

,WHP 1DPH \$SSURYDO RI 5HJHQWV *UDG WUBHUGLSFWIDYH
0HWKRGVWBEOL,QGMSHQGHSHVDRQDEO\
&RQWUR 0DULEDOIOXHQZ]RQH LQ \$ULJRQD

\$FWLRQ ,WHP

5HTXHVWHG \$KWLXQQ LYHUVLWLHV DQG WKH ERDUG RIILFH D
DSSURYDO RI LWV 5HJHQWV *UDG WUBHUGLSFWIDYH 0HWKRGV
(VWDEOLVK WKH ,QGSHHQGHSHVDRQDEO\ 0HWKRGV
2]RQH LQ \$ULJRQD

%DFNJURGX+LVWRU\ RI 3UHYLRXV %RDUG \$FWLRQ

\$ULJRQD ODZ HVWDEOLVKHG 75,) IURP 3URSRVLWLRQ VW
\$%25 WKH DXWKRULW\ WR DGPLQLVWHU WKH IXQG RQ WKH
PDQDJHV DQG DGPLQLVWHUV WKH 75,) UHYHQXHV WKURXJK
UHYHQXHV

2QH RI WKH RSWLRQLWV RZDZ ERDUG ,KDUHYHQXHVKWRXWKH XQL
WKH UHFHQWO\ GHYHORSMSUSRFHQWV

7K\$XUSRVH RI 5HJHQWV

7K ERDUG RIILFH HQJDJHG ZLWKHSUHWPHQWRIILFH
WKHSUWPHQW RI (QYLURQPHQWSDUWPHQWRIILFH
\$]'+6DQG 'HSUWPHQW RI :DWHU 5HVRXUFHV \$]':5 WR GHY
VWDWHPHQWV

7KXQLYHUNEML\$HVGIV LQSLURLEOHP VLQDWHPEUWRIDQG
HQJDJHG LQ D 4 \$ VHVLRQ KHOG LQ -DQXDU\ WR DQVZHU I
RUJDQLF FRPSRXQGV 92&V DQG ELRJHQLF YRODWLOH RUJ
LPSDFW RU DVVLVW LQ WKH SURGXFWLRQ RI R]RQH LQ \$ULJ
W\SHV RI FRQWUROV FDQ EH SXW LQ SODFH RU YROXQWDU\
UHGXFH R]RQH DQG LPSURYH DLU TXDOLW\ %H\RQG WKH H
PRGHOLQJ DQG DQDO\VLV \$ULJRQD QHGGV D EHWWHU SUHC

%RDUG RI 5HJHQWV 0HF
\$SULO
,WHP

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%RDUG RI 5HJHQWV 0HH

\$SULO

,WHP

3DJHRI

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FDQ WDNH WR UHGXFH R]RQH DQG LPSURYH DLU TXDOLW\ 7HDP

\$UL]RQD 6WDWHU 8QDLW WUKVIZW3D QIGD3LHUUH +HUFNHV 8QLYHUVLW\ RUV\$ULYRQDQD Q\$UPLQDQRURRVKLDQ

3URSRVDO 6XPPDU\

,QWHJUDWH PHDVXUHPHQWFKRPLRF]RQHFSPSRXQDQWQWH DUW UHJLRQDO DLU TXDOLW\ PRGHO DQG VDWHOOLWH SUR FRPSRXQDVEKQWHU VWDQG PR\$UQ]BQG S]RGLFWKHHQWUDV UHVHDFWZLWQDPVH D QXPHULFDO ZHDWKHU SUHGLFWLRQ V\ VLPXODQWVNUHDFWLYH SURFHVVHV LQIOXHQFLQJ WKH SURGX VROXWR]RQWHGDHRRQW DGGUHVVLQJ WZR NH\ FRPSRQHQWV U R]RQH PLWLJDWLRQ 0VDGY

%RDUG RI 5HJHQWV 0HF

\$SULO

,WHP

3DJHRI

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&RPPLWWHH 5HYLHZ DQG 5HFRPPHQGDWLRQ

7KH 5HVHDUFK DQG +HDOWK 6FHMQHFWHG & WRELVLWHP DW LWV
PHHWLQJ DQG UHFRPPHQGHG IRUZDUGLQJ WKH LWHP WR WH

6WDWXWRU\ 3ROLF\ 5HTXLUHPHQWV

\$ 5 6 † 37HFKQRORJ\ DQG 5HVHDUFK ,QLWLDWLYH)XQG´

\$%25 3ROLF\$GPLQLVWUDWLRQ RI 7HFKQRORJ\ DQG 5HVHDU

%RDUG RI 5HJHQWV 0HH

\$SULO

,WHP

3DJHRI

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,WHP 1DPH \$SSURYDO RI 5HJHQWV *U\$QWJVR QDHSR MDU
D&RV(WIHF W6RYCKWL,3G QWRL2S WQP DOORZ)

&RQWDFW ,QIRUPDWLRQ

&KDG 6DPSVRQ \$%25DG VDPSPVRQ#D]UHJHQWV HGX

.HQ 3RO\$%R NHQ SRODVNR#D]UHJHQWV HGX

%RDUG RI 5HJHQWV 0HH
\$SULO
,WHP
3DJHRI

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PRGHOLQJ DQG DQDO\VLV \$ULJRQD QHHGV D EHWWHU S
LQGHSHQGHQW DQG UHVRQDEO\ FRQWUROODEOH YDUL

\$ULJRQD ZRXOG EHQHIIHFW WLRP D FRXWLRQ DQG RU RSW
RSWLPDO IDOORZ ILHOG SODRZWKDOW P&QXFWJHMPZLVQGR
9DOOH\)HYHU VSRUHV

1HHG FRVW HIIHFWLYH WHFKQRORJ\ WR UHPHQGH 3)\$
D FRVWHFWLYH PHDQV WR UHSODFH FXUUHQW \$))) VXSS
HIIHFWLYH ILUH VXSSUHVVDQW

\$ULJRQD QHHGV D FRPSUHKHQVLYH DVVHVVPHQW LGHQV
PLQH IHDWXUHV LPSDFWLQJ VXUIDFH DQG HUIXFOGLZDWH
VROXWLRQ RU PLWLJDWLRQ WHFKQRORJ\ WKDW FDQ OL
ZDWHU DQG DLU

V \$KULSRQDQZAX@P ENKPPAWHVRQ DQVOPWQRPFV F VHDWQELPH
PXQLFLSDOLW\ VLJH 7KH VWXG\ VKRXOG GHWDLO UHF\F
KLJKOLJKW SURV DQG FRQV IRU HDFK FRPPXQLW\ VLJH

7KH XQLYHUVLWLHV VXEPLWWHG WKHLDVSHURSRVDOV LQ UHV
VWDWHPHQWV LQ)HE\$X'DDQDQ\$%\$'4UHWKHZHURSRVDOV

'SKRYE#XULH@LQ@XBE@DDHBEV HFE`))H'ED'ES2XQVLIH ZHFG1 W``W3 S €
DQ&A u p 0 U " € 0 D R Z

%RDUG RI 5HJHQWV 0HH
\$SULO
,WHP
3DJHRI

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)HYHU RQH RI WKH PRVW FRPPRQO\ UHSRUWHG LQIHFWRX
7HDP

\$ULJRQD 6WDWH 8QLYHUVLW\ 'UV 0DWWKHZ)UDVHU 3LHU
)HUUDQ *3LUFK(ED.DYDJDQMLDQ
1RUWKHUQ \$ULJRQD/8QDXBU.VLW\ 'DYLQ :DJQHU %ULGJHW %
8QLYHUVLW\ RU\$ULJRQD#KRRURQ#DOJLDQL

3URSRVDO_6XPPDU\

7RGHSOR\ V XVWPHGLDOWHGEORVLELHG WHFKQRORJLWLRQ IDO
VXSSUHV V IXJLWLYH GXVW IRUPDWLRQ DQG VILFLXVWDOVHRLXQ
PDQQHU WKDW LV VLP SOH DQG HYHQWXDOO\ DFWLRQDEOH

\$OVRRWKUHH \$ULJRQD 3XEOLF 8QLYHUVLWLHV KDYH WKH N
QHHGHFRMRW DQG DQDO\JH WKH SK\VLFDQ PROHFXODU DQ
PXFK GHXSGHUVWDQGLQJ RI WKH VRXUFH DQG WUDQVPLVVL
D WDQJLSDRGHQV RI WKLV ZRUN ZLOO EH D JHRVSDWLDO P
V\VVHVVZKDDWHUSURRWRW\SHPNDDQGHFRORWKDW ZLOO EU
ZLGH YDULHW\ RI FXUUHQW GDWD RQ WKH VRXUFHV RI WKH
LPSDFW LQ WKH VWDWH

:K\ LW 0DWWHU V WR \$ULJRQD

%ORZLQJ GXVW LV D VLJQLILFDQW XQGHUUDWHG KDJDUG LG
GLVFLSOLQHV DQG VHFWRUV RI WKH HFRQRPI\ LQFOXGLQJ W
TXDQLSRVXUH WR VXFK SOXWDFRQV FDQ DIIHFW ERWK OXQJ

%RDUG RI 5HJHQWV 0HF

\$SULO

,WHP

3DJHRI

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&RPPLWWHH 5HYLHZ DQG 5HFRPPHQGDWLRQ

7KH 5HVHDUFK DQG +HDOWK 6FHMQHFWHG & WR PLVWLWH DW LWV
PHHWLQJ DQG UHFRPPHQGHG IRUZDUGLQJ WKH LWHP WR WH

6WDWXWRU\ 3ROLF\ 5HTXLUHPHQWV

\$ 5 6 † 37HFKQRORJ\ DQG 5HVHDUFK ,QLWLDWLYH)XQG´
\$%25 3ROLF\³\$GPLQLVWUDWLRQ RI 7HFKQRORJ\ DQG 5HVHDU

%RDUG RI 5HJHQWV 0HH
\$SULO
,WHP
3DJHRI
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,WHP 1DPH \$SSURYDO RI 5HJHQWV *U\$QWJRGDHSRVDO
D&RVMIIHFVHLFKQRORSHPMRLD)W(3)RUHYHU
&KHPLFD&RQWDPLQDWHG

\$FWLRQ ,WHP

%DFNJLQX+LVWRU\ RI 3UHYLRXV %RDUG \$FWLRQ

\$ULJRQD ODZ HVWDEOLVKHG 75,) IURP 3URSRVLWLRQ VW
\$%25 WKH DXWKRULW\ WR DGPLQLVWHU WKBRDQG RQ WKH
PDQDJHV DQG DGPLQLVWHUV WKH 75,) UHYHQXHV WKURXJK
UHYHQXHV

2QH RI WKH RSWLRQLWRRKZBRDUG, KDUHYHQXHV WR WKH XQL
WKH UHFHQWO\ GHYHORSHSURFHHQWV

7K\$XUSRVH RI 5HJHQWV LV WR DGGUHV DQG GHOLYHU VROX
IDFLQJ WKH 6WDWH RI \$ULJRQD DQG LWV FLWLJHQV

7KRDUG RIILFH HQJDJHG ZLWKHSUWPHQWRII\$GRLQLVWU
WKHSDUWPHQW RI (QYLURQPHQ'WSDUWPHQWOW\$K' (4HUYL FHV
\$]' +6DQG 'HSDUWPHQW RI :DWHU 5HVRXUFHV \$]':5 WR GHY
VWDWHPHQWV

7KXQLYHUVEMILSHVGTIV LQSLWRLEDOHP VLQWRMPPHGMWV DIQG
HQJDJHG LQ D 4 \$ VHVLRQ KHOG LQ -DQXDUWBLDQVWKH I
SUREOHP VWSURFHHQV OHPV VWDWHPHQWV DUH

&XUUHQWO\ ZH GR QRW XQGHUVWDQG KRZ WKH XQLTXH
&XED@EPCAPVGR S @

&RQWDFW ,QIRUPDWLRQ
&KDG 6DPSVRQ \$%25DG VDPSVRQ#D]UHJHQWV HGX
.HQ 3ROD\$%DR [NHQ SRODVNR#D\]UHJHQWV HGX](#)

%RDUG RI 5HJHQWV 0HH
\$SULO
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7HDP

1RUWKHUQ \$UL]RQD 8QLYHUVLW\
8QLYHUVL]RQD

3URSRVDO_6XPPDU\
QHZ P

7KH JRDO RI WKLV SURMHHFMMFLWLWR WUHFDFWRORFRFRWW UHPHG
W\SHV RI 3)\$6 LQ ZDWHU 7KH DSSURDFK XVHV DGYDQFHG V
PRGLLHG WR UHPRYH DOO W\SHV ZRIGH) \$D QURPRZDFRQD LKQGR
7KHVH VSRQJHV DUH FRQFRW WXFWYGLUWPHGRZD EDWHULD OV
FHOOXORVH DQG DUH UHJHQHUDEOH pK\SHeG DU0@P DD
RpLPL]H WKH WUHDWPHQW V\WVHP 7H4°€0XQLYH`WLHV H[S

• FWLYH PHPI `WG HFRQLQD P3)Q\$W

7KLV SDJH LQWHQWLRQDOO\ OHIW EODQN

%RDUG RI 5HJHQWV 0HH
\$SULO
,WHP
3DJHRI

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,WHP 1DPH \$SSURYDO RI 5HJHQWV *U\$OWJVRQDHSRDVDO
&RPSUHKH\$VLMVP,SEOWL\$RLVHQWD PDUGR+XV
\$EDQGRQHQHDWX,PSDFWEXWIDFH DQG
*URXQGZDWHU

\$FWLRQ ,WHP

%DFNJQGX+LVWRU\ RI 3UHYLRXV %RDUG \$FWLRQ

\$ULJRQD ODZ HVWDEOLVKHG 75,) IURP 3URSRVLWLRQ VW
\$%25 WKH DXWKRULW\ WR DGPHLQQLWVWVWKHHIXPGRKOI 7K
PDQDJHV DQG DGPLQLVWHUV WKH 75,) UHYHQXHVKURXJK
UHYHQXHVK

2QH RI\ WUDPØOKH P °€0WKKH@ €`U

&RQWDFW ,QIRUPDWLRQ
&KDG 6DPSVRQ \$%25 DG VDPSVRQ#D]UHJHQWV HGX
.HQ 3ROD\$%R NHQ SRODVNR#D]UHJHQWV HGX

%RDUG RI 5HJHQWV 0HF
\$SULO
,WHP
3DJHRI

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7HDP

\$ULJRQD 6WDWHU8Q15YIU VLDV\GHQ 5HEHFFD 0XHQLFK (ULQ
&RQU\PHQHUU\ +DPLWRQ
8QLYHU\$UW\RDID 0DUN %DUWRQ

3URSRVDO 6XPPDU\

\$ WKUHDU VWXG\ LV EHLQJ SGRSRVSHQLEEDU\PKHODPLRI HQJLQH
ELRORJLVWV JHRORJLVWV DQG ULVN DFFHVVRUV WR L LC
\$ULJRQD LL LGHQWLI\ SRWHQWLDO UIXNLQSRVHIGVNLLL U
DVVHVPHQW IUDPHZRUN DQG LY FUHDWH PXOWLSOH ZRU
QHDDQG ORHUIP PDQDJPHQW

:K\ LW 0DWWHUV WR \$ULJRQD

'HVSLWH WKH JUHDWHU WKDQ \HDUV KLVWRU\ RI GHYHO
WKHUH LV QR FRPSUHKHQVLYH GDWDVHW WKDW SURYLGHV
PLQLQJHODWHGVIKHWXVRSHQQLQJV ZDVWH DQG FRQWDPLQD

%XGJHW

\$QQXDO

7KLV SDJH LQWHQWLRQDOO\ OHIW EODQN

%RDUG RI 5HJHQWV 0HF

\$SIUO

,WHP

3DJHRI

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3URSRVDO 6XPPDU\

7KH SURFRIDDERUDWLYH SURMHFW ZLOO SLORWQWHVW KXE
 \$ULJRQD FRPPXQLWLHV YDOLGDWHG ZLWK IRXU VFDODEOH
 WR HYDOXDWH WKH HFRQRPLF LPSDFW RI UHF\FOLQJ LQ \$U
 SURYLGH YLDEOH ILQDQFLDO VFHQDULRV IRU LPSOHPHQWL
 \$ULJRQD 7KH PRGHOV WRROV DUH \$Q \$ULJRQD 5HF\FOLQJ
 DPRXQW RI UHF\FODEOH PDWHULDO DYDLDEOH LQ FRPPXQ
 GHPRJUDSKLFV 7KH \$ULJRQD 5HF\FOLQJ (FRQRPLFV ,QIRUP
 HFRQRPLF LPSDFW RI UHF\FOLQJ IRU WKH 6WDWH RI \$ULJRQ
 OHYHO \$ &RVW %HQHILW \$QDO\VLV PRGHO WR HYDOXDWH V