFFRUGLQJ WR WKH IROORZLQJ IRUPXODV

7KH PHDQ $PXV \bar{X}$ ^{finite} H [F H Z K H \bar{X} H D Q G 6 D U H U H V S H F W L Y H O V
P H D Q D Q G W K H V W D Q G V K L H G T Q X D Y O L L D M F L D R V L R Q V D P S O H

7KH V D P S O H P L Q L P X P P_k^{Xbb} V W S H Z [K H H \bar{X} G D Q G 6 D U H
U H V S H F W L Y H O \ W K W P E G Q U D Q G H W K B M F L D R V L R Q W I O H P S O X D O

, I H L W K H U W K H P H D Q D R O J W K E H O R Q L W P K P X R [S M I K M W G P P S Q H L L V
F R Q V L G H U H G W R K D Q F \ I D R L O H V K D W X E G Y D O W K M H Q X L O W K F S B W K H
U H M H F W H G 7 K H S U R I E D W E K E U W W K R H P H O Q P R W H W W H W K Q . O H Y H
V H W D W

)RU 0RGXOXV YDOXH V I M K O X U T K I R Y F O H O F H V V I P S O H U P W R R K
W R R O R Z F R P S D U H G L W G P H K D H T X D Q V I L D F D W H H W Z R H G L V R G †
K \ S R W K H V L V W H V W V S P S W D I Q G Z R J G V D L Z O R H V G R V G W W M W P L Q K V L H W
P H D Q I U R P W K H H T X L Y D O X Q I F L F V E Q S W O A D I O L U I E D R W L R Q H V D P S O H
W R U H M H F W W K H Q X O O K \ S R W K H V L V L V K V H S U B W D E L O L W \ R I

7KH V H W H V W V D U H S K H I R J R H G / S U W D G V K G H H W L Z K H G K W Z R D W H V
H T X L Y D O H Q F \ E H W Z V H I Q Q W Z F F P U D Q V D H Q L H D Z P L H W K W W K R H S O H T X L U *
V H F W L R Q 7 H V W Q L Q R J U H G H E M Y M Z O H H Q F W Q Q U I [I G D W D E D V H D Q C
Q H Z G D W D V H W I R U W K H H W D R L O P D V E R X W D G I O H P I G V R K R B M Q X W H G
W K H U H I H U H Q F H V O L V W H G L Q 6 H F W L R Q

0DUFK

1&3 53

5HY 1 &

@ p p p 16#q À

0DUFK

1&3 53

5HY 1 &

0DUFK

1&3 53

5HY 1 &

(TXLYDOHQF\ 7HVW 5HVXOWV

7KHUH ZHUH D WRHWDVVRHVWGLRIHHUTKLVYDIDLFQFHQWXCQDZMDWDFP
WR WKH UHFRPPHQGDWLRQVURI ZHUH HLOKWHVWGLSLURIDPH
ZLWK LQVXIILFLHQWSDVRD WSKFRDPSHWDNFNCFXVHGDSVODWR PD
\$OO WHVWV ZHZLWSDQR.UOHCHO RI

7KH UHVXOWV RI WKS DUTXLRQV HDOFH OBMVHGFDR μ3DVV ZLW
&9† μ3DVV ZLWK ORG &9† UHIHUV WR

0DUFK

3&3 5 5HY 1 &

B, J, P, Q, R, S, T, U, V, W, X, Y, Z, 7HVW 5HVXOWV IRU 6ROYD\)RUPHUO\

	&7'	57'	(7'	(7:	(7:
	6WUHQJWK	)DLOHG E\		3DVV	3DVV
	0RGXOXV	3DVV		3DVV	
	6WUHQJWK	3DVV			)DLOHG E\
	0RGXOXV	3DVV	3DVV ZLWK ORG &9		)DLOHG E\
	6WUHQJWK	3DVV	3DVV	3DVV	3DVV
	0RGXOXV	3DVV	)DLOHG E\	)DLOHG E\	
	6WUHQJWK	3DVV		3DVV	3DVV
	0RGXOXV	)DLOHG E\	)DLOHG E\	)DLOHG E\	
	2IIVHW	3DVV	)DLOHG E\		3DVV
	6WUHQJWK	)DLOHG E\			3DVV
	6WUDLQ	)DLOHG E\			3DVV
	6WUHQJWK	,QVXIILFLHQW 'DWD			,QVXIILFLHQW 'DWD
	0RGXOXV	3DVV	3DVV		3DVV
6KRUW %HDP 6WUHQJWK 1R	6WUHQJWK	3DVV ZLWK ORG &9		3DVV ZLWK ORG &9	3DVV)DLOHG E\
2SHQ +ROH &RPSUHVLRQ <HV	6WUHQJWK	3DVV		,QVXIILFLHQW 'DWD	3DVV
2SHQ +ROH 7HQVLRQ <HV	6WUHQJWK	3DVV			3DVV
,QWHUODPLQDU 7HQVLRQ 1R	6WUHQJWK	3DVV ,QVXIILFLHQW 'DWD		3DVV ,QVXIILFLHQW 'DWD	3DVV ,QVXIILFLHQW 'DWD
&XUYHG %HDP 6WUHQJWK 1R	6WUHQJWK	3DVV ,QVXIILFLHQW 'DWD		3DVV ,QVXIILFLHQW 'DWD	3DVV ,QVXIILFLHQW 'DWD
&RPSUHVLRQ \$IWHU ,PSDFW <HV	6WUHQJWK	)DLOHG E\ ,QVXIILFLHQW 'DWD			
&XUHG 3O\ 7KLFNQHVV 1\$	1\$				

0DUFK

1&3 53

5HY 1 &

\$ JUDSKLFDO SUHVH QWUHWXFOV RILDVCK MZGLQ JXUJUH ,Q
RUGHU WR VKRZ GWKHUMQPHWHVDSKLFQO VFDOH DOO

:DUS &RPSUHVLRQ :&

7KH :DUS &RPSUHVLRQ DWD Qrupdoljhg zlwkw &37
 VWUHQJWK GDWD 0HDQ 6WUHQJWK NVL
 WKH 57' FRQGLWLRQ OLQLPXP 0D[LXP
 57' DQG (7: FRQGLWLRQ XV GDWRZDVOQRWGLYDHLG &9
 ZHUHQRW SURYLGHG IRUVW KHQJW &9 GDWD EHFDXVH WKH FR
 YDULDWLRQ ZDV DERYHWK DZKLVFKHP IRU QVZHUHQ &9
 IURP WKH UHVXOWV IRU DQG DGDWDWLRQ IRU WKH DVMVHKQJW
 LQ 7DEOH DQG XOWW &9 WPD LQ 7DEOH

:DUS &RPSUHVLRQ	:& 57' 6WUHQJWK 4 X	(7: D O	(7: (T
'DWD Qrupdoljhg zlwkw &37 0HDQ 6WUHQJWK NVL 6WDQGDUG 'HYLDWLRQ &RHILFLHQW RI 9DULDWLRQ OLQLPXP 0D[LXP 1XPEHU RI 6SHFLPHQV			
5(68/76		3\$66	3\$66
OLQLPXP \$FFHSWDEOH (TXLY 6DPSOH	0HDQ		
OLQLPXP \$FFHSWDEOH (TXLY 6DPSOH	0LQ		
02' &9 5(68/76			
ORGLLHG &9		1\$	1\$
OLQLPXP \$FFHSWDEOH (TXLY 6DPSOH	0HDQ		
OLQLPXP \$FFHSWDEOH (TXLY 6DPSOH	0LQ		

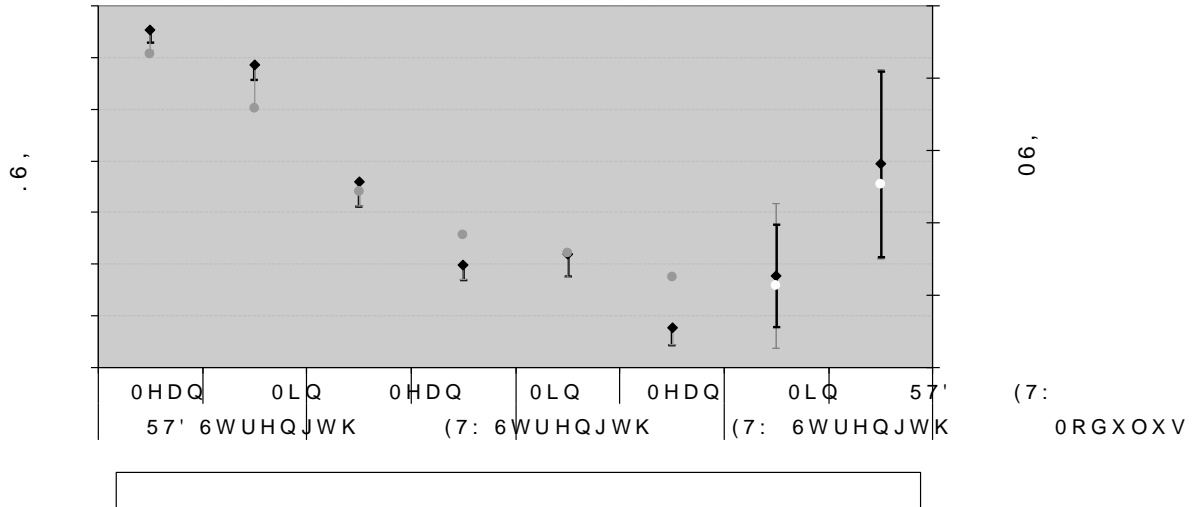
X L Y

7DEOH :DUS &RPSUHVLRQ VWUHQJWK 5HVXOWV

4XDO (TXLY 4XDO (TXLY
 'DWD Qrupdoljhg zlwkw &37
 0HDQ 0RGXOXV 0VL
 6WDQGDUG 'HYLDWLRQ
 &RHILFLHQW RI 9DULDWLRQ
 OLQLPXP
 0D[LXP
 1XPEHU RI 6SHFLPHQV &9

)LJXUH LOOXV WPSUHWWRQ V V B HQ QWR XPH DDO XHQVGRQ LG W
 PRGXOXV PHDQV IRB QWK BPTXOHO DIQ G DWWLB FSTOHL Y D OHH OELPLWV
 HTXLYDOHQF\ VDP SOHJUD B H E B Z QZ DWK QW G B WTX DOKHL O B W J H
 OLJKWHU FRORUH G HWKUR B REGLU V HDG U & 9 I R R P S X W D W L R Q V

6ROYD\)RUPHUO\ \$GYDQFHG &RPSRVLWHV *URXS 070 &) 5:
 \$6)DEULF &RPSDULVRQ RI /+ &XUH V & R Q H + Z & X H B U L Q H L Q D O 4 X D O L I L F
 7HVV 5HVXOWV IRU :DUS &RPSUHVVLRQ 'DWD 1RUPDOLJHG



0DUFK

1&3 53

5HY 1 &

7KH :7 PRGXOXV GD'WHDQMLU RQKPH QW IDLOFHGWMK/M HETHFLDYDVOH
 VDPSOH PHDQ YDOXHH WKH X S SHEL R DFFHSWD QKHI OLPLW
 HTXLYDOHQF\ VDPSDVH PHDQ RYDVKH X S SFFUH SW DEVO HR YDOXH V
 8QGHU WKH DVVX PSCMLLR QR GR & WR H WPKRG DWIKUR P RAGXO X' GDW
 HQYLURQPHQWH SDVLYG QHQFH WHVW

7KH :7 PRGXOXV GD:WBIQRUURKPH QW IDLHQFG WHKWHHEHEEDXOF
 WKH VDPSOH PHDQWEEORZ WKH LORZHUWDFHHSWDQKHI OLP
 HTXLYDOHQF\ VDPSOH PHDRQ WKOXORLZHFHHS WPLEVO IR IYDOXH V
 8QGHU WKH DVVX PSCMLLR QR GR & WR H WPKRG WKPSS GR XLYDOHLQF\
 RI WKH PLQLPXIP DFFBQSYDDEXH

)LJXUH LOOXVWULRQHWWWKIQJVKPQVQVDOXQGVPLQGPKKH
 PRGXOXV PHDQV IRBQWKBIPTXOHO DIQG DWMLB FSTOHL YDKHH OFLPLWV

0DUFK

1&3 53

5HY 1 &

)LOO &RPSUHVVLRQ)&

7KH)LOO &RPSUHVVVQBQLGHDV\LFXQRIG7&B\WQLFUFQDHOVJHG
 VWUHQJWK GDWDDSEBQVHWHVWV IRUVDIOWIHRG U7KRQQLWRBBD
 PRGXOXV GDWD SDVVHGVHXRQLOADIRHQWYOMQR'WFRQGLWKLH (7' R
 (7: FRQGLWLRQV (7: DPZRGXQRWGDYDLOBEQUHVXQVVI ZHGH C
 SURYLGHG HRQWKKIGDWWDEHFDXVH LQHQDQD REIDYBVLVWVHLFRHZID
 DERYH ZKLFK PHDQMLMIGD&9 WKNXPORVGHZQW HURR GVKHHUHV
 VKRZQ 6WDWLVLVLFVQVQGDQDQVZQVLRHUGXWHD VQV7HDEOH
 IRU WKH PRBXLQX7DEGW

4XDO (TXLY 4XDO (TXLY 4XDO (TXLY 4XDO (TXLY 4XDO (

0DUFK

1&3 53

5HY 1 &

)LOO 7HQVLRQ)7

7KH)LOO 7HQVLRQ GDWD FXUHQBUFDOMJLGRQFDOLJHG VWUH
GDWD SDVVHG HTXLYDOHQIRXWHFRQKLRVLRQRUPDOWJHG FRG
GDWD GLG QR\Gp`0•

0DUFK

1&3 53

5HY 1 &

8QGHU WKH DVVXPSWLRQ RI WKH P

0DUFK

1&3 53

5HY 1 &

/DPLQD 6KRUW %HDP 6WUHQJWK 6%6

7KH 6KRUW %HDP 6VQRHQ QW K PDDWLPHGV 7KHU 6KRUW %HDP
SDVVHG HTXLYDOHOOFWWHMWFRRGLDMLRQV(7:ERKQWKWLS7QV
UHTXLUHG WKH XVH&RIPWWKFRGLRSHGQ/GDQDOLWLVLEHVXOV
WKH 6%6 GDWD DUH VKRZQ LQ 7DEOH

6KRUW %HDP 6WUHQJWK	^{5 7'} ₄ 6%6 X	D	O	(7:	(7:
'DWD DV PHDVXUHG				(	T X L Y
0HDQ 6WUHQJWK NVL					
6WDQGDUG 'HYLDWLRQ					
&RHILFLHQW RI 9DULDWLRQ					
0LQLPXP					
0D[LXP					
1XPEHU RI 6SHFLPHQV					
5(68/76					3\$66
0LQLPXP \$FFHSWDEOH (TXLY 6DPSOH 0HDQ					
0LQLPXP \$FFHSWDEOH (TXLY 6DPSOH 0LQ					
02' &9 5(68/76	3\$66	ZLWK 02' &9	3\$66	ZLWK 02' &9	
0RGLLHG &9					
0LQLPXP \$FFHSWDEOH (TXLY 6DPSOH 0HDQ					
0LQLPXP \$FFHSWDEOH (TXLY 6DPSOH 0LQ					

ODUFK

1&3 53

5HY 1 &

)LJXUH LOOXVWUJWDIR @WKUHQRVK PFDYDWDQV IRLQWKH
TXDOLILFDWDRQ WDKPSDFXLYDOHQF\ VDFSDYDORKEFOLPLASOH
DUH VKRZQ DV HUWRH EXDQGLWZKHODRQVHU FRORUHG HU
DUH IRU WKH PRGLLHG &9 FRPSXWDWLRQV



0DUFK

1&3 53

5HY 1 &

,Q 3ODQH 6KH DU ,36

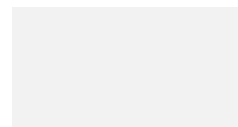
7KH ,Q 3ODQH 6KH DRU B D W D J H G Q R W 36 6WUBIQQVGD V W SDV V
HTXLYDOHQF\ WHV V FRQQGLWRURV K H I G & D' L D G 5RU W

0DUFK

1&3 53

5HY 1 &

'DWD DV PHDVXUHG 4 X D O (T X L Y
0HDQ 0RGXOXV 0VL @P@P@



0DUFK

1&3 53

5HY 1 &

)LJXUH LOOXV ~~W~~ ~~D~~ ~~Q~~ ~~M~~ ~~H~~ ~~K~~ ~~H~~ ~~D~~ ~~K~~ ~~H~~ ~~V~~, ~~Q~~ ~~U~~ ~~3~~ ~~Q~~ ~~Q~~ ~~R~~ ~~X~~ ~~P~~ ~~H~~ ~~D~~ ~~Q~~ ~~X~~ ~~D~~ ~~H~~ ~~Q~~ ~~G~~ ~~D~~ ~~R~~ ~~I~~ ~~G~~ W
PRGXOXV PHDQV IR ~~B~~ ~~Q~~ ~~K~~ ~~E~~ ~~P~~ ~~T~~ ~~S~~ ~~X~~ ~~D~~ ~~H~~ ~~D~~ ~~I~~ ~~Q~~ ~~G~~ ~~D~~ ~~M~~ ~~L~~ ~~E~~ ~~F~~ ~~S~~ ~~T~~ ~~O~~ ~~X~~ ~~H~~ ~~L~~ ~~Y~~ ~~D~~ ~~K~~ ~~H~~ ~~O~~ ~~F~~ ~~L~~ ~~P~~ ~~L~~ ~~W~~ ~~V~~

0DUFK

1&3 53

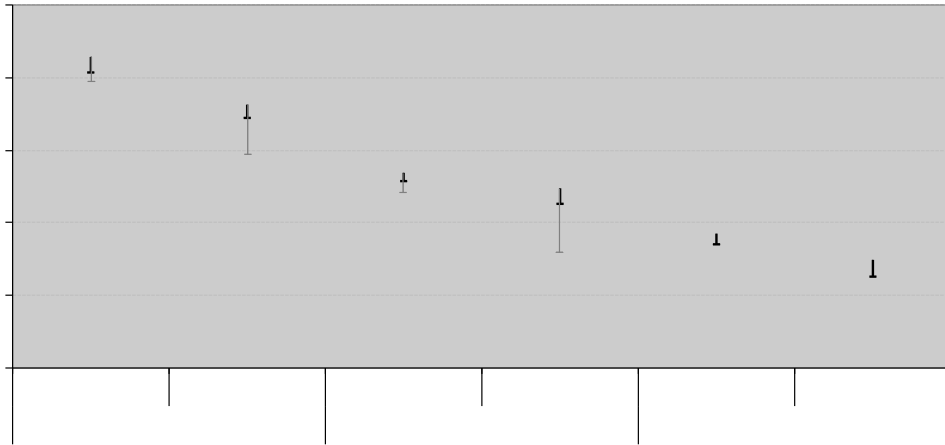
5HY 1 &

3 ' 2SHQ +ROH &RPSUHVVLQR 2+&

7KH 2SHQ +ROH &RPSUHVVLQR QHVVLRQLGHV\LFQWVHG S QH W S H QN+RO
&RPSUHVVLQR QRUP GOWJDSVWUHQJHWKRVDOKHQ 57 WDHQV I
(7: FRQGLWLRQV E(XW FRQGLWLRQV H 7 KHLFLHZQW HV S Q V XPHQV
WKH 2+& (7: VWUHQJHWKGDWHDW XHOWI RV R QFH Q R QWHL GHW B W LFV
DQG DQDO\VLV UHVXOWV HIGJWWKGDW 2+& EDUHH VKRZQ LQ 7D

4XDO (TXLY 4XDO (TXLY 4XDO (TXLY

)LJXUH LOOXVWURDWH & RVPISH HZSVILQR QVVWUQH QJLQKPPXPD Q
 YDOXHV IRU WKH TXDODQGF DWKLR BTXD PFKOHQEP LWDVSBH
 HTXLYDOHQF\ VDP SOHMURB H E B Z QZ DWK QW & B WTX DOKHL E B W J H
 OLJKWHU FRORUH G HWKLR B REGLU VHDG U & 9 I R R P S X W D W L R Q V
 lb U0Q - -5VD P 0lb U0Q -"p p` 0• U`-% ,ap` 1 Á- ðUV ibP 6 ap



0DUFK

1&3 53

5HY 1 &

,QWHUODPLQDU 7HQVLRQ ,/7 DQG &XUYHG %HDP 6WUHC

7KH ,QWHUODPLQDUYTHGV%RQPDQWU&XJQRUBDOWD]HGUH7QRW/7
 VWUHQJWK GDWDDSBQVHWHVWV IRU ERWKRQGHW5ZRQQG 7KH
 &%6 GDWD SDVVHG HTXLYDQHQ57' WRQVWHLRQ: ERWQRWLRQ
 ORGLILHG &9 UHQXW SURZYLGHGWBBQWVK ,GDWD IURP HLWKH
 DQG WKH &%6 GDWDQGLWWRQ BFFBRVHRWKDUEBMLRQLZQWDE
 ZKLFK PHDQV WKDW9WKHV RQVMIZHGHBRQPRVGLHIBHMQOWIV VK
 7KHUH ZDV LQVXIIWFLHQWUGHWQWQWQBQWVLYH 6WDWLWV
 DQDO\VLV UHVXOWWKDU,H7VBRQ&PRUGDWD LQ 7DEOH

	4XDO	(TXLY	4XDO	(TXLY	4XDO	(TXLY	4XDO
'DWD DV PHDVXUHG							
0HDQ 6WUHQJWK NVL							
6WDQGDUG 'HYLDWLRQ							
&RHILFLHQW RI 9DULDWLRQ							
0LQLXP							
0D[LPXP							
1XPEHU RI 6SHFLPHQV							
5(68/76							
0LQLXP \$FFHSWDEOH (TXLY 6DPSOH 0HDQ							
0LQLXP \$FFHSWDEOH (TXLY 6DPSOH 0LQ							
02' &9 5(68/76							
0RGLILHG &9							
0LQLXP \$FFHSWDEOH (TXLY 6DPSOH 0HDQ							
0LQLXP \$FFHSWDEOH (TXLY 6DPSOH 0LQ							

0DUFK

1&3 53

5HY 1 &

0DUFK

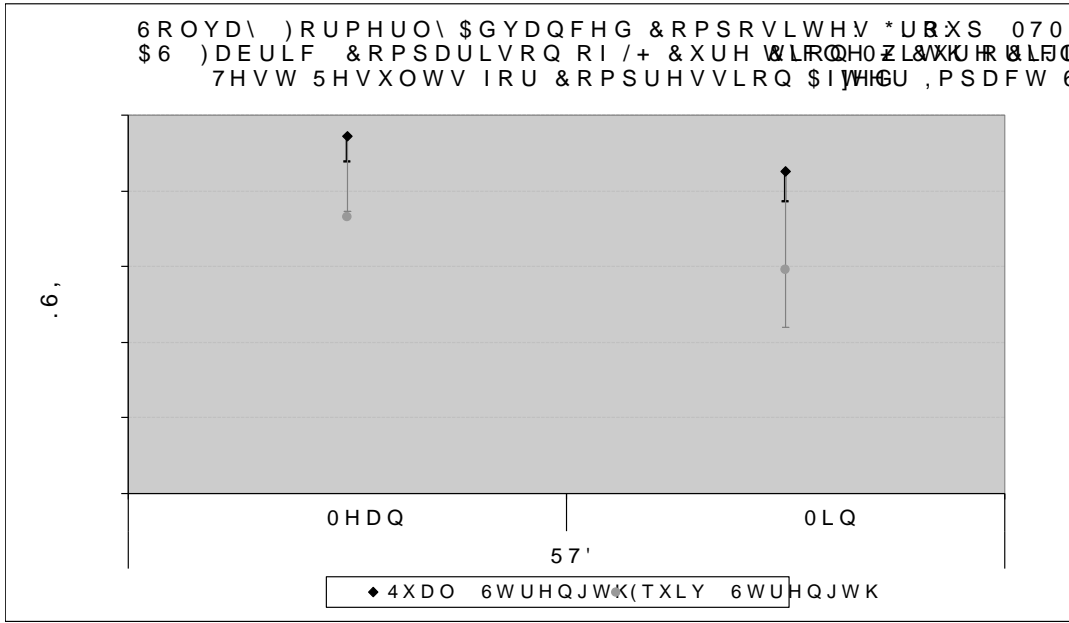
1&3 53

5HY 1 &

&RPSUHVVLQR \$IWHU ,PSDFW &\$,

7KH &RPSUHVVLQR \$DWLHUQRSDWLGDFNFXHUVG 7SIOH WK
&RPSUHVVLQR \$IWHUH,PSDFWHQRWRDGDHMDXIGLGOORW\SBVWK
57' FRQGLWLRQ 7KHUHQZDGDVQDXIRUFRKHUHQXHWFRQIEOXV
6WDWLWLFV DQG DQ\$WVWUHQJXKGLQWDEOH VKRZQ

)LJXUH LOOXVWUHDWHLRQVSDHWRVPSHIDQJWDKQEP LQLPXP
 YDOXHV IRU WKH TXDODQLGDKLHRTXDFSKHQEP LWDVSBH
 HTXLYDOHQF\ VDP SOHMDRH EEBZQZDWKQWGBWTD DOKHLERWJH
 OLJKWHU FRORUHGUHWKLRBREGLVHGU&9IRRPSXWDWLRQV



)LJXUH &RPSUH,PSDFQ \$IWHIDQV PLQLYDOPHQFBGO LTXLWV

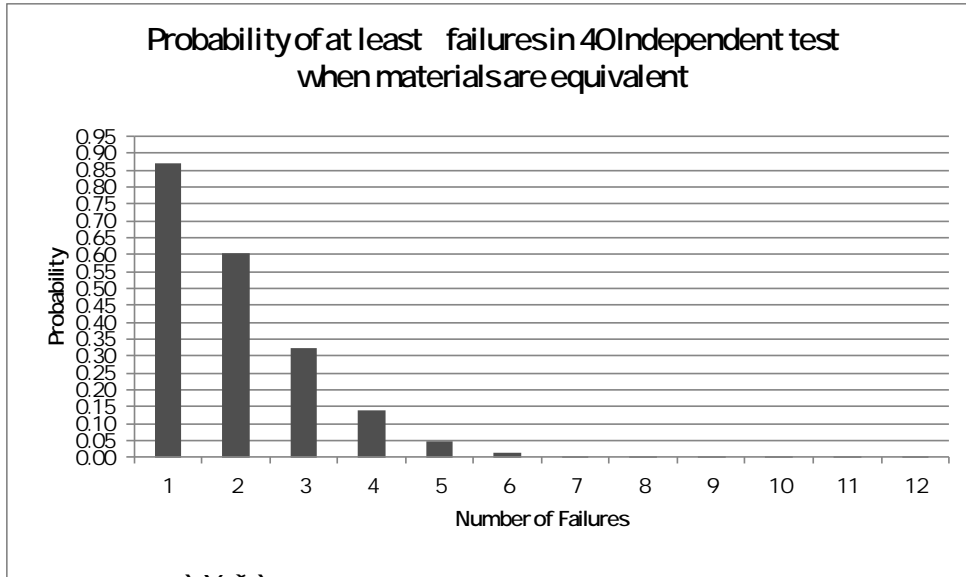
0DUFK

1&3 53

5HY 1 &

)DLOXUHV

7KH /+ &XUH &\FOH XDEPSIOHQMDWHVW UMRQOZLWKRWKRFRPSDUL
TXDOLILFDWLRQ PWRUHQDOWRMDQVHVVXQ\SIHVHQW FRQGLW
LQFOXGLQJ WKH FXUHG SO\ WKLFNQHVV FRPSDULVRQ



) X ð ì
) L J X U H

3 U R E D E L O L W \