

# Attitude face au risque & Sciences économiques

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**Laura Concina**

*Rédaction coordonnée par Caroline Kamaté*

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**Les  
Regards**  
sur la sécurité  
industrielle



**FONCSI**  
Fondation pour une culture  
de sécurité industrielle







3bdĀe'SLb^MUFa' | >V#5SZ[VdeWWS eĀLgd[fĀ[ Vgefd[VWVf Va' f^g' W#atWVf]e  
[ [f[Sgj V#f WWS'ad[e]d V# dĀeg'fSfe WWS dMZWVdZW'S 8a' VSf[a' S 'Mb'S[e]d  
Sg\agdVZg[ WWhagebcbaedVd | >V#DWSdVe' žG' W' aghWVVLb^MUFa' ° 'ScgVWV  
' agefVā' eVfVbka' ebSof[Lg'ĀdW VVf, [^eSY[f^ VV/baedV' Mba[ f WWhgVWg' W  
V[e]b[ Vēgdg' aTVVf'g' Lā U#f'g' VcgVf[a' [Āe° 'S eĀLgd[fĀ[ Vgefd[VWV'Egd  
'M#ēgdV V/bĀ[VWUNbSdVWV b'McgVW[da' fg' ĀLā a\_ [efVg' eaUa'āYgW 1Egd  
' [ U#f'fgVWVcgVbVVeLā' fg' S' fZcaba'āYgVg' [ YĀ [Vgd 1

@afdWha'ā' fĀ ShWU# | DWSdVe' V#f WVLĀVd'g' ba' f WfdVW#V[e]b[ V#f W  
XShad[e]d MbSofSYWg' \_ Ā VāTVVfWdMZWVdZWVShWV#ba[ feWWhgVW[V#dVfe  
VfLā bĀ\_ WFS[d#

7' X' f ShWU#DWSdVcgv agehag'ā' eSU#e]T#Sgj `a' ž[ [fĀd SydĀ\_ WfĀe  
VWV b^V#VWV [e]W e]fgSf[a' f` ageeagZS[fa' e\_ V#fV# V[e]baef[a' Vg YdS' V  
bgT[VUW#Lā' fVge d[Vf[XcgV# >V#U[fakWeeV#hĀWf Wb'geW b'ge[ fĀd#e  
° Lā\_ bdVWdV#cgVf[a' eVfV#V#j e[Vf[XcgV# ° \_ [V#j SbbĀZVWV#V\_ a' W  
Lā\_ b^VWWS' e VcgVf[eĀhā'gWfz>S 8a' VSf[a' f bSdU#fW aghWVVLb^MUFa' f bcaž  
baedW#dMSdVe egd` afdV\_ a' W#XShad[e]V#f dS' e\_ [ee'a' WVLā' `S[ees' U#fV  
eagZS[fV#SbbadV#eS bVfV#b[V#bV# ^ĀV[XUWg' VēaUĀĀ Va' f V#XV\_ V#fV#  
Za\_\_ V#ea' fW\_ VēgdVWbdVWdVW#VĀL[e]a' eĀUS[d#

Fag'ageW^W Shd[^  
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# DfÁLa Vi`Y

5 SbagdaTVV [ [fVdVWé'VUVgde` a` ŽÁLa` a\_ [efVéSgj fZÁadVéVWÁLa` a\_ [W USee[cgVWVLa` badfW WfS'WVg d[ecgVWVWV [ UvV[fgVW; ^VÁUbfVéVdÁeg'fSfeYÁ` ÁdS'W Wf SUWbfÁeW eU[WUvéÁLa` a\_ [cgVécg[ea` fVÁVd\_ [ S feVS e'Sbd[eWWWÁU[eja` W Ua` V[fja` eVW d[ecgVág V [ UvV[fgVWVVS eVvéefgSf[ia` eaÖ[ ^Vé'cgVé[ia` VbVdVéVWVWVS[ ežBagd [ ^gefVd UvéV' agebdÁeWfVda` eg` WéÁVU[ia` VVdÁeg'fSfeZÁad[cgVd WfdV\_ ÁÁeV VjV\_ bVéVWS h[V cgaf[V[W` WS[ e[ cgVWVé'fdShSgj VdVUZVdZVWV eU[WUvéÁLa` a\_ [cgVéVW bekLZa` aY[Végd` S bVdUv[ia` Vg d[ecgV

>Vd[ecgVWV [ UvV[fgVWéa` fUa` eFS\_ WfbdÁeWfeVS e'Sh[Vcgaf[V[W` WSGee[T[W` YdS` Wé'g` bVf[VÁLZVWVé/bSdVjV\_ b'W'VéSU[VWfeVa` Vef[cgVéV' V'USfSefcabZVé [ VgefVWVé\_ SVjgdVéž >Vé eU[WUvéÁLa` a\_ [cgVé'a` f'g` Wá` YgWfcdSV[fja` V S SkelWg d[ecgVWV fS` f'cg` ÁÁ\_ Wf\_ SVjgd V'Xa` VS\_ WfS'VS e'Sbd[eWWWÁU[eja` , S'b'gbSdf VvéVÁU[eja` eÁLa` a\_ [cgVé` WbVghWf ÁrdV Wf[ÁdV Wfbd[eVéW X[S'e` fX` WVS` af[ia` Vd[ecgVBSdVjV\_ b'WVS e'S` fffÁdSfgdVW` S UÁdV ^S` SkelWVéV[XÁdVfe\_ aVÁVéVmbadVWVg [ ^Vé'fTSeÁVégdVé'efcSfÁY[VéVWV[XÁdVU[Sf[ia` Vg d[ecgVéVá` ^Sff[fgVWVWV [ hVé[eeVgdbSdSbba'f` UvV[ŽUž7` eU[WUvé\_ SÚbaŽÁLa` a\_ [cgVé` W fSgj VUZI\_ SWV'Vé'fSgj V [ fÁÁfeV'VWUZS` YW'SeST [ fÁba [f[cgVWV [ badfŽj/badf` Wéa` f cgVcgVé'cgVéžg` VéVé'hSd[ST` VéÁLa` a\_ [cgVé [ eST` Vé'cg [ XgWf egd` ÁLa` a\_ [W` aTSV

5WValg\_ Wf

Dc|bhVÁ

>VéVÁU[eja` eW Ua` fVfVd[ecgÁea` fÁrgV[ÁVéW bVd\_ S WUmbSd` VéLZVdZVgdeVS e`WVa` S[ WVé eU[WUvéÁLa` a\_ [cgVéž5WValg\_ Wf fVfVW VjV [cgVd V'fZÁad[VéÁLa` a\_ [cgVéVWTSeVMS[ e[ cgVWVgde dÁeg'fSfe' g` bgT [Ucgl fdShS[ ^VWV YVé[ia` Vg d[ecgVág cg [ V'fÁdVéÁbSd` Wé'gVéEa` Tgf V'fV S[Vd LZSúg` Ua` bdVdVéVé` g` ba[ fVWgVÁLa` a\_ [cgV'Vé' Ua` bca [eUa` eVf[e'ebSd` V' [ V[hVgeXSUW Sg d[ecgV

5a\_ Wf V' [ V[hVgead[WfVfZ[é` VgdeUZa] `adécg [éea` fUa` Xda` fÁeSg d[ecgVME [ ^a` Ua` ež VÁdVcgVWéVÁU[eja` ecg [ébdV` Wf ea` f dSf[ia` ` WVé` VgdSff[fgVWVSUWSg d[ecgVbVgVf ÁrdV\_ aVÁVé eÁVé5Wéa` f V' TSeVéVg\_ aVÁVéSf[ia` ` Wé'fS` VsdV` VÁhVabbÁbSd` VéÁLa` a\_ [efVé'cgVUW] DWVsdV` h[eVfagfV STadv` VjbaeVéž5VéVVS` fi bVf[ f bVf[ fW bagde]hS` f` S` VUfgdV` ageaTeVéha` eVW ` a\_ Tdvj` ÁUdfeSg\_ aVÁVé'bd` U[bS'W Wf fÁe' V' V' T[S[e'bekLZa` aY[cgVéž5a\_ Wf V' eU[WUvé ÁLa` a\_ [cgVé'bdV` WfZV'VéW Ua` b'fVUvé'bSdS` ÁrdVé'cg [ XgWUWf` afdMSff[fgVWVSUWSg d[ecgV cg [ ageUa` Vg[eWf` b'WVdVWVéVÁU[eja` ecg [ V' Wéa` f bSeUWVé'bdÁhgVé'bSd` W\_ aVÁVé 5 V'f UW cgVUW] DWVsdV` eSffLSZW` b'ÁeWfVdVS eVé'YdS` V' V' V' V' S [ÁdMSUWéT` W` g` bgT [U ÁSd]z

3 [ e] ` ageUa\_ WUWda` ebSdg` Wt'ÁhW [ fdaVgU[ia` VÁ\_ a` fdS f cgVWVé eU[WUvéÁLa` a\_ [cgVé ea` f` a] V' ÁrdV` SXS[dMVVé` eVg` éÁLa` a\_ [efVé V' cgVUWcgW ageVÁX [ da` eUa\_ WVé' LZa] ÁLa` a\_ [cgVé'ea` f bSdfagfVS` e` afdVh[VWVfage V'é'agdež5 V'fVS` eUWfVé'bd[f cgW ageVÁU[da` e V' V' af[ia` eÁLa` a\_ [cgVéVWTSeV' Ua\_ WUWbSd` S'VÁX [ f[ia` tSg eW e` SdVWVé'egVf'eSTadv' Áe VS` eUWValg\_ Wfz@age hVé' eW bSdf[Lj` Vd[cgW'S VÁX [ f[ia` Vg d[ecgVWVg` ba[ fVWgV ÁLa` a\_ [cgVé'bdV' bSdSgdVdÁeV[XÁdVfVWVéVÁX [ f[ia` eUSee[cgVéVg fVd\_ V'7` eg[fW'Sg LZSb[fdV' ` agefdSÚda` e V' V' V' V' V' aVÁVéÁLa` a\_ [cgVUSee[cgVé'cg [ VjV [cgV'Sff[fgVWéSf[ia` ` WVWVSUW Sg d[ecgV@age [ fdaVg[da` e] S [ e] ` S fZÁad[VWV'gf [ fÁ V' b'ÁdÁV` afÁW7GF bagd 7] bVfVW Gf [ f'k F ZV'ck W S` YS[efV'ha` @Vg\_ S` V' ? adV'eVd t\_ aVÁVéZÁad[cgVWVé'egVf [ f'ÁbSd` S b'gbSdf V'VéÁLa` a\_ [efVéž6Vb'ge` ageVjbaeVé' eW\_ aVÁVéVWTSeV'ÁU[hS` f ^Sff[fgVWVSUWSg d[ecgV[S[ e[ cgVcgVé'cgVéžg` V' V' SbbcaLZVé'gf [ f'ÁVé' bagd ÁhS'gVd V' Sff[fgVé [ V[hVgVWéXSUW Sg d[ecgVž7` V' [ÁdVbSdf[VWVUWUZSb[fdV' ageVjS\_ [ Vda` e V' U[ [cgVé'badfÁVé'egd` W\_ aVÁVé 7GFžBSdVjV\_ b'W` ageV[eUj'fVda` eVé'efgSf[ia` eVS` e V'cgVWVé V' b'ÁV[U[ia` eVg\_ aVÁVéa` f V' V' ÁVéž3g LZSb[fdV' t\_ ageVjS\_ [ Vda` eg` Vha[VWVdVUZVdZVWV eU[WUvéÁLa` a\_ [cgVé'b'ge dÁUWfVcg [ badfVégd` ^SebV'f bekLZa` aY[cgVWVé LZa] [ V[hVgVé V' eSbbg[Végd V' b'VghVé

>VUZa] Wé'egVé' V' [ VjZSgefX [ dVdÁeWfSf[XVWV` fÁYdS'fÁVWS fffÁdSfgdVW\_ Sff[ÁdVWVd[ecgVW\_ Sje` Wt'gf V'f VWA` ` Vd'g` VhgVW WéV\_ T` Végd V'ha[VéVWdVUZVdZVWj[efS` fVéž

Vj/bAd\_ WfS^@ageVÄ\_a` fdVda` eS[ e] Sg fdShVdeVjVW\_ b^Vd cgWS dÄS^fÄ` WUaddVda` V bSe  
fag`agde^ UMcgW^a` bagddS[f SffWVdMW g` La\_ badfV\_ Wf dSf[a` ` W^SUA^Sg d[ecgVZG` WfZÄad[W  
S^fVd Sf[hW/SbbWÄWfZÄad[VWVebVdVhV/BdabWV F ZVdck W S Y^S[efVf S^ade [ fcbVg[fVZ>W  
LZSb[fdW bdÄeWfW SgfdVjVW\_ b^Vd cg[ eWÄ\_ SdcgW f VWS ^ffÄdSfgdWÄLa` a\_ [cgWWTSeW  
ag VVZkbarfZÄe dSf[a` ` W^@ageVjS\_ [ Vda` eVbdVghVW\_ b[d[cgVWVj/bAd\_ WfS^VW  
VÄh[Sf[a` eVg La\_ badfV\_ WfZ7` bSd[lg^Vd` agehVda` eLa\_\_ Wf ^SbVdVb[f[a` Vg d[ecgW^V  
bdaTST[ÄeV^ [ Uvd[fgVWbVghWfS\_ WVdUvdS[ e[ V[h[Vge^ La\_\_ VfdWVbdVjdxSUM^ VV  
LZaj d[ecgÄz

; ^Vf US[dcgW afdW[eUgee[a` ` Vef bSeVjZSgef[hV5WUZaj Vef VÄ[TÄÄ USd^WTgf Vef VbdÄeWZ  
fVdVWVW[eeÄ\_ [ VdVWfZÄad[VÄÄLa` a\_ [cgVWWTSeWS[ e[ cgWVbdVghVbekLZa`aY[cgVg  
La\_ badfV\_ WfZg\_ S[ ^SUMSg d[ecgWV^ [ Uvd[fgVW





# bf cXi Vjcb . ei Y gcbh`YggVWbWg AVbca J ei Yg3

G` WwVvVAX [f]a` efdSV[f]a` ` WwVvVedUWUvVAla` a\_ [cgVvVef

>VedUWUvVAla` a\_ [cgVvVef f g` VvUWUvVAlSvWcg[S` S`keVsbcbVgUf]a` I` SV[efc]Tgff]a` VvV`SLa` ea` \_ Sff]a`  
WvV[VvVWvVvVh]UvVz

@AS` \_ a[ d [^Vj]efWg` WwVvVAX [f]a` b`ge\_ aVvVd WvV` \_ a[ eLa` hWf]a` ` WwVvVcg[ bdWV Sgee[ W  
Ua\_ bfWwVvVegVvVeb`ge[ ZST[f]gVvVef fVvVcgWSba f[f]cgVvVedUSV`SbcbVgUf]a` I` Sba f[f]cgVvV` a` AS[dVvV  
VvVz>VvVedUWUvVAla` a\_ [cgVvVef \_ aVvVd VvV`eVvVea` f [ fAdVvVvVvV` VvV`egVvVef fAe Sg Ua\_ badfW VvV  
Zg\_ S[ VvV`ea` fVvVWvVgVvVeg` WvV[ed]b[ VvV`b`ge`SdVvVcg[ [ fVvVSY[f ShVvVTVSgUagb V SgfdVvV`Va\_ S[ VvV`  
edUWf]XcgVvVebSdVvVjW` b`W`S`eaU]a` aY[VvV`S`bekLZa` aY[VvV`ST]a` aY[VvV`S` VvV`jca` aY[VvV`z

G` WvV`SgfdWvV`AX [f]a` WUadVvVcbabaeVvVcgWvV`edUWUvVAla` a\_ [cgVvVef AVhVvVbbWvV`VvV`fZAdVvV`TSeAVvV`  
egd VvV`bZa` a\_ A` VvV`Ala` a\_ [cgVvVef UvV`fz` ZvV[dVvVfagf bZa` a\_ A` VvV`cg[

SfdS[f` fagf SbbVvV`Vg Ua\_ badfW VvV`Zg\_ S[ fA` `S`aUS]a` WvV`vV`egdUvV`edSdVvV`-bSdLb` eAcgVvV`f UvV`f g`  
Va\_ S[ WvV`eAVvV`VvV`gZBSdVvV`WvV`b`VvV`fagf UvV`cg[ eg[f]bVvV`f fAdVvV` UgeVvV` e`S`VvV`X [f]a` WvV`bZa` a\_ A` VvV`Ala` a\_ [cgVvV`  
\_ A` VvV`f T[VvV`eCt UvV`bZa` a\_ A` VvV`bVvV`hWf [ b[VvV`cgVvV`V SgfdVvV`V[ed]b[ VvV` SdVvV`VvV`ZVvV`g` bSdVvV`S[dVvV`VvV`gVvV`  
egd[ fVvV` VvV`dVvV`SdVvV`M]g` ValUg\_ WvV`S[dVvV` `S`fA`h]e]a` I` X[dVvV`g` Va` ` g` W`ghdVvV`SdVvV`Sf]hWvV`SLa` bSY VvV`g`  
ha]e[ W`halfgdVvV`bagd\_ [VvV`j` bagha]d`g[ WvV`S` WvV`g` WvV`ShVvV`gd b`ge fSdM VvV`VvV`WvV`S[dVvV`S`eVvV`WvV` S[ fVvV`S` f`  
b`g]f fcgVvV`WvV`fa` VvV`VvV`S`bVvV`geVvV`SbbdVvV`VvV`VvV` eai` WvV`S` f` `egVvV`Sg fVvV` [eVvV`S`VvV`d` `AVvV`]eVvV`WvV` [ ]` eai` @

6 VvV`LZa]j Ala` a\_ [cgVvV`

Dc]j h vV`

6 WvV`Uba] f WvV`hgW`S`cgVvV`f]a` UvV`fcb`WvV` edUWUvVAla` a\_ [cgVvV`ef `S`dSdVvV`AZ>VvV`dVvV`egdUvV`ea` f  
f [fAVvV`VvV` VvV`YVvV`eVa[hWf]Ua` f] gVvV`WvV` Wf X[dVvV`WvV`Ua\_ bcb\_ [eWfcdVvV`SgUagb/ag bVvV`fVvV`baee]T[ f]fAez  
; ^dVvV`eadf US[dVvV` Wf VvV`VvV`WvV` b`VvV`UzVvV`egecgWvV`bZa` a\_ A` VvV`Ala` a\_ [cgVvV`Ua` UvV` Wf` a` eVvV`WvV` Wf  
VvV`LZa]j \_ a` AS[dVvV`ag X` S` UvV`VvV`Sg eVvV`eefdUf] \_ S]eSgee[ VvV`ef]gSf]a` eaO` VvV`abf]a` e` a` f bSeVvV`hS`VvV`gd  
bAlUg [S[dVvV`7` V SgfdVvV`fVvV` VvV` WvV`LZa]j Ala` a\_ [cgVvV`z

>VvV`bSdSYdSbZvV`bdAVvV`WvV`feVa` ` Wf VvV`VvV`WvV` b`VvV`WvV`bZa` a\_ A` VvV`Ala` a\_ [cgVvV`-` agebdAVvV`fa` e  
[U` W] egVvV` cg[ Va]f VvV`UvV`WvV`dWfdWvV`VvV`hVvV`VvV`baee]T[ f]fAez@ageSbbWvV`vV` eUvV`egVvV` WvV`AUvV`VvV`gd  
^SYWf Ala` a\_ [cgVvV`ag ^SYW fZC gWvV`VvV`SYWf ea]f g` [ V]h[VvV`g` YcagbVvV`ag g` WvV`aU]fVvV` ` age  
VvV`vV` eX[dVvV`WvV`Zkba]fZAVvV`egd`S`XSA` Va` f [^bdWVvV`eVvV`VvV`e]a` e` ^adecg [VvV`f VvV`S` f g` LZa]j  
Ala` a\_ [cgVvV`z

>SfZAdVvV`Ala` a\_ [cgVvV`VvV`aeVvV`fcdSV[f]a` ` WvV` Wf egd VvV`baefg`Sf WvV`Za\_ a VvV` a\_ [Uge5VvV`g]ZU VvV`  
g` SYWf Zkba]fZAVvV`cgWvV`bdAVvV`WfSf]Xcg[ bdWVvV` WvV`VvV`U]e]a` e` dSf]a` ` WvV`TSeAVvV`egd ea` bcbabdW  
[ fAdVvV`z6S` e` WvV` aVvV`VvV`Ala` a\_ [cgWvV`TSeW` AaZU`Sae[cgWvV`UvV`VvV`U]e]a` f fag]agde AVvV`bVvV`Age  
Ua\_ \_ W,

- z bgdW VvV`fAVvV`eVvV`VvV` a` ZUa` UvV` AVvV`Sd VvV`eagU]eVvV`SgfdVvV`
- z SY[ees` fVvV`S` [AdVvV`Sf]a` ` WvV`VvV`bagd\_ S] [ [eVvV`VvV`gd bcbabdWbcb]Xf eVvV` ^[ Xad\_ S]a` Va` f  
[eV]ebaeWf egd WvV` a\_ Wf]
- z USbST VvV`WvV`bdAVvV`[dVvV`UvV`WvV`Wf Ua\_ \_ Wf ^Wh]ca` ` WvV` Wf eVvV`S`WvV`fA` bSd VvV`gd LZa]j VvV`  
UvV`g[ WvV`SgfdVvV`z

@AS` \_ a[ d VvV` \_ aVvV`VvV`TSeAVvV`egdUvV`Zkba]fZAVvV` VvV`bdAVvV`eVvV`f bSe]agdeUvV`UvV`WvV` Wf UvV`Ua\_ badZ  
fW VvV`Zg\_ S[ VS` eUvV`S[ eLa` fVvV`fVvV`zB`gebSd]Ug [fAdVvV` Wf] [e` VvV`bdW` Wf bSeW Ua\_ bfWV]hVvV`



bScS\_ ÁrdVéVfT[S]ecg[ bVghWf [ fVÁdVd fVécgVWvébdÁdWUvéVéSgfdVé` SdSf[a` S{fÁ` 1\_ [fÁW  
VvéLá\_ bÁrWUvé` 1\_ [fÁVé W USUg` S V[X]Ug` fÁ` 1\_ bdÁV[dWVvéÁhÁ` W\_ W feXgfdel VvéUSbSu[fÁe  
efSf[ef[cgVé` SVÁcgSfVéag` 1\_ USbSu[fÁV` g` S'WVf` 1\_ Ua\_ bdWVdWVvébdáT` Á\_ VvéLá\_ b'VjVé  
>VéÁLá` a\_ [efVé U'See[cgVé Vj` ÁaZU'See[cgVé a` f TSeÁ` Vjgd fDShS[^egd VvébdVghVé W\_ b[d[cgVé  
;`ea` fVéÁ` Vjgd dÁeg` fSfe fZÁad[cgVé ShVjVéVéagf[` eÁLá` a\_ Árd[cgVé Vj` ádcgVWvé dÁeg` fSfe` W  
LaddaTadS[Wf bSe` S fZÁad[W[` e\_ aV[X]S[Wf Vjgd fZÁad[Vé W` Xa` Uf[a` WVjgdS` S'keVWvéVa` ` ÁVé  
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8Á b]h]cb

>ÁLá` a\_ Árd[WVé` ÁrgVWVW` Sbb` 1USf[a` Vvé` ÁfZaVvéefSf[ef[cgVé Sg] Va` ` ÁVéÁLá` a\_ [cgVé 7` WUa\_ Z  
bdWV fagfVé` VéVéVé` [cgVéefSf[ef[cgVé Vj` SFZÁ` Sf[cgVécg[ ea` fVÁhVébbÁVébagd` Ába` VdVéSg] bdaZ  
T` Á\_ VvéÁLá` a\_ [cgVé S` S'keVdVéVa` ` ÁVé fVéVdVé fZÁad[Vé VjVé` aVÁVé

BWVS` f` á` YfW` bel` [^ÁRS[f` SdW` Wf dVá` ` g` cgVWvé d[WUvéÁLá` a\_ [cgVé` WbaghS[Wf ÁrdW  
g` W[dU]b[` Wj/bÁd` WfS'VéBWVS` fVéVÁUW` [Vé` S\_` S` [ÁdVbd` U]bS'WVWVéVd` Wbagha[d  
VvéfZÁad[VéÁRS[f` VÁrgV[VdWV` S` [ÁdWV` b[d[cgVWvéVa` ` ÁVéaTéVhST` Vd` VÁd[hÁVéWVW[h[da` Z  
` W` Wf` SfgdVé>W[h[da` ` W` Wf` SfgdWVé` M'Áeg` fSf` VbdaUvége` a` ZLá` fD` ÁeVj` Ua` f[WfVW  
` a\_ TdVj` XSURVjgd` cg[ bVghWf` WbSeÁrdVáTéVhÁeVj` bagdS[Wf XgeéVd` S` S'keVéSf[ef[cgVé>Vé  
Va` ` ÁVéÁLá` a\_ [cgVéea` f` XgWUÁVé bSdg` W` g` ffgVWVWVhSc[S` VéVjV` [ fVdUf[a` eWfdWVWVéV  
bSdLá` eÁcgWf T[W` cgVWvéVéVé` [cgVéÁLá` a\_ Árd[cgVé bVd` VjS[WfVW` S` [bg` VdVéVa` ` ÁVé  
UWfS[` VécgVé[a` e` WbaghS[Wf fcbaghVdVdVába` eVZ> [VÁVdSV[f[a` ` W'VcgVW` L` badS` feXURVjgd  
ÁLá` a\_ [cgVé` WbVghWf ÁrdVá` fD` Áe` b[cgSf` cgVWS` Ua` VVfWVWá` ` ÁVéÁRS[f` VéVé` ^` akW  
` SdW` Wf dVá` ` g` VVhÁd[XVd` S fZÁad[VÁLá` a\_ [cgVé

<b^b\ S  
<b\ ebqC\ C^z-YC

B'gedÁUW` \_ Wf` a\_ TdWVUvébdSf[cgVéa` fUZS` YÁVjVW` aghWVéSbbdaLVVéa` fÁfÁVÁhVébbÁVé  
6` g` U` fÁ` ^SbbdaLVVéa\_ badfW` WfS'VéSdV` [eW` cgVé[a` ` Mbaefg` S'fVW` Za\_ a` Ua` a\_ [Ugebagd  
Xhad[VdWVé` aVÁVéVWá` ` ÁVé b'geéagb` VéVjVé` b'ge\_` S^AST` Vé

>Vé` aVÁVé` Ua\_ badfW` WfSg] ea` fUSbST` VéV` [ U'gdW[hVéT[S]ecg[ ` WbVghWf bSeÁrdVbd[eW  
Lá\_ bfVWS` e` S fZÁad[VU'See[cgVéWbSdVjVW` b'W,

>Vé` 1\_ [fVéVWS` UaY` [f[a` Zg\_` S[` Wz>adeVg` bdaUvégeVWS` bdeWVWVÁU[e]a` t` VéZg\_` S[` e  
` WéVdS[Wf bVjgfZÁrdVbSeW` \_ VégdW` See[` [Vd` fagfW[` Xad\_` Sf[a` ` ÁUvéS[dVbagd` bdWVdVWS  
| Ta` ` W` VÁU[e]a` ` VjVéZ' ZV[dWUWVécg[ Va` ` WVW` VjVéVjgd dÁeg` fSf` bagd` ^` V[hVgfiZ6` Wb'ged  
VS` eW` a\_ TdVj` Ua` fVjVéVé [^eVdSf[` VjSURVégbbaeVd[cgVWvéS'WVfeÁLá` a\_ [cgVéea[Wf  
WfÁdW` Wf dSf[a` ` VéZ

>VéT[S]eLá\_ badfW` WfSg] dÁUgde[XéZ>Vé` [V[hVgeVghWf eVfda\_ bVdVS` eUWfS[` VéefgSZ  
f[a` eW` WbSeÁrdWV` \_ VégdWVW` aV[X]Vd` VjgdLá\_ badfW` WfZ?` Á\_ WVW` VjgdWéVjV` S` fag` W  
VjgdVjVé[cgS` fVéefgSf[a` eLá\_ b'VjVé [e` WbSch[W` Wf bSe` 1\_ S\_ Á` adVd` VjgdS[ea` ` W` Wf  
VjVéVéS[` e\_ aVÁVéf[W` Wf Ua\_ bfWVWUvé` Ua\_ badfW` WfeVdca` ÁéZ

\_\_\_\_ DSf[a` S{fÁ` 1\_ [fÁW\_

8Á b]h]cb

> [VÁWVWdSf[a` S{fÁ` 1\_ [fÁVW` ÁfÁ` bÁeWfÁW` bagd` XáUS` f[eVd` S'fWf[a` egd` ^ÁUSd` WfdVWS` dSf[a` S{fÁ` Zg\_` S[` W  
bScS[Vécg] eageZ'VW` S fZÁad[VÁLá` a\_ [cgVéU'See[cgVéVjVé` ÁaZU'See[cgVéVjVé` S dS` fFÁVg` Ua\_ badfW` WfZg\_` S[` fVj  
cg[` V'f baeef` V'WVWáTéVhVdVéS` e` S'h[VÁLá` a\_ [cgVé> [VÁW` V'f bSecgVWVéYVéea[Wf d[VW` Wf VjVéVjTÁÁ` Wf  
[dSf[a` ` VjVé` cga[cg[` e` M'ea[Wf bScXá[e]d` \_ S]e` cgW` [ Vjgd` eSha[d` ` [ Vjgd` bagha[d` WUWS` Uj` ^` Wjgd` bVd` VjVéVf  
V'SfVjVé` VdVWVZSg' [hVsg` V'SVbSfSf[a` abf` \_ S'WVWé` akW` e` bSd` cSbbad` Sg] X` d` LZadVdVjgd[eVWV` ÁLá` a\_ [W  
VéL` a` VjS` Z` Q

BsdS[Vjgd` g` VsgfdVdÁha` g'f[a` ` SbbScDf` ShVj` S` Ua` VVfWVWá` ` ÁVé Vj/bÁd` \_ WfS'Vé` 1ÁVé Sg] bZÁ` a\_ Á` VvéÁLá` a\_ [cgVéZ>VéVa` ` ÁVé Vj/bÁd` \_ WfS'Vé` ea` fVéVa` ` ÁVé

cg[ ea` fVÁVé d[VW` \_ WfVS` eg` Tgf` d[Wf[X]cgWag` SgfdVWS` eWéUa` Vj[f]a` eLá` fD` ÁVéVd[VW` S` W  
Eg` Wd` 1` bZ` Q

>VfVd` Wj` dSf[a` S{fÁ` 1\_ [fÁW` Ua` ` g` Sgeé` eage` W` a\_ Wj` dSf[a` S{fÁ` 1ÁW` /Tag` WV dSf[a` S{fÁ` W` S` Y'S` eVfVéVÁX` [ UZVéageZ  
G` bdW` [VdVbSeVS` eUWéVéS` ÁfÁ` X[Sf bSd: VdVfVéZzE` L` a` VS` e` VéS` ` ÁVéU` cgS` fVé











# 5h]h XY fUh]cbbY`Y ZUW U f]gei Y

5 WUZSb[fdWfS[fWVWVbd[ U]bS[VVAVcgW ageSbbadfWVW\_ aVAVWUa` a\_ [cgWUSee[cgWV gf[ fFV  
VbAdAVegd`Sff[fgWVWV[ V[h[VgeXSUWSg d[ecgV@ageegbaea` ecgWVWVAVU[VVgde/[ V[h[Vgecg[  
Va[hWfXS[dWg` LZa]i` ALa` a\_ [cgVfVea` f dSf[a` ` WVeSg eW eaO[`eLZa[e]eeWf fag`agdeWV\_ S` [AdW  
bSdS[fWUWcg[eVfSg\_ [V]j` V]gde[ fAdVfz@ageLa` \_ WVa` ebSd`SVAX` [f]a` Vg d[ecgWVW eU[WUWV  
ALa` a\_ [cgVb bg[e` ageV[e]bfa` eWVZkbarZAVeVfVWVfZAd[Vz

## ž @f]gei Y Yh`rYgdAfUbW a Uh.Aa U]jei Y

6 V]j VAX` [f]a` efA\_a[Y WfWVWSXaA` Va` f`Wd[ecgWVWf YA` AdS\_W Wf bVdAg ,

**Risque` a\_ Lh`\_g`**

ž >Sbaee[T[ fFV WVMWVdVWVWVbVdVfVag WV\_ SZV]gdež

ž 6 S` YWVSeegds` UVf, Szd[ecgWVWbVdVfVag SgfdVhA` V\_ Wf bagd` VdVgVg` WdVUS\_ Sf]a` bV]f fAdV  
XS[fW Tz` Wk bVWg` fVhA` V\_ Wf fVcgWV[ UVWV]ag` Vha` Lz` W\_ a` fS` fWVS dVUS\_ Sf]a`  
VS` e` MUSE aO`g` fVhA` V\_ Wf eVbcbVg[f- Vz` bV]a` ` Vag aTVf` hS`gA` bSd` dSbbad` ° eV  
LbSdVf]f[cgVcg[ d[ecgVbS[WfVWVMWdV]g` [ U]WVf SeegdA`ž

**Risque**

| >Wd[ecgWUWVf` VbafWf[Vcg`g` VSLU[a` ag`g` VSLU[h]fFV LZa[e]VWk Lh` bde` MZa]i` WV[ SUT]a` fi  
S\_ A` Vp`g` VbVdVWg` d[eg`fSf[ V]e]cST`Mz`>S` af]a` [ b[cgWV]f[eWUWVg` LZa]i` cg[ [ XgVdSf  
/ag` S [ XgVfiegd` VdVeg`fSfz6 VebVdVfVbafWf[VVWVbV]hWf WVWz` A` VdVfAdVbVbVAVe` d[ecgVz` BalmVcgW  
fagfVSLU[h]fFVZg` S[ V]h` bafV]g` d[ecgW\_ S[eU]fS[ V]ea` fTVSgVbgb`b`ge d[ecgVdVcgWV SgfdVz`

>S VAX` [f]a` Vg d[ecgWVW eU[WUWV ALa` a\_ [cgVd Vef SgfdVcgWUWVVe U]fAVe U]ZV]gež7` dAY`W  
YA` AdS`W Wd[ecgWVWf bVdAg Lh`\_ W AYsf]z5 VdVVS fi W eU[WUWV ALa` a\_ [cgVd [^bV]f fAdV  
SeeaU]A` VVeVWVe` AYsf]XeLa`\_ WVVeSU[VWf ebaVWf[VefVf` VVeT`A` AX[U]e`fVVe cgWV[ ` ahSf]a`  
[eegWVWS dVUZVdVz6 g ba[ f V]hgWVVe eU[WUWV ALa` a\_ [cgVd` Wd[ecgWVWf VShS` fSYWSeeaU]A`  
^ [ U]Wf[fgVWcg` VVeVWVe` AYsf]Xež

BagdU`Sd[V]Vd`S fVd [ a`ay[W` agegf[ fV]eVd` e`S` af]a` Wd[ecgWVWV` a\_ [cgWVf VAX` [ca` e` Vd  
fVd` Vd` VbAdS` UV\_ SfZ`A` Sf[cgW` afAVW]H bagd [ 7j bV]VW HS`gW W S` Y`S[e]f] hA` V\_ W f VV  
dVeg`fSfz

\_\_\_\_\_ 7ebAdS` UV\_ SfZ`A` Sf[cgW\_\_\_\_\_

8A` b]h]cb

>VbAdS` UV\_ SfZ`A` Sf[cgW`g` VhSd[ST`MS`ASfa[dWVf`S` akW` Vba` VAdAVWVfagfVd` Vd`hS`V]gdebaee[T`Vd`  
cgWSHsd[ST`VbV]f bV]VdVz

Egbbaea` ecg`g` WfdVdVWV]dVATgV]g` VSLU[h]fFV Va` f [^aTf[Wf]g` T`A` AX[U]MS` `gVz`@AS` \_ a[ e  
W\_ a` fS` fVg T`A` AX[U]WVf [ U]WfS[ / T`A` AX[U]W Vef`g` VhSd[ST`Vf,

`adeVVeT`a` ` VdS` ` AVe [^Vef` A`VhA`/ fShW]g` VbcaTST[ fFV/bf]

`adeVVe`\_ SghS[eVdS` ` AVe [^Vef` TSe`KfShW]g` VbcaTST[ fFV Lh`\_ b`A`\_ WfS[dWVW` Zb]z



5VeaUjgdWUveSbbWVWFVveAhA` W\_ WfeVW`VveTAA` AXUveSeauUjAeWve dAeg`fSfez> WfdVbdVWgd`  
`WesJfbSe`^ShS`Uve`^S`AVeVdSTa``Wag`\_ SghS[eWVLa`\_ bfvEgd`Vve bcdTST[frAeb V` Zb bagd  
bdAha[dVveTAA` AXUve;`Vve`^1` afVdcgW age` VbdVva` eW La`\_ bfvEcgWVWvj baeE[frAe, g` WTa` `W  
ag g` W\_ SghS[eWS` `AV;`^Vef`US[dcgWWS` e`SdAS`frA [^Vj[efVTVSgUagb Vve[fgSfrA` ebaeE[Vve  
V`ShSdST`M` TA` AXUW bagdSfr bcdVdVTVSgUagb VVhS`VjgdeV[XAdVfVve@AS`\_ a[ `d` age` W  
fdSfrVda` ebSe`VehSdST`VveLa` f[ gVd`Uvcg[[\_ b[fcgVcgW age` Sgda` ebSe`^XS[dW ZkbfAZAeV  
Sg eg VVWWSV[efdTgf[ra` VveTAA` AXUve/` afS`\_ Wfe[ `SV[efdTgf[ra` VVbcdTST[frA`Vve`g` [Xad` W  
`ad` S`Wag e[ VVdVhA`g` VsgfdVad` Vve

BagdAhS`gVvea` SUR[hfrA` ^WfdVbdVWgdVa[frUS`Vg`Vd`VveYS[` e`Xgfgde` bSdf[dVWSbcdTST[frA`cgW  
VveYS[` ebaeE[VveVj[efVfz7` fVd` VveAla` a` [cgVd`Uve[ eSbbWVW`VveAdS` UW` SFZA` Sf[cgW` afAW  
7H bagd[ 7j bVWV`HS`gW` W`S`Y`S[efVW`SUR[hfrA`VW`Vve`US`Vg`AVLa`\_` Wag[fr,

$$EV = pX + (1 - p)Y$$

4A` AX[UWVebAdAV`g` V`SUR[hfrA`

9 Ya d`Y

E[ bSdVWV` b`W`WTA` AXUveA`AhW` `adeVg` WTa` `WS` `AVW`^1` `adeVg` W\_ SghS[eW  
S` `AVW`V`cgWWS`bcdTST[frA`cgWUve`Wvj` AhA` W\_ WfeVdAS`[eWf`Vve`S`\_A` VVUveZ`ZV[dNb/` `fr` W  
TA` AX[UWVebAdAV` V` z

>VebAdS` UW` SFZA` Sf[cgW7HfVve`g` W` VvegdVZkbfAZAfr[cgWVWS`hS`VjgdeVWV`SUR[hfrA`Z7`^W  
`VdVW`VfVbSe`SdAS`frA` VVW`V`S`\_akW` `Vba` VAdAVWVhS`VjgdeVWV`Vve`[fgSfrA` e`dAVWV`baeE[Vve;`^  
eVbagdSfr[cgW`SUR[hfrA` VbcdVg[eWS`\_Sleg` TA` AX[UW`gfgdVW` -UVve`fagf e[ b`V` Wf  
UvcgW agebagha` eVebAdVd`^` e`S` f bAeWf z

;^Sd[hVeaighWf cgW`adecgW age`Sha` e`g` LZaj` ^1`XS[dW` age` age`XaUS`[ea` e`egd`^ShW[dW  
LZa[e]eS`f`Vve`abfrA` ecg[Sgda` f`g` [ bSuf`egdUWVg[ZUzBSdeagU[VWU`SdfrA` ageS`^a` e`\_S[ `fWS` f  
VAX[ `dUvcgW ageWfV`Va` ebSdAhA` W\_ Wf`V`V`dAeg`fSfz

chA` W\_ WfV`V`dAeg`fSf`

8A` bjhcb

G` AhA` W\_ Wf`V`V`g` WU[da` e`S` Uvcg[ bVgfr`eVbcdVg[dV[ VAbWVS`\_ WfVvea` [ bAdS` UW`6S` e`  
`afdVWV` b`W`g` W` Ta` `WS` `AV` Vve`g` AhA` W\_ Wf`-g` W` \_ SghS[eWS` `AV` Vve`g` SgfdVhA` W\_ Wfz  
4[W` cgWWS` e`SdAS`frA` VveAhA` W\_ WfeVdVghWf`Sha[dVveLa` e`AcgWUve[ bAdS` fVebSdVWV` b`W`g` W  
`S[eS` UW`g` SU[VWf` gU`AS[dVg` ea`\_` VV`Vg` 9` fr`^ade`VWSV[e]gea[` cg[ hSeg[hndV`VveAhA` W\_ Wfe  
eVda` f`AhS`gAe[ VAbWVS`\_ WfVWVgd[ XgWUWag` VVWgd[ bAdS` UW`  
>VdAeg`fSf`V`g` AhA` W\_ Wf`V`V`e`S`dAS`[eSfrA` /bSdVWV` b`W`S`Ta` `Wag`^S`\_ SghS[eWS` `AV`5ZScgW  
AhA` W\_ Wf`SbbadVWV`La` e`AcgWUve`cg[ bVghWf`fagLZVd`VWAL[VWgd`BSdVWV` b`W`adeVg` WTa` `W  
S` `AV` Vve`hWfVve`ea` f`AV`AV`V`V`V` [ b[ fe`ea` f`TSd`^S`bcdVgUfr[hfrA`Vve`e`ST`V`V`Z`A` `egbaeVcgWUve  
USdUAd[ef[cgVve`ea` f` [ b[VfVve`VS` e`VdAeg`fSf`VW`AhA` W\_ Wf`V`V`bVghWf` frdVWV`bd[ AV`W` Vd` Vve  
\_`a` frS[dVebSdVWV` b`W`WTA` AXUW`Vve

BagdW`dVW[d`^1`VWV` b`W` agebagha` e`VALU[dV`SUR[hfrA`U`ZVvegeLa`\_` Wd[ecgAVUSdVWV`\_ Z  
b[fcgWVve`AhA` W\_ WfeVW`Vve`dAeg`fSfe`cg[ ea` f` [ UvdfrS[` eez7` V`SgfdVve`fVd` Vd` VdAeg`fSf`dAV`  
bagdSfr[ frdVb`geA`VhA`ag`b`ge`T`SecgW`VebAdS` UW` SFZA` Sf[cgW`BSdS[`Vjgde`g` V`SUR[hfrA`cg[ YAZ  
`AdW` VVXS`a` dAYg`frAdVUZScgV`S` `AVW`V` eOdW`z5V`V`SUR[hfrA` VLa`\_ bAdVbSe`Vd[ecgW  
AVdfr[fgVhVdege[ Uvdfr[fgV`U`USde`a` dAeg`fSf`Vve`fag`agde`W`\_A` VVUveZ`ZV[dVcVWS`bcdTST[frA`  
cg`VWVWV`VdVg` TA` AX[UveOdVW` Vve`AYS`W` z

;^Vef`US[dcgWWS` e`WVa`\_S[` VVve`e[UVUve`Ala` a` [cgVd`SVAX[` [frA` V`g` V`SUR[hfrA`d[ecgAVWV`  
T[W` b`ge`SdV`cgWUW`Vgfr[feAW`ad`S`V`Wfz6S` e`VveV`eYA` AdS`^W` ad[fcgWVve`SeauUjA`^1`S`  
bVdVW`Sg[ Va`\_`SVve`^1`g` V`abbadfrg[ frA`\_S`cgAV`ag`^1`g` VbVdVWV`WS[` eez>SV[XAdV`U`U`bd[ U]bS`W  
WfdVSVAX[` [frA` AlA` a` [cgW`g`d[ecgWVve`eSVAX[` [frA` b`geYA` AdS`VveV`fcaghWWS` e`SLa` `afSfrA`  
`AYSfr[hW`cgVbAdVWU`VWVd[ AdV`7` AlA` a` [W`S` afra` Vd[ecgVLa` Uvd`Vg` AhA` W\_ Wf`cg[ eW  
bcdVgfr`ShW`g` WbcdTST[frA`La` `gWag`cg[ ^Vve`baeE[VW`Vve[ Vd`S`ade`cg`g` AhA` W\_ Wf`cg[ eW  
bcdVgfr`ShW`g` WbcdTST[frA`VWg` ag`VW`Ada`Vve`Vfr[eOd/ag`UvdfrS[` fr

>VebAdS` UW` SFZA` Sf[cgW7H` Vve`bSeg` VhS`VjgdeAVWV` S[e`S`\_akW` `Vba` VAdAVWVhS`VjgdeAVWV`-S[` e[ `W` a` TdW  
`\_akW` VVWS` feBsdVWV`\_ WbSdVWV` b`W`z` WXS` fr` WLa`dV`Vba` VbSe`^1`g` `a` TdVdAVWV`WS` feBsdVWV`\_ Vve  
;^Vef` [ bAdS` f`VW`SdVdU`VfWAX[` [frA` ^1`^Vebdfr`VS` e`VveV[e]gea[` e`^1`hW[dVdS[`^k`SVve`SbbWVve`bekLza`a`y[cgVve`cg[  
V[ef]`YgWf`Vd[ecgWWS` e`WVa`\_S[` VVve`bVdV`V`V`V`d[ecgWWS` e`WVa`\_S[` VVve`YS[` eez



Dc]bhwA

\_\_\_\_\_ >Wd[ecgWVW eU[VWUWÄUa` a\_ [cgVÄ \_\_\_\_\_

7` dÄeg\_ Äi g` WSUR[h]fÄ d[ecgÄW\_ b`[cgWcgWVÄÄhÄ` W\_ WfeVW` VgdeUa` eÄcgWUWÄea` f` UvÄfS` e, Vgd dÄS`[eSf]a` VÄf` b`geag\_ a`[ ebdÄTST`VÄ` hVÄVW` Wfi g` WSUR[h]fÄ eÖdW\_ b`[cgWcgWVWÄeg`fSf`VÄf` UvÄfS` ž 7` eU[VWUWÄUa` a\_ [cgVÄ` Vd[ecgWVÄf` SeaaUÄ` 1` ^` UvÄf`[fgVWcgWVÄ`VÄVÄeaa[WfTÄ` ÄX]cgVÄ`ag` ÄXSeVÄZ

6WS\_ Ä\_ W\_ S` [ÄdV`SVÄX` [f]a` Vg d[ecgWVa` `ÄVbSd`^EA` [ fÄYdWSh[e]a` ÄUa` a\_ [cgW VÄfV` ÄZVÄfV` ad` VVÄX` [f` Vd[ecgWUa` \_ W` ^VÄVÄVÄVÄ` UvÄf`[fgVWÄgd`^SfVÄf` fVWÄeÄTVÄf`X` ž Fcb[e` af[a` e` badfS` fVÄeaa` f`Ua` fWgVÄVS` eUvÄfVÄX` [f]a` ,

>Wd[ecgWVÄbVWVWV` VÄfVÄ` [ S]f`a` ag`VWV` UvÄf`[fgVWVÄÄhÄ` W\_ Wfel`Sg`eW`eÄÖ`[`^bagddS]f` eVÄÄS`[eVÄ]ag` VbSe`eVÄÄS`[eVÄZ

>Wd[ecgWVa]f`Äf`dVÄVÄÄ`UdS`[^Sg` [ bSuf`egd`^ShW`[d`VÄ`\_ aV[X]Uf]a` e`bSd`dSb`ad`f`Sg`eSf`g`f` [ f]S`f`cg`[ fagLZ`WVÄ`VÄU`VÄgdZ

>Wd[ecgWVÄf`bVÄf` Wf`eVg`W\_ Wf`^adecg`[^VÄf`Ua` bSdÄ`Sgj` aTVÄf`[X`e`dÄVÄ`Vg`VÄU`VÄgd`VS` e`W`Ua` fVg`fVWVÄ`VÄU`[e]a` ecg]`Sgdä` f`g` VÄVÄf`egd`^ShW`[dZ

>ScgVÄf]a` cg[eW`eg]f`VÄf` SfgdVÄW` Wf` ,

5a\_ Wf` VÄW`edÄSY`[eÄVÄZ]`e°` VÄÄhÄ` W` Wfe`[ UvÄfS`] e`bSd`dSb`ad`f°` V`SgfdVÄeS` e`d[ecgWV

ž @U]h]i XY ZW U f]gei Y

Bagd`Ua` f` gVd`ShW` ^VWV` b`WbdÄUÄWVfi` [ SY` W` cgVhage`eakW` bcbad[ÄRS]dW`g` WSUR[h]fÄ d[ecgÄW`d`cg` YÄ` ÄdWg` d`WVW`gea]f`VW` ShWUg` WbcbÄTST`[fÄ`VW` f` ea]f`VW` ShWU` S\_ Ä\_ WbcbÄTST`[fÄ`VW` f` ž6`S` eUÄUd` ^VÄÄÄS` UW\_ SfZÄ` Sf[cgW7Hf]MÄD` VÄf` 7H`Df`M`VÄf` ÄYS`M` /7H`Df` fÄ?` S` fWS` fi`egbbaea` eg` VSUR[h]fÄ`eÖdW`Ei`cg` YÄ` ÄdW` ShWUg` W` bcbÄTST`[fÄ`VW`/7H`EfV` fÄ4`W` cgWVÄ`VÄgj` SUR[h]fÄ`eS]Wf` S\_ Ä\_ W`VÄÄÄS` UW\_ SfZÄ` Sf[cgW`/7H`fi`eVg`^WS`eVÄ` VÄVÄf` eÖdW`U`VÄZ` ŽV`[d`W`cg`WVÄ`gd` [f`g` d`WVW`g` eÖdZ`E` W`VÄ`VÄÄS]Wf`UZa]e]d` bSd` [ UÄ`VÄgj` SUR[h]fÄ`d` UvÄfS` VÄ`bVÄea` ` VÄ`eVÄS]Wf` [ V[X]ÄdV`fVÄ`-V`SgfdVÄ`bdÄVÄÄÄS]Wf` ^SUR[h]fÄ` d[ecgÄW`D`-V`SgfdVÄ`W`Uad`MUZa]e]dS]Wf` ^SUR[h]fÄ`eÖdW`Ez`7` V`SgfdVÄ`fVÄ` VÄ` UvÄfS`] e` [ V]h[Vge`S` Wf` Vd[ecgWVÄ]UZa]e]eW`f`Di` UvÄfS`] e`bdÄVÄdVÄf` VÄVÄ Wf` VÄ`UZa]` eÖd`VÄ`ea` f`Sff`[dÄ`e`bSd`Ei`VÄ`V`SgfdVÄ`ea` f` [ V[X]ÄdV`fe`Sg`XS]f`cgW`SUR[h]fÄ`ea]f`eÖd`W`ag` d[ecgÄW`fS` f`cgWVÄ`VÄÄÄS` UÄ` \_ SfZÄ` Sf[cgVÄ`/7H`f]ea` f`ÄYS`VÄZ`>S` af[a` V`Sff`[fgVWVÄS]UM`Sg`d[ecgWVÄ`\_ SfVÄgd`ShVÄeWVÄ` VgfdVÄ` Ua` \_ W`UvÄfS`] e]` 1` Ä\_ VÄVÄZ

? S` fWS` fi` ageS`a` e`dVÄSd`VÄd`VÄb`gebdÄ`e`^SUR[h]fÄ`d[ecgÄW`d`VÄ`U`SeeVÄ`VÄ` [ V]h[Vge`W`Xä` Uf]a` Vg`bd]` Sg`cgW`[`e`S]U`VÄ`fVÄS]Wf` VWS`hW`Vd`WV` g]f`[eS` f` 7H`Ua` \_ W` Ugd`VÄgd` ž>VÄ`bVÄea` ` VÄ` a` f`fVÄ`W`Äg`fVÄ`VÄb`ÄVÄd`W`UÄ`S]UM`Sg`d[ecgWVÄ` U` VÄgd`e`bdÄVÄd`W`UÄ`ea` f`ZÄ`fÄ`dÄ`YÄ` VÄZ`5`a` e]VÄÄ`e` ^SUR[h]fÄ`d[ecgÄW`d`Z`E`[a` VÄ`S` WÄ`g` Yd`ag`bW` [ V]h[Vge` ,

Egbbaea` ecgWVÄf`VÄS]UR[h]fÄ`hage`Sbb`Sd]f`W` WUa` T]W` WÄ`S` WÄ`[W]Z`hage°` cgVÄ`eg` g` bagd`S`YÄ`Äd`bVÄVÄS` f` g` S` 1

>Sb`gb`Sd]f`VÄ`Y`W`e`VÄ`S` WÄ`f`g` \_ a` fS` f` [ XÄ]VÄgd` ž

\_\_\_\_\_ 3` `W>gUWÄ@W` \_\_\_\_\_

g`Ya`d`Y

Egbbaea` ecg`3` `WWW`S`WV` bagd`hW`VdW`SUR[h]fÄ`Z`E`[ WWS`YSd]S]fi` WV`bagddS]f`W` a`fW`[d`g` YS` X]T`VÄ` fi`ag`g` YS` Ä`VÄÄ` f`bSd`Ua` fd`VÄ` W`VÄ`WV` ^SUR[h]fÄ`W`VÄ`f` Seeg`dÄW`W` YS` VÄ` ž5`VÄ`fVÄ`dS` eSUR]a` eÄVÄf`bVÄ`Ag`WbSd`TVÄ`Sg`Ug`b`Ua` \_ Vg` VÄ`a` ` VÄ`X]S]dÄ`\_ Ä` VÄ`[ VÄ`bd]` W`hW`fVÄ`f` XÄ]VÄgd` ^VÄÄÄS` UW\_ SfZÄ` Sf[cgW7Hf]ž5`VÄ`bVÄf`Äf`d`W`VÄ`Ag` Ua` \_ W`VÄ`bd]` 1` bSk`VÄ`bagd` Äh]fVÄ` Vd[ecgWVÄ` WÄSY` VÄ`cgW` ž4`[W`cg`[^VÄ]f`e]f`WVÄ` a\_ Td]VÄ` X]S]UR]VÄ`de`cg`[ VÄfVÄ` [ Wf` VÄ` dÄS]UR]a` eZg` S` VÄ`S]UM`Sg] SUR[h]fÄ`d[ecgÄVÄ`/bek]UZa`^ÄY`[cgVÄ`bVÄea` ` VÄ` VÄ`f]i`W` fVÄ` VÄ`ÄUa` a\_ [cgVÄ` g` [ V]h[Vg`bVÄf`Äf`d`MU`SeeÄ`Ua` \_ V`ShVÄ`eVÄ`Sg`d[ecgW`[ V[X]ÄdV`f`Sg`d[ecgW` VgfdVÄ`fi`ag`S\_ SfVÄgd`VÄ`d[ecgW` [ VÄb`VÄVÄ`\_ Wf`VÄ`UÄ`cg`[U]SgeVÄ` Sff`[fgVWVÄS]U`W`Ug`[Z]ž6`S` eUÄ`VÄ`VÄ`b`VÄ`3` ` VÄ`VÄS]f`U`SeeÄ`Ua` \_ W` ShVÄ`eVÄ`Sg`d[ecgW`Ud` VÄ`f`g` \_ a` fS` f` [ XÄ]VÄgd` ^VÄÄÄS` UW\_ SfZÄ` Sf[cgW7Hf]i`W`^SUR[h]fÄ`Z`E`[ Wf` VÄ` ž>gU`VÄ`f`g` S\_ SfVÄgd`VÄ`d[ecgW`Ud`[^VÄ`S` WÄ`b`ge`cgW`VÄÄÄS` UW\_ SfZÄ` Sf[cgW7Hf]i`@W`i`g]f`VÄ`[ V[X]ÄdV`f`Sg`d[ecgW`Ud`W`a` fS`f`cg`[^VÄ`S` WÄ`f`W`Ä` WÄ`g`W`VÄÄÄS` UW\_ SfZÄ` Sf[cgW7Hf]i`



>WSf cgWWAUWVgd bVgf Va` `Vd^1 ^SUR[hfA d[ecgAWg` WhSvjd cg[V]XAdWWW^VbAdS UW\_ SZ  
fZA\_ Sf[cgW ageS\_ A` W` S` af[a` VAcg[hS'Wf UWfS]` / afA57t bagd5VfS]` fk 7cg[hS'Wf W  
S`Y'S]efz

\_\_\_\_\_ c[cg[hS'Wf UWfS]` \_\_\_\_\_

8Ä b]h]cb

>Acg[hS'Wf UWfS]` Vg` WSUR[hfA d[ecgAWWf` W\_ a` fS` f cg[V]VfSffdTgA^1` ShS'VgdVWV SUR[hfA> Acg[hS'Wf  
UWfS]` bVgf Sgeel` AfcdMSbbWA bdj` VVhWfVZ5 Vef` Mbdlj` Xj` VSgcgV^SUR[hfA eVdS]f hWVgVZ

7` V SgfdVfVd\_ Vd` ^Acg[hS'Wf UWfS]` Vef` W\_ a` fS` f V SdWVf` AUeS[dW bagd dVWdW^` V[h]Vg  
[ V]XAdVf Sg XS]f VhWVdVea` SUR[hfA ag VWSLa` eVhVZ

c[h]WV\_ Wf Mbdlj` VVhWVWAcg[hS'Wf UWfS]` fVef` Va` `AbSd`SoAba` eW` S'cgVef`a` bdAUAVfW,

^Acg[hS'Wf UWfS]` V3` `WVf` WW` t

UWg[V]W@W Vef` WW

VfUWg[V] Wb-gUVef` WW` ž

5Wcg[ ` ageS\_ A` W` g` WAX` [f]a` e\_ b`WWW Sff[fg]WWSUMSg d[ecg]Wsg fdShVde WWSLa\_ bScS[ea`  
WfdWAcg[hS'Wf UWfS]` /57fVWUZScgVSWVf Vf` ^VbAdS UW\_ SZÄ\_ Sf[cg]V7HfiaTWVhVZ

\_\_\_\_\_ 3hVde[a` Sg d[ecg]WVf bd\_ WVVd[ecg]W \_\_\_\_\_

8Ä b]h]cb

>ShVde[a` Sg d[ecg]W\_ b[cg]WcgW^Acg[hS'Wf UWfS]` bagdg` WSUR[hfA d[ecgAWWf]` XAdVgd^1` ea` VebAZ  
dS UW\_ SZÄ\_ Sf[cg]W57. 7Hfi USdg` WbVde` `WSHVeVSG d[ecg]WVeS]VdS WVeWAT SdSeeVdVW SUR[hfA  
d[ecgAW\_ A\_ Vef` WVdW a` UW` g` YS]` baeeT` VVbAdAfz>SV]XAdV UWWfdWVbAdS UW\_ SZÄ\_ Sf[cg]WVf  
^Acg[hS'Wf UWfS]` Vef` SbbVAVSbd\_ WVVd[ecg]W` afADBI bagdD[e] BdV [g\_ W` S` Y'S]efz>Sbd\_ W  
VVd[ecg]WVef` baef[h]WWS e` WUa` fVj]fW` g` La\_ badfW` Wf ShVdeVSG d[ecg]WUVef` W\_ a` fS` f\_ S] [g\_  
cg` g` [ V[h]Vg SUUbfVWVbVdVdVbagdAh]fVd` Vd[ecg]VZ

c[S] fVa` `AVUWVWVAX` [f]a` t3` `WVef` ShVdeVSG d[ecg]WbSdUWcgVea` 57/` fVef` [ XAdVgd^1`  
^7H/` fZ7` ^VbAdVAdVdW a` Uv^1` g` VbSd[V]WVea` dAeg`fSf VdLa\_ bfA/g` Wbd\_ WVVd[ecg]W  
VW` fibagdAh]fVd` WbAeg`fSf Vg` W\_ SghS[e]VdS` AVZ; ^Vef` ^1` afVd]cgVef` 3` `WbaghS]f hWVdW  
bagdg` \_ a` fS` f egbAdVgd^1` ea` Acg[hS'Wf UWfS]` VW` t` WbAeg`fSf eVdS]f W LdVb`ge AVVAA  
cgWUWg[V] VebAdAZ

\_\_\_\_\_ 3\_ SfVgd VVd[ecg]W \_\_\_\_\_

8Ä b]h]cb

>S\_ SfVgd VVd[ecg]W hS`V` e` WVeLa` fdSdW, ^Acg[hS'Wf UWfS]` Vg` S\_ SfVgd VVd[ecg]WVef` fag`agde  
b`ge AVVAA cgW VebAdS UW\_ SZÄ\_ Sf[cg]VZ3]` e]t` Sbd\_ WVVd[ecg]WVef` AY S]f hWVdVbAdVfVWV` a` fS` f  
\_ S] [g\_ cgWS bVde` `WVef` bdAfW` La` UAVdV bagdLa` eVhVd` ^SUR[hfA d[ecgAVZ]Bagd` Vef` S\_ SfVgd VV  
d[ecg]W` ShS'Vgd S`ea` g`WWSbd\_ WVVd[ecg]WVdVbAdVfVWV` a` fS` f\_ S] [g\_ cg [e`ea` f`bdAfe^1` bVdVdW  
^adcg [e]Uza[e]eWf WfdWg` WSUR[hfA d[ecgAWVf` ea` VebAdS UW\_ SZÄ\_ Sf[cg]VZ;` e`bdAVdVfLa` eVhVd  
^SUR[hfA d[ecgAVcgW SUUbfVdVea` VebAdS UW\_ SZÄ\_ Sf[cg]W, Vd[ecg]WdVf` g` USdSurAdVbaef]fZ

>gUVef` bdf^1` SUUbfVd` Vd[ecg]WVf` ea` 57/` fVef` b`ge AVVAA cgWS hS'Vgd VV^7HzESbd\_ W  
VVd[ecg]WDBfVef` VVZ` ž>gUdVgeVdS]f fagf` \_ a` fS` f W VVeageVW` -W` dVdS UZV  
VVe a` XdVef` egbAdVgdVef`^1` eVdS]f Wf SUUbfAVZ

7` La` U`ge[a` t` Vef` [ V[h]Vge fVef`cgW@Vf` bagd cg[ `Sbd\_ WVVd[ecg]WVef` g` W` ^Acg[hS'Wf UWfS]`  
Vef` AY S^1` ^VebAdS UW\_ SZÄ\_ Sf[cg]VZ` ea` f` [ V]XAdVf` VgfVdVef` XSUMSg d[ecg]VZ@W Vef` VgfVdV  
XSUMSg d[ecg]WbSdUWcgVea` 57 Vef` AY S^1` ^7H` VVea` SUR[hfA d[ecgAVZ]; ^Vef` [ V]XAdVf` Sg XS]f  
V SUUbfVdVg` Vea` \_ Wef` OdVWV` ag` VVegbbadVd` Vd[ecg]WVg` WSUR[hfA Va` f` ^VebAdS UW  
\_ SZÄ\_ Sf[cg]WVef` [V]Wf[cg]VZ

G` WSgfdV\_ S` [AdVWV\_ VgdVd` ^Sff[fg]WWSUMSg d[ecg]WVef` fagf` e\_ b`W` Wf VVVW` S` Wd^1` g`  
[ V[h]Vg e[ `bdAVdVg` WSUR[hfA d[ecgAW` g` WSgfdV SUR[hfA d[ecgAV]ShVW` S\_ A\_ WVebAdS UW\_ SZÄZ  
\_ Sf[cg]W\_ S]eg` WhSd]ST[ ]fA` [ XAdVgdVZBSdV]WV` b`W` agebagha` eVW` S` Wd^1` 3` `W>gUVf@W  
VWUZa[e]dWfdWVdVg` SUR[hfAe,

UWVWa` `AWs e^VjWj bWbAdUAWWf/dWVWj WfVLa\_bfAVW agVW ShWU  
`S\_Ä\_WbcaTST[frÄ, WbAdS UW\_SfZÄ\_Sf[cgWÄSYW fî  
ag`g` WSgfdMSUR[hfrÄcg] bVgfdSbbadVdeaf ea[fr ShWU`S\_Ä\_WbcaTST[frÄ  
WbAdS UW\_SfZÄ\_Sf[cgWÄSYW fSgeel fî

4[W cgWVWVWj SUR[hfrÄeS]Wf`S\_Ä\_WbAdS UW\_SfZÄ\_Sf[cgWÄH/ fî`ShSd[S UWVf`b`ge  
ÄVWÄVbagd`SbdV [ÄdV -ÄUSdZrkW, † fîcgWbagd`SeVla` VVhSd[S UW, -ÄUSdZrkW,  
† fî

\_\_\_\_\_ >ShSd[S UW

8Ä bjhc

>ShSd[S UW\_VgdWSV[ebVde]a` WvhsVgdeTeVhAVz>ShSd[S UWVf`S\_akW` WWWÄUSd[Sg USdÄ VW  
hS`VgdebSdSbbadf` `S\_akW` Vî

CgS` V`WbAdS UW\_SfZÄ\_Sf[cgWÄVf`S\_Ä\_Wjg` [ V[h]Vg ShVdeVSG d[ecgWbAdVAdVfag`agde`g` W  
SUR[hfrÄb`geeOdM`g` VSUR[hfrÄd[ecgÄVUWVShVUg` VhSd[ST[frÄ`\_ [frÄVî>S\_SfVgdVWd[ecgWVsg  
Ua` fcd[MbAdVAdVfag`agde`SUR[hfrÄd[ecgÄVUWVShVUg` VhSd[ST[frÄ`ÄVhAVz7` X` †g` [ V[h]Vg  
[ V[XÄdWf Sg d[ecgW` SbSeVWbAdVAdVUW VVW, [^La` e[VÄdVcgWVdeVWj ea` fÄcg[hS`WfVdeVfVf  
[ V[XÄdWfz5a`\_` W3` `WvShVdeVSG d[ecgWVWbAdVAdVf`SeVla` VMSUR[hfrÄ/ShWU\_a[ eVW  
hSd[ST[frÄf`@WÄfS` f[ V[XÄdWf Sg d[ecgWÄVdSf` VgfdW`V>gU`^S\_SfVgdVWd[ecgWbAdVAdVf`S  
bdV [ÄdV SUR[hfrÄ/ShWU`b`geVhSd[ST[frÄfz

@agebagha` d bSdUa` eÄcgWfî` agebaeVd`ScgWef[a` WvSha[dLa`\_` Wf`Vde[ V[h]VgeXa` f`Vgd  
UZa]j` XSUM` ^[ Uvdf[fgVWVh` W bSd[Ug[Vd eVla` `Vgd Sff[fgVWbVde` `WWWÄUSd[Sg d[ecgWV6S` e  
`S bSd[Veg[hS` fW` age VÄUd[ha` e Td[ÄhV` Wf` Vde SbbcaUZVde` Vde b`ge Uagds` fVde gf[frÄVde bSd` Vde  
Äla` a` [efVde Vgds` f Ude ea] S` fWVd [ÄdV`S` ÄVde bagdÄrgV[Vd`S bd[eVWVWÄU]e[a` W` bdÄeW UW  
VWd[ecgWV` afS`\_` Wf`S fZÄd[VWV`gf[frÄ`WbAdÄW` afÄW7G† bagd7j` bWVW` Gf[frÄ fZVdck` W  
S`Y`S[efz5VfVfZÄd[VdSÄfÄ VÄVbabbÄVbSdha` @Vg`S` `W?` adWefVd` W` Ma` @Vg`S` `V?  
? adWefVd` ÖVfÄfSkÄVbSdESHsYVWzshSYW` Ö

\_\_\_\_\_ : kbaZÄeW

Dc]jhwÄ

>SfZÄd[VWV`gf[frÄ`WbAdÄW7GfVfTSeÄVgd`^ZkbaZÄeVcg` SYWf cg[Va[f bdWVdWg` WÄU]e[a` VS` e  
VdeUa` V[frÄ` e[ Uvdf` Vde ÄhSgWVdeTÄ` Ä[Vde VÄd[hÄeVÄhÄ` V` WfV[hVde bSdSbbadf` `SbcaTST[frÄ  
cgWVdeÄhÄ` V` WfeeVbcaVg[eWfz

ž @gdfÄZÄfYbWgYh`ñ`h`]hÄ

6VdeVWj bVdeegbb`Ä` WfS[dVdeVfVdeVÄX` [frÄ` eea` f` ÄUdeS[dVde bagd[`^gfdVd`SfZÄd[VWV`\_` Vgj  
Ua`\_`bdWVdWSV[e]geef` cg[hSeg[h]dVz

\_\_\_\_\_ >S`afVd[V

q]Va d`Y

Bsd[e`\_`b[UfrÄ` SbbVde` eUvVfVafVd[V> z5ZScgW` V[h]Vg bVgfdUZa[e]dWfdWVWj S`fVd SfrhVde` SLZVWd`ag  
`WbSeSLZVWd`g` T[`VfVWafVd[V>W[T`VfVxÄdVbSbae[T[frÄ`WWSY` Vd` ShWUg` WbcaTST[frÄ`VW` † z  
>WbAdS UW\_SfZÄ\_Sf[cgWÄVf`afVd[V> Wf bSdUa` eÄcgWfVW` /` j` † fîE[ Vbdj` Vg T[`VfVfÄYS`  
`^7H` Vg` >` ÄW` Va` Ufîg` WbVde` `WShVdeVSG/dVbVf[hV` WfS`\_`SfVgdVWd[ecgW` SLZÄVdSf`bSe  
/dVbVf[hV` WfSLZÄVdSf[frîg` T[`VfV?` S[` fWS` fî eggbaea` ecg[`^k` Sfr`g` WSgfdWafVd[V>` -VS` eUWSe  
g` T[`VfVLaÖfW` VfbVd` VfWWSY` Vd` ShWUg` WbcaTST[frÄ`VW` † z5`S[dV` WfUa`\_`W`WbAdS UW  
`SfZÄ\_Sf[cgWÄV>` Wf b`geÄVhAVcgVWUaÖfVg T[`VfV/` j` † 0` fîfageUWj` cg[`Vde` f bSefÄe  
ShVdeVSG d[ecgW`ha` f bcaTST`W` Wf fVfVd`VgdUZS` UWWWSY` Vd` z

E[` ageegbbaea` ecgWUZScgW` V[h]Vg` WbVgfd SLZVWd`cg`g` T[`VfV [^k` S`\_` S[` fWS` f fca[eS`fVd` SZ  
f[hVde`,

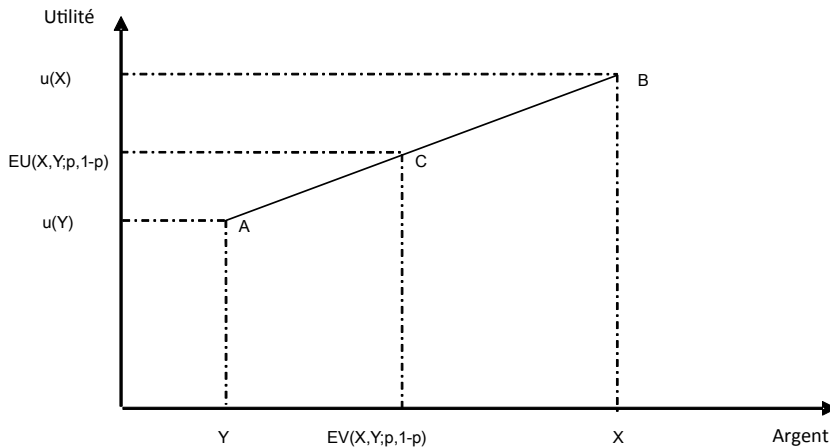
- SLZVWd`g` T[`VfVW> †
- SLZVWd`g` T[`VfVW> †
- `WbSeSLZVWd`VWT[`VfVz

7` gf[frÄ` f` VdeVÄX` [frÄ` eVa` `ÄVdebdÄÄVW`\_` WfUa`UZScgWafVd[VWef`g` ÄhÄ` V` WfUa` bSdUWcg[  
bVgfd egdW[dVS` e`WVgfd [ VÄbVVS`\_` WfVW`^` V[h]Vgž>S`dÄS`feSf[a` Vg`XgfgdÄhÄ` V` Wf





cgW ž; ^ VfbSeTVa[ VWAHwabbVdg` Wad\_ WY/b(UfWbagd/SXa` Uf[a` Vgff[1fA-` age  
 bagha` ee[ \_ bW WfV(dWcgW, g' fDg' fibagdfagf[ V[hVgž7` XS[fi [^ VfbSe[  
 [ \_ badfS fVMeSha[dVWLa\_ T[W g' fVfb'geYdS VMcgVg/ fi, 'SeVg WUZaeVcg[  
 ` age[ fAdVWVf` WVS[f cgW'gf[1fA Vg' WUWV Wvj dAeg fSfeea[f b'geYdS VMcgWUW'VWVW'SgfdW  
 / La\_ bScA` fž> gr[1fA Vfb'ad[ S'W, UMcg[ [ \_ badfWUWVf` V'eY' WWSV[VAdWUW  
 g' fiž'g' fD W'WUSeeW Wf Wfb'S'fVd Sf[hVd b'gfl f cgWS hS'Vgd dAW'VWWS  
 V[VAdWUWZE[ ^AZW'WUZS YWbSdVjW b'WV Wjbd[ \_ S f V'hS'VgdW Va` Scl` ^ad/dW WUZS YW  
 bSe/WUW Vfb' hS'ST'WShWUZScgWfdS` eAd\_ Sf[a` \_ a` afa` Vž6 WS\_ \_A\_ WSAa` t` S'hS'VgdSTea'gW  
 W'gff[1fA` VfbSeSge[ [ \_ badfS fVcgWes hS'Vgd dVsf[hW'ag SgfdW Wf V[fi WUSeeW Wf WfdW  
 gf[1fAebagdVW dAeg fSfeV[VAdW fefž



8 ž 7j W b'WVWVWVS[fa` WfdVb' Ufa` Vgff[1fA Vfb'adWV, b'ge` S ea` \_ W'W'adWV Wfb'AMb'ge` gff[1fA g'Si  
 SeaaU'AV' U'V'Vea` \_ W'W'AM'AV

>gecg` b'AdW'f' ageSha` e'AhS'gA` S'Ta` ` WS` ` AVW'`S` SghS[eMS` ` AVeAbScA` Wfž6` Aad` S[e  
 ` ageagZS[fV[fa` eeSha[dLa` \_ WfdVb'AdW'fVdg` AhA` W Wfd[ecgAV'cgWd' W'agWSbcaTST[1fA  
 VS` e WUSeeW Wf V S'fVd Sf[hVd[ U'V'fS[ Vž>SeU'fa` eg[hS` fVb'aba` V` U'V'VcgVfb'fa` Vfb'AdW'fW  
 S'fZAd[W'W'gff[1fA Vfb'AdAV

ž @UH.Ácf]Y XY`ñ h]hÁYgdÁfÁV

>SXa` Uf[a` Vgff[1fA` ages[VW USeeW Vfb'S'fVd Sf[hVd cg[ea` feC'dV'U'Vež' ŽV[dWU'V'fS[ V'eV SVhW[d-  
 V'WbcaTST[1fA ÁYS'W fž@ÁS` \_ a[` d[e] Vfb'S'fVd Sf[hVd cgW ageV'W'ba` eUSeeW'ea` f[ U'V'fS[ V'eV  
 a` f'g` WbcaTST[1fA WfdW` Ad V'g` t` agebagha` e'Adeg` Vd` gff[1fA VAd[h'AW'W'V'SUR[h]fA d[ecg'AWW  
 g' W` V'gdVg` [cgW` ^S[VW'g US'Ug` W'W'gff[1fA Vfb'AdAV

6S` e` afdWjW` b'W' SUR[h]fA d[ecg'AVb'AdW'fW'W'vj dAeg fSfebaee[T'V'g' W'fa` ` W'V'g' W` SghS[eW  
 S` ` AV'Sgj cgW'ea` f SeaaU'AV'V'W'vj gff[1fA ebaee[T'V'g' fV'g' fieV'a` ` M'Adeg fSf'VW  
 ^AhA` W Wf` ^ShW[dž6` AX` [ea` eJ La` \_ WS ea` \_ W'W' SdW'f'YSY` AV'adeV'g' W'fa` ` VS` ` AV'bcaŽ  
 TST[1fA, b'fi W'K` 'Sea` \_ W'W' SdW'f'YSY` AV'adeV'g' W` SghS[eMS` ` AV'bcaTST[1fA La` b'Á` W'fS[dW  
 Žbřž6S` eU'W'Sel` ^SUR[h]fA d[ecg'AVb'V'g' f'rdW'AX` [WLa` \_ WJ` I K` -b[ Žbřž> V'eb'AdS` U'W` SFZÁ` Sf[cgW  
 /7HfW'W'SUR[h]fA S'V'AV` AfÁ V'AX` [WLa` \_ W'W'Adeg fSf' V'eb'Ad'Á` ShS` f cgW'AhA` W Wf` S[f` V'g,

$$EV(X, Y; p, 1 - p) = 0,5 \times 100\,000 + 0,5 \times 60\,000 = 80\,000$$

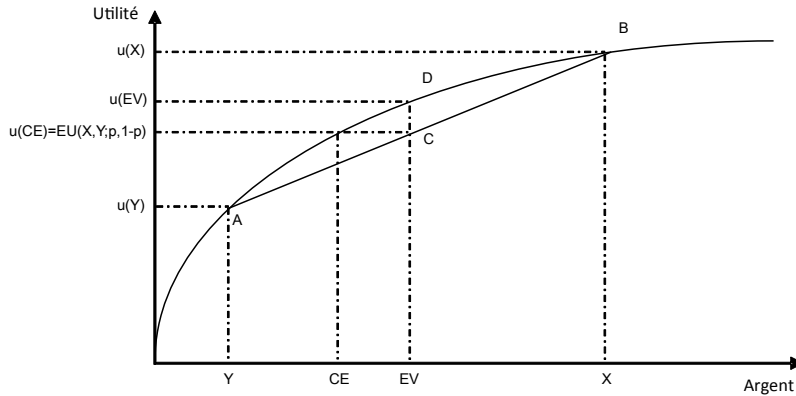
>V'eb'AdS` U'W` SFZÁ` Sf[cgW'V'g' f'rdW'f'cU'AV'egd` ^STeU'eeW'g YdSbZ[cgW'W' X'YgdW` žž  
 @ÁS` \_ a[` d` W'W'AU'W'gdVa[f SY[dShS` f cgW'W'Adeg fSf` W'ea[f La` ` g W'fS'TV'ba[ V'AhS'g'Vd` ^SUR[h]fA  
 d[ecg'AW` ^ShS` U'W'Sg hg W'eb'caTST[1fA e cg [^La` ` Sg` ag SgdS` U'adW'W'W' Wf Vfb' \_ AV'ež> gff[1fA  
 V'eb'Ad'AW'W'SUR[h]fA d[ecg'AW'V'f` S` \_ akW` W'W'gff[1fA e V'Ad[h'AV'e W'eb'Adeg fSfebaee[T'V'ba` V'Ad'AV'e  
 bSd` S'bcaTST[1fA cg [e'eb'caV'g[eW fž6S` e` V'W'W` b'W'Ad'AV'W'f' gff[1fA V'eb'Ad'AW'W'SUR[h]fA d[ecg'AW  
 V'fb'Va` ` AV'La` \_ W'eg[f,







5a\_ \_ W age^Sha` eVj/b[cgÅbdÅUÄWV\_ Wfi`Sbd[ WWD[ecgWVf`SV[XÄWUWVfdWVbÄS` UW  
 \_ SfZÄ` Sf[cgWVf`Äcg[hSWfUWfS[` /Va` U bagd3` `Vz@age` afa` ecgWSbd[ WWD[ecgW  
 Vef`g` W\_ VgdVbVf[` WfWVWVShVef`a` Sg d[ecgW, b'ge`Sbd[ WWD[ecgWVf`ÄVÄVb'ge`W\_ a` fS` f  
 SgcgW^SYWfVef`bdÄf` dV'a` Ubd bagdÄh[fVd` Wd[ecgWVf`S^Vd hVef`Vef`abf[a` eb'ge`ÄVef`ÄVÄZ  
 BSdS[`^VgdÄ UWfV\_ VgdVbVf`ÄVÄWV`S` e`S`Ua` Ush[fÄVWS`Xa` Uf[a` Vgf[ fÄ` SgfdW` WfV[f b'ge`S  
 Xa` Uf[a` Vef`Ua` UshVb'ge`^SYWfVef`ShVef`WSg d[ecgW



8 ž Ea` Uf[a` Vgf[ fÄ` Vg` SYWfShVef`WSg d[ecgW

6 WS\_ Ä` W\_ S` [ÄW` Vef`bdÄÄWUef`Vg` S\_ SfVgd` WWD[ecgWbVghWf` ÄfdVdÄÄWfÄVef`bSdg` W  
 Xa` Uf[a` Ua` hVjWUd` bagdUWVd` [Vd` ^gf[ fÄ` VVÄcg[hSWfUWfS[` Vef` fag`agde`b'ge`ÄVÄVcgW  
 ^gf[ fÄ` VVÄÄS` UW\_ SfZÄ` Sf[cgWV>Vef`bdÄÄWUef`Vef`SYWf` VgdVef`XSUMSg d[ecgWbVghWf`  
 ÄfdWÄb[fVef`bSd`Wef`Xa` Uf[a` eVgf[ fÄ` f` ÄS[dVef` Ua` \_ WÄX[` [WU]ZVef`ge` ^gf[ fÄ` Vef`ÄÄWVef`g` W  
 Ua` T[` S[ea` f` ÄS[dWgf[ fÄ` b'ge` VÄÄVef`W`Xa` Uf[a` WVgd` bdaTST[ fÄ`-S[` e[ f` Vef`US[dcgWS  
 eVj`Wef` Uf[a` bagd` ScgWVÄcg[hSWfUWfS[` Vef`ÄYS`^` ^gf[ fÄ` Vef`ÄÄWVef`S`Xa` Uf[a` f` ÄS[dVef`

F ZÄd[WVWgf[ fÄ` Vef`ÄÄW

Dc]joh WÄ

@agebagha` edÄeg` Vd` SfZÄd[WVWgf[ fÄ` Vef`ÄÄWUa` \_ Wef[f` ,

ž ; ^Vef`baeef`T` WWD` VgdVd` ^gf[ fÄ` bagdWef`ea` \_ Vef`V`SdWf`Ua` ` gVef`-b'ge`S`ea` \_ WVef`ÄVÄVb'ge`  
 ^gf[ fÄ` VgdVef`VdS`Ä`VÄW

ž ; ^Vef`baeef`T` WWD` VgdVd` ^gf[ fÄ` Vef`ÄÄW`g` W`SUF[h[fÄ`d[ecgÄWV`ba` VÄdS` f` ^gf[ fÄ` VÄd[hÄWVef`  
 hS`Vgd`Ua` ` gVef`Wef`dÄeg`fS`febaeef`T` Vef`bSd`S`bdaTST[ fÄ` WVgd`daUjgdWUW

ž >Vef`[` V[h]Vge`ShVef`Vef`Sg`/dVef`VUf[hV` Wf`S\_ SfVgd`Wf`d[ecgWbVghWf` fag`agde`/dVef`VUf[hV` Wf`  
 `S` S[ef`Wef`ea` \_ Vef`ÄVef`cgWVef`ea` \_ Vef`Äcg[hSWfVef`\_ S[e[` UWfS[` Vef`V`UWV` bVgf` ÄfdVdÄÄWfÄ`  
 YcSbZ[cgW` Wf`bSdg` Wef`Xa` Uf[a` Vgf[ fÄ` Ua` UshWdVef`VUf[hV` Wf`Ua` hVjVef`

<gecg`1`bdÄWf`fi` ageSha` ehg`Ua` \_ Wf`dVef`ÄÄWfVd` Vef`bdÄÄWUef`[` V[h]VgWVef`W`fVd` Vef`Vgf[ fÄ`  
 Vef`Sgeef`Ua` \_ Wf`SfZÄd[WVWgf[ fÄ` bVgf`U`SeeVd` Vef`ÄÄ` W` Wf`ecg[ a` f`g` W[ecgW[` UWfS[` Vef`7`  
 UÄcg[ Ua` UW` WUÄZa]j` W`ef`fgS[f`a` WWD[ecgWVf`V[` UWf[fgWV`SfZÄd[VÄUa` a` \_ [cgWU`See[cgWU`  
 egbbaeVcgWfagf[` V[h]Vg`dS[ea` ` ST`Wef[f` Vef`Sj`[a` Vef`WVWgf[ fÄ` Vef`ÄÄWVef`cg`g` W\_ Säd[fÄ`eV`  
 Ua` badVfWcggWVbÄV[f` SfZÄd[V`6 WS\_ Ä` W\_ S` [ÄW` a` TdW`Ua` a` [ef`Vef`eagf[WVdS[Wf`  
 cgWWT`a` UZa]j` VS` eWef`Ud`a` eFS` Uef`d[ecgÄVef`WVdS[f` ÄfdVdÄÄWf`ShWU`SfZÄd[Vef`



### ž A Yg fYf`ñj Yfgjcb U f]gei Y

>VefgSf[a` eAla` a\_ [cgVef\_ b[fcgWf Mb`ge eaghWf VefLa` eAcgWUve d[ecgAVež5 Vef bagd UWS  
 cg [^Vef\_ badfS` fi bagdg` W\_ g`f[fgWVWWS[ea` d` VWLa`` SfgdV`Sff[fgWVWVLSUg` XSUMSg d[ecgW  
 USd UWS S VefLa` eAcgWUve egd`Ala` a\_ [W Vef` [hVsgj V [ hVef[eeV\_ W fi VefUZa] V SeegdS Uve  
 [ V[hVgVef V` Sba f[fcgWbgT`fcgV? [Vgj La` bdW VdWVLa\_ badfV\_ Wf Zg\_ S` Sg` [hVsg [ V[hZ  
 VgVef\_ b[fcgWVef [ fAdVefVd` ^ShVef[a` Sg d[ecgWVg ba [ fVWVgWVW` [ V[hVg Vg` WbSof -V SfgdV  
 bSof La\_ bdW VdWVefLa\_ badfV\_ W feV WefV T`WVefg` W\_ S` [AdVgf[ WVVWVfVdVWdAb` VdW Vef  
 cgVef[a` eb`geYA` AdS Vef VVWVefVd` ShS[VfAVe` aVAVežBSdVjVW\_ bVWg` WS` S`keVWV\_ SdLZ  
 dVefg[Vef` SLa`` Sfees UWWW`Sff[fgWVWSUMSg d[ecgWVW`WefV\_ T`WVWS babg`Sf[a` f V`S\_ [eWV  
 ghVWVWS ba f[fcgW Sfa` S`V\_ b[fcgVcgWVef YaghVef V\_ W fe Va[hWf bdW VdWV La\_ bWVW  
 [hVsg YA` AdS V ShVef[a` Sg d[ecgWb`gfi f cgWVW [hVsg [ V[hVgVef

### ž ž @ubUngj AVtbcA Af]ei Y

>VefAgVefAla` a\_ Afcd[cgVefcg[ fWfWfV AhS`gVd` ^Sff[fgWVWA` AdS VWSUMSg d[ecgVefSbbg[Wf egd  
 Vef WefV\_ T`Vef VVWa`` AVef bdahWS` f WefVefVgde ag V SUR[hfAe bSofUg` VdVefBSd VjVW\_ bWV`^Vef  
 T[W La`` g` cgWVef aghd[Vef VVWVfS` f Wef fUzVef eV\_ T`ST`Vef` \_ S[ecg[ ea` f Vj/baeAe` Vef` [hVsgj  
 WWS` VdVef V[AdVef a` f Vef eS`S[dVef cg[ dVAVef W d[ecgWcg [e`bdW` Wfz7` \_ VefgdS` f UWVW  
 V[AdVef UWVef` \_ badfS` UWVg d[ecgW` agebagha` eAhS`gVd` W [hVsg V ShVef[a` Sg d[ecgW` g` SYWf  
 fdAe ShVefVSG d[ecgWVWVdS[f VV\_ S` VdVg` eS`S[dVAVeVAd` bagd fdShS`^Vd VS` eg` W[h]da`` V\_ Wf  
 d[ecgAZ

\_\_\_\_\_ 8g\_ VgdeVf` a` Žg\_ Vgde \_\_\_\_\_

9 Ya d`Y

>Vef fdShSj VV VdVef V[H[e]ge] Xagd [eWf g` Ta` VjVW\_ b`WVdVef V[H[e]ge] Q: `ea` f USeeA` Vef  
 aghd[Vef W Vgj YdabVef, VefXg\_ VgdeVf` Vef` a` Žg\_ Vgdež: `ea` f La` e[VAdA` WVSf WVg\_ VdLa` \_ WARS` f  
 g` LZa] UadVefba` VS` f` g` La\_ badfV\_ Wf b`gfi f` d[ecgWVf` a` f AgV[AV` S V[AdVef UWS` Sd[S`WVfdV  
 Xg\_ VgdeVf` a` Žg\_ Vgdecg[ aUjgS[Wf VefbaefVef` d[ecgVef: `ea` f fdaghA` cgWVef Xg\_ VgdeUZVdVLS[Wf  
 VefbaefVef b`ge d[ecgAd` \_ S[eARS[Wf` \_ a] ebSkAe cgWVef aghd[Vef` a` Žg\_ Vgde` VefbaefVef e[` [S`dVef  
 ? A` Vef` Vef Vgj YdabVef V aghd[Vef ARS[Wf dA` g` AdAe bagd Vef d[ecgVef cg [e`W LagdS[Wf fi W [hVsg  
 WdA` g` AdSfa` LZW VefXg\_ VgdeARS[f [ AdVgde: ^Vef` ^afVd cgWVef Vgj YdabVef V aghd[Vef Xg\_ Vgde  
 Vf` a` Žg\_ Vgde fARS[Wf ShVefVef Sg d[ecgWbSdUcg [e`ARS[Wf fage Vef Vgj dA` g` AdAe bagd Vef d[ecgVef  
 W LagdVef

EWa` S VAX` [f[a` bdAefAVAbdAVWV\_ W fi g` S\_ Sfvjd Vd[ecgVef SffWVdS[f` f` AfVbSkA` \_ a[ e  
 cg` g` VbVef` ` WShVefVSG d[ecgVb bagd` V\_ A` WV\_ b`a [ d[ecgAZ6 Vef bdAVAdV Uve/Sff[fgVef XSUMSg  
 d[ecgVW[hVWVfVef` A` Wf` Vef` SdLZ AefVWV\_ b`a [ VV Vef eS`S[dVef V[AdVef fež7` gfi f`es` f UWVW  
 [ Xad` Sf[a` VVW egbbaeS` f g` WAd` WVA` AdS WWS` Xa` Uf[a` V gfi f`fA` agebagha` eAhS`gVd` W  
 [hVsg V ShVef[a` Sg d[ecgW` bSof[dWVAVSof eS`S[dS`Wf dVaghd[Vef Sg] USdSURAd[fcgVef eV\_ T`ST`Vef  
 /bSdVjVW\_ b`WVefXg\_ Vgde fVS` eVefefgSf[a` eVWfdShS`^S` S`aYgVef` SleaO` SbdTST[ f`fAVWVMT` VefVd  
 Vef V[AdVef VVef@age` age SffWVa` e` fdaghVd cgVb`ge S V[AdVef UWVWVdVef cgW UWVWV SdU[VW feVg  
 fdShS`^Vef YdS` WVb`ge W [hVsg V ShVef[a` Sg d[ecgWVef AVeAZ

6 VefS` S`keVef e[` [S`dVef` a` f`fAVdAS` f`eAVeVS` eVefLa` fVjVef V[AdVef fežBSdVjVW\_ b`W; d [ 8d[VW  
 VV? SdZS`^ž4`g\_ Wa` f gfi f`fA` Vef Va`` AVef Uba[eAVe egd` Vef T[Wef VV Sha[de Vef` A` SYVef bagd  
 AhS`gVd` S` SfgdWVWVgd` Xa` Uf[a` V gfi f`fA` Vd[VW VV 4`g\_ W` Q>Vgde Va`` AVefLa\_ bdW S[Wf Vef USZ  
 dSURAd[fcgVef eaUfaZAla` a\_ [cgVef VVAVe` aYdSbZ[cgVef ZST[fgWVef VVef` A` SYVef 7` VefLa\_ badfS[Wf  
 AVS`W\_ Wf VVef [ Xad` Sf[a` eegd` Vef dVWVge Vef Vef T[Wef dVWVef cgWVSGS` f`fAVV` S` SfgdWVef Sha[de  
 VV Vef bSefVefLa\_ bVefW TS` cgW/aT` fYSf[a` d` SeegdS Uve h[VWVUf[a` d` Xa` VebdabVef VVef

9 VdVW9` ZEI b[cl` gfi Sgf[ f`eAVef Va`` AVefW eAd[Vef LZda` a` aY[cgVef egd` Vef SeegdS Uve [ \_ aT[ f`AdVef  
 bagd fVefVd V[AdVef Vef Xa` Uf[a` eV gfi f`fA` VV VAVd [ Vd UWVef cg[ UadVefba` VS[Wf W\_ [Vgj Sg  
 Va`` AVef V b[cl` Q4VSG Lagb WUZVdVZ Vgde a` f La` e[VAdA` Vef bd [ Vef V SeegdS UWLa` \_ Wj` W  
 \_ S` [AdW AhS`gVd` S` ha` a` fAV` g` SYWf Wef age b[dVg` V SeegdS UWV W a\_ TdWVWAVU` SdSf[a` e  
 La` \_ Wj` W` V[USf[a` egd` SbdTST[ f`fAV` cg` SdU[VWV eVbdaVg[eV>W\_ SdLZAVW SeegdS UWV Sd

@age` WdVfca` ebSeVS` e Vef VARS` f`egd` S`Xad` VcgVbVjVf bdW VdVg` W`a` Uf[a` V gfi f`fA` AS` \_ a[ d` ha[U` g` VjVW\_ b`W  
 e[ \_ L` SY[ a` eg` W`a` Uf[a` Vj/ba` Wf[VWV` SZE[ `WLaVX[UWf S Wef Vef` \_ A` S/ f` S`Xa` Uf[a` Vef` f` AS[dW` SYWf Sg` W  
 Sff[fgWV` VgfdVWSUMSg d[ecgVef E] S Vef efd[UWV\_ Wf b`ge YdS` V cgWV` ^SYWf Vef ShVefVSG d[ecgW` S` e] b`ge S Vef AVeVd` b`ge  
 S`Xa` Uf[a` Vef La` USHVVW` W [hVsg V ShVef[a` Sg d[ecgWVef AVeAZ E[ S. f` S`ade` ^SYWf Vef` S\_ Sfvjd Vd[ecgVef





bdW [AdVē'afVdVēfīg` bSdf[U]bS` f dSf[a` ` WV` VgfdWVSUMSg d[ecgWVWdSf bAdVē'abf[a` 3` 1`  
^abf[a` 4 -Sgeē] bagd Vēēj VVd [AdVē'afVdVē [^VWdSf LZa[e]d`abf[a` 4] UēdWVWbdaVg[f`g` YS`  
VēbAdēgbAdVgd` ^abf[a` 3z6 Vb`gēl bagd`SbdW [AdVē'Y` VēVg`g` S` SfVgdVWd[ecgWUa` Xd` Ā  
LZa[e]dSf`abf[a` 4 -VVS` e`S Wd [AdVē'Y` Wfagf` W` a` VVWdSf LZa[e]d`abf[a` 4] Uēd[`Vēf  
UWfS` cg WVVagd [f`g` YS` b`gēĀVēĀcgW`abf[a` 3z

>VēSgfVgdea` f`\_ a` fdĀcgW`\_ Ā` WShVUWēW`Vgij` Sgeē[TSe`WVS` \_ Sj` L`\_ g` ĀfSf[VW` fiWh[da` ,

- VēbSdf[U]bS` feĀfS[Wf`ShVēVēSg d[ecgW`
- ĀfS[Wf`S`\_ SfVgdVWd[ecgW`
- Vē Vd [Vē`\_ ĀfS[Wf` VgfdVēXSUMSg d[ecgW`

5 VU[ dV`XadW[VĀVcgWS`\_ Sad[fĀ`VēbVēa` ` VēVēf`ShVēVēSg d[ecgVē@ĀS`\_ a[` d` W` a`\_ TdVgij`  
SebVUēēa` f`1` bdWVdWV` Ua`\_ bfWVbSdVWV` b`VēVēZUMcgWV [hVēg`V`ShVēVēa` Sg d[ecgWVēf` W`\_ Ā` W`  
bagd VēYdēVēag VēbVēfVēēa`\_ VēV`SdWf`1`>VēbSdf[U]bS` feVUa`\_ badWfZ[ēV[XAdV`\_ W`f`  
ē[ VēcgVēf[a` ēēa` f`ēVg`WV` Wf`ZkbaZĀf[cgVēag`ē[ WVē`\_ b`[cgWf`W`SdWf`dĀW1

\_\_\_\_ 8S[T`VēYS[` e`vs`YdēYS[` e`-YS[` e`dĀVē`vs`YS[` e`ZkbaZĀf[cgVē` \_\_\_\_\_

9 Ya d'Y

>VēSgfVgdea` f`VWVgĀ` VgdeVj/bAd[VUWēShVUWēhS`Vgde b`gēĀVēĀVēW` egTēf`fgS` f` V` 1`  
Vf` t` W` abf[a` 3` V` t` V` W` abf[a` 4z>adecgWUWēW`Vgij` ĀVēĀēĀfS[Wf`ZkbaZĀf[cgVē` W`  
` [hVēg`V`ShVēVēa` Sg d[ecgWĀfSf`ēV` T`ST`W` UWg[ TSeĀēgd`Vē`W`Vgij` dĀVēTSez5VēWVS` fi`adecgWVē  
W`Vgij` ĀfS[Wf`ĀVēĀēVēdĀVē` VēSgfVgdea` f`aTēVēĀg` WēdVUa[ēēS` UWS` e`W` [hVēg`V`ShVēVēa` Sg  
d[ecgVēG` f[VēVēbSdf[U]bS` fe` ĀfS[Wf`bSebĀfē1` bdWVdWVēd[ecgVēVg`fagf` , [ēa` f`LZa[e]`abf[a` 4`  
ēVg`WV` Wf`VS` e`S Wd [AdVēcgVēf[a` z`

G` Wj/b`[USf[a` baēēT`WbagdUWUa`\_ badfV` Wf` bagdS[f`ĀfdVcgWadecgWVēYS[` ebaWf[Wēēa` f`  
ĀVēĀē` ageWVW`a` eb`gēShVēVēSg d[ecgVē>S V[XAdV`UWVfdVg` YS[` UWfS[` V Sg`\_ a[` e`  
Vf`g` YS[` bafWf[WVWēVg`WV` Wf` XS[f`cgW`abf[a` 4` Vēf`g` Wābf[a` d[ecgĀWVf`cgW`a` ` WS`  
LZa[e]f`bSe`ĀYdV` Wfz>adecgWVēW`Vgij` ēa` f`ZkbaZĀf[cgVē` VēbSdf[U]bS` fea` f`fWVS` UW` ĀfdV`  
b`gēUagdS`Vgij` Vēf`kb[cgW` Wf` eageZēf`\_ Wf`gēcg`aO`[ē`[da` f` bagdĀh[Vēd`Wd[ecgVēg` Wē[ecgW`  
Vē`W`Vgij` eVēa` f` dĀVēz`

? S`YdĀ` VēdĀēg`fSfedV` SbcgST` Vē`VēVj/bAd[VUWēĀUa` a`\_ [cgVē`\_ b`[cgS` f`WēdĀUa`\_ bW`ēVē`\_ aZ`  
` ĀfS[dVē` ageSha` eTVēa[` fVS` eW` a`\_ TdVgēVēēf`fgSf[a` d`V`g` W`\_ S` [AdVē[W` b`gēē`\_ b`W`b`gē`  
V[dVWVW`\_ a[` ēa` ĀdVgēW`SUĀVēd` ^[` Xad` Sf[a` egd`^Sff[fgVWVWVZSLg` XSUMSg d[ecgVē; ^Vj[ēfW`  
W` a`\_ TdVgij` ēa` VSWēV[XAdV`feV[ēba` [T`VēVf`g[`fēĀēbSd` VēLZVdVgVgde@ĀS`\_ a[` d` [^dVēW`  
` ĀUWēS[dVWVhS[VdVcgWVēdĀba` eVē1` UēcgVēf[a` S`dVē` a` ZēĀ`\_ g` ĀēVēV`ZkbaZĀf[cgVēēa` f`  
WV[VĀVē[` V[USfVgde`WUa`\_ badfV` Wf`fedĀVēVS` e`Wēēf`fgSf[a` e`dĀVēVēz`

6aZ`\_ W` VēS`z`a` f` dĀS`[ēĀg` WĀfgWVTSēĀVēgd` MbS` WēaUjāZĀUa` a`\_ [cgWS`W`\_ S` V`EA`7Bfi`cg[  
Ua` f[Wf`g` YdS` V` a`\_ TdWVW`a` ` ĀVē`\_ VēgdS` f`^Sff[fgVWVSUMSg d[ecgWVS` eV[XAdV`feUa` fVj/Vē`  
^Ā` ĀdS`†`Ua` Vg[fWdāgf[ĀdV`SXS[dVē`X` S` U[AdVē` ebadfē Vē` a[e]dē` eS` fĀ` VēUēd[ĀdV`VēZz`>WbS` W`  
Ua` f[Wf`ĀYS`W` Wf`V`SgfVē[` Xad` Sf[a` egf[Vē`fVēVēcgW`>YV`WēVjV`/S`Xadfg` W`VēdVW`gd` W`  
fdShS[†`ĀVgUSf[a` †`ĀVgUSf[a` WēbSdV`fē` W` a`\_ TdWV` ^>YVWēW`XS` fē` ĀfSf`U[h[†`S`dMf`Y[a` †` W`  
ba[Vēl`S`fS[`^W`ĀfSf`WēS` fĀ` VēSgfVēVēaZ`\_ W` VēS`z` z>VēSgfVgdea` f`hAd[XĀē`g` VcgVēf[a`  
fagfVē`\_ b`WbaghS[f`VĀU[b`dVWUa`\_ badfV` Wf` dĀW` adē`V`g` Wj/bAd[VUWShVU`g` W`afVd[V`g`  
bVg`ēV` T`ST`W` UW`WbĀS`[ēĀWbSd` a` f` Vē`>Sgckz>Vē`dĀba` eVē1` S` afVd[VWj/bAd`\_ WfS`WāO` Vē`  
bSdf[U]bS` febaghS[Wf`YSY` Vē`gēcg`1` fia` f`dĀhĀĀcgW,

- Sgij` S`W`fagde`WV` , WVS`babg`Sf[a` ĀfS[f`ShVēVēSg d[ecgW`
- ĀfS[f` VgfdV`
- S`\_ SfVgdVWd[ecgWz`

@a` ēVg`WV` Wf` Vgde`dĀēg`fSfe`Ua` UadV[S[Wf`ShVU`Vgij` VV` a`f` Vē`>Sgck` Vē`ShVU`V`SgfVē`Āf`g`Wē`  
[` badfS` fVē`ēgd` ^Sff[fgVWVSUMSg d[ecgW`\_ S[e` Vē`SgfVgde`a` f` Sgeē[`fdāghĀ`cgW`S`dĀba` eVē` S`  
cgVēf[a` VV`Sff[fgVWVĀ` ĀdS`WVSUMSg d[ecgWj` 5a`\_ Wf`dĀSf`ēdMZhage`XSUMSg d[ecgWV` YĀ` ĀdS`1`  
/ēgdg` WĀLZ`W`VWV` 1` fiĀfS[f`g` [` V[USfVgd`X`ST`WVWUa`\_ badfV` Wf`d[ecgĀVS` e`^MUSE`V`g` WafVd[V`

G` b`Vf`f`bagdUWfS`WēVēVgWdVĀfSf` VēbSdf[U]bS` feVā` f` Vē`dĀba` eVēĀfS[Wf` [` Ua`\_ bSf[T` Vē`ShVU` Vē`fcb[eVĀX` [f[a` e`  
VW`Sff[fgVWVSUMSg d[ecgVēz`



1 W Vg d'Vež: ^Vef [ f'AdVeS f VVdVdVd S VÄU] S[ea` We d'Äeg fSfe' S'cgVef[a` dVShW  
^Sff[fgVWÄ` ÄdS'WVWÄg d[ecgVg dVdVd VVeVa` `ÄVeV[eba` [T'VeLa` Uv S' fUVfS] VVeLSfÄYad[Vež  
7` dÄY'WÄ` ÄdS'W'VeXV\_ Ve'ea' f b'ge ShVVeV Sg d[ecgVcgWVeZa\_ \_ Ve- ^ShVe[ea` Sg d[ecgW  
eSUUfgVShWU` »YV' Sha[d'VVe bSdVfeT[W'ZÄVgcgÄeXs]f cgWUZSug` Vef b'geaghVf' Sbd[eVWV  
d[ecgW-V' Vb'ge egbdV S' fl UVef cgWVe bVea` `Ve VVWdS' VVfS[ ^Ma` f VVVS UW ÄfdV\_ a[ e  
ShVVeV Sg d[ecgV

ž ž **Ei fMb YgH] XYg{ UbcA U]YgE3**

FagfVe Ue ÄfgVVe` age bVd VVWf VVLa\_ bdVdVdLa\_ \_ WfUZSug` dÄSY[fXSUW VVe[fgSf[a` e  
d[ecgÄVe- bSdVWV\_ bW' age bagd[a` e SffWVdVWVXV\_ \_ Ve cg WVe ea[Wf b'ge bdgVW VVe VMS' f  
VVe VÄU[efa` e d[ecgÄVež-gecg S'adl S'fZÄd[VÄLa` a\_ [cgVcgW age Sha` e VÄUd[VegbbaeVcgWVVe  
Sff[fgVVeXSUWSg d[ecgVea` fZÄfÄdÄYÄ` VÄ\_ Sje eS' VdV[eÄVVeBSdLa` eÄcgWfi` ageSha` e egbbaeÄ  
cgWUZSug` Vef ea[f | fag'agde' ShVVeV Sg d[ecgW ea[f | fag'agde' WU]` 1 bdVdVdVd d[ecgV  
[ VÄbVVS\_ \_ WfVg fV\_ beag VWSefgSf[a` + V' afdV\_ aVÄWZÄd[cgW]` U'gf Ue ÄÄ\_ Wfež

>SfZÄd[VWV'gf[ f'Ä VebÄdÄV S ÄfÄ` SdVW\_ Wf gf[ f'eÄWS' e fagfVe VVe TdS' UZVe VVe d[VWUe ÄLaž  
` a\_ [cgVVe V' VVe ÄLa` a\_ [efVe a` f ÄfÄ VVWVhVfe VÄXV eVgde VVeS hS[V[fÄž? SYdÄ UMSI g' YdS V  
` a\_ TdVW Sd[VUeV ÄLa` a\_ [WV/bÄd[ \_ WfS'WV La\_ badVW\_ WfS'WTSeÄebSdVWV\_ b'Vegd WfShS[ ^  
VVe bekUZa` äYgVVe =SZ` W\_ S' S' V FhVVe] k[ a` f dÄHÄÄcgWWS' eVW a\_ TdVg] Ue d'Ve bÄV[Uf[a` eVW  
'SfZÄd[VWV'gf[ f'Ä VebÄdÄVea` f ekeÄ\_ Sf[cgVW\_ Wf h[ a` ÄVe MSZ` W\_ S' V FhVVe] k` + + Q

3[ e] VS' e WUZSb[fdVeg[hS' fi` ageS' Skea` eg' WeÄd[VWVdÄeg fSfeW\_ b[d[cgVVe VV/bÄd[ \_ WfSg]  
cg[eÄ'a[ V' Wf VVe bÄV[Uf[a` eVWS' fZÄd[VWV'gf[ f'Ä VebÄdÄV @age` age XaLS[ea` eegd VVe [dÄYgž  
'Sd'ÄeÄeg fS' fVW\_ af[hSf[a` ebekUZa` äY[cgVVe[ VÄbVVS' fVeVg La` fVJ/fVUWVŽ' ŽV[dVcg[ ea` f  
[ VÄbVVS' fVeVg' USVdVebÄU]XcgVfVcg[ bSdLa` eÄcgWfi' ea` f Sbb[UST VVeVS' eVW a\_ TdVgeV  
U[dLa` eS' UeV[XÄdVfVVe @age SbbVä` eUe [dÄYg/Sd[fÄeVVe | S a\_ S'Ve` ž

\_\_\_\_\_ 3` a\_ S'W

8Ä b]jcb

7` e[VWUeÄLa` a\_ [cgVg' V S a\_ S'VWf'g' La\_ badVW\_ Wf cg[ ` Vef bSeLa` Xäd\_ Vg\_ aVÄWZÄd[cgW  
USe[cgV

>ÄfgVWVUeS' a\_ S'Ve bSdSbbad' 1 S'fZÄd[VWV'gf[ f'Ä VebÄdÄV S La` Vg[f' 1 ^SbbSd[f'a` Vg` W  
fZÄd[VMS'fVd' Sf[hVLa` ` gWeage W a\_ VVWZÄd[VWVVe bVebVUf[hVd' cg[ eVdS' bÄeW fÄWWS' e W  
UZSb[fdV ž@ÄS` \_ a[ e] fagfVe VVeS' a\_ S'Ve` Wea` f bSeegX'eS\_ \_ Wf dÄbS' VgVVeVS' e S'babg'Sž  
f[a` bagdÄfdV]` U'geVVeVS' eUVfW' aghVWfZÄd[VWÄ` ÄdS'W' bSdLa` eÄcgWfi' Sg UZSb[fdV i` age  
bÄeWfa` eV SgfdVVe VÄh[Sf[a` eVg La\_ badVW\_ Wf dSf[a` ` Wcg[ ` a` f bSeW UadVÄfÄ\_ aVÄ[eÄV  
\_ S[ecg[ a' f g` Xäd[ \_ bSuf' egd' Sbd[eVWVWÄU[efa` W efgSf[a` V [ UVf[fgVW







# 8]j Yf[ YbWgYbhfY `Y a cXÀY fU]cbbY Yh`UfÁU]hÁ

6 Vē dĀeg fSfe W b[dcgVē egYĀdWf cg W YĀ ĀdS^Vē YWeea` f ShVēVē Sg d[ecgVĀG` WĀ [Y\_ W] fĀZ dVēS fVbSobScSĀ UbbWVS fcgS Vg` W\_ Ā\_ WbVēea` ` WbdWVg` WSeegdS UMcg[ LaŌFWShS` fSYW cgWVd[ecgVcG WVWlaghdmLa\_ badfW\_ Wf ShVēVē Sg d[ecgVĀG` SLZAFWg` T[ ^Vf WwafVd[VcG[ LaŌFW VShS` fSYWcgWWTĀ` ĀX[UWVēbĀdĀLa\_ badfW\_ Wf S\_ S[VgdVWd[ecgVĀE[ ` age egbbaea` ecgW`SfZ f[fgVWVg` SYWf ĀLa` a\_ [cgWVēf bSdVj/W\_ b`VWVfag`agde Āh[fVd Vē d[ecgVē [ ^ WVhds[f S`ade `S\_ S[e`agVd`1 `S`afVd[VWf`fagf SgfdWLa\_ badfW\_ Wf bVgjf ĀfdWbVdAg La\_ \_ WdcSf[a` ` Vē

6 S` e`WUZSb[fdMbdĀĀWVf` ageSha` ehg `Vd` ^WV`ShVē[a` Sg d[ecgWVS` e`Sbd[eVWVWĀU]eja` W e[fgSf[a` V[ Uvd[fgVĀ>Sb`gbScf Wē[ V[h[VgedVZ[Y` Wf`1 Seeg\_ Vd Wē d[ecgVē VfbĀĀdWf Vēabf[a` eēŌVēcgS` V`WĀeg`fSf` Vēf bSefafS`W\_ Wf Uvd[S]` ž

6 S` e`WUZSb[fdW` agebdĀeWfa` eVēS` a\_ S[Vē Vē egbbaea` e`1` aghVēg cgWUZScgWā[ecg [^k S` g` d[ecgW`VēbdaTST[ fĀeVēS`fVd` Sf[hVēea` fLa` `gVd UVēZ` ŽV[dMcg [^` k S`Sglj` W[ Uvd[fgVW egd`ShS`VgdVj/SUfWVēbdaTST[ fĀeLa` Uvd` ĀVē ž

## ž @Uj Yfgjcb , `UdYfhY

G` WVēS` a\_ S[Vē Vē b`ge[ fĀdVēS` fVē Vē dĀUgdWfVē Vg La\_ badfW\_ Wf Zg\_ S[` XSUMSg d[ecgW Vēf` ^ShVē[a` `1` ^SbVdVfV7` fVd\_ VēV[ \_ badfS` UMW eU[WUēĀLa` a\_ [cgVē Vē W b[eVWVWĀU]eja` W e[fgSf[a` V[ Uvd[fgVWVWVēf W Wg[ Ā\_ Wbaef[f[a` †`gefWVd[ĀdV`ShVē[a` Sg d[ecgVhgVW eVU]a` ž ž

> ShVē[a` `1` ^SbVdVfWēbdaVg[f VS` eVē e[fgSf[a` eaŌSg\_ a[ eg` WVēbae[T[ fĀeS`fVd` Sf[hVē V]eba` [T Vē bagd`WĀU]VgdWfdSĀ Wg` WV[ \_ [ gf[a` VēS` d[UZVēVēB`gebdĀU]eĀ` Wf WēgbbaeW cgWVē e[fgSf[a` eVS` e`VēcgW`Vēg` [ V[h[Vg bagdS[f egT[dg` WbVdVēa` f bVdAgVē V[XĀdV\_ Wf cgWVē e[fgSf[a` ecg[ \_ Ā` Wf`1` YS[ ž5a\_ \_ W`SZ` W\_ S` V`FhVē] k` ^SX[d\_ S[Wf ^[VĀVēagfWS` f` ^ShVē[a` `1` ^SbVdVfWēf cgW

>WēbVdVfWēbScS[eafWfb`ge\_ WSAŠ` fVēcgWVēYS[ e`Ācg[hS`WfeMSZ` W`S` V`FhVē]k @

7` V`SgfdVēfVd\_ Vē` ^SX[UR[a` eg[fW` g` WbVdVfWēf b`geĀVĀMcgWVb`S[e[d`Ā`1` g` YS[ Vg\_ Ā\_ W ad/dWVWdS` Wgčž

\_\_\_\_\_ BvdUvb[f[a` VēbVdVfVē VēVēYS[ e` \_\_\_\_\_

q Ya d`Y

: \_ SY[ W cgWhageShW`YS` Āg` Wha[fgdW`g` WhS`VgdVW ž? S[ fWS` f[ \_ SY[ W cgWShafgdW Vēf`VĀrcj[fWVS` eg` SU[VWfz4[W cgWVS` e`VēWg[ e[fgSf[a` eYS[ VfbVdVfWēa[Wf Vg\_ Ā\_ WbdVdWVW YdS` Wgčž` WēVf[ \_ Wf` ĀYS[fXVWS`bVdVfWVWShafgdWēVdS`bVdAg[ W fVd\_ VēStea`ge[ WV\_ S[ ĀdVb`ge` SUbtjWcGWS`dĀSU[a` baef[fhW` ea` YS[ ž

5 Wbd[ U]bWbēkLZa`āY[cgWYĀ` ĀdS↑cg[ bagdS[f ĀfdW[Ā`1` afdM[ ef[ UfVWēgch[WXS[f cgWVēSYWfe ShVēVē Sg d[ecgVēWLa\_ badfWfV[XĀdV\_ Wf VS` e`S\_ Ā\_ Wē[fgSf[a` eVā` ^SXSĀ` Va` f`WVēW b[eWfW` ea[f La\_ \_ Wg` WbVdVfWēa[f La\_ \_ Wg` YS[ ` a` ŽdĀS`[eĀž

@agefdSf[a` eVS` e`WUZSb[fdMg[hS` f` ^ShVē[a` `1` ^S\_ T[YgēĀ]cg[ Vēf` WĀe[dVaTfW[dVē[` Xad\_ Sf[a` eegdWēbdaTST[Ž fĀe[ La` `gVēž



BdWa` eg` VjWV b`WTSeÂegdVWdW [eVWVWV\_` S'adSf[a` ež

\_\_\_ DW [eVWV\_` S'adSf[a`

9 Ya d'Y

:\_ SY[ W g` WefgSf[a` eL\_ b`W, hageAfvEegd`Mba[ f V SLZVWd g` F Žez[cf cg[ LaOwV Wf egd`VzgW hagebWwW TĀ AXU[VdVg` WdW [eWwW . ž-`SUS[eW hageVĀLaghW cg W XSf[ [^` k SbSeVWdW [eV 5a\_bSdW UWVWefgSf[a` 1 UWVĀO hagebWwW SLZVWd g` F Žez[cf 1 Wf cgWVWVWd hageV[fcg [^k Sg` W\_ S'adSf[a` Vg bdj W`Sdf[UWVWcg [^LaOwV\_ S[ fWS f ž

;^Wf ZST[fgWVW Wf b`geXSU[ WwWbSedVdVg` WdW [eVcgWV S UWbVdVg` VZSgeeWwWbdj] t\_ Ā\_ W e[ `S V[ XAdW UWVWf `S\_ Ā\_ VZSdLa` eAcgWf VS` e`SbdV [AdWefgSf[a` t hage S UWbVdVW cgS` V \_ Ā\_ WbcbTST`W Wf V SLZVWd Wf Žez[cf S'adecgWWS e`S Wvj [Ā\_ WefgSf[a` t hage` WwWdVW bSž

G` SgfdWjWV b`WwWUWfkbWwWLa\_ badfW Wf S ĀfĀ Xgd [ bSd = SZ` W\_ S t = `WfLZ W F ZS`Wd Msz` W\_ S WfSž Q;`ea` f Ww\_ S VĀ`Sh[eWbSdf[U]bS fe bSdWfdWfWe fĀ`AbZa` [cgWf egd`Vgd XSĀa` WwVgd`Wf Suf[a` ebd[eVVS e`Wf Wvj efgSf[a` eeg[hS fVē,

\_\_\_ >Wes`S[dVdĀWVf`Wbagma[dV SLZSf

9 Ya d'Y

G` WēU[ĀfĀ Sdb[hW bdaVg[dWg` bWfTĀ AXUW7`WwVf efgĀWSg eVj Vg` WLa\_`g` SgfĀcg[ fdShVēWg` W dĀUWē[a` ShVg` [hVg WwLZĪ` SYWĀVĀVf` SfeS e[ XSF[a` ž>SeaU[ĀfĀ VĀU[VWwWdAVgdWwW . Wē eS`S[dVēWfbd\_ Vēž

G` WēU[ĀfĀ Sdb[hW bdaVg[dWg` bWfTĀ AXUW7`WwVf efgĀWSg eVj Vg` WLa\_`g` SgfĀcg[ fdShVēWg` W dĀUWē[a` ShVg` fSgj WwLZĪ` SYWĀVĀVf` fSgj V[ XSF[a` Ww . ž>SeaU[ĀfĀ VĀU[VWwWdAVgdWwW . Wē eS`S[dVēWfbd\_ VēWēVg`Wf . UWfWS` ĀVē

6S` e`Wf Wvj USe[ [^k Sg` WTS[eWwW . Vg bagha[dV SLZSf dĀVē 6S` e`WēVĀ` V USe[ Wē . V SgY\_ WfSf[a` Wē eS`S[dVē [ [f[Sgj` WLa\_ bW eVf bSe`S bVdVdĀWwWdVWVgeVgW Sgj . V[ XSF[a` ž4[W cgWUWē Wvj efgSf[a` eea[Vf Ācg[hS`WfVē W fVd\_ Wē dĀVē`S XSĀa` Va` f Wwē ea` f bĀeVfĀVē ad[WfWS\_ S [ĀdWā` f Wē [ fVh[W Āe`gWVf`Sff[fgWwWWS eāU[ĀfĀ . Wē bSdf[U]bS fea` f bVdAg`SbdV [AdWefgSf[a` La\_`W [ `gefW ag | fdĀe[ `gefW S'adecgWēVg`Wf . a` V[ f`S\_ Ā\_ WUZaeWwW`S Wvj [Ā\_ WefgSf[a` žG` WbVdVWēALZWS e`MbdV [Vd USe/g` W V[ [ gf[a` WēS`S[dVēWf La\_ bSdĀW`g` YS[ bVdAg`VS e`WēVĀ` V/g` W SgY\_ WfSf[a` WēS`S[dVē \_ Ā\_ Wē WēS`S[dVēWVf`Wbagma[dV SLZSf a` fV[ [ gĀž

6WfWēLa\_ badfW WfeēVdVdVchghWfVS eWw a\_ TdVg SgfdVēVa\_ S[ Wēž = SZ` W\_ S Wf FhVē] k eVēa` f bWUZĀe egd`S cgWf[a` W adYS [eS` f g` Wj/bĀd[VUWShW bSdf[U]bS fe Wf hVē] k Wf = SZ` W\_ S --SZ` W\_ S Wf FhVē] k Q-`S\_ a[[fĀ V WfdWvj /@/ fVgfbĀeVfĀVē WēfgSf[a` cg[ [ b[cgSf[g` WcgWf[a` WēS` fĀ-`SgfdV\_ a[[fĀ/@/ fVgSf[XSUW`g` WēfgSf[a` eV T`ST`W \_ S[e bĀeVfĀW[XAdW\_ Wfž7` ha[U` WĀfS`^,

\_\_\_ ċb[VĀ\_ [WSe[Sf[cgW, bdaT`Ā\_ W#/#` \$fi

9 Ya d'Y

:\_ SY[ W cgWwWbSkeJ eWbĀbSdW g` WĀb[VĀ\_ [WSe[Sf[cgWdSdWcg[ bagdbSf fgVd bVēa` `Vē 6 Vgij bdaYdS\_` WēS`Vd Sf]ēa` f ĀfĀ bdaēāē bagdLa\_ TSffdWS\_`S`SV[VēEgbbaeW cgWwVēVf\_ Sf[a` eU[Wf fZ XcgVēbdĀU[eVēWēLa` eAcgWUWēWē bdaYdS\_` Wēea` f Wēeg[hS fVē,

E[ `MbdYdS\_` W3 Wf SVabfĀ bVēa` `Vē eVēa` f eSghĀVē-  
E[ `MbdYdS\_` W4 Wf SVabfĀ [^k S ! WUZS` UAcgWwē bVēa` `Vē ea[Wf eSghĀVē W ! Ww LZS` UAcgWbVēa` `W Wēa[f eSghĀž

CgWbdaYdS\_` WUZa[e[d[Wž hage1

5WfWwWdV[bf[a` \_ Wf W hS`Vgd`^aUgdbWUWg` ĀhĀ` W\_ Wf` ĀYSf[X/ bVēa` `Vē bVgjhWf VĀUWVfž 3`adē Wē [ V[h[Vge bĀVdWf`S`Vd Sf[hWcg[ eV T`WWS b`ge abf [ eWVf cg[ bdaēāēV`S`YgĀd[eā` UWfS[ WwW bVēa` `Vē b`grf f cgW`S`Vd Sf[hWcg[ eV T`Wb`ged[ecgĀVbg[ecgWS bcbTST[ fĀf WēSghVd fagf`W\_ a` WwVf Ww! t\_ S[ecg [^k S LZS` UWē egd`cgWfagf`W\_ a` Ww \_ VgdVž3[ e] . Wē bSdf[U]bS fe bĀVdWf`MbdYdS\_` W3 S'adecgWēVg`Wf . LZa[eVēWf`MbdYdS\_` W4 ž5a\_` WsfWVg[ `S\_ S'ad fĀ Wē [ V[h[Vgea` f g` La\_ badfW Wf ShVēVW Sg d[ecgW T[W cgWwW a\_ TdWbĀdĀ Ww[Vē eSghĀVē ea[f [Ww f[cgWbagd`Wē Wvj bdaYdS\_` Wēž





=SZ` W\_ S` V FhVde] k baeWf` S'cgVf[a` eg[hS` fVSGj bSd[U]bS` fe dVfS` fe,

\_\_\_\_ c b[VÄ\_ [VSe]Sf[cgW, bdaT`Ä\_ W\$/@/#` ' fi

9 Ya d`Y

```

;_ SY[ W cgWmBskE k eWbÄbSdW g` WÄb[VÄ_ [VSe]Sf[cgWdSdW/cg[ bagdS]f fgVd bVdeä` ` Vëz6 Vtj
bdaYcS_ _ VëS`fVd` Sf[Xe`a` f`ÄfÄbdabaeÄebagdLb_ TSffdWS_ S`SV[VëEgbbaeW cgWVëVf[ _ Sf[a` e d[U]Wf[Z
X]cgVëbdÄU[eVëVëLä` eÄcgWUvëVëbdaYcS_ _ Vëea` f` Vëeg[hS` fVë,

E[ `WbdaYcS_ _ W5 Vëf SvabfÄ` bVdeä` ` Vë` agdda` f-
E[ `WbdaYcS_ _ W6 Vëf SvabfÄ [ `k S !` VMLZS UWcgVbVdeä` ` W W_ VtjdWVf !` VMLZS UWcgW
bVdeä` ` Vë` VtjdWfz

CgWbdaYcS_ _ WJZa[e]d[WZhage1

```

>WbdaYcS\_ \_ W5 Vëf` W\_ Ä\_ WcgWmB W fVd\_ VëVWh[VëeSghÄVëag VW a\_ TdVëVWh[Uf\_ Vë V` W`  
bdaYcS\_ \_ W6 Vëf [VWf[cgWsg bdaYcS\_ \_ W4 W fVd\_ VëVWbdaTST[ [fÄëz7` X]f[ VëcgSfdWbdaZ  
YcS\_ \_ Vëea` f` ÄfSgj W fVd\_ VëVW a\_ TdVëVbÄdÄVWh[VëeSghÄVëz@ÄS` \_ a[ d` VëbSd[U]bS` fe  
Lä` Xb` fÄe` UWWtj [Ä\_ WbdaT`Ä\_ Wä` f` dÄSY[ V[XÄdW\_ Wf, eVtj`e` . a` f LZa[e]` WbdaYcS\_ \_ W5  
Vf` . a` f LZa[e]` WbdaYcS\_ \_ W6 z5` S[dV\_ Wf UW] h[a` VWSfZÄad[W]W]gf[ [fÄ VëbÄdÄVcg[ bdÄV[f  
cg`g` SWWf ShVëVëSg d[ecgWJZa[e]dS]f` VëbdaYcS\_ \_ W3 W`5+ Vtj`g` S\_ SfVtjdWd[ecgWJZa[e]dS]f` Vë  
bdaYcS\_ \_ W4 W`6 z7` b[ U]bW`VëbdÄdWUvëWfdVëS`fVd` Sf[hVë` W]Vh[S]Wf bSeÄfdWëV eT` Vë  
Sg`Lä` fVj/fVWf V]h[S]Wf` WÄbWVdVcgWVëV[XÄdWUvëbVd[ WfVëWfdVëS`fVd` Sf[hVë/Wä` Vfi  
Vf` a` bSeVWS\_ S` [ÄdWä` f` WVëea` f` bÄdÄVfÄVë/S`Xad\_ Vëz5 Vëf UWcgW`a` ` a\_ W]b[ U]bW  
V[ hSd[S` UWcg[ eWfdaghVWS` eUWfV]W\_ b`WLa\_ \_ WWS` eVW a\_ TdVtj` SgfdVë` [eW ÄLZVëz

\_\_\_\_ >Wbd[ U]bW [ hSd[S` UW

8Ä b]hcb

```

7` YÄ` Äds` Mbd[ U]bW [ hSd[S` UvëWÄdÄSg X]f cgW/VS` e Wtj` e]fgSf[a` e e[ [S]dVëW fVd_ Vë
V VëbÄdS UW_ SfZÄ_ Sf[cgW]a` Lä` eVÄdVcgW afdWLa` badfW Wf` Wwa[f bSe LZS` Yvü` _ Ä_ Wë] bSd
V]W_ bVë` VëLä` fVj/fVëea` f` VÄU]fV[XÄdW_ Wf/Y]S` e he bVdVfZÄ` bSdW]W]h[a` Sf[a` f` VÄLZVW W]
^] hSd[S` UWadcg W abbae]f[a` ` S`fZÄad[Wä` | hSd[W! | LZS` YW` afdWJZa] z

```

5VfW\_ kefÄdVjW[XÄdWUWf` dÄbS` VgWf` eWdVdaghVWS` eVW a\_ TdVtj` Lä` fVj/fVëz5a\_ \_ W  
=SZ` W\_ S` V FhVde] k` a` f aTeVhÄ

```

>ÄLZVW]h[ hSd[S` UWf` S`X]eS` LÄVf`SdW_ Wf`dÄbS` VgZ` VëfSge[ LbgdS` fLZW` VëbSd[U]bS` feÄVcgÄe
cgVJZW` Vëb`ge` SÈeVf` W]bSd[S]f` bSe` Ä_ Wcgs` V` W_ Ä_ VëbSd[U]bS` fe dÄbä` W]fSgj` Wtj` cgVf[a` e
W cgVëgVë` [ g]fVëFk]b[cgV_ Wf] VëbSd[U]bS` feLä` Xb` fÄe` Vtj`e` dÄbä` eVäLä` X]fVW]Wëa` f` bVb`V]Wëz
? Ä_ W]bÄe dW]fVg]W]bdaT`Ä_ Wf [e bÄdÄVf` fag`yag`e dÄVf` ShVëVëSg d[ecgW]ShVëVëa` SXX]LZS` f` Vë
h[VëeSghÄVë` - [e dÄLZVW]Wf` Vd[ecgW]S` e` ShVëVëa` hS`ad[eS` f` Vë` h[VëbVd]gVë` - Wf [e eegZS]fVf` aTÄ` d`
^] hSd[S` UW]Vä` ` W]Wë dÄbä` eVj/SU]VëS` e` VëWtj` hVë]a` eZ

```

Bsd` S`eg[fW` ageS`a` eha[dg` V]W\_ b`Wcg[ ` WfagLZVbSe` ` S`h[VZg\_ S` W]U]d bSdVd]W]fSgj  
W\_ adS`fÄb`bVj`f` Sha[dWëLä` eÄcgWUvëÄfZ[cgVëVf` VëbSd[U]bS` fe bagdS]Wf` ÄfdWÄf[U]Wf`  
bdWVdW]WëVÄU]e]a` eLä` Uvü` S` f` S\_ adf` Uvü]S` W] SgfdVëÄfdVëZg\_ S` eZ

\_\_\_\_ 6ÄU]e]a` ee[ g`fS` ÄVë/@/#` " fi

9 Ya d`Y

```

;_ SY[ W cgWhage X]fVë XSUWSgj` Wtj` VÄU]e]a` e e[ g`fS` ÄVë eg[hS` fVëz6 StadV V]S_ [ W` Vë Wtj
VÄU]e]a` e V]Weg[fW] V[cgW` hafdWb]f[a` bÄdÄdÄVz

6ÄU]e]a` /fi, LZa[e]dWfdW,
A bf[a` 3` G` Y]S` Uvü]S` W]W
A bf[a` 4` . VMLZS UWWW]SY` Vd` Vf` . VMLZS UWWW Wd]W YSY` Vëz

6ÄU]e]a` /[[fi, LZa[e]dWfdW,
A bf[a` 5` G` VbVd]WUvü]S` W]W]
A bf[a` 6` . VMLZS UWWW]bVd]dW` Vf` . VMLZS UWWW Wd]W bVd]dVz

```

Bagd` S`VÄU]e]a` /[[fi` S` S`ad[fÄ` . fVë[ V]h[Vgea` f LZa[e]` ^abf[a` 3` Wf` . a` f LZa[e]` ^abf[a`  
4] Lä\_ \_ WbdÄng bSd` S`fZÄad[W] ShVë]e]a` Sg d[ecgVz@ÄS` \_ a[ d` bagd` S`VÄU]e]a` /[[fi` . Vëz





Λfi;` hve[dvS` eWēat[YSf[a` ežEgd`S` `ÄWUWVēZU` Xagd [da` fg` dWVW` WfcgSeZUWfS` WW  
. ž  
Λfi;` hve[dvS` eWēat[YSf[a` e\_g` [U]bSVēZēgd`S` `ÄWUWVēXagd [da` fg` dWVW` WfVW`  
`WV[\_ bī fež

\_\_\_\_\_ HafdWd[LZVWdS` Vža: UW, bdaT`Ä\_ W\$ \_\_\_\_\_

9 Ya d'Y

Hage ĀfVē g` Sh[WWVUfVgd WēbSVē X` S` U[ÄdVē \_ S[e` gēcg` 1` dÄUW` \_ Wfi hage Sh[W bVg V SdWf 1`  
[ hve[dzBg[d hage ShW ZÄdfÄV g` badVWg[`^WWV[cg[VfÄe VVWVfVdVē WWhafdWdS` Vža: UVzG: WbSdf[W  
` a` ž` ÄY[VSfT` WWWUbadVWg[`^WVē [ hve[WVS` e` SēaUÄfÄ` 1` ZSgf d[ecgW4žHage ZÄefW` 1` S[eēVd` W  
badVWg[`^WWVcgWag` 1` WZS` YVdW [ hve[ēS` fVS` eV SgfdVē ffdVē/Vē XS[e WVWagdSfWVW` Vē[\_ bī fe  
ēā` fVÄd[ēa[dVēž

HageShW` WZa]j` WfdW,

Λfi;` hve[dvS` e` SēaUÄfÄ` 1` d[ecgW` aVÄdÄ` 3žEgd`S` `ÄW`/ShSVgdWēSUF[a` eS` † LZS` UWW  
Uba[gdWW` . † LZS` UWWVdVēVd` eST` WV` † LZS` UWWVdÄYdVēVd` WW` . ž  
/TFi? S[` fW[d`d`[ hve[ēeW` WfVS` e` SēaUÄfÄ` 1` ZSgf d[ecgW4žEgd`S` `ÄW`/ShSVgdWēSUF[a` eS`  
† LZS` UWWWagT`Vd` † LZS` UWWVdVēVd` eST` WV` † LZS` UWWVdÄYdVēVd` WW` . ž  
Λfi;` hve[dvS` eWēat[YSf[a` ežEgd`S` `ÄWUWVēXagd [da` fg` dWVW` WfcgSeZUWfS` WW` . ž  
Λfi;` hve[dvS` eWēat[YSf[a` e\_g` [U]bSVēZēgd`S` `ÄWUWVēXagd [da` fg` dWVW` WfVW`  
`WV[\_ bī fež

3hW` WbdaT`Ä\_ W† WēcgSfdW[ hve[ēeW` Wfeēā` f` aghVsgj` ,` WYdS` Vža: UW hage S` S[eēÄ` WW  
^SdWf cgWhage baghW [ hve[d` †TdV` Wf bSd\_ [ WēcgSfdWVd` Sf[hVēz`@age SobVWVdā` e` S  
efgSf[a` Vg bdaT`Ä\_ W` S`Uā` UWbf[a` ` VgfdV3hW` WbdaT`Ä\_ W† WZa]j` /TfVēf` WēfSfg` cgaI` UWēf  
WZa]j` cg[ ShSf` ÄfÄ` WUWfGÄ` bSd` hafdWdS` Vža: UWSg` \_ a\_ Wf aÖ`^ hve[ēeW` Wf SÄfÄ` Xsfz6S` e  
WēVWg] UēS` WēbSdf[U]bS` feēā` f` †TdVē WZa]j[e]dbSd\_ [ WēcgSfdWbfb[a` eWV` YdSfg[fV` WffL` S[e  
ShW` WbdaT`Ä\_ W†` a\_ TdVg] ēā` f` UWg] cg[\_ S[` f[W` Wf` S`fVd` Sf[hWTFi` UVēž` ŽV[dW` SefgSf[a`  
SUFgWVW` WēfSfg` cgaž5VU] dVēad` cgS` V` ageUā` bSdā` e` WbagdWVfS` WWbSdf[U]bS` fecg[a` f`  
LZa]e[` ^abf[a` /TfV` S` Uā` UWbf[a` ` VgfdVWg` bdaT`Ä\_ W/` . fSg` bagdWVfS` WWbSdf[U]bS` fe  
cg[a` f` \_ S[` fWg` SefgSf[a` 1` ZSgf d[ecgWWS` e` S`Uā` UWbf[a` eSfg` cga/` . ž

5VfVWV/bÄd[W` UMS` ÄfÄ` dVdVg[fV` ShW` WēfSfg` cga V[XÄdW` fel` V` SgfdVē S`fVd` Sf[hVēV [ hve[ēeW` Wf  
VfVēLSVdVē S`fVd` Sf[Xē/ha[dV]W` b` WU]ŽVēage` NēS`\_ gVēā` W`L` WU] ZSgēVd` . ž

\_\_\_\_\_ 5SVdMS`fVd` Sf[X` \_\_\_\_\_

9 Ya d'Y

Ž>S5a\_\_ [ēēa` bagd` SÄUgd[fÄ` Dagf[ÄdW@Sf[a` S`Wwa[f` VÄU]WdUā` \_\_ WfS` ^agVdēā` TgVWV` WfdW  
WVg] bdaYdS` \_ WēWVdVZVdVZ` Vēgd` SÄUgd[fÄ` [fS` Ä`jadSf[a` VWS` eÄUgd[fÄ` WēSgfa`\_ aT[` WēbSdWZa]Uē  
fī` W[WUā` X]YgdSf[a` eVg` dÄVēVha[dV` VēWUWUW] fgdVē WēÄUgd[fÄ` VV [fS` Ä`jadSf[a` VWS` eÄUgd[fÄ` Wē  
SgfadagfVē/TScd[ÄdVē WēÄUgd[fÄ` S`b` S` [ēēW` Wf VVē LZSgēÄVē ÄLZS` YVgdeV` SgfadagfVē VV` \_ [eWV` b`SUV  
WV[\_ [fSf[a` eVWh[fVē WēÄVg[fVWā` US[ēÄVēž

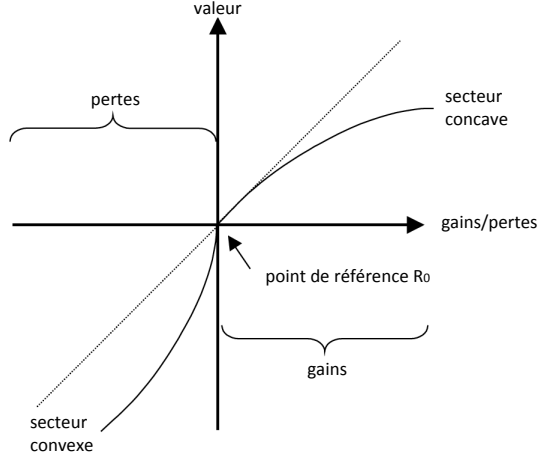
CgSfdW` VēgdVēēā` f` Uā` e[VÄdVē,

Λfi 3` ^agVd` . 1` SÄUgd[fÄ` Sgfa`\_ aT[` WV` . 1` SÄUgd[fÄ` dagf[ÄdW`  
/TFi 3` ^agVd` . 1` SÄUgd[fÄ` Sgfa`\_ aT[` WV` . 1` SÄUgd[fÄ` dagf[ÄdW`  
Λfi 3` ^agVd` . 1` SÄUgd[fÄ` Sgfa`\_ aT[` WV` . 1` SÄUgd[fÄ` dagf[ÄdW`  
Λfi 3` ^agVd` . 1` SÄUgd[fÄ` Sgfa`\_ aT[` WV` . 1` SÄUgd[fÄ` dagf[ÄdW`





6 Wb`gd La\_\_ W age`Sha` ehg VS e`Ve VjWj b`Ve bdaUAWWfet`Ve YWea` f`fWVS UW` f`rdMS`hVdeVe  
Sg d[ecgVWV UMcg[ La` UvV WVeYS[ et`\_ S[eS\_ SfVgdeVWd[ecgVWV UMcg[ La` UvV WVe bVdVez>W  
ba[ f`VWdAdVUWAbScMVeWvj Va` S[ VeVf SFZA` Sf[cgVW Wf`S`Xa` U[fa` Vgf[ f`fA Va[f` f`rdW  
La` LShWS e`McgSd[Vd bae[fXVfLa` hVjWWS e`McgSd[Vd` AYSF[X  
>VWdSbZ[cgW z` bdaVfVg` WLagdTWfkb[cgWbdabaeAWbagd`W\_ aVAVz



8 z` 9dSbZ[cgW a` fS` fg` VLagdTWfkb[cgWbdabaeAWbSd`SfZAdVWVebVdVbVf[hVz`TSaAVegd`Ve f`dShSgj` W  
=S` W`S` ` V`FhVde]kfi

>VWdSbZ[cgWLa` f[Wf fagfVe`Ve USdSfAd[ef[cgVdecg[ SbbScd[eeWf La\_\_ VS` a` S[VeVS` e`SfZAd[V  
WV`gf[ f`fA VebAdAVz`=S` W`S` ` V`FhVde]k egYAdWf cgWVbdUWgecgWUZSuj` gf[ f`eWbagdXS[dW  
VVeUZa]j La` badVWVvj` f`SbVde,

bdV [AdV Wfi a` La` efdg[f` WLa` fVj/fWVg UZa]j -  
bg[ea` bdWV eSVAU[eja` eVa` Vdebd` U[bVe WWTSeVde WWSfZAd[VWVebVdVbVf[hVz`

5 VVfWbdV [AdVfSbWeSbbWVWVUSvdSYWLaY` [f]z>WUSvdSYWVf` f`fSbWaO UZSuj` UZa[e]f` ea`  
ba[ f`VWdAdVUW` bSd[dVgVgW[^eVdVdAdVfVdS` VeS`fVd` Sf[hVdebaee[T`Vz5a\_\_ W age`Sha` e  
hgl` WUSvdSYW` Vef` bSeevj`W` Wf[` XgWUAbSdVWVdS[e]bcbT`A` VebSdVjWV` b`W` ^Sd[LUZVdeW`V  
bVdVdeag` VdeYS[` e`cAVde ag` VefSfg` cgaffi`\_ S[eSgee[ bSd`S` S` [AdV] XU[hW` Va` fg` Vef[fgSf[a`  
Vef` bdaVfAVz`? aV[XVd` VVfSgj` VV` adS[f`fA` W` fSgj` VVegch[VWVdSf` f`rdWg` Veb` b`WcgVef[a`  
VWefk`Vz5VdWVVS` fi` S`bVdUWb[fa`` VWS`bVde` W` aV[XWS`\_ S` [AdVWa` f` MbcbT`A` WVef` USvdA  
Vf`bSdLa` eAcgWf`f` ea` UZa]j z` ST[f`gVWV` Wf` adcbcg` VbVde` ` Vha[f` WLa` fVj/fWV` fVd` VebVW  
bVdVde/fSgj` WV` adS[f`f`f`i` WWS`fWVS` UW` f`rdMS` SfVgdeVWd[ecgVWV UZa[e]f` ^S`fVd` Sf[hVd[ecgAVz`  
5VbWVS` fi` cgS` V` WLa` fVj/fWV` UWg[ WWS[` e`fSgj` VVegch[VWV UZSuj` Vef` fkb[cgW` Wf` ShVdeWSg  
d[ecgVWV UZa[e]f` ^S`fVd` Sf[hVdS`b`geeOdVz

; ^Vj[efWj` USe aO` MbcbUWge VVUSvdSYWbVg f` f`rdVfde` [` XgWf`egd` VdAg` fSf` WWS`VAU[eja` z5` Vef`  
`adcbg[ ^`\_ aV[XWVba[ f`VWdAdVUWz6S` eUWUSd[ ^SgY`\_ W`fWV[` XgWUWVg` La` fVj/fWV` bVdVde` Sha[d  
g` W`dS` WLa` eAcgWUWegd` WVAU[Vg]d5Wg]ZU` bVdVde` VhWV[deaf` ShVdeWSg d[ecgVWVea[f` S`\_ SfVgde  
VWd[ecgVWVeb` ^S`baef[fa` VdeS`fVd` Sf[hVde`dMSf[hVde` Sg`ba[ f`VWdAdVUWz



### ž @Uj Yfgjcb , `UdYfHY . i b Wta dcfHYa Ybh\i a Ujbc i Ubja U 3

G` WcgVef[ a` [ badfS fWbaeAWbSd`VeLZVdLVjgdeVS` eV[XAdWfeVa\_ S[ Ve/du[WUveAla` a\_ [cgVef bklUZa`aY[WS fZdaba`aY[WT[ a`aY[WVZfVef VveSha[deq UWLa\_ badfW\_ Wf e[ dAbS Vg Vef [ ` Aag e[ UVef g` T[SjeVAdhA VW`Wh[da` ` W\_ Wf ag [ XgWUA bSd`Ve` ad\_ Ve eaU[SVeZ>Ve AFGVve egd` VeS` [ Sgj VWSTadSfa[dWbVd\_ VffWf VW\_ WVdVve Vj/bAd[WUveLa` fd` AVe cg[ [ fVdaYWF` Ve fZAdVveAla` a\_ [cgVefV` S`USbSUfFA`VWVed`dVdVg[dVShWUWVe bSd[U]bS` feZg\_ S[ eZ

BSdVjW\_ b`VWS` eg` VAd[W Sd[UW 5ZWI >S] eZ\_ [ SdSkS` S` VES` faea` f fdaghAVve e[ [ ffgVve cgS[ fSf[hveVS` e` WLa\_ badfW\_ Wf Vbdl\_ S`VveNZW` V`S`z` i` ->S] eZ\_ [ SdSkS` S` V`S`z` ->S] eZ\_ [ SdSkS` S` V`S`z` Q

\_\_\_\_ >Vef[ VveUSbgU[ e` \_\_\_\_\_

9 Ya d`Y

>VeLZVdLVjgde`a` f bdeWfA` Vve e[ VveUSbgU[ e`VveLZa] d[ecgAeeW` T`ST`VeSgj` Vj/bAd[WUvecgW` age` Sha` eboAeVfAVeVS` eUWUZSb[fdVZ>Vef[ Vve`a` fSbdc[e` ALZS` YVdVve` Vve` eLa` fdWVve` adU[Sgj` VW` ba\_ \_` Ve` , [ebaghS[Wf bSd[VdV` AYaUv d V`La\_ bdlV[S[Wf` WLa` Uv f V` ShS`Vgd` VW` ^SdWf` La\_ \_` W` cgVcgWUZaeWcg[ baghS[f AfdVUZS` YA`La` fdWWS` agd[fgdVZ6S` e` VgdSd[UWVW` i 5ZWI >S] eZ[ SZ` dSkS` S` V`ES` faeA`Ve`a` f bWUZAEegd` Ve` VV`Ve` Vg` LSVdSYWV` VW`ShVde[ a` Sg` d[ecgWMS] eZ\_ [ SdSkS` S` V`S`z` Q3g` VATgfi LZScgVef` VMS`dVg` Vve` Vve` e` VAbW`eVd`W` ALZS` YWVW` agd[fgdVZBagd`A`ST` [d`W` ba[ f`WVdVAdWUW` Vj/bAd\_ WfSVgdShSf` i` S\_ S[ g` VSee`VfVShWVg` WcgS` f[FA`Va` ` AVWVfcd` LZVveVW` ba\_ \_` Vez>Vbd\_ S`VWVMS[f\_ VfdVg` Vve` VS` e` SgfdV\_ S[ VWVj/bAd\_ WfSVgd` bagd[VV`V`ad` ^See`VfVW` /`abf[ a` eCdvZ`Bagd`VbAeVfVd` VveLZa] d[ecgAe` W` a\_ TdWVfcd` LZVve` egd` ^See`VfVveSUba[eeS[ f ag` VL\_ [ gS[ f` SbdAe`cgWVMS[V\_ Wf ShS[ f` AfA` VV`Vf`gA` , bagd` Vve` bV`Vve` Vj/bAd\_ WfSVgd` W` VMS[ f` cgVcgVve` fcd` LZVve` VV`See`VfVW` Vve` fcd` LZVve` A`S[ Wf` dSagfAVve` bagd`VbAeVfVd` Vve`YS[ eZ

3hVUWve Vj/bAd[WUve 5ZWI >S] eZ\_ [ SdSkS` S` V`ES` faea` f\_ a` fdA`cgW

cgS` V` VveUSbgU[ eea` f`XUW` Vve` bSd[e`d[ecgAe` [e`SXLUZWF`g` YdS` V` a\_ TdWVMT[S]eLScSUAd[ef]cgVveVg` La\_ badfW` WfZg\_ S[ i k La\_ bde`VveLZa] VAbVMS` fVg`ba[ f`WVAd`VUWV`VW`ShVde[ a` °` S`bV`Vve`

;`e`eagf[W` Wf cgWUWU] dV`XadUWS`fZAd[WcgW`ShVde[ a` ` ^S`bV`Vve`

g` Wve` Ufa` [ ` AVWWS` S` [Ad`Wa` f` aeUv`h`Sgj` WLa`VWf` aeVj/bAd[WUve` b`gfi` f`cg`g` La\_ badfW` Wf` Sbg[eag` VdAeg`fSfVZVgde[ef]cgVve` S`Sbb[fcgAe`VNZW` V`S`z` Q

>SbadfAVWUWUWaUg\_ Wf` Vef` bSeVWVagd` [dg` WdAba` eWVARS[ ^AV` ^ScgVef[ a` WveSha[deq UW` La\_ badfW\_ Wf Vef [ ` Aag` S`Ucg[d` age[ h[fa` e` WUWVgd[ fAdVveA` eVdVAdVd` V` SgfdVve` [hdVve` V` Sd[UWve` bSdVjW\_ b`W,

7La` a\_ [U5Za[UWfZVackz3` 7j` bVd[ WfS^3` S`ke[eax3` [ S^4VZSh[adMASWVMS`z` Q`  
3` [ S`e` 5Za[UWfA` hVdG` Uv`fS[ ` A`gfLa\_ Vef` , 8gdZVd` 7j` bVd[ WfS^DVg` feM` SLba` S`V`V`S`z` Q`  
9dVf` 3bV` D[e] Z`S[ [ Y`EfdSfV`Vve[ ` S`6VU[e]a` ?` S[ [ Y`FSe] M`Sg` V`S`z` Q`

BagdLa` U`gdWUWUZSb[fdMS` a` fdA`La\_ \_` Wf` Vve`S` a\_ S[Vve`cg[ ea` f` dAbS` VgVve`VS` e` WLa\_ badf` fW\_ WfZg\_ S[ ` V`S` [ S`f`ibVg`hWf` AfdW\_ aVAd[eAVe`eS` e`f`cab` e`A`a`[Y` Vd`WWS` fZAd[WVW`g`f[ fFA` VebAdAVZ

\_\_\_\_ 5Wcg[ \_` af[hWg` WVAU[e]a` \_\_\_\_\_

Dc JbhVVA

>SVAU[e]a` Vg` [ V[h[Vg` bVg` AfdW\_ af[hAV` a` eVg` W\_ Wf bSd` Vve` W` Vg` Vg` bcaUvege` WveAVUf[ a` cgS` V` VdAeg` fSf` Vef [ Uv`fS[ ` \_` S]e`VW`bVg`f` AYS`W\_ Wf` XadW\_ Wf` V`bca`Xa` VAd\_ Wf` AfdV` XgWUA`VbSd` VLSVdW` S`e[fgSf[ a` V` VefSfg` cgaZ









# 5i hfYgUbca U]YgXY`rũh]h XY ZUW U f]gei Y

@ageVa` `a` eVS eUWVaf [VdUZSb[fdMg` WtdAhWVdUbf[fa` VvcgWcgVdSgfdVdS a\_ S[Vd[ fAZ  
dVdS fVdVg La\_ badfW WfZg\_ S[ cg[ ^Aa[Y WfVg\_ avA`WdSf[a` ` WWWWfZAdqWAla` a\_ [cgW  
USee[cgVZ5VdTS[eLa` Uvd Wf`SbVdUvd[fa` cg`a` f` VdSYWfeWWSbdaTST[frA bSdV]W bWcGS V  
VgdeUSbSUfrAeWVUSUg`ea` f` [frA`VZ6VdTS[eLa\_ badfW WfSg] SbbSdS[eeWfSgeel` adecgWVd  
SYWfeea` f`La` Xba` fAe` VdLZa] Va` f` Vd bdaTST[frAeVdAhA` V\_ Wfeea` f` VAX` [VdWWSAa`  
S\_ T]YgAZ

G` WVdZkbaFzAeVd` Vd`geXadVd`WWSfZAdqWVWg[frA VdAdAWW`WWSfZAdqVd`Vd`bVdVd[hVd  
VdUWVWg USVdWLa\_ b`VdVW` Xad\_ Sf[a` , VdUZSb[fdVd`bdAUAVWfe`a` f`ekefA\_ S[cgW\_ Wf\_ [e  
W Ah[VWUWcgVWS`efagrVd`Vd`efgSf[a` d` agebaefg`a` ecgWVWAVUWgdVd`La` eU]WfVd`bdaTSZ  
T[frAeVdAhA` V\_ Wf`cg[ ^Wh[esYVZfagfVd`Vd`V]bAd[WUWcgW ageSha` ebdAeWfA`Vd`gecg [U  
a` f`egbbaeAVd` Xad\_ Sf[a` ebdAU[eVd`egd`Vd`bdaTST[frAeVdUeag V`ALZVU` S`afVd[Vag`egd`S  
XAcgWUW aU]gdWUW AhA` V\_ Wf`deqgAez

5VdWVS fte] Vd` \_ Vd`V]bAd[WUWVd`cgVd[fa` S[dVd`ea` f`bdAeWfAeSg] bSd[U]bS`feeS`eW Va` Z  
` Vd`Vd`bdaTST[frAeV]b[V]Vd`ag W` W`a` ` S` f`cg` VhSYgWVAVWWSXAcgWUWVd`AhA` V\_ Wf`d  
S` SfgdWg bdaT`A` WZS` YWWWVSAa` dS[VUSVWV`VdLZa] Vg VAVUWgdVdVhWf`AdW[V]XAdVfez

>afVd[W

q Ya d'Y

;\_ SY[ W] bSdV]W bWcgWhageSUZVW g` T[frA WVafVd[VshWg` YS[ baeeT`WWW `g` bd] WV ž  
E[hageeShW cgWS bdaTST[frA WWSY` VdVd`VW ` f`S`ade` \_ a[ eV`AdW]Vd`V\_ Wf`ShVdVdSg d[ecgVd  
hageSUZAVW bdaTST`V\_ Wf`WT[frA`7H/ fZ5VdWVS fte]a` hageV]f`cgWS bdaTST[frA WWSY` Vd`bVd  
hSd[VdWV ` , f`S`ade`^SUZSf`WUWV[frA hageeW` T`VdS` VdVW Wf\_ a[ e[ f`AdVdS` fZ6Vd`ge]e] hage  
` ShW SgUg` V]VAVWVd`bdaTST[frAe`S`ade`hagebagd[W \_ A` WST` Va` ` Vd`^VAVW`k bSd[U]bVd`z

@ageSbbWd` eS\_ T]YgEAV]UWVW` Uvd[fgWVgd`S bdaTST[frA`cg`g` AhA` V\_ Wf`eWbdaVg[eVZ5 Vd`f  
SbdAe`Sff[fgWWSUWg d[ecgW`SbWVf`Vd`ge[ \_ badfS` f`WWSfZAdqWVWVAVU]eja` W bdaeWUWVW  
d[ecgVZ@agebdAeWfa` d`VS`e`S bdaV` [AdVbSd[VWUWUZSb[fdWUWcgWUWVMS\_ T]YgEAV] \_ b[cgW  
bagd`S bdeWVWVAVU]eja` ž

4[W cgWVS\_ T]YgEAV]efWVS`eWV a\_ TdVd] AhA` V\_ Wf`eWVSh[W]` Vd`Vd`Se[cdAS`efWVdVd`gebbaeVd  
cgWV`g` W\_ S` [AdVag`V`g` WSGfdW` age`bagha` e`UadVdVd`Wf`VAVg[dVdS`bdaTST[frA`cgWUW  
AhA` V\_ Wf`eS[Wf`V]Vd`bSd[V]g[V]AdV`Wf`adecg`[eSY[f`V`Ab[eaVd`e]\_ b`Vd`Vg`cgaf[V]W`z5a\_ \_ W  
`age`Sha` eVAV` eag`f`Y` A[ ^Vd`f` \_ badfS` f`VWLa` ` Sg]dVd`bdaTST[frAeVW\_ S` [AdVbAdU[eVag`Sg  
\_ a[ eWVbagha[dXS[dVg` WbdAh[e]a` eOdV7` dAY`WVA` AdS`W` ageegbbae` ecgW`ageea` \_ Vd`  
USbST`Vd`WVAVg[dVdS`bdaTST[frA`V`g` AhA` V\_ Wf`bSdUWcgW`ageea` \_ Vd`W`La` f`SUF`bVd` S`Wf  
V[dVd`ag` [ V[dVd`ShW` afdWVh[da` ` W\_ Wf`z

chA` V\_ Wf`eXS\_ [Vd`e`

q Ya d'Y

@agebagd[fa` d` bSdV]W bWVdVd`Ode`WWS bdaTST[frA`V`g` SU[VWf`WWha[fgdVgd`WUZV\_ [ Vg`fdShS[fr  
WWSUZS`UWWSY` Vd` S`afVd[W`Sf[a` S`WWWVd`bdaTST[frA`V`g` SU[VWf`Va\_ Vd`[cgVag`WUWVW`AdV  
h[V]\_ W`g` ha`^VS`e` afdVd`Sd[V]d`Sgeel`T[W`cgWWS bdaTST[frA`cg`[k`Sf`g` `agdb`gh[V] \_ [ZAdVd  
VS`e`Sh[frA`O` age`Sha` ehAV]g`Vd`geVd`VAVU` [Vd`z

@age` WbdW`a` ebSeW`La\_ bfVd`e`afVd`Vd`bagd`Vd` ghdV`VWT[W]S[eS`UW]SdVS`eUW]Se`^AA` Wf\_ afVd`WWS  
VAVU]eja` S`SUZVWVd`g` T[frA`Vd`Vd`f`AdVd`S`Y` AdAe]f`Ag`g` VSGfdVd`W`Sf`d]e\_ Vd`



? Ā\_ Wē` aebdĀh[e]a` e` Wēa` fbSefafS\_W\_ WfLadMUFVē` age` VēXS[e]a` eShWUla` X]S UWēa[fYdWUW`  
`afdVēSha[dbVUēa` `Wfēa[f bSdUWcgWUWēĀhĀ` W\_ Wfē` agea` fXS\_ [fVēz;` ēēa` fXSU[Vē` 1\_ SY[ Vēd  
Vē` afdW\_S\_ [fScfĀbdah[Wfbd` U]bS\_W\_ WfVWVj/bĀd[WUW, cgWUWēa[fVW\_ S\_ [ĀdW[dMUFVag  
[ V[dMUFV` ageSUbVēa` e`Wē[` Xād\_ Sf[a` eegd` afdWVfagdSYW` afdW\_ [fVg cgW ageaTeVēa` e  
W bVēd\_ S` WUW@afdWgYW\_ WfVē` aeLZa] VĀbWVWf XādVW\_ WfVW afdWVh[da` `W\_ Wf ag WV  
` afdVZ[e]a[dVē

6Āe` ādēcg[ ^\_ S` cgWVē[` Xād\_ Sf[a` eegd` S` XĀcgWUW` g` ĀhĀ` W\_ Wf d[ecgĀ` ^SgdW\_ S\_ [ĀdW  
VĀ[ \_ [ Vēd` S\_ T[YgĒĀW VZadeWVS VĀVgUf[a` VēVWVj/bĀd[WUWbVēa` `WVWVfVWagd [dVē[` Z  
Xād\_ Sf[a` e` S` cgS` fVēz>Vē` YaghVēd` W\_ Wfēd` Vē\_ ĀV[SeVēSgdVē[` e[f]g]f[a` e` Xā` fVWVdS` VeVēadfe  
bagddĀVg[dWV [hVēg V\_S\_ T[YgĒĀag` W\_ S` cgWVbVēa[e]a` La` Uēd` S` fUēdS[` eĀhĀ` W\_ Wfēz

3U[VWfe` gUĀS[dVē

9 Ya d'Y

;\_ SY[ W cgWVēbVēa` `Vēh[hS` fVS` e` Wha[e]` SYW` g` WUWfcdS` W` gUĀS[dVēVg[` ^Wf` La` ` SgdVVS bcaZ  
TST[fĀV` g` S\_U[VWfz?` Ā\_ Wē` WVēēa` f` [` Xād\_ ĀVēegdUWēVēdVēegd` VēbcaTST[fĀē[` ^Vēf` fag` age  
baeē[` Wcg` WVē` SbbāZ` WVWf` bSe` M[dēcgWĀM` V` STadV` bSdUWcg` WVē\_ S` cgWf` WUa` X]S` UWS` e` Vē  
bVēa` `Vēcg[` Xagd` [ēWf` Uē[` Xād\_ Sf[a` e` Vē` ag` Weg[fVbSdUWcg` WVēa` f` g` VbVēUēb[fa` [` UadMUFV  
WēbcaTST[fĀēVj/SUfVē

3[` e] Vēhā` eZ` ageSTadVēd` MbdcaT` Ā\_ WVVS` La` X]S` UWV` bcaVēVfVēa` e` cgWcgVē` Vj/bĀd[WUWē  
cg[ [` fcaVg[e]Wf` WēT[S[e]VS` e` MVS` Uē` ^LadMUF` VēbcaTST[fĀēz` 5Vē` cgVēf[fa` e` [` XgWf` egd  
S` S` [ĀdWā` f` VēSYWfe` Xā` f` g` LZa]` Sbbcbcd[Ā` UēfZ[` Z[VdWUWg[` cg[` hS` VgdVa` `Vēd` ^gf[` fĀ  
VēbĀĀWS` b` gēĀVēĀVē

ž @]bWf]h XY # rj Yfg]cb , `rūb V][i QĀ

>Vēe]fgSf[fa` e` S\_ T[YgĀēegdY[ēeWf` W` ^STaWUW` [` Xād\_ Sf[a` e` UadMUFVē` egd` VēbcaTST[fĀēz` 6S` e  
`Vē\_ aVĀVē` WVS` fZĀad[WWW` g]f[` fĀ` VēbĀĀWV` WVS` fZĀad[VWVē` bVēbVUf[hVēd` Vē` ĀLa` a\_ [ēfVē` Vē  
Vē` bekLZa` āYgVē` egbbaeWf` cgWVWĀU[VVgd` ]` La` ` Sg` ` VēbcaTST[fĀē` egT` WUf[hVē` Vē` cg[` ^bVg]f  
ĀhS` gVēd` MbdcaT` Ā\_ VēSgcgW[` ^XS]f` XSUWV` SY[ēeS` fV` g` W\_ S` [ĀdMcg[` \_ S]` [` [ēWg]f[` fĀ` 1` ShgWVWUWē  
bcaTST[fĀēz` 3[` e]f` Uē\_ aVĀVē` Wf[W` Wf` STēa` g\_ Wf` bSe` La\_ b` fWVVS` baeē[` T[fĀcg[` k` S]f` g` W  
ShVē[fa` 1` ^[` Uēd[fgWVUēfZ[` Z[VdWg` WShVē[fa` 1` ^S\_ T[YgĒĀfifS` fV` g` ba[` fVWhgWVēd[bf]X  
cgW` ad\_ Sf]z

A` d` ^S\_ T[YgĒĀVW[` Xād\_ Sf[a` dMS[fhVēg` d[ecgW[` S` U[Vēag` \_ a` ĀfS[dVēbSdVjW\_ b` VVS` g` VVW  
egd` VēVĀU[e]a` eĀLa` a\_ [cgVēz` 5WU[` Vēf` ĀYS` W\_ Wf` hds[` VS` e` Wēe]fgSf[fa` e` La` Uēd` S` f` bSdVjW\_ b` W  
Vēd[ecgVē` fVUz` a` āY[cgVē` egd` fagf` cgS` V` W` aghWVē` fVUz` a` āY[Vēēa` f` VĀhVēbbĀVē` Vē` cgW` age  
` Sha` e` SgUj` WUa` ` S[ēeS` UēbVēS` T` Vēgd` SgcgWVēa` Vēd` aeUēakS` Uēag` ae[VĀVēz` G` VjW\_ b` W  
U` See[cgWVēf` UWg[` VēS` fW` Vē` WēbĀēVēg` \_ aT[VWV` WVēgdē` baeē[` Vē` VVWē` Ā` SēfVē` egd` S` eS` fĀz  
> [` cg[Āf]gVWbgT[` cgVWV` bSd[VWgW` ^Y` adS` UēVēf` SdVW\_ Wf` dĀbS` VgWVē` S` [XēfĀW` bcbabae  
WVS` V[Xgē]a` VW` aghWVē` fVUz` a` āY[Vē` bagd` VēcgWVē[` ^` k` S` SgUj` Wj/bĀd[WUWbĀĀVWfVēz` 5W  
\_ S` cgWVUa` ` S[ēeS` Uē` bVg]f` WYVW` Vēd` S` bVgdVē` W` YĀ` ĀdS` S` b` gbSd` Vē` bVēa` ` Vē` bcaVēdWf  
La` ` SgdVWē` d[ecgVēz

>SbdW\_ [ĀdVĀf]gVWVUWUa\_ badVW\_ Wfē[` Uagds` fSĀfĀVWVf]gĀVbSd6S` [W7` ^eTVēY` f` cg[` SegbbaeĀ  
cgWVē` SYW` febdĀĀdS[Wf` YagVēd` Vē` āfVēd[Vē` ShWUWē` bcaTST[fĀē` La` ` gVē` b` g]f` f` cgWVW\_ [ēVēd` egd  
Vē` f[dSYVē` ShWUWē` dĀēg` fSfe` S\_ T[YgeM` ^eTVēY` QEa` ZkbaFZĀēMSĀfĀ` hS[VĀVbSdVW` a\_ TdVgēVē  
Vj/bĀd[WUWē` Vē` eVēf` dĀhĀĀVfcdS` eĀdST` M` V` SgdVē` La` fVj/fVēz

6 S [W7` ^eTVēY` Vēf` Sgeē[` La` ` g` bagdSha[dV]XgēĀg` WĀf]gVg` fcdZēVēbĀfVWg` BWfSYa` W` Vē[` BSb[VēVg` BWfSYa` W` f  
La` Uēd` S` f` Sba` f[cgWVagVēd` W\_ WfS` VVē` cfsfēz` [ēbWVS` f` SYgVēdWg` H[Āf@S\_ z>SfWfSf[hW` 7` ^eTVēY` V[` Xād\_ Vēd  
` S` bagSf[fa` fVēS[` e]f` [` XgWUēd` ^ab[` ja` bgT[` cgVēgd` SYgVēdWVfĀfĀ\_ af[hĀVbSdēS` UēakS` UWS` e` S` dĀhĀSf[fa` VWS  
hĀd[fĀ` US[dW\_ Wf` La` Xād\_ W` ea` fcdShS` ^egd` ^S\_ T[YgĒĀfz` ^ĀfS]f` Āh[VWf]` 1` bSd[VdVē` VēVēg` Wfēg` fcdZēVēbĀfVWg` cgWVS  
h[La]dVĀfSf[` S\_UWē[` T` WVē` cgWVW` a\_ TdWVWĀUē` SffV` VgeĀfSf` fTVēg` Lg` b` gēĀVēĀ` cgVēdVēg` z` 7` f` 7` ^eTVēY` dVēg]f  
` M]Yz` f>[hVēZaaV` 3i` SdV[` bagdSha[dV]XgēĀg` S` bSj` Vē` S` hĀd[fĀ` eVēd[ecgVē` Vē` bĀd[` ē` VēVĀV]Ā` eS` h[W` [` eb[dVē` Vē  
SgdVē` 1` eg[hVēēa` VjW\_ b` Vēz



5a` e[VAdW MbdaT`A\_ Weg[hS f ,

>Vegd` Vē

q Ya d'Y

;^k SWVj gd VēWMS f hagd`^gd W Vē^gd W; l LZSLj` WLa` fWS f TagVē>VēTagVēbVghWf ĀfdW ea[f dagVēea[f` a[dVē>gd W La` f[Wf VēTagVēdagVēVē` a[dVē>gd W; La` f[Wf TagVēdagVēVē TagVē` a[dVē

HagebaghW LZa[e]d`g` WVVēVWj gd VēVS` e VēefgSf[a` eeg[hS fVē/3 ag 4fz3bdĀeSha[dLZa[e]g` W gd Wg` WTagVēVēf f[dĀWWW` S [ĀdMS`ĀSfa[dWS` e UWWVU W` S LagVēgd VWS TagVēVēVē [ Vē] hage YS` W ag ž

5Zalj 3žHageWVW LZa[e]d`g` WVVēVWj bS[e,

S Ž` STagVēVēf f[dĀWWW`gd W l hageYS` W e[VēVēVē` dagVēVē e[VēVēVē` a[dVē

S Ž` STagVēVēf f[dĀWWW`gd W; l hageYS` W e[VēVēVē` dagVēVē e[VēVēVē` a[dVē

5Zalj 4žHageWVW LZa[e]d`g` WVVēVWj bS[e,

T Ž` STagVēVēf f[dĀWWW`gd W l hageYS` W e[VēVēVē` a[dVēVē e[VēVēVē` dagVēVē

T Ž` STagVēVēf f[dĀWWW`gd W; l hageYS` W e[VēVēVē` a[dVēVē e[VēVēVē` dagVēVē

>SeVg VV[VĀdW UWWfdW`gd W Vē^gd W; Vēf UMcgW ageeSha` eVg` a\_ TdWWWTagVē` a[dVēVē dagVēVē@ageeSha` ecgW`gd W; La` f[Wf Vj/SUN Wf Vē\_Ā\_ W a\_ TdWWWTagVēdagVēVē` a[dVēVē 3] e[Vē` S bdaTST[ fĀ VVf[dVē]g` W LagVēgd bSf[Uj fĀdVēVē VV` ž3g La` fdS[dW` age` Wea\_\_ VēbSe eĀdeVWS V[e]d[Tgf[a` W bdaTST[ fĀ VVēVWj LagVēgd eVS` e`gd W ž>S b`gbSf VēbSf[U]bS` fe bĀĀdVf bSf[U]bS` hW`^gd W; l \_Ā\_ Vē[ U MbSf Vēf d[ecgĀ eS bdaTST[ fĀ VVēgUĀeVēf La` `gVē7` XS[f ZST[fgWV Wf SgfdVW` VēbSf[U]bS` fe bĀĀdVf S` S V T` T ž5 V V bĀĀdV UWWēf S bVĀVShVē[a` `^S\_ T[YgĒĀ, VēbSf[U]bS` fe Āh[fWf` S` afVē[VēĀ Vē[ fĀĀēēē` f Vē\_Ā\_ Vē \_S[e VēbdaTST[ fĀēēē` f [ La` `gVē ag hSYgVē

>abf[a` eĀdW

Dc]bh WĀ

5VU`\_ a` fdMcgW`abf[a` eĀdW Vēf bSe fĀV Sg [hV Sg V M d[ecgV Sēēē UĀ` ĀhĀ` V W f i \_S[e b`g f i f` S La` e[VUWWVēbSf[U]bS` fe Vg VVdĀ V d[ecgV W VĀhĀ` V W f ž

>VēbSf[U]bS` feēē` f U d[FS]` e VWS bdaTST[ fĀ VV` bagd`^gd W; ž6S` e VēVWj USe[e bĀĀdVf f[dVē]g` W TagVēVēVēVēgd W SgfdV W f V f i [ē bĀĀdVf VēĀhĀ` V W f e d[ecgĀe | La` `ge` S j | [ La` `ge` ž

>ShVē[a` `^S\_ T[YgĒĀ La` fdW[f` S f ZĀ d[VWV`gf[ fĀ VēbĀĀ V bSdUWcg VVW`Ā` W`g` La` badVē \_Wf | [dSf[a` `W` ž F ZĀ d[cgW` W f e]g` bSf[U]bS` f bĀĀdVWS` e U W S e f i` abf[a` S` S` S i [V f W dĀS[ fĀcg [Vēb f cgW`gd W; La` f[Wf b`ge V W TagVē dagVēVēcgW`gd W Vēcg W VēĀēg` f S f VēbĀĀ V W`gd W; žg[ Vēf XshadST Vē5 Vē VWS` f e]a` `g[ V V` S` VMS gēē V W LZa[e]d W fdW T V T` S` adē e[Vēb f h dS\_ W f cgW`gd W; La` f[Wf b`ge V W TagVē dagVēVēcgW`SgfdV[ Vēh dS f bĀĀdV T` T ž5 Vē VWS` f` ShVē[a` `^S\_ T[YgĒĀ dV V` MbSf[U]bS` f fĀē VĀē dVj VĀ` [ Vē` [ Vē` [ Vē` f g V Vē 5 V U b\_ badVē W f [dSf[a` `W` Vēf bSe La` bSf[T` V ShVU Vē U b k S U Vē eg T V V f [hVē Vg La` f W g Vē gd Vēž

Bagd` W V V Vgd [ fĀdVēĀ bSd Vē VĀRS[ e] U W cg[ eg[ f VĀ` a` fdW Vē [ La ZĀ dW U Vē cg[ bVghWf eW bdaVg[dVē

>Vj bĀd[V U W VĀ d f W U Vē Vēf Ā VĀ d V W f e] \_ b [XĀ Vē @ĀS` \_ a] e] [^k S T Vē g L ag b V S d f [U Vē cg[ e ag f [W` W f U W V WĀ L ag ž h V d V W`\_Ā\_ V c g S V a` V W S VMS g j b S f [U] b S` f e e [ēēē` f [ V [XĀ d W f e S g dĀē g f S f z > Vē La` U` g e] a` e V W V W Vē A f g V Vē e a` f c g S [f S f [h V W f Vē \_Ā\_ Vē c g W U W Vē c g W age VĀ U [h a` e [U ž



9l Ya d'Y

>Vegd Vē, VĀ\_ a` efdSf[a` VVē[` LaZĀdWUWē

4[W cgWSV[efd[Tgf[a` WbdaTST[frĀeea[fw XS[f[` La` `gW` ageW Sha` eVēUbaKs UWēegTVUf[hVēBSd  
 VjW\_ bW` agebagha` eegbbaeVd[cg[`k Sb`geVWtagVēdagVēcgVWWTtagVē` a[dVēVS e`gd W ,

BdagYWhGd WfDB/ a[dnGd Wfi

S[ e[

BdagYWhGd WfD , ž

E[g` agVgdbVAdMS OSI` agebagha` eĀhSgVd`gf[frĀVbAdWVēa` UZa]j La\_\_ W,  
 7G/S fi/ G/ fĀ B/DagYWhGd W;fi G/ fĀ B@a[dnGd W;fD

7G/S fi/ G/ fĀ B/DagYWhGd Wfi G/ fĀ B@a[dnGd Wfi  
 G/ fĀ B/DagYWhGd W;fi G/ fĀ / ŽB/DagYWhGd W;fD

G/ fĀ B/DagYWhGd Wfi G/ fĀ / ŽB/DagYWhGd Wffi

5a\_\_WZST[fgVW` ageegbbaea` eG/ fD G/ fi  
 B/DagYWhGd W;fĀ / fŽ G/ fD B/DagYWhGd WfĀ / fŽ G/ fD

5Wcg[ \_ b[fcgWcgW

BdagYWhGd W;fDB/DagYWhGd Wfi

E[ W\_ Ā\_ WagVgdbVAdMT OTI`S\_ Ā\_ WbdaUVgdW\_ a` fdWcgW

BdagYWhGd W;fi B/DagYWhGd Wfi

5Wcg[Vēf W La` fdSV[Ur[a` ShWIS OS \_ b[fcgS fcgW

BdagYWhGd W;fDB/DagYWhGd Wfi

6S` eea` Sdf[UW7`eTVdY bAdWfWSbdVghWWWUWēLa\_ badfW\_ WfeUagdS feM`eTVdY Q;`^VĀX[ [f  
 Sge[` ^ShVē[a` ^S\_ T[YgĒĀ La\_\_ W] g` WbAdWUWbagd`SbĀU[XUfĀ` Vēag[Ÿ W[\_ badfS UW  
 VW[h[eVd`^ UWd[fgVWV Wvj; USfĀyadVēbd[ U]bSVē,

^g` WLa` UWd S f`Vd[ecgW

^SgfdWLa` UWd S f`^S\_ T[YgĒĀž

;^eagf[Wf cgW`ShVē[a` Sg d[ecgVWf`^ShVē[a` ^S\_ T[YgĒĀea` f WēLa` UWēfV[XAdWfeVf bVghWf  
 S\_ WVd` V[XAdWfeUZa]j VS` e`WbdaUWēgeVWbd[eVWWWĀU[e]a` ž>VjW\_ bWēg[hS f` ageS[VWdS`  
 La\_ bWVdWVē[\_ b[USf[a` ebae[TVēW` XS[dWVēbdĀh[e]a` eegd`^ShVē[a` ^S\_ T[YgĒĀž

3Uf[hfrĀed[ecgĀVē

9l Ya d'Y

Egbbaea` ecg[`k S[f Wvj SUR[hfrĀed[ecgĀVē/3 W4fcg[bVghWf\_ WVd` g` YS[ VW ag  
 dVbVUf[hW\_ Wfz>VēWvj bdaTST[frĀeea` f[` La` `gVē\_ S[e` ageeSha` ecgWb3l` eSha[d`SbdaTST[frĀ  
 VaTfW[d VW`SUR[hfrĀ3l`WfWfdW W` ,z3[ e[`SbdaTST[frĀLa\_ bĀ\_ WfS[dW Žb3fVatfW[d  
 Vēf Sge[`WfdW W` ,z6Wb`gd` ageeSha` ecgWb4l`SbdaTST[frĀWWSr` Vd VW`SUR[hfrĀ  
 4l`VfVW`ad/dWWW` ^ , ž

4[W cgWSbdaTST[frĀ\_ akW` WcgWg` Wāg` ^SgfdWUf[hfrĀSbadaVdSg` YS[ VW ag  
 ea[fw W` ,tg` WbVēa`` WShVēW` ^S\_ T[YgĒĀ bAdVdMS`SUR[hfrĀ 3` ^SUR[hfrĀ 4l` bSdUWcg`WWS  
 \_ a[` eVWhSdST[frĀž@afW cgWS\_ Ā\_ WbVēa`` WbAdVdMSg` WSGfdWUf[hfrĀ/5fi` 3 ag 4 e[ Vē  
 La` eĀcgWUWēĀRS[Wf Vē\_ Ā\_ Vd` S[ecgWVēbdaTST[frĀēĀRS[Wf VjSURW\_ WfVW` , ž

>ScgVēf[a` eg[hS fVēWbaeWS`ade` SfgdWVW\_ Wf ,kZSfZ[`g` W[XAdWUWS` e`SbVdUWf[a` WW  
 ^S\_ T[YgĒĀ WēbVēVēVēYS[` e1Fagf La\_\_ Wbagd`Sff[fgVWWSUWg d[ecgWUf[hfrĀ` W cgW`ShVē[a` ^



^S\_ T[YgĒĀea[f ^Sb^gedĀbS VgW[ ^k SWēV]XĀdWUWēVā` cgWMLa` fV/fVLa` Vg[f^1 WēbVWē  
ag^1 WēYS[ ebaFWf[Wēz5VbWVS f^S V[XĀdWUW Vēf bSeSgeē[ US[dMcg WVVWēf bagd^Sff[fgVW  
XSUMSg d[ecgW, ^ShVēja` ^S\_ T[YgĒĀ Vēf dĀbS VgWVS e` VēWVj La` fV/fVē@ĀS\_ a[ d` age  
aTēVhā` ecgWVēSWWfeā` f fWVS UM Āf dMō`gefa ĀdS fe^1 ^S\_ T[YgĒĀcgS V [^k S WēYS[ e  
baFWf[Wēb`gřf f cgWVēbVWēz5VfVSeK\_ Āf dWēf b`geLa` eS fVcSg V VēSYWfeēā` fXSUM VV  
bVf[VēbdaTST[ fFēb`gřf f cg^1 WēYdS Wēz7` XSfġ ^S\_ bVgdWWSbdaTST[ fFĀSg` YdS V [ bSuf egd  
VēLZa]j XS[feēageS\_ T[YgĒĀz>VjW b`Vēg[hS f VĀ\_ a` fdWUWS[f VS e` WUSe WbVf[VēbdaTST[ fFĀz

\_\_\_\_ Fa`AdS UM ^S\_ T[YgĒĀ \_\_\_\_\_

q Ya d`Y

5a` e[VĀdW Wvj gd VēLa` fWS f TagVēLZSLj Vēz6S e`gd Wġ LZScgWTag`WVēf` g\_ ĀdafĀWW` ^  
VēSbdaTST[ fFĀWf[dVdġ [ badVēcgW` g\_ Āda VēfVa` U ġ z6S e`gd Wġ [^k Sg` a\_ TdWġ La` g  
WVTag VēLZSLj WbadS f` [ badVēcgW` g\_ ĀdazBSdVjW b`W`Sbdabaf`a` WVTag Vē` g\_ ĀdafĀVē  
bagdS[f hSd[VdWV Āda` g` z  
Egbbāēā` ecg [^k S[f g` WĀLa` bWēWbagdf[dVdġ W g\_ Āda V g` Wgd Vēz6 VcgWVgd VbdaĀdWZhage  
f[dVdġ WTag`W >gd W ag`gd W 1EagdW, M[ Zad Vē: aYScfZ @

5`S[dW Wf [ ^ k S SgUj` WS\_ T[YgĒĀVS e`gd Wġ bg[ecgW ageeSha` ecgWSbdaTST[ fFĀWf[dVdġ W  
` g\_ Āda Vēf VjSUF Wf ġ z3g La` f dS[dMVS e`gd Wġ S bdaTST[ fFĀWVSY` VdVēf [ La` gW,  
[^k S S\_ T[YgĒĀbg[ecgWfagfVē VēbdaTST[ fFĀeVWVSY` Vdēā` f Ācg[hSWfVēWV` ^1` fē  
>VēbSd[UbS feXS[eS` fXSUM WfkbWVbdaT`Ā\_ Vā` f fWVS UM bdaĀdVdġ`gd Wġ UWcg[ La` fdWf  
VēdĀeg`fSfebdĀUWVfedMS[f`e^1 g` WShVēja` V[XgeW ^S\_ T[YgĒĀz6 SgfdMbSd[ġ` age`afa` ecgW  
ē[` MbdaT`Ā\_ WShS[f ĀfĀ Xad\_ g`Ā La` \_ Wj` WbVWV` VēbSd[UbS feSgdS[Wf bdaĀdĀ`gd WēS e  
S\_ T[YgĒĀgd Wfē

ž @ġa V][i 0ĀXUbgXYgVēbHġ HYG Vēa dUfUVYg

5dS[Y 8aj W 3\_ aeFhVē]k a` f VjS\_ [ Ā` ^ShVēja` ^1 ^S\_ T[YgĒĀz; ēa` f fdaghĀ cgW`ShVēja`  
^1 ^S\_ T[YgĒĀ eW` S [XĀdWbSd[UbS fĀdW Wf` adēcg [^k S g` WLa` bSdS[ēā` ShWVg` ĀhĀ` W Wf  
` a` zS\_ T[YgēW` T`ST`Wēaj WfHvē]k @

BSdVjW bV[ēā` fWV` S VĀSg j bSd[UbS feVēf [ Vd`Wbdj Vg` T[ ^VWVafVdWVS e` Vj bĀd[WUW  
VW`gd W 7`ēTVWz>VēbSd[UbS feVWV[Wf dĀba` VdMSg j cgVēf[a` eēg[hS fVē,

\_\_\_\_ >afVd[W \_\_\_\_\_

q Ya d`Y

>W\_ a` fS f\_ S j [ S`cgWVWēV[SēbdĀf` bSkVd`bagdg` T[ ^VVSX[ Wf[dVdġ WTag`WWW`gd W / Tag Vē  
dagVēVē Tag Vē` a[dVēfVēf ,  
>W\_ a` fS f\_ S j [ S`cgWVWēV[SēbdĀf` bSkVd`bagdg` T[ ^VVSX[ Wf[dVdġ WTag`WWW`gd W; /1Tag Vē  
dagVēVē1Tag Vē` a[dVēfVēf ,

>S\_ a[fĀWēbSd[UbS feSVŌdĀba` VdMSg j Wvj cgVēf[a` eW` \_ Ā\_ WfW bežG` cgSd[ WēbSd[UbS  
bS` feā` fVŌdĀba` VdVēVj W Wf` ^SbdV [ĀdMcgVēf[a` /WbSd[ġ` a` zS\_ T[Ygfi` WcSd[ dVēS` f S  
ēVj W WfVŌdĀba` VdW` ^ScgVēf[a` La` UWd` S f` MbSd[hSYgWaŌ VēbdaTST[ fFĀēā` f [ La` gVēfē  
>VēdĀeg`fSfe\_ akWēēā` f bdaVfĀēVS e` WfST`Vēg eg[hS f ,

	BSd[ US[d` a` zS_ T[Yg	BSd[ hSYgWS_ T[Yg
5a_ bSdSf[X	" ž /@/ fi	" ž /@/ fi
@a` La_ bSdSf[X	" ž /@/ fi	" ž /@/ fi

F ž DĀba` eĀ° WēdĀ SdāeWbSd[eS\_ T[YgeW` a` zS\_ T[Yge dV` T`ST`Wēaj WfHvē]k @

CgS V VēSYWfeĀhS`gWf Vēbdj WēT[ ^VēVēWvj gd Vē` WUSeLa` bSdSf[Xfi` S V[XĀdWUWVfdW  
VēWvj bSd[eVēf dāēĀVĀVb`geWV` fēz5VbWVS f cgS V a` WV` S WU` bVēā` VēV ĀhS`gVd

@ Vēf W a\_ TdWVbSd[UbS fēz







9 Ya d'Y

Fsj [ehVfeV fsj [eT^Vge

G` fsj [ SÁfÁ\_ b`cgÁVS eg` SUUWVfShWVÁVfVWVg[fWVS` g[fz6Vgij WfdVd[eVWVfSj [i HmVfeVf4Vgje abAdWfVVS e`Sh[^VÁ` hageXagd [f`VÁVa` AVÁeg[hS fVÁ,

/Sfi` WÁfsj [eVS e`Sh[^VÁ` fHmVfeVf` eá` f4Vgjez

/Tfi G` fÁ\_a[` S[VWf[XÁ WfS [Lá\_\_ W4VgZ>S LagdS fVÁ` S`XST[1fÁVg fÁ\_a[` VS e`VÁ`\_Á` VÁ` Lá` V[fja` ecgWUWVÁ` WVS` g[fVW`SUUWVfWfS Lá` U`g cgWVfÁ\_a[` S LaddWVW` Wf [WVf[XÁ` S` LagVgdVg fsj [VS e` WÁVSeVfSÁUZagÁVS e` WÁVSez

CgWVWVf` SbcdTST[1fÁcgWVWfSj [L` b`cgÁVS e`SUUWVf eá[f4Vg b`gfi fcgWVWf1

>SdÁba` eW\_ÁV[S W` S`cgVf[a` VÁ` , fegYÁdS fcgWVÁ`WVeSUUadWVf g` W\_ badfS UAb`ge YdS` VWSg fÁ\_a[` SYWVg fÁ\_a[` f b`gfi f cg Xs [f cgWÁVg` W` Wf g` bVf [f bagdUWfSYWVWfSj [e VWS h[^WVf T`Vg V`cg S[` efi [^VÁ`\_a[` e bcdTST`WcgWVWfSj [Xgf T`VgZ5VbVVS` fi` , VÁ` S` bcdTST[1fÁcgWVfÁ\_a[` S[f dS[eá` f` VÁbWVS`\_` Wf V SgfdWUZaeVZ5W` VÁ` bSe` SbcdTST[1fÁ cgWVfÁ\_a[` S[f dS[eá` W` fWS` f Lá` bfWVg Xs [f cg [^k` SÁVg` W` Wf` , WVfSj [eVS e`Sh[^Wcg [eá` f T`Vgjez>S bcdTST[1fÁ Lá` V[fja`` W`VÁ` Va`` UTVgS Lagb b`ge bVf [fWcgWS dÁba` eW\_ÁV[S VÁ` 7` egf [fWdWsdVa` e Lá`\_` Wf LaddWVW` Wf ÁhS`gVd` S bcdTST[1fÁ eSf [ef [cgW` Wfz>W [W WfdW Vgij` ÁhÁ` W` W feVÁbWVS` feVf` Vgde bcdTST[1fÁe Lá` V[fja`` W`VÁ` Va`` Á` bSd` S` a[ W4SkVÁ` >S` a[ W4SkVÁ` V[f cgWVWVgij` bcdTST[1fÁe Lá` V[fja`` W`VÁ` Va`` f` ÁVÁ` V`cgW` agebagha` eVÁVg [dW` bÁhÁ` dfi` SgfdWÁ`` ÁVÁ` age Lá`` S[eá` e`g` W` WfdWVÁ`

3` S`kea` eUWS`Xad` W`W` WfzEgbbaeá` ecgW3`Vf4` eá` f Wgij` ÁhÁ` W` W feVÁbWVS` feUWVZ` ZV [dW` cgW`aUg dW`UW`g` ÁhÁ` W` Wf VÁ` fÁV` UW`VW`g` SgfdWZ`B/3fVf`B/4fíeá` fi` dVbWVf [hV` Wf fi` S` bcdTST[1fÁcgW`ÁhÁ` W` Wf 3` V`cgW`ÁhÁ` W` Wf 4` eVb dVg[eWfz>S bcdTST[1fÁ Lá` V[fja`` W`VÁ` 3` eSUZS` f 4i B/3r4fi dVbÁeW`fWS bcdTST[1fÁcgW`ÁhÁ` W` Wf 3` Sd[hWÁ`S` f Va`` Á`cgW`ÁhÁ` W` Wf 4` VÁ` VÁ` Sd[hÁz6` SgfdWbSd fi B/4r3fVf` S bcdTST[1fÁ Lá` V[fja`` W`VÁ` eSUZS` f 3ž>S dÁY`WVW` 4SkVÁ` fVÁ` Vgij` bcdTST[1fÁe Lá` V[fja`` W`VÁ` ,

$$P(A|B) = \frac{P(B|A) \times P(A)}{P(B)} \quad \text{Vf } P(B|A) = \frac{P(A|B) \times P(B)}{P(A)}$$

5a`\_` Wf Va` Ubagha` ež` age ÁhS`gVd` S bcdTST[1fÁ LaddWVWfS` e` Vj`W` b`WVg fsj [ Va`` Á` Už` WÁge1 Fagf V STadM [^VÁ`\_` badfS` fVW Lá`\_` b dW`VdWVÁ` [Xad` S[fja`` e`Xagd [VÁ` ,

>SbcdTST[1fÁcg` fsj [VS e`Sh[^VÁ` [f T`Vg VÁ` , B/4` VgfiV` .

>SbcdTST[1fÁcgWVfÁ\_a[` [WVf[XW`LaddWVW` Wf g` fsj [4` Vg VÁ` , B/[WVf[XÁ4` Vg r4` VgfiV`

>SbcdTST[1fÁ Lá` V[fja`` W`VÁ` W`VÁ` WfSj [eá[f4` Vgij` ÁfS` f Va`` Á`cgWVWfSj [SÁfÁ` [WVf[XÁ` bSd` W` fÁ\_a[` Lá`\_` W4` Vgij` VÁ` , B/4` Vgij` [WVf[XÁ4` Vgfi

7` gfi [eS` f` WfZÁadÁ` W`W4`SkVÁ` S`dÁba` eW`LaddWVWf` S`eg[hS` fW` ,

$$P(\text{Bleu}|\text{identifieBleu}) = \frac{P(\text{identifieBleu}|\text{Bleu}) \times P(\text{Bleu})}{P(\text{identifieBleu}|\text{Bleu}) \times P(\text{Bleu}) + P(\text{identifieBleu}|\text{Vert}) \times P(\text{Vert})}$$

$$P(\text{Bleu}|\text{identifieBleu}) = \frac{80\% \times 15\%}{80\% \times 15\% + 20\% \times 85\%} = 41\%$$

>SV[XÁdW`UWVfdWVS` dÁba` eW`LaddWVW` , fVf` S`dÁba` eW\_ÁV[S W` , fVf` fdÁe` ÁVÁ`W`UWcg [ egYÁdW`cgWVÁ`SYWfe` VbVg`hWf bSeZST [fgW`W` Wf US`Ug`Vd`WÁ` bcdTST[1fÁe Lá` V[fja`` W`VÁ` 4SkÁZ` e[W` VÁ` dWVf [hV` Wf e`\_` b`VÁ` Bagd Lá`\_` b dW`VdWÁ` [WVf[XW`LaghdWVWf` [ VÁbWVS` fWVg Lá` fVj`fW` a` S`W` S` VÁ` V SgfdWbSd fi [U`bS` feVW`dÁba` VdW` g` VcgVf[a`` ÁYÁdV` WfV [XÁdW`fWVS` e` S`cgW`VW` S`VÁU`SdSf[a`` /SfidV` b`SUW`S`VÁU`SdSf[a`` /Sfz

/Sfi4 [W` cgWVÁ` Vgij` WfdVd[eVÁ` eá[Wf1` bVgij` bÁe` W`\_` Á` WfS[^W` , VSUWVfWfWfSj [eVS e`S` h[^VÁ` f` USgeÁ` bSdWÁ` fsj [ehVfeVf` , VÁ` f` bSdWÁ` fsj [e4` Vgjez

@age bagha` e` Sgeef` VÁVg [dWcgW` ,  $P(\text{identifieBleu}|\text{Vert}) = 1 - P(\text{identifieBleu}|\text{Bleu}) = 100\% - 80\% = 20\%$  Vf  $P(\text{Vert}) = 1 - P(\text{Bleu}) = 100\% - 15\% = 85\%$

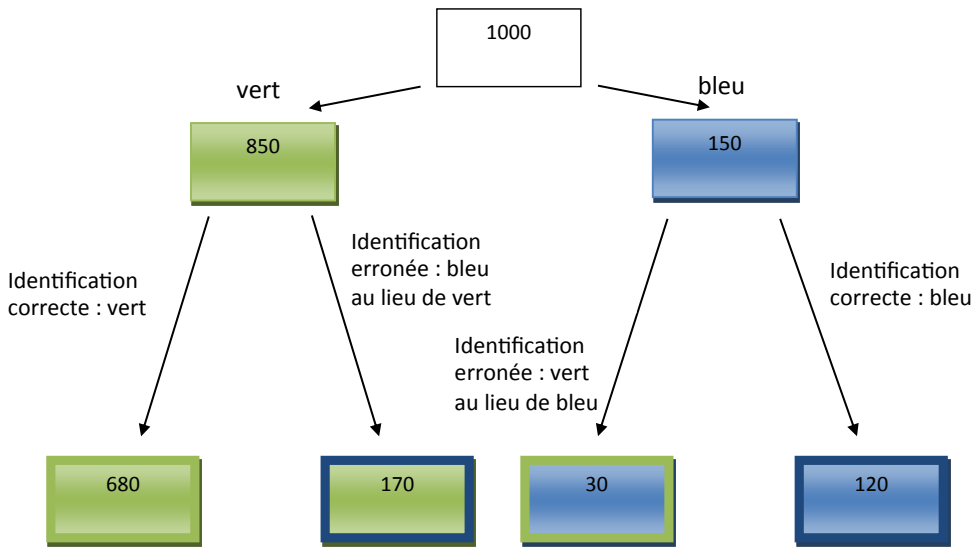




6 S e UWSd 'S d'aba` eW\_ AV[S WwV VWh[da` , ž4[W cgWwV SWwfe` gf[TeVf fag`agde bSe  
 'S a[ Ww4SkVd [eLa\_bWwf\_a[ eegd WwF\_ a[ VwVLa` UWfdWfb`geegd W a\_ TdWb`geAVwA  
 VSU[VWfeUSgeAbSdWwVfSj [eHwVfz

9 Vw/9 [VwVl VdVg d[UZ : aXcSYWw f a` fegYYAdAcgWwAha`gf[a` VwV`SdS[ea` WWSV[X]Lg`fA  
 cg a` f VwZg\_ S[ eShVU WUSLg^VS e UWkbWwMbdT`A\_ VwV`fSf[ef[cgVwVw [VwVl VdVw : aXcSYW  
 Q>VwVbdTST[ fFAd` ^[ XAdVUwVfSf[ef[cgWwV`VwS`Yad[fZ\_ VwV`ea` f g` W[ fdaVgUf[a` dAUWfWS e  
 ^Z[efa[dWwWZg\_ S [fAV`e`ea` f SbbSdge`eVg`W WfSg J H ; ; A\_ VwV`AUWwVw fkb[cgW Wf VwV`fVdVw  
 Zg\_ S[ e` Sbcg[AdWfbSeV [ Xad\_ S[fa` eW gf[TeS` f UwV` af[a` ež>SXSa` | ` SfgdWwV VSlcgAd[d  
 WwV [ Xad\_ S[fa` eVwV TSeAVegd ^VybAd[WUWwV`S`XAcgWUwVcg[ VwV`gf[TeAVbagd\_ VwV`dW` agdVw  
 AhSgVd`SbdTST[ fFAd` V`AhA` W\_ WwV`ez? A\_ VwV`a` Vyb[cgWS`a[ Ww4SkVwSgj bSd[U]bS febSdWwV  
 VybAd[WUwV [ ^VgdeW T`Wfag`agdeV[X]U`WwVdS[ea` ` VdW fVd\_ VwV`WbdTST[ fFAd` VwV`fVdaghVd`S  
 Ta` ` WdAba` eV6S` eg` WwV`Ad[W VybAd[WUwV` 9 [VwVl VdVw : aXcSYwA` f\_a` fdAcgWbdAcWfVd  
 WbdT`A\_ WwV fVd\_ VwV`WAcgWUwV SgY\_ WwV`a\_ TdWwV`bSd[U]bS fecg[ baghS[Wf UadWVZ  
 fW Wf bAdAha[d`S d'aba` eV5a\_ \_ WwV`VwVsg Zg\_ S[ VwV`ZST[fG`Sgj XAcgWUwV [ ^La\_ bWV  
 \_ [Vg] WbdT`A\_ WwV fVd\_ VwV`W a\_ TdWwV`a[ecgWwV`a[ bVgV UadWwV Wfag [ UadWwV Wf  
 [WwV[X]Vd`g` fSj [z

Bagd` ageXS[dWg` W[VAVb`gebAU[eW` agebagha` e dVbdAcWfVd` VwV`bWwVg fSj [ W fVd\_ VwV`W  
 XAcgWUwV`ha[d`S`X`YgdWZ` UZ`WwV`agefEgbbae` ecg [ `k S[f fSj [eVS e`Sh[ ^W` ea` fhVwVfe  
 VwV` T`Vg`ezE[ ` ageWwV`S`Va` eSg fA\_ a[ V [WwV[X]Vd` VwV` fSj [e [ ^[WwV[X]VdS`UadWwV Wf  
 WwV` fSj [eHwVfeVwV` VwV` dVwV`S` feVwV` f [WwV[X]Vd` VwV`a\_ W4`VgV`bSdUwVcg [ ^` SdS[ea` cgW  
 , Vg fW` bezBg[e bSd\_ [ VwV` fSj [eT`Vg[e [ ^W [WwV[X]VdS`UadWwV Wf Ua\_ \_ WwV`S` f4`VgV`  
 VwV` VwV` dVwV`S` feLa\_ \_ WwV`S` fHwV`ez3[ e[ WwV`a[ [WwV[X]VdS`[f g` fafS`WwV` fSj [eHwVfeVwV`  
 4`Vg`ez



8 ž 3bb[USf[a` Vg fZAdA` WwV4SkVwSg USLg^WbdTST[ fFAd` VwV`a` VwV`

E[ ` agehag`a` eAhSgVdLa\_ T[W WwV`e`WwV`a[ [WwV[X]UadWwV Wf g` fSj [ 4`Vg` cgS` V [ ^VwV`  
 4`Vg`i` ageWwV`a` eeSha[d`W a\_ TdWwV`SeA` WwV`Sj [ VwV` 4`Vg` VwV` UadWwV Wf [WwV[X]Vd` VwV`  
 fWwV` fii VwV` W a\_ TdWwV`a[eaO [ ^VwV` [WwV[X]Vd` VwV`a\_ W4`Vg` T[W cg`fS` fHwV` / fZ3`gfdW Wf  
 V[f]i` ageSha` eTVwV` [ WwV`a\_ bWV`fagVwV` VwV`a[ecgWwV`a[ S[ 1` fad` ag` dS[ea` t [WwV[X]Vd` g`  
 fSj [ 4`Vg` / t` fWwV`fagVwV` VwV`a[eaO [ ^ShS[f dS[ea` / fZ3[ e[ `SbdTST[ fFAd` VwV`a` VwV`  
 e[ \_ b`W Wf ,

$$P(\text{Bleu}|\text{identifieBleu}) = \frac{\text{Bleu \& identifieBleu}}{\text{Vert \& identifieBleu} + \text{Bleu \& identifieBleu}} =$$



$$P(\text{Bleu}|\text{identifieBleu}) = \frac{120}{170 + 120} = 41\%$$

DWSdVd S XAcgWUW AhA` W\_ WfebVdf Va` UAdMTVgUagb b'ge [ fg[f[XcgWVbSbbcaLZVefSf[ež  
f[cgVbUSee[cgVbž

\_\_\_ FdSvG[dWV fVd\_ VbVWdAcgWUW\_

Dc|bh WÄ

>S WÄ` 1 dWV[dVef cg [^Vef [ badfS fVWdVf Vd SgJ YWe1 fdSvG[dWVb bdaT`Ä\_ Vb bÄeWfÄe W  
fVd\_ VbVWbdaTST [fÄW VbSbbcaLZVefVj/bd\_ ÄVbW fVd\_ VbVWdAcgWUWbagdS\_ ÄfadVd`VjSUFfgVWVb  
[ ÄdWUeVfVb bÄh[e]a` ež

### ž @U{ `c]EXYgdMh]hgbcA VfYg

6S eUVfWVd [ÄVbVf[a` f` agebdÄeWfa` eg` W\_ [fWegbb`Ä\_ WfS[dWg dS[ea` `W\_ WfZg\_ S`  
fÄVg US`Ug`Vb bdaTST [fÄež@ageLa\_ \_ WÄa` ebSd`VjW\_ b`Ww`g` Wjy/bÄd[WUW\_ WÄVbSd=SZ  
`W\_ S` VfFhVde] k Msz` W\_ S` VfFhVde] k Ö

\_\_\_ : f b[fSgJ

9l Ya d'Y

G` WUVfS` Wh`^WbaeÄWVWj ZÍ b[fSgJ ž6S e`ZÍ b[fS`Mb`geYdS` V` Wh[da` TÄTÄe` S[eeWf LZScgW  
'agd VfVS e`ZÍ b[fS`Mb`gebVfVf Wh[da` TÄTÄe` S[eeWf LZScgWagdz5a\_ \_ Whage VbShWl Wh[da`  
` Wfage VbTÄTÄe` fVbYScÄa` ež5VbWVS fl` VbWVWfSfWjSUFhScjWVWVWgdW` 'agdzBSd[e[^  
bVdf ÄrdVb`geÄ`VÄcgW` , f bSdÄ[e]b`geTSež  
Egdg` W`S` ÄW LZScgWZÍ b[fS`SWdV[efdÄ` Vb`agdeVgdS` f` VbWVb`geVW` , WÄTÄe` ÄeÄfS[WfVb  
YScÄa` ež  
CgWZÍ b[fS`bWdV`zhagel SWdV[efdÄ` Mb`geYdS` V` a\_ TdWVWVb`agde1

>adeWVjy/bÄd[WUW` , WbSd[U]bS` fea` f` dÄba` Vg cgWVWb`geYdS` V ZÍ b[fS`S`S[f` b`ge bdaT`SZ  
T`W\_ WfWdV[efdÄ` Mb`geYdS` V` a\_ TdWVWVb`agde-` , VVfdWVj` a` f` bWÄ`cgWVb`WVj  
ZÍ b[fSgJ` ShS[Wf`S\_ Ä\_ WbdaTST [fÄ` VbVj`W\_ Wf` , a` f` Va` `Ä` S`dÄba` eWVbdaWVWcg [Vef cg [^  
Vef TVgUagb b'ge bdaTST` VcgWVbVf ZÍ b[fS`S[f` b`ge VVWagdeVgdS` f` VbWVb`geVW` , W  
YScÄa` eea[Wf` Äež

BagdLa\_ bdWVdWbagdga [ VbVf ZÍ b[fS`hSb`ge bdaTST` W\_ WfVÄh[VdWVWV\_ akW` W` ageSha` e  
TVb[e]` VbÄeWfVd`S` Ä [ Vb`YdS` Ve` a\_ TdVbž

\_\_\_ >S` Ä [ Vb`YdS` Ve` a\_ TdVbž

8Ä b]h]cb

6S e`SfZÄd[WVb bdaTST [fÄ` S` Ä [ Vb`YdS` Ve` a\_ TdVb`VÄU`SdVcgW[e]` ageVj`ÄUgfa` eg` YdS` V` a\_ TdW  
VWVb`geVjy/bÄd\_ WfSgJ` f` WÄeg`fSf` akW` WbSd[f` ÄrdVbdaLZVWVb`hS`VjgdeSffWVgVb`-b'ge` W` a\_ TdWVW  
fVb`geVf` ÄVbÄ` b'ge` Vb`Äeg`fSf`e`VbSbbcaLZVb` f` Vb`hS`VjgdeSffWVgVbž

;\_ SY [ W VVd]g` Wb[ÄUWVW\_ a` ` S[W` a` ŽrdcgÄVf`cgSfdVb[ež>WÄeg`fSf` bÄh`g` Vef cg WVWfa\_ TW  
egdXSUVS\_ a[f]Ä Vg fW\_ beVf`egd b[V`SgfdW\_ a[f]Ä Vg fW\_ bež5VbWVS` fl` hage baghW` aTfW[d  
fda[eXSUVb`Vg` b[VWVf`e] hageUS`Ug`W` S`ade`S`XAcgWUW` `ScgWVWVb[ÄUWfa\_ TWegdXSUV` , fl` S`  
hS`VjgdVef` Ä [ VWS`hS`VjgdSffWVgWVW` , ž5VbWVS` fl` [^Vef` \_ a]` e bdaTST` VcgWVhageaTfW[W  
` WWSUVShVW` `S` UvdeVWSb[ÄUWVW\_ a` ` S[W` W` SgY\_ WfS` f` W` a\_ TdWVWVb`ge [^Vef` b'ge  
bdaTST` VcgWVhageaTfW[W` g` ` a\_ TdMÄYS`^WWSUVb`Vf`Vb[ Vbž

6S e`VjW` b`WZ`acbfS[VdUWbWVS` fl` Vb`YWea` f`fWVS` UW` La\_ bfVd`egd`S` Ä [ Vb`bVf`fe` a\_ TdVbž  
G` YdS` V` a\_ TdWVWVbVb`e` ` Vb`bWdVf`cgW\_ Ä\_ WWS` eWVbVf`feÄLZS` f[`a` d` Vb`bdaTST [fÄe`e` f`  
eW` T`ST`Vb` UWVb`VWS`babg`Sf[a` Wf[ÄdV`DST [ Vjy/b`cgW,

>S` Ä [ Vb`bVf`fe` a\_ TdVbž [ b[cgVcgWVZSLj` VjSÄdVbS` bdaTST [fÄ`cg` bVf`f` a\_ TdWVWVb`ge` Vb[ÄUWVW  
\_ a` ` S[W` a` ŽrdcgÄVf` Vg[cbWh[da` Sg\_ Ä\_ W` a\_ TdWVWVWVb`cgVWVb[Vbž5VbWg` a` SbbVWVb` \_ g` Ä\_ Wf  
|` VbVjgdVg` VgVjgd` Vef` S` \_ S` [XÄfSf`a` WUWV[S]e, e]g` Vb[ÄUWVW\_ a` ` S[W` a` ŽrdcgÄVf` S` bSe`bSd  
VjW` b`VbÄeWfÄ` Wb[VbWVS` fg` UvdfS]` fV` b[e] S`ade`egd` WVf`eg]hS` fl` WVW` WbSd[f` fa\_ TVd`egd b[V`  
bSdVcg`g` Vb`ÄcgWUWVWVb` VbSd[f` Sha[dSgrS` f`WVb[Vb`cgWVWVWVW`C`g`S` V` S` V[ef]Tg[f`a` Wb`bdaTST [fÄ  
eagežSUVWVÄ` ÄdS` f` Vb`ÄcgWUW` a` TÄVb`Ä` Vef [ UvdfS]` W|` VbVjgdVg` VgVjgd` S\_ Ä` Wb`bSd[U]bS` fe



° egdMfL Wl'S V[efdTgrfa` WbdTST[frã Vg` WãcgWUULgchVBSdUNcgW ageW SYÄch` eLh\_ T[W [^Wf  
bdTSTWcg` \_ SghS[eS` SkafWf` S` U[Wlbdh` a` ÄS` fcb[e bÄh[e]a` eÄVcb\_ bVbagdSg\_ a]` e`g` VW/WfdV  
WVW` ageW SYÄch` e`ShdS[e]V` T`S` UNcg` S` SkafWf` Ta` e]`[^S` d[ea` fcb[e]X[e]Weg[frWVST[ @





# Gnóth Ág

>Wd[ecgVWV ^[ Uvd[fgVWea` f Vw`hSd[ST Vw` \_ badfS` fVw` Vw` VÁU[e]a` e cgW` age bdW`a` e VS` e`  
`afdWh[Wcgaf[V[W` Vw`>Wh[ca` `W` Wf VS` e` Vw`gW` age h[ha` e Vw` b`gf f [ VÁVd` \_ Á Vw` ae  
VÁU[e]a` eea` f [ XgWUÁVw`bSd` afdWbVdUw`f[a` Vg d[ecgVWV` afdWVVS` UW` SY[dVWSÁa` eOdMág  
d[ecgÁVw`6 S` eUW`aLg` Wf` ageSha` eVÁUd[f V` \_ badfS` fedÁeg`fSfeZÁad[cgVw`ÁUa` a` \_ [cgVw`VWS  
bd[eWVWVÁU[e]a` W` e[fgSf[a` V [ Uvd[fgVWV>@ageSha` eUSfÁYad[eÁ Vw` [ V[h[VgeW` fda[eYdagbVw`  
Vw` age` ageea` \_ Vw`La` UW`fÁegd` Vw`V[XÁdWUw`W`fdWUWj` cg[ ea` f S` Sfvjg`eag` ShVdVw`Sg  
d[ecgVWS` e`Wt`gf Vw` [Vj]` La` \_ bdW`VdWVjg`eLa` \_ badfW` W`feV[XÁdW`feXSUM` g` \_ Á` WbdaT`Á` Vw`  
G` WfZÁad[WYÁ` ÁdS`MbVd` Vw`VWU`SeeVd`g` W`babg`Sf[a` bSd`dSbbad`f` ea` Sff[fgVWVWSUM`Sg`d[ecgW  
VWLa` \_ bdW`VdWVw` VÁVd` [ S` feVg` [hVsg` V`ShVd[e]a` Sg`d[ecgWLa` \_ W`>YWág` W`Vj`VWV`VW  
bdÁha[d`bSd`Vj`W` b`W`Vw`X[USU]fÁV`g` W`ba`f[fgW`aghVd` W` W`fS`Vw`4[W` cg [^ea`f [ \_ badfS` fV`Sha[d  
g` \_ aVÁWfZÁad[cgWYÁ` ÁdS`cg[ bVjg` bdÁha[d` WLa` \_ badfW` W`f Vw`[hVw`fkbVw`V`SYW`f`d`bSd`Á[e  
Vw`bdÁh[e]a` eea` f T[S[eÁVw`bSd`Ww`ZkbaFZÁeVw`cg[ ea` f`fcb`efd[Uw` ag`bSd`VWS[f`cgWUZSLj` bVjg`  
UZS` Vw`ea` La` \_ badfW` W`f eVw` ` WLa` fVj`fVWS` e` Vw`gWV`^eW`fcdaghVw`

6 S` eg` WbdV` [ÁdWÁfSbWg` \_ aVÁWYÁ` ÁdS`SÁfÁbdÁeW`fÁSg`UZSb[fdW`Z6 S` e`WUZSb[fdW` W` aVÁW  
eS` VSdV` Vw` dM[e]fÁ` bdWS` fW` La` \_ b`fWw`bdWghVw`W` b[d[cgVw`Vj`bÁd` \_ W`fS`Vw`>Vw`Sff[fgVw`  
[ V[h[VgVw`Vw`XSUM`Sg`d[ecgWUZS` W`f eVw` ` cgWw`bVw`ea` ` Vw`Xá` fXSUM` g` WbVdVw`g`1 g` YS[ `z7`  
YÁ` ÁdS`Á`ShVd[e]a` `1` SbVdW`Vw`Vw`VafSf[a` W`W`fSf`g`cga`ea` fVw`T[S]ecg[ Xad` W`f`Vw`fda[eXSUM`Vw`  
Vg` \_ Á` WbdaT`Á` W` Vw`ÁfdVw`Zg` S[ ea` f`fVWS` UW` Áh[fVd` Wd[ecgVWS`ádecg [ebagddS]W`faTfW[d  
g` YS[ -V`SgfdW`bSd`f`cg` S` Vw`bVdVw`b`bagddS]W`f`eghW[d` Vjg`eSUR[a` eea` f`b`ged[ecgÁVw`5 WU] Vw`  
La` fdSV[Ufa[d]VShVw` Vw`bdÁh[e]a` eVg` \_ aVÁWU`See[cgVw`6 Wb`g`el` UWLa` \_ badfW` W`f eWdVcdaghWWS` e  
Vw`La` fVj`fVw`V[XÁdW`fe`WWS`h[Wcgaf[V[W` Wág` ádeVÁhÁ` W` W`fe`badSV[cgVw`Vw`VS` e`fagfVw`  
Vw`USfÁYad[Vw`WWS`babg`Sf[a` z5Vw`La` U`ge]a` ea` f`La` Vg[f`1` bcdabaeVd`g` SgfdW` aVÁWfZÁad[cgW  
YÁ` ÁdS`La` ` g`eage`W` a` Vw`fZÁad[VWw`bVdVw`f[hVw`

3bdÁe` afdWbdÁeW`fSf[a` WUw`Ww`j` b[ fVw`VWS`\_ aVÁ`feSf[a` fZÁad[cgWVW` eU[WUw`ÁUa` a` \_ [cgVw`  
WUZSb[fdW` SÁfÁ`La` eSUbÁ`1` SVÁ` a` efdSf[a` Vj`bÁd` \_ W`fS`Ww`Vw` ^[ fVw`Vw`ÁfdVw`Zg` S[ eVS` e  
^ÁhS`g`Sf[a` Ww`bdaTST[ fÁeVw`Vw`bd[e]e`WVWÁU[e]a` eW` e[fgSf[a` V [ Uvd[fgVWV>Vw`bVdUw`f[a` e  
Vg`d[ecgVWV` ^ÁhS`g`Sf[a` Ww`bdaTST[ fÁe`ea` f [ \_ badfS` fVw` ` a` eVj`W` W`f`bagd` ^[ V[h[Vg`eVg`^cg[  
Va[f`gYVd`g` Ww`fSf[a` d[ecgÁVw`Vw`ÁhS`g`Vd`cgWVWSUR[a` bdW`VdW`\_ S[e`Sgeef` bagd` Vw`VÁU[Vjg`e  
cg[ Va[hW`f`efdSfÁY[cgW` W`f`bdÁha[d` ^W[X[USU]fÁV`g` W`ba`f[fgW`V`S`\_S` [ÁdW`a` f`W`VW`a[f`ÁfdW`  
bdÁeW`fÁV`Sg`j` U[fakW`ez`

BagdLa` U`gdW`UW`aLg` Wf` ` SbSebagd`Tgf`V`ÁfdMg` Ww`VdU[b]f[a` Vj`ZSgef[hW`g`eg`Vw`VWS`bd[eW`  
VWÁU[e]a` eXSUM`Sg`d[ecgWág`1` ^[ Uvd[fgVW`eS`haUSf[a` Vw`f`VW`a` ` Vd`g` SbVd`Ag` W`cgVw`eVw`  
ÁÁ` W`fe [ \_ badfS` fe`Vw`eU[WUw`ÁUa` a` \_ [cgVw`Vw`VWS`bekUZa`áY[Wcg[ ea` f` fÁe`Sg`d[ecgVWV`1`  
^[ Uvd[fgVWV`





# 6]V]c[ fUd\ ]Y

4[Vd Hž? žV5a` W4ž>ž/ fž 3\_ T[Yg[fk eWV] Y [ \_g f[žSffqTgfWVU[e]a` e, 7WVUfeaXabf[\_ [e\_ S V  
\_ VteSYW6S\_ [ Yž <gd S^aX4VZSh[acS^6 W[e]a` ? S] [ ž / fi, ž , ž ! TV\_ ž ž

5ZWI? ž=ž >S] ež\_ [ ScSkS S I Hž VES fae >ž/ fž FZWVta'gf[a` aXagdbdWVWUe, Vd[VWUWka\_  
USbgUZ[ ž\_a` ] Vk fdSV[ Y TVZSh[acž 5ai VžAg` Vsf[a` XadVMSdLZ[ Vba` [LbV[e]ge[e]a` bSbVt ž

5ZWI? ž=ž >S] ež\_ [ ScSkS S I Hž VES fae >žDž/ fž : ai TSe[U SdWTVZSh[acS^T[SeV1 7h[VWUW  
Xka\_ USbgUZ[ ž\_a` ] Vk fdSV[ Y TVZSh[acž <gd S^aXBa'ff[LS^7Lb` a\_ kl / fi, ž 6[eba` [TW yttf K@r] r.tyz%>, %tvt?wau, ttAA@DeF@DeaUWtpt...:tp  
@SS?r.u.v.t, e? t)r?u@vt`]:@]vzty?tye@r.fv.t@M@r)p[aV@?fuž

5adLad 3ž BS` Vtg[ I 8ž V4agdVd[ež9 [ca` WVEž/ fž: efdgef S\_ T[YgagedfZVdFZS` Sd[e] k WU[e]a` 1  
7Lb` a\_ [Lb4g^Mf` I / fi, ž 6[eba` [TW yttf K@r] r.tyz%>, %tvt?wau, ttAA@DeF@DeaUWtpt...:tp  
r@r-szx, `tputztz, e?fuž

6aZ\_ WIFž 8S] I 3ž: gX\_ S I 6ž Eg` WVGž ELZgbbi ž VFI S' Vd 9ž9ž/ fž: V[h[VgS^d[e] Sff[fgVWž,  
? VsegVd\_ Wfi WVd\_ [ S feL S V TVZSh[acS^Lb` eVtgWUWž <gd S^aXfZWVgcbVt 7Lb` a\_ [U3eal[S]f[a` I  
/ fi, ž , ž ! ž ž ž ž ž ž ž ž

7U] W5ž5žVFI [eaa` I Dž=>ž/ fž: efdgef Sd[e] k WU[e]a` 1 <gd S^aX7Lb` a\_ [U4VZSh[acS` VA dS` [I S]f[a` I  
/ fi, ž , ž ! žWaz ž ž ž

7[ Zad I: žV: aYSdFZIDž/ fž 6WU[e]a` \_ S] [ Yg` WMS\_ T[Yg[fkž FZWagd S^aX4gef Vt / fi, E E ž

7^eTWd 6ž/ fž D[e] I S\_ T[Yg[fk I S V fZVESHSMVj [a\_ ež FZVNCgSdVt k <gd S^aX7Lb` a\_ [Lb / fi, ž  
6[eba` [TW yttf K@SS?(t, .2, .x@trs)v@ I EDEž

8aj I 5žDžV FhVt ki 3ž/ fž 3\_ T[Yg[fk ShVt[e]a` S V La\_ bSdS[hW]Y` acS` UV FZVNCgSdVt k <gd S^aX  
7Lb` a\_ [Lb / fi, ž , ž ! ž ž

8d[W\_ S I 4ž/ fž 5a` eg\_ VtdVba` eVfa [ UVf[hVg` VdS'fVd S[hVZVtFZ [ egdS` UMbcaYdS` ež: cg[dk  
/ fi, ž

8d[W\_ S I 6žV E g` Wd Ež/ fž 7j bVd\_ WfS^? VZaVe, 3 Bd\_ VdXad7Lb` a\_ [efž 5S\_ Td[VWVg` [hVt[fk BdVtž  
, ž I bSVtž

8d[WV: žV 4'g\_ W? ž7ž/ fž FZVWV\_ S V Xad[e] k SeeVtž FZVb\_ Vd[US` 7Lb` a\_ [UDVtVt / fi, ž  
6[eba` [TW yttf K@r. f?] tv?rt?`] @r.fv.tUS@Vzv@S` ~vp9RQpF: ?fuž

9[VdWV Vd 9žV: aXcSYWVgž/ fž: ai fa [ bcahWtSkVt[S` dVSe` [ Yi [fZagf [ efdgUf[a` , 8dVtWVuk  
Xad\_ Sfež BkLZaž[LS^DVtVt / fi, ž , ž ! ž ž ž ž ž ž ž ž

: Sg` I 6ž @Si dafZ I 5ž V5S^4ž/ fž 9dVt Sbv[e] d[e] žS] [ Y efdSfVt[e] S WU[e]a` \_ S] [ Y fSe] ž B>aEA @7  
ž , ž ! <gd S^ba` V ž ž

: VdLZ I žV H[e]ge I ž=>ž/ fž 5[YsdVt[e] a] VdSe` aT d[e] fS] Vdž FZVdVtVt aX7Lb` a\_ [LbS` VEfS[ef]Lb  
/ fi, ž , ž ! ž ž

: a'fi 5ž3žV>Sgckl Ež/ fž D[e] ShVt[e]a` S V [ UVf[hWVWVtž 3` VdV Kag` YELZaa^aXBa'Uk EfgV[VdVMSdLZ  
BSbVtEvdVt bSVt ž

=SVM ž: ž 4SffS[ai Dž5ž V9dWVt >ž/ fž 7Lb` a\_ [U5Za[UVFZVtckž 3` 7j bVd\_ WfS^3` S'ke[e]aX3` [ S^  
4VZSh[acž 5S\_ Td[VWVg` [hVt[fk BdVtž , ž I bSVtž

=S' W\_ S I 6ž =` VdLZ I ž>ž V FZS Vd Dž: ž/ fž 8S[d VteSeS` La` efdS[ f a` bcaXf eWV] Y , 7` fF W\_ Wfe  
[ fZV\_ Sd] Vtž FZVb\_ Vd[US` 7Lb` a\_ [UDVtVt / fi, ž , ž ! ž ž

=S' W\_ S I 6ž =` VdLZ I ž>ž V FZS Vd Dž: ž/ fž 3` a\_ S[Vt, FZVWVai \_ Wf VVtVt 'aee ShVt[e]a` I S V  
efSfgecgat[Sež <gd S^aX7Lb` a\_ [UBVtVtVtVt / fi, ž , ž ! Vtž ž ž ž ž

=S' W\_ S I 6ž V E\_ [fZ I Hž/ fž: fVh[W i [fZ fZW` SgdVtVt [ Vba` a\_ [Už @aTWBd] W] 7Lb` až  
\_ [LbValg\_ Wfe ž I @aTWBd] W5a\_ \_ [ffWV ž: fVh[W Tk BcaXVead = Sdž9 gefSX>I XdW S V 6d  
3` VžEabZ[W5dV] ž 6[eba` [TW yttf K@SS?e, sv] f. z' v?, .x@e, sv] pf. z' vt@t, e, -zt>ttzvvt@r...:rv tvt@CAC@  
|ryev-r@z@tv.%wS?yt-ž



=S` W\_ S t 6 ž V F H V e ] k l 3 ž / f i B d a e b W f f Z W d c k , S` S` S k e j e a X W W U [ e a ` g` W d d [ e ] ž 7 l a ` a \_ V i Z [ L B / f i , ž 6 [ e b a [ T W y t t f K a e S S ? f . z e t v t , e r u u | r y e v - r e a u t t e a ` s ] z t r t z , e t e f . . . t f v t p t y v , . C E f u w ž ! ž

=S` W\_ S t 6 ž V F H V e ] k l 3 ž / f i 5 Z S b [ f d W F Z V e \_ g S f a ` Z W g d e f U V S e - g W \_ W f g ` W d g ` U a F S ` f k , : W g d e f [ L e S` V T [ S e W = S` W\_ S t 6 ž E ` a h [ U B ž V F H V e ] k l 3 ž c V ž i b S V e ž 5 S \_ T d [ V W W G ` [ h V e ] f k B d V e t 5 S \_ T d [ V W W G = ž , ž ž

=S` W\_ S t 6 ž V F H V e ] k l 3 ž / f i 5 Z a [ U a h S ` g V e S` V X S \_ V e ž 3 \_ V a [ U S ` B e k L Z a ` a y k / f i , ž , ž ! ž J ž ž ž ž

=S` W\_ S t 6 ž V F H V e ] k l 3 ž / f i 5 Z a [ U a h S ` g V e S` V X S \_ V e ž 5 S \_ T d [ V W W G ` [ h V e ] f k B d V e t @ W` K a d ] t G E 3 ž , ž t b S V e ž

=` V i e L z i ž > ž / f i F Z W W V a i \_ W f V W W V S` V V i [ W W U a X ` a ` d V i V e [ T W ` V [ X W W U W U g d h V e ž F Z V B \_ V a [ U S ` 7 l a ` a \_ [ U D V i [ M i / f i , ž

> S ] e Z \_ [ S c k S` S` I H ž 5 Z W i ? ž V E S` f a d > ž / f i F Z W W a ` g f [ a ` a X W W U [ e a ` ž S ] [ Y g` W d d [ e ] , 8 d S \_ [ Y W W U f e [ \_ a ` ] V k d [ e ] b d V W W U V e ž < a g d S ` a X 7 j b i d \_ W f S ` E a [ S ` B e k L Z a ` a y k , ž 6 [ e b a [ T W y t t f K a e S S ? f e u . t , e r ` t ] r ? u u @ v t ` ] t e [ v z t y ? t y e e f r f v . t a W e r ] p [ V e B B ? f u w ž

> S ] e Z \_ [ S c k S` S` I H ž 5 Z W i ? ž V E S` f a d > ž / f i 7 ` V a i \_ W f V W W V [ \_ U S b g L Z [ \_ a ` ] V k e ž B Z [ ` a e b Z [ L S ` F d S` e S f [ a ` e a X F Z W D a k S ` E a [ V k 4 , 4 [ a ` a y [ L S ` E U [ W U W / f i , ž 6 [ e b a [ T W y t t f K a e S S ? e t s z ? e ] - ? e z y ? x , % e f - t e . i z t ] v t e ` T C F B H @ f u e . t t s O A A B E J ? f u w ž , ž ! d e f ž ž ž

? S L b a ` S V i 6 ž > ž = S W i ž : ž V i 4 S f f S [ a i D ž 5 ž / f i 3 ` [ S ` e U Z a [ U e a h V d g ` U a F S ` a g f l a \_ V e , 8 g d F Z V d V j b V d \_ W f S ` d v g ` f e ž F Z W 7 l a ` a \_ [ U - a g d S t / f i , ž , ž ! ž

? a f V i 9 ž / f i > S ` a d \_ W E A W c g W f [ a ` e ž 5 S Z [ V e W W S E A U g d f A ; ` V g e f d [ W W ž t 8 a ` V S f [ a ` b a g d g ` W 5 g ` f g d W W E A U g d f A ; ` V g e f d [ W W F a g ` a g e W 8 d S U W ; E E @ ž ž 6 [ e b a [ T W y t t f K a e S S ? w e t z ? , . x e ž

D S T [ t ? ž / f i B e k L Z a ` a y k S` V W a ` a \_ [ U e ž 4 W i W i G ` [ h V e ] f k a X 5 S ` Y a d [ S i 6 W d S f \_ W f a X b e k L Z a ` a y k ž 6 [ e b a [ T W y t t f K a e z t v t w . x ? z t t ? f t ` u u @ a u š u t e u š e ] , r u P u z N B A ? B ? B E C ? J F F i 7 . v f N v f B t Q A V N f u ž

D a f Z i 3 ž 7 ž V E Z S b ` V k i > z E ž / f i E f S T ` V S ` a U S f [ a ` e S` V f Z W b d S u f [ e W a X \_ S o j V W V e Y` ž E U [ W f [ X U T S Y ] Y d a g ` V a ` f Z V E h W [ Y V e D [ ] e T S ] b d [ W ` W a ` a \_ [ U e [ W U V e [ \_ W \_ a c k a X 3 ` X W @ a T W F Z W D a k S ` E i W [ e z 3 U S W \_ k a X E U [ W U V e ž

E S \_ g V e a ` I I ž V L W U ] Z S g e V d D ž / f i E f S f g e c c a T [ S e [ W U [ e a ` \_ S ] [ Y ž < a g d S ` a X D [ e ] S` V G ` U a F S ` f k / f i , ž , ž ! 4 8 ž

E S h S Y W > ž / f i 8 a g ` V S f [ a ` e a X e S f [ e f ] U ž I [ V k ž E W a ` V c v [ f [ a ` t @ W` K a d ] t 6 a h V e ž

E [ \_ a ` t : ž 3 ž 7 Y [ V i ? ž H [ S W D ž V i ? S d [ e ] D ž / f i 7 l a ` a \_ [ U ž T a g ` W W d S f [ a ` S [ f k S` V f Z W b a Y [ f i h V d V a ` g f [ a ` ž 7 7 ` Y S d ž , ž ž ž ž t b S V e ž

E i b [ d a t 9 ž 9 ž / f i ? V S e g d [ Y d [ e ] S h V e [ a ` , 3 ` S ` V d S f [ h W S b b c a S U Z ž F Z W D V i W a X 7 l a ` a \_ [ U e S` V E f S f [ e f ] U ž / f i , ž , ž ! ž

F Z S V d D ž : ž / f i F a i S d V S b a e f [ h W F Z W d c k a X U a ` e g \_ V d U Z a [ U W ž - a g d S ` a X 7 l a ` a \_ [ U 4 V Z S h [ a d S` V A d S` I ] S f [ a ` t / f i , ž , ž ! ž / f i ž ž

F h V e ] k l 3 ž V i = S` W\_ S t 6 ž / f i F Z W X S \_ [ Y a X W W U [ e a ` e S` V f Z W b e k L Z a ` a y k a X U Z a [ U W ž E U [ W U W / f i , ž , ž ! e [ W U W ž ž

h S ` 6 [ ] t 7 ž V i h S ` = [ b b W T V d i 6 ž / f i F d S V [ Y i [ W , A ` f Z W W V a i \_ W f V W W V i ` a e e S h V e [ a ` t S` V f Z W U a \_ b S c S T [ f k a X U a ` e g \_ V d Y a a V e ž < a g d S ` a X 7 l a ` a \_ [ U B e k L Z a ` a y k / f i , ž , ž ! E ž / f i ž ž

H a ` @ V j \_ S ` t ž V i ? a d W e V d t A ž / f i F Z W d c k a X Y S \_ W S` V W a ` a \_ [ U T V Z S h [ a d S` B d [ U V a ` G ` [ h V e ] f k B d V e t B d [ U V a ` t G E 3 ž d V W ž / e f W f i , ž ž

I [ ] [ ` e a ` t @ ž / f i 3 ` [ f a V g U f [ a ` f a T V Z S h [ a d S` W a ` a \_ [ U e , 3 Y g [ W V e d e f g W W f e ž B S Y d S h W` S U [ ` S ž , ž t b S V e ž



## FYdfcXi Vm]cb XY W XcW/a Ybh

5Wwalg\_ WfVfV[XgeAeMa` VefVd\_ VevVWS [UWUW4KZ@5Z@6 Vg 5dVf[hW5a\_\_ a` ezhage  
AfVf [TdVfVWdVbcaVg[dMV[efdTgVdVfLa\_\_ g` [cgVdUWfVWbASf[a` Sg bgT [UeVfA` VefLa` V[f[a` e  
eg[hS fVf,

BSfVf [fAZhageVWVW UfVd`W a\_ VW`Sgfvjgdad[Y] S`VWS\_ S [AdW] V[cgAWbSd^SgfvjdVW  
^ ghdmAg` Mf[fg`S[dWVfVch[fe cg[ hageLa` XAdWUWfVMSgfa[efSf[a` /\_ S[ebSeVg` W\_ S` [AdW  
cg[ egYYAdVfS[fcg [ehageeagf[W` Wf ag SbbdaghWf hafdvjgf[efSf[a` VW` ghdmVf

BSeVgf[efSf[a` La\_\_ VdU[S`Vzhage` ShW bSe`Wdch[fVgf[efVdUWfVWbASf[a` 1 WfX` e  
La\_\_ VdU[S`Vfz

BSeVW\_ aV[X[USf[a` zhage` ShW bSe`Wdch[fVW\_ aV[X[Vd WfcdS` eAd\_ Vdag VSVbVdUWfVW  
UbASf[a` z



Hage baghW fAZSdVdUWwalg\_ Wf S[` e[ cgVW SgfvfVS` e`S La`Vf[a` Wf 5SZ[Vf WWS EAZ  
Ugd[fA` Vgefd[VWMSgj Xad` Sfe` f` /bagd [efVgeVfAVfch` [cgVfVfSTVfVf` g\_ Ad[cgVfVfVf  
/bagd [efVgeVf=[ VVfVWbg[e` WefW` VV WWS 8a` 5E; z6 VfVW\_ b[S[dVf bSb[Vd bVghWf AfW  
La\_\_ S VAEsgbdAeVg` eVh[UW [ bdmef[a` 1` SVW\_ S` Wfz



8a` VSf[a` bagdg` W5g`fgdWWEAlgd[fA` Vgefd[VWV  
8a` VSf[a` WdWZVdZVdWd` gW gf[ffAbgT [cgW  
ytf K@SS?WETdZ?, .x@

S`AWC\_ [W? a` ea 4B  
Fag`ageUWVWj  
8dS UW

FAZAbZa` Wf  
Fi [ffVd QrWETdZ  
5agdvWf t, €trtQWETdZ?, .x







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6 allée Émile Monso  
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