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Department of
Economics and Finance

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. \$0#!p!n!AF!0#'0!\$%F! '99* . \$-D!3*)!' -!\$-0()/(&0F! '- ,!\$\$\$;! (%0\$ 8 '0\$-D!o!' - ,!p!3)* 8!0#(! , '0!
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7J)(9' - ,;! ' - ,!A?CM!7H'&' - ;;! ' - ,!0#(\$)!/*-3\$, (-/(!\$-0)+ '9%!(</92 , (!0#(!/'%(!*3! , !n!BQ!0#\$%!

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019#aP#3<4#6&%%4+:&19*12#3/Q0.)4+!"

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7@AAR;! ' - ,! S\$90 e9' - '!7@AAL;!0(%0%F!0#(!9'00()! 1(\$-D! ' -! (<0(-%\$*-!*3!0#(!3*)8 ()!0*!0#(!
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@C96>?

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- 6@:9!Z/!'?'D= 5 6D9G!B6:89?!<F!G!87G9C!DA9!6??8 5 LD=<7!<F!68D<I<CC9:6D9G!9CC<C?!

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(A, ?#

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(%0' 19\$%#\$-D!

- 6@:9![/!"?D= 5 6D9?<F!G!8?-7K!6!?9 5 =2L6C6 5 9DC=I!6LLC<6IA!

I()\$(%!t!8!	BB!u!" "#\$!	BL!u!" "#%0!B!	BK!u!" "#%!	@A!u!" "#%ZB!	RC!u!" "#&!
E e l e U e!	A?CK@!	A?\AC!	A?\B[!	A?\RB!	A?CAA!
G a e l E 4!	A?\MC!	A?\@@!	A?\RB!	A?\RK!	A?CR[!
J a 4 V e l U!	A?LKB!	A?\ [C!	A?\ML!	A?\KC!	A?MAK!
He 5 e l!	A?MCA!	A?M@B!	A?MC[!	A?CBL!	A?L [K!
I q 4 U 4 l!	A?L[R!	A?\ [L!	A?\ [K!	A?\@R!	A?M\A!
6 I!	A?MRM!	A?C[A!	A?CKR!	A?\RM!	A?[\A!

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" ' 19(!KY!0#(!-299!*3!(P2'9!*), ()%!*3!\$-0(D)'0\$*-!' /' - - *0!1(!)(d(/0(, !\$-!' - :! / '%(?!"#(!% ' 8 (!
/*- /92%\$*-!\$%!)(' /#(, !2%\$-D!W2'9, (c%!7@AAR;! '&&)*' /#!70#(%(!)(%290%! ')(! - *0!)(&*)0(, !0*!
%'+(!%&' /(;?!

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!	G a e l E 4!	J a 4 V e l U!	He 5 e l!	I q 4 U 4 l!	6 I!
E e l e U e!	0A?B\A!	0A?[[A!	B?[KK!	0A?RMA!	A?@AK!
G a e l E 4!	000!	0A?@\A!	B?CCK!	0A?BLA!	A?R\K!
J a 4 V e l U!	000!	000!	B?K[A!	A?AKA!	A?C[K!
He 5 e l!	000!				

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'!9* . ()!, (D)((!*3!\$-0(D)'0\$*-!/* 8 &')(, !0*!0#(!\$-, \$+\$, 2'9!%(\$(%?! "#(!+'92(%!\$-!1*9, !')(!

VHe 5!t!VI q 4! A?CM!!7A?M\F!!A?\ [;! A?MM!!7A?[MF!!A?CL;!
VHe 5!t!V6 I! A?MR!!7A?[\F!!A?CB;! A?M[!!7A?[[F!!A?CL;!
VI q 4!t!V6 I! A?[[!!7A?RKF!!A?MA;! A?[C!!7A?[AF!!A?M[;!

?&34+\#>1#:0%413<4+*+P#3<4#^K_#6&1'*94164#]019#<4#Q0.)4+#&'#9"!

!

1 (<0F! . (!0(%0!0#(!-299!#:&*0#(%\$%!*3! -*/\$-0(D)'0\$*-!+(%)2%!0#(!'90(-'0\$+(!*3!
3)' /0\$*- '9!/*\$-0(D)'0\$*-!1:!/')):\$-D!*20!0#(!W'2%8 '-!0(%0!&)*&*(, !1:!!T')\$-2//\$!' - ,!
a*1\$-%*-!7@AAB;F! . #*!0(%0(, !0#'0!

! ! 7M;!

. #(! \$!n!<F!:Q!%!k!v"t@w!\$%! '-*0#(!1' - , . \$, 0#!&')' 8 (0(!%\$ 8 \$9')!0*!8!' 1*+(F!' - , ! \$%! '!
)(%0)\$/0(, ! (%0\$ 8 '0(!*3! , !*10'\$-(, !3)*8!0#(!1\$+!)\$'0(!)&)(%(-0'0\$*-!*3!0#(!0 . *!(%)\$(!
2- ,)!0#(!'%2 8 &0\$*-!0#'0!, !n!, (?!T*)(!&)/\$(9:Y!

!!!!!!!!!!!!!!

!!

. #(! (_)! n! v9*D! J(·7x);F! 9*D! J(7x);w*! ' - , ! ' - , ! ! \$%! '!

/*-%\$%0(-0!(%0\$ 8 '0(!*3!0#(!9\$ 8 \$0\$-D!+')\$' - /(!8 '0)\$<!*3! !

"#(!(%0\$ 8 '0(%!*3!, +!3)*8!0#(!d*\$-0!)&)(%(-0'0\$*-!*3!0#(!0 . *!(%)\$(!3*)!'!)' -D(!*3!

1' - , . \$, 0#!&')' 8 (0(

!

VE e 1 !t!VJa 4!	A?LAA!	A?CKL!	A?\BM!	A?\@L!	A?CMK!
VE e 1 !t!VHe 5!	A?CKR!	A?C\R!	A?CLC!	A?\BA!	A?M\L!
VE e 1 !t!VI q 4!	A?MLC!	A?MBR!	A?ML\!	A?CR[!	

VGa e! W-"Y!A?MB! W-"Y!A?M[! W-"Y!A?M\! W-"Y!A?\A! W-"Y!A?\[! W-"Y!A?\L!
VEe 1!t! W,"Y!M?\M!
VJa4! W-"YA?MB

VJa4! W-"Y![?CK! W-"Y![?BB! a /!W!WV! a /!\!SX! W-"Y!A?MM!
VGa e!t! W,"Y!A?@@!
VHe5! W-"Y!B?L\! -" -"

/*2-0)\$(%!\$%!(<'8\$-(,!1:!'&&9:\$-D!'!3)'/0\$*- '9!/*\$-0(D)'0\$*-!8(0#*,!.#\$/#!0(%0%13*)!0#(!
&*%%\$19!((<\$%0(-/(!*3!'!9*-D0)2-!(P2\$9\$1)\$28!) (9'0\$*-%#&!9\$->\$-D!0#(!\$-,\$+\$,2'9!\$-,\$/(%?!
!
"#!8'\$-!)(%290%!'-'-!1(!%288')\$\$(,! '%!3*99* .%?!456!\$%!3*2-,!0*!1(!\$-!8*%0!
/'%(%!'!-* -0%0'0\$*-') :F!8(' -0)(+()0\$-D!%)(%!.#\$/#!\$%!/#!)' /0()\$(, !1 :!9*-D!8(8*):?!
I(+()'9!1)('>%!')(!'9%*!, (0(/0(, !\$-!('/#!/*2-0):?!G2)0#(F!0#()(\$%!(+):!9\$009!(+\$, (-/(!*3!
/)%%%0/*2-0):!9\$->'D(%?! "#(%(!3\$-, \$-D!%#*29, !1(!0'>(-!\$-0*! '/*2-0!1:!' /', (8\$/%F!
&*9\$/ :!8 '>())!' - ,!&)' /0\$0\$*- ()%!. #(-!12\$9, \$-D!8*, (9%'\$8(, !'0!(+'92'0\$-D!0#(!\$8&' /0!*3!
456!* -!0#(!(/*- *8 :F!, (%\$D-\$-D!&*9\$/ :!8 ('%2)(%!' - ,!, (+9*&\$-D!\$-+(%08 (-0!%0)'0(D\$(%?!
G202)(! . *)>! . \$99!' , ,)(%!*0#()!\$%2(%!%2/#!'%!0#(!&)(%(-/(!*3!/: /9\$/ '9!&'00(-%!)\$-!456!



,9F9C97I9?!

!

e 1', \$)F!X? T ?F! q ?!U\$%0' %*!' - , !V?!S\$)'\$0\$%!7@AA\ ;F! 1 * - %0'0\$* - ')S0:0(<0(-, (, !9*/ '9! q #S009(!
(%0\$ 8 '0\$* -F! !B[BF!BRMR0BRL[?!

!

e 11)\$00\$F! T ?F! V?! S\$90e9' - 'F! _?! V*+/#'F! ' - ,! e?! T*)(-*?! @ABC?! r"()8! I0)2/02)(!
5()%)\$0(-/(sF!H*2)- '9!*3!G\$ - ' - /\$'9!4/* - * 8 (0)\$/%!B[F!7@;F!RRBgM@?!

!

eD#\$* -F! 5?! 5?! = '//#(00'F! a?!

F!CAF!@B\0@@C?!

!

=)*D' '),F! H?F! '- ,! e?! U(0f(9F! @ABMF! z"#(! e%%(005)\$/\$-D! J8&9\$/'0\$*-%! *3! S*+(-)8(-0!
4/*- *8\$!5*9\$/:!6-/(0)'\$-0:Fz! T'-'D(8(-0!I/\$(-/(F!CB7@ABM;F!ROBL?!

!

E'))*99F! E?! U?! 7BKK\;?! =233(0)0*0*/>! %'+\$-D! '- ,! 0#(! 9\$3(! /:/9(t&())8'-(-0! \$-/*8(!
#: &*0#(%\$%?! F! 7B;F!BOMM?!

!

E(), 'F!a?F!e?! I\$9+'F! '- ,!H?! "?! ` '9(-0(?!@ABC?!r4/*- *8\$!6-/(0)'\$-0:J8&'!0!\$-! !I8'99!
N&(-! 4/*- *8 :Y! "#(! E'(! *3! E#\$9(?s! e&&9\$(! 4/*- *8\$/%?! 5219\$%#(, ! *-9\$-(! A\!
U/(81(0)!@AB\?!#00&%Ytt, *\$?*)DtBA?BALAtAAARCL[C?@AB\?B[B@A\C?!

!

E#(2-DF! _? q?! ' - ,!X?I?! V'\$F!7BKKR;F! e!3)' /0\$*- '9!/*\$-0(D)'0\$*-!' - '9: %%%! *3!&2)/#'%\$-D!
&* . (0)!&')\$0:F! !BBF!BAR0BB@?!

!

U'#9# '2%F!a?F!7BKLK;?!433\$/\$(-0!&')' 8(0(0)!(\$8'0\$*-!3*)!(930%\$8\$9!)!&)*/(%?!
B\F!B\ [KOB\CC?!

!

U\$(1*9, F!G?! | ?F! ^!J- *2(F!e?!7@AAB;?!V*-D!8(8*):!' - ,!)(D\$8(!% . \$0/#\$-D?!
7B;F!BRB0BMK?!!

!

U\$<\$0F! a?! X?F! ^! 5\$- , :/>F! a?! I?! 7BKK[;?! ?! 5)\$-/(0*-!
6-\$+(\$0\$:!5)(%?!

!

U\$<\$0F! e?! 7BKLK;?! 4-0):!' - ,! (<\$0! , (/)\$%\$*-! 2- , (0) 2-/(0)'\$-0:?!
F! 7R;F!C@A0CRL?!

!

4-D9(F! a?G?! '- ,! E? q?H?! S)'-D(0)! 7BKL\;! E*0J-0(D)'0\$*-!' - ,! 4))*)! E*))(/0\$*-Y!
a(&)(%(-0'0\$*-F! 4%0\$8'0\$*-F! '- ,! "(%0\$-DF! 4/*- *8(0)\$/'! MMF! @F! @MB0@\C?! UNJY!
BA?@RA\tBKBR@RC?!

!

G()-' - , (fF! a?F! ^! a* ,)\$>F! U?! 7BKKB;?! a(%\$%0' -/(!0*!)(3*)8Y! I0'02%! P2*! 1\$%'! \$-! 0#(!
&)(%(-/(! *3! \$- , \$+\$, 2'90%&(/\$3\$! 2-/(0)'\$-0:?! F! BB[C0
BBMM?!

!

S\$90e9' - 'F! V?e?! 7@AAR;F! " (%0\$-D! *3! G)' /0\$*- '9! E*\$-0(D)'0\$*-!' \$-! T' /)*(/*- *8\$/'! "\$8(!
I(\$)(%F! N<3*),! =299(0\$-! *3! 4/*- *8\$/%! '- ,! I0'0\$%0\$/%! CMF! [F! MB\0M@K?!
#00&%Ytt, *\$?*)DtBA?BBBBtB [CLOAAL[?0AB0B0AAA[L?!

!

S\$90e9' - 'F!V?!e?!7@AAL;?!G)' /0\$*- '9!\$-0(D)'0\$*-!' - , !%0)2/02)'9!1)('>%'! '0!2->- * . - !&())\$* , %!
*3!0\$8(?! F! 7B;F!BCROBLM?!

!

S\$90e9' - 'F! V?e?! '- ,! e?! T*)(- *F! 7@AB@;F! 6-/*+(\$-D! 0#(! 6I! 0(0)8! &)(8\$28Y! e-!
'90(- '0\$+(!) *20(F!H*2)- '9!*3! = '->\$-D!' - , !G\$- '- /(!RCF! [F!BBLB0BBKR?!

!

S\$90e9' - 'F!V?e?! '- ,!5? T?!a*1\$-%-F!BKK\F! "(%0\$-D!*3!2-\$0!)*0%!' - , !*0#(0)!- *- %0'0\$*- ' -) :!!
#: &*0#(%(!\$-!8' /)*(/*- *8\$!10\$8(1%(\$)(%?!H*2)- '9!*3!4/*- *8(0)\$/%!LAF!@[B0@CL?!

!

S*2)\$-/#'%F!5?0N?! '- ,!H?e?!5')>(0)F!zE*- %28&0\$*-!N+(0)0#(!V\$3(!E: /9(Fz!4/*- *8(0)\$/'F!
\A!7@AA@;F! [\0LK?!

!

!

S)'-D()F!E?! q ?F! ^ !W:2-DF! I ?!7@AA[;!N// '%\$*- '9!%0)2/02)'9!1)('>%!' - ,!9*-D! 8 (8*):!
q \$0#!' -!'&&9\$/ '0\$*- !0*!0#(!I ^ 5!MAA!' 1%*920(!%0*/>!)02)-%?
7R;F!RKK0[@B?!!

!

S)'-D()F! E?! q ?! 7BKLA;?! "(%0\$-D! 3*)! /'2'9\$0:Y! '! &()%- '9! +\$(. &*-\$-0?!
F! F!R@KORM@?!

S29(-F!W?F! ^ !J*-F! T ?!7@ABC;?!5*9\$/ :!2-/(0)'\$-0:!' - ,!/*&*)'0(!\$-+(%0 8 (-0?!
F! 7R;F!M@ROMC[?!

!

S2\$%*F!V?F!H' &&(99\$F! " ?F! ^ !5' ,29'F! T ?!7@ABR;?!5(-%\$*-! . ('90#!2-/(0)'\$-0:?!
F! 7[;F!BAM\OBALM?!

W(F! i ?F! ^ ! I \$2F! H? ! 7@ABL;?! "#(! (33(/0! *3! (</*- * 8 \$/! &*9\$/ :! 2-/(0)'\$-0:!' *-! 1' ->!
+'92'0\$*- %?! F! 7M;F!R[MOR[\?!

W9'0%# . ':*F! I ?F! '- ,! T ?! I '<(D' '),?!@ABC?! r "#(! E*-%(P2(-/(%! *3! 5*9\$/ :! 6-/(0)'\$-0:Y!
US\$/*- -- (/0%' - ,! US920\$*- %! \$-!0#(! I *20#! e3)\$/' -! a ('9! 433(/0\$+(! 4</# ' -D(! a '0(04<&*)0!

!

X' -DF! q ?F! V((F! X?F! ^! a '00\$F! a?! e?! 7@AB[;?! 4/*-* 8\$!/!&*9\$/ :! 2- /()0 '\$-0:!' - ,! 3\$) 8 09(+ (9!
\$-+(%0 8 (-0?! F! F![@OMR?!
!
X)*(%(F! V?F! I?! X*>F! '- ,! H?! 5')9(+9\$(0?! @ABM?!

a*1\$-%*-F!5?!T?F!^!_'d\$8'F!_?!7@AA@;?!U(0()8\$-'0\$*-*3!/*\$-0(D)'0\$-D!)'->!\$-!3)'/0\$*-'9!
%:%0(8%?! F! 7@;F!@B\0@[B?!

a*1\$-%*-F!5?!T?F!^!W2'9,(F!H?!7@AAR;?!E*\$-0(D)'0\$*-*!\$-!3)'/0\$*-'9!%:(8%!.\$0#!
2->-*.-!\$-0(D)'0\$*-*!),)%?! F! 7C;F!B\@\0B\CC?!

I'#\$- *fF!I?F!^!4?!E*%'F!4?!7@ABL;?!4/*-*8\$!/!*9\$/:!2-/(0'\$-0:!'-'- ,!(/*-*8\$!'/0\$+\$0:!
\$-!"2)>(:?! F! 7@B;F!BMB\0BM@A?!

!
I#*'DF!U?!'- ,! I?! `(2D()!7@ABC;?!r6-/(0)'\$-0:!'-'- ,!0#(!S(*D)'&#:#! *3!0#(!S)(0!
a/(%%\$*-sF!H*2)-'9!*3!T*-(0'):!4/*-*8\$!/!L[F!L[OKR?!

!
I\$-#F!e?!7@ABC;?!T*-(0'):!*9\$/:!2-/(0)'\$-0:!'-'- ,!\$-+(%0*)!(<&(0'\$*-*%?!
F! F!BLL0BKK?!

!
` (9%/*F!E?!7BKKK;F!S'2%%\$'-!%(8\$&')'8(0)\$/!(%0\$8'0\$*-*! *3!-*-%0'0\$*-'):!0\$8(!%())\$(%F!
!@AF!L\0B@\?!

!
i'99'F!a?!@AB\?!r4/*-*8\$!/!5*9\$/:!6-/(0)'\$-0:!'\$-!J)(9'- ,?s!e09'-0\$!/!4/*-*8\$!/!H*2)-'9!
[MY!@CKg@\B?!,*\$YBA?BAA\t!%BB@KROAB\OKMRCOL?!