What Drives Stock Price Movement?

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Abstract

A cen r s ss e n sse pr c ng s he her s oc pr ces mo e d e o he re s ons of e pe ed f re c sh o s or/nd of e pe ed d sco n r es nd y ho m ch of e ch s ng consens s c sh o forec s e sho h h here s s gn c n componen of c sh o ne s n s oc re rns hose mpo r nce ncre ses h n e s men hor zons For hor zons o er hree ye rs he mpo r nce of c sh o ne s f r e ceeds h of d sco n r e ne s hese conc s ons ho d o h rm nd ggreg e e e s nd d ers c on on y p ys s second ry ro e n e ng he re e mpo r nce of c sh o /d sco n r e ne s he con en on sdomn h c sh o ne s dom n es h he rm e e d sco n r e ne s dom n es h he ggreg e e e s rge y s my h dr en y he e s m on me hods F n s y s oc re rns nd c sh o ne s re pos e y corre ed o h rm nd ggreg e e e s

JEL C ss c on G E
ey ords An s ys forec s e pe ed re rn d sco n r e ne s c sh o ne s pred c y

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1 Introduction

nderst and ng hy stoc pr ces mo e p and do n s a cent ra ss e for nanc a econom sts Do stoc pr ces change ec a se of ne nformat on on e pect ed cash o s or ec a se of t me- ary ng r s a ers on and n est or sent ment ? he cr c a q est on as Cochrane (006) p t s s o m ch of each?" he re at e mport ance of cash o s (CFs) and d sco nt rat es (DRs) re ea s ho t he nanc a mar et or s and has profo nd mp cat ons for t he ma or oc s of asset a at on – cap t a dget ng port fo o a ocat on so rces of syst emat c r s r s management and so on [1]

nce net her e pect ed cash o s nor d sco nt rat es are o ser a e a common pract ce n t he c rrent t erat re s t o se t he d dend pr ce rat o (d dend y e d) t o pred ct t he t o component s and dra conc s ons on t he re at e mport ance ased on t he r re at e pred ct a t y he dea s t hat t he d dend y e d y de n t on s eq a t o t he e pect ed f t re cash o s d sco nt ed y t he e pect ed d sco nt rat es t s ar at on m st a so re ect t he re s ons of t he t o e pect at on component s h e t h s t erat re pro des mport ant e dence on pred ct a t y t s a t y t o ans er t he q est on of hat dr es st oc pr ce mo ement ?" s m t ed for t o reasons

F rst d dend y e d ar at ons are not t he same as ret rn ar at ons mag ne a st oc t h a const ant d dend y e d and a const ant e pect ed d dend gro t h rat e pr ce changes are mat ched propor t ona y y d dends he d dend gro t h rat e s not pred ct a e Yet a pr ce ncrease s dr en y CF ne s – a h gher d dend payo t and h gher e pect ed f t re cash o s (e h gher d dend e e m t p ed y a const ant e pect ed d dend gro t h rat e) herefore t here co d e p ent y of pr ce mo ement and re s ons of e pect ed f t re cash o s (n do ars) t no d dend gro t h rat e pred ct a t y econd t he pred ct e po er on e pect ed cash o gro t h rat es/d sco nt rat es s sma and freq ent y a sent More mport ant as e sho e o e en f pred ct a t y can e fo nd t s d c t t o nt erpret t s mean ng

e a o d t he re ance on pred ct a t y yd ams dpr r e he

pr ce ch ange (e c pt g n rte rn) CF ne s nd DR ne s t rm nd ggregte e e s

What drives aggregate stock returns? At he ggregte e e t he pot on of rte rns t- t r t edt o CF ne s s s gn c h 6% t q t er y hor zon 6% t nn hor zon 6% t t o-ye r hor zon 63% t t hree-ye r hor zon nd 80% t se en-ye r hor zon herefore s gn - c h pot on of ts oc pr ce r t ons s re t edt o CF ne s nd ncre s ng y more so s n ets men hor zon e p nds For hor zons more h nt hree ye rs CF ne s f r e ceeds DR ne s

O r nd ng ppe rst o d er sh rp y from t he some ht d sconcer ng nd ng nt he c ss c sste pr c ng t ert re ht t here s mos no CF ne s t t he ggregte e e (e g Cochr ne (00 006)) [2] N necess r y so f one re zest ht pr ce o t y s nt t he s me s d dend y e d o t y ht t he c rren t ert re re y s ys st ht t he d dend gro t h rte s n pred t e y t he d dend y e d [3] B t s e h e rg ed t here co d e p en y of CF ne s e en f he d dend gro t h rte s n pred t e he nd ng nt he c rren t ert re pro des d ret e dence on pred t t y t n d ret y on rte rn mo emen

In con rts o r nd ng s yst ht s gn c h pot on of ggregte e ts oc pr ce mo emen s ccomp n ed y con empor neo s re s ons of m r e pre ng forec s s on f re c sh o s h s res t s ys n h ng ot pred t t y t s sed on t ets d ret y re ted o ts oc pr ce mo emen f rge y e e t est he concern nt he c rren t ert re y ets sh ng ts rong n t een ts oc rte rn nd CF ne s

O r nd ngt ht t he mpot nce of CF ne s ncre ses t h n ets men hor zon s n t e nce t he DR s ts t on ry t s mp t ont he c m t e re rns m ts e m n m ht s s n ets men hor zon e p nds rte rns m ts re e CF ne s ncre s ng y more n t he ong-r n nt s rte rn ne s m ts e CF ne s (e g nsen e on nd L (005) nd B ns D t m r nd (006)) e0 35 (0 3 076(J-3 37- 7 08(0368(3 37 6(78 0 78385 0 0 50fF ( ) J3 3

ts tr st o e ceed nd dom nt e DR ne s

How are returns and CF news correlated at the aggregate level? Aggregte e rt rns nd CF ne s h e s gn c n y post e corre t on of 0 6 t q tr er y hor zon 0 t nn hor zon 0 86 t t hree-ye r hor zon nd 0 8 t se en-ye r hor zon h t e y s nce ts oc k rt rns m ts ncre s ng y represen CF ne s s n ets men hor zon e p nds t h s corre t on sho d r se

he c rren t ert re pro des m ed e dence ont he re t on t een rt rns nd *realized* CFs M ny ts d es nd post e re t on (e g Ro (88) Fm (0) h r nd h n en ( ) nd t m gh (0), h e h r Le e en nd rner (006) doc men neg t e re t on A neg t e re t on s gges st ht t he DR n on y goes p t me hem here s post e CF ne s t so dom nt es t he CF ne s nd m k es rt rns neg t e As h r Le e en nd rner (006) po n ot s ch nd ng s co n er- n t e nd p zz ng

One m t on of ts dy ng he re t on t een rt rns nd *realized* CFs st ht t s d c t t o net hem p – rt rns co d h e responded o e rn ngs ne s he d of me n comp r son t s e s en o mt ch he for rd- oo k ng CF ne s (c c ted from n yts forec ts s) t h ts oc k rt rns O r res t s re n t e nd e t e he concern y h r Le e en nd rner (006) he ncre s ng corre t on (t h hor zon) s so n mpo t n propet y ht t h s rge y een m ss ng nt he c rren t ert re

What drives firm-level stock returns? A t he rm e e on ver ge t he pot on of ts oc k rt rns tt r t ed o CF ne s s 5% t q tr er y freq ency 6 % t t o-ye r hor zon 76% t t hree-ye r hor zon nd 8 % t se en-ye r hor zon hese n m ers re s gh y h gher t h nt hose for t he ggregt e pot fo o t t he shor end s gges ng t ht t he CF ne s s d vers ed re t e y more t h nt he DR ne s o e ert h s d vers ct on e et s second ry nt ht t does no ch nge t he re t e mpo t nce for shor hor zons DR ne s seems more mpo t n t h rm nd ggregt e e e s for ong hor zons CF ne s dom nt es t h rm nd ggregt e e e s

he nd ng ht t here s on y n nt ed *relative* CF/DR d vers ct on e et hen mo ng from nd d rms t ot he ggregt e pot fo o pro des ts r k con r s t ot he pre ng e t ht ec se of d vers ct on CF ne s dom nt es t rm e e t DR ne s dom nt es t t he ggregt e e e f t her sho t ht t he con en on e h s tt et o do t h d vers ct on t s m n y dr en y t he f nd men d er- erence t een cross-set on nd me-ser es pred t y B s c y t he cross-set on he erogen y of CFs s pers s en (e g L on sho k h e fer nd

shny ( ) and Fama and French (5)) and pred e t s h s e sy o nd ht CF ne s dom n es hene er p ne d – common for rm and por fo o n ys s – s d ed o e er n he me-ser es d mens on CFs re ess pred e h n DRs and DR ne s s s y fo nd o e more mpor n p re me ser es regress ons – common for he ggreg e por fo o n ys s

If one n s o nder nd hy s oc[k] pr ces mo e ro nd h ch s me ser es concep hen me-ser es e s re more s e[4] In h s c se fo o ng he con en on me hods s ng re zed re rn d (nd no s ng forec s s d) e sho h nn hor zon DR ne s s more mpor rm por fo o nd ggreg e e e s he oppos e s fo nd hen p ne d s sed As n e reme e mp e e so he ho e m r[k] e o o por fo os e ers s gro h e ch of h ch s e d ers ed If e pp y me ser es n

t me r t on of e pe ed rn nd c sh o gro h r es t s on y nd re y re ed o s oc pr ce o t y O r ppro ch comp emen s h s er re m he sense h e s y no h ng o pred c t y s d re y re ed o s oc pr ce o t y

Caveats and what to take away h s p per h s fo r nd ngs F rs here s s gn c n componen of CF ne s n s oc rn s h s pos e y corre ed h s oc rn s econd he mpor nce of CF ne s ncre ses h n e s men hor zon A hor zons more h n hree ye rs CF ne s f r e ceeds DR ne s n dr ng s oc rn s h rd he rs o conc s ons ho d o h rm nd ggreg e e e s ccord ng y d ers c on p ys s second ry ro e n e ng he re e mpor nce of CF/DR ne s n dr ng s oc rn s Fo h he con en on sdom n es CF ne s dom n es rm e e DR ne s dom n es he ggreg e e e s my h dr en y es m on me hods

A ey ss mp on n o r p per s h he n ys e rn ngs forec s s me y re e he m rg n n e s ors e ef reg rd ng f re CFs Any de e on from h s ss mp on s ch s s e or oo op m s c n ys forec s s e y o pre en s from nd ng s rong ro e of CF ne s n dr ng s oc rn s n h s sense o r es m es on he mpor nce of CF ne s n he shor r n c n e reg rded s o er o nd – e er CF me s res sho d m e he res s s ronger O r conc s ons reg rd ng he mpor nce of he CF ne s n he onger hor zons (more h n hree ye rs) sho d no e ec ed m ch s nce he CF ne s re dy dom n es m r y hese ses/de e ons re n e y o ec ny of o r o her conc s ons

he res of he p per proceeds s fo o s n e on e descr e he me hod o cons r e CF ne s nd DR ne s nd repor he s mp e s mm ry n e ons 3 nd e repor he e dence e ggreg e nd rm e s respe e y n e on 5 e cond c ro s ness chec s A r ef conc s on s pro ded n e on 6

2 The model and the sample

2.1 The model

Fo o ng P s or nh nd m n h n (006) e de ne he eq y e s he presen e of f re d dends" nd erm n e

$$P_t \quad \sum_{k=1}^{T} \frac{FE_{t+k}(- b_{t+k})}{(+ q_t)^k} + \frac{FE_{t+T+1}}{q_t(+ q_t)^T}, \qquad ( )$$

here P_t s stoc^k pr ce FE_{t+k} s earn ngs forecast k years ahead b_{t+k} s the p o ac^k rate (e $- b_{t+k}$ s the payout rat o) and q_t s the cost of eq ty T s set to e 5 years

For each rm the earn ngs forecasts for $t+$ $t+$ $t+3$ are the consens s ana yst forecasts for the rst three years respect ey and are obta ned from the I/B/E/ data ase For year $t+$ to $t+T+$ e ass me the earn ngs gro th rate and the earn ngs forecasts are

$$g_{t+k} \quad g_{t+k-1} \times \exp[\log(g/g_{t+3})/(T-)] \qquad ( )$$

$$FE_{t+k} \quad FE_{t+k+1} \times (+ g_{t+k}) \qquad (3)$$

H ere g_{t+3} s the rm-spec c consens s ong term earn ngs gro th forecast g s the ong term nom na GDP gro th de ned as the steady-state" GDP gro th (he h stor ca a erage of ann a GDP gro th rate p to that year) he a o e form a s ggest that the earn ngs gro th rate for each rm mean re erts to the ong term GDP gro th y year $t+T+$

e a so need to forecast the p o ac^k rate b_{t+k} For the rst t o years the p o ac^k rate s ca c ated from the most recent net payout rat o for each rm he net payout s common d dends (tem n COMP A) p s stoc^k rep rchase (tem 5) m n s stoc^k ss ance (tem 08) he net payout s then d ded y the net ncome (tem 8) to o ta n the net payout rat o If net ncome s negat e e rep ace t y 6% of assets

he p o ac^k rate then mean re erts et een year $t+3$ and $t+T+$ to a steady-state rate h s s ased on the ass mpt on that n a steady state the prod ct of the ret rn on n estment ROI and the p o ac^k rate e s eq a to the gro th rate n earn ngs g $ROI \times b$ If e f rther ass me that the ret rn on n estment s eq a to the cost of eq ty then the steady-state p o ac^k rate s $b \quad g/q$, e the rat o of GDP gro th to cost of eq ty herefore the p o ac^k rates from $t+3$ to $t+T$ are

$$b_{t+k} \quad b_{t+k-1} - \frac{b_{t+2} - b}{T - }. \qquad ( )$$

th the forecasted earn ngs and p o ac^k rates e then ac^k o t the cost of eq ty s ng eq at on ( ) for each rm at each po nt of t me he a o e set of ass mpt ons fo o Pastor nha and am nathan (006) e e am ne a ternat e mode s n ect on 5

CF news and DR news e can re r te eq at on ( ) as

$$P_t = \sum_{k=1}^{T} \frac{FE_{t+k}(1-b_{t+k})}{(1+q_t)^k} + \frac{FE_{t+T+1}}{q_t(1+q_t)^T} = f\left(c^t, q_t\right). \quad (5)$$

By construction, stock price P_t is a function of the vector of cash flow forecasts available at time t (the superscript t), c^t, and the discount rate q_t. The proportional price difference between $t+j$ and t is then

$$r_t = \frac{P_{t+j} - P_t}{P_t} \quad (6)$$

$$= \frac{f\left(c^{t+j}, q_{t+j}\right) - f\left(c^t, q_t\right)}{P_t} \quad (7)$$

$$= \frac{\left(f\left(c^{t+j}, q_{t+j}\right) - f\left(c^t, q_{t+j}\right)\right)}{P_t} + \frac{\left(f\left(c^t, q_{t+j}\right) - f\left(c^t, q_t\right)\right)}{P_t} \quad (8)$$

$$= CF_t + DR_t, \quad (9)$$

where

$$CF_t = \frac{\left(f\left(c^{t+j}, q_{t+j}\right) - f\left(c^t, q_{t+j}\right)\right)}{P_t} \quad (10)$$

is the CF news. This is so because the numerator is calculated by holding the discount rate constant at $t+j$ and the difference is driven by the CF difference between t and $t+j$. Similarly,

$$DR_t = \frac{\left(f\left(c^t, q_{t+j}\right) - f\left(c^t, q_t\right)\right)}{P_t} \quad (11)$$

is the DR news. This is so because CFs do not change in the numerator and the difference is driven by the variation of discount rates in the period. Note, DR news and DR go in opposite directions. We can then study the variance of the capital gain return through CF news and DR news:

$$VAR(r_t) = COV(CF_t, r_t) + COV(DR_t, r_t) \quad (12)$$

$$1 = \frac{COV(CF_t, r_t)}{VAR(r_t)} + \frac{COV(DR_t, r_t)}{VAR(r_t)}, \quad (13)$$

where VAR and COV are variance and covariance operators, $\frac{COV(CF_t,t_t)}{VAR(t_t)}$ is the slope coefficient of regressing CF_t on r_t, $\frac{COV(DR_t,r_t)}{VAR(r_t)}$ is the slope coefficient of regressing DR_t on r_t. In other words, to understand the portion of return variance that is driven by CF news and DR news, one only needs to regress CF news and DR news on the capital gain returns respectively and draw inferences based on the slope coefficients.

What should one expect from the model? he mode ses an yts forec ts s nd ts oc k pr ces t o ac k ot t he DRs h s me ns ht t he DR ne s c p rest he res d ne s For e mp e f t he pdt es on an yts forec ts s re p re y no ses t hent he rden of e p n ng rt rns f s comp t e y ont he DR ne s In t her ords t s no s rpr s ngt o see ts rong ro e oft he DR ne s t he s ccess oft he mode depends on ho e e c n c p ret he CF ne s s ncet he DR ne s p c k pt he ret s

A ey ss mp on nt he mode st ht t he pdt es on an yts forec ts st me y c p ret he m rg n n ets ors re s ons on e pet ed ft re CFs here re good re sons hyt he re t y m gh de t e fromt h s ss mp on For e mp e some an yts forec ts s co d e ts e ec se t hey re no pdt ed n t me y f sh on t s so e no nt ht e rn ngs forec ts st end o et oo op m ts c o e er no et ht t hese o t onst end o pre en s from nd ng ts rong CF et s – t er pro es of e pet ed CFs re e yt o y e d ts ronger res t s nt h s sense o r ets mt es of t he CF et s c n e reg rded s o er o nd fort he t CF et s

he mp ed d sco n rt e st he s me for hor zons h et h s pro des no nform t on on t het erm ts r t re of e pet ed rt rns t c n ts c p ret he DR ne s he presen e of ts oc k c n e nt en s ng et her t erm ts r t re of DRs or s ng e DR (ts e ond y e d) t he s ng e DR s f nt on oft het erm ts r t re oft he DRs o d ng e pet ed CFs cons nt DR ne s c n e c p red y s ng et hent he ch nges oft het erm ts r t re oft he DRs ont he ch nge oft he s ng e DR

F n y CF (DR) ne s s de ned st he propor on pr ce ch nge d et ot he ch nge of e - pet ed CFs (DR) h s de nt on t st he porh g rch - 0 3 (D 0 33 f 8(r 0 f 0368(0 50

Bes des e rn ngs forec s e so co e from I/B/E/ sh re pr ces nd he n m er of sh res ot s nd ng o e nc ded n he s mp e e req re non-m ss ng d , for one-ye r hed e rn- ngs forec s If rm h s m ss ng forec s for ye r o e fo o he e ng er re nd pro e e rn ngs n he second ye r s ng he ong erm gro h r e nd he pr or ye r s e rn ngs forec s FE_{t+2} $FE_{t+1} \times (1 + g_{t+3})$ e so req re h he rm h s pr or ye r s d dends n COMPU A e res r o r s mp e ot he 1985-2006 per od ec se I/B/E/ co ers o fe rms efore 1985

e pro des he ye r- y-ye r q er y s cs for he n s mp e he n m er of rms r nges from 105 to 8 5 he e ge p yo r o (rep rch se nd ss nce nc ded r nges from 3% o 53% O er o r s mp e represen s more h n 78 perce n of he o m r e c p z on here s gener do n rd rend of cos of eq y d r ng he s mp e per od h ch m es sense ec se here s so s m r do n rd rend off he r s free r e for he s me per od

3 Aggregate level evidence

e nsor ze rm-spec c r es n he n s mp e h he % nd % re po n s e hen co pse he s mp e n o e- e gh ed ggreg e me ser es co er ng 1985-2006 he p rpose s o s dy he re on mong rn s CF ne s nd DR ne s for he m r e po fo o

e no e h rn s s de ned n eq on (6) do no nc de d dends s nce o r pr m ry go s o s dy pr ce o y In ddi on d dends p y m nor ro e n he o rn o y ny y For e mp e for he pos r per od he e ge q er y o rn for he CR P e- e gh ed po fo o s 3 03% h s nd rd de on of 7 % he e ge q er y rn e c d ng d dends s % h s nd rd de on of 7 % D r ng 1985-2005 he e ge o rn s 3 33% h s nd rd de on of 8 % he e ge rn e c d ng d dends s 7% h s nd rd de on of 8 3% herefore d dends on y e he e e of rn s s mp on rn o y s neg g e

In he fo o ng e ddresses o ss es n seq ence

3.1 What drives aggregate stock price volatility?

In P ne A of e e repor e ge c m e gn rn s CF ne s nd DR ne s r ng ng from one o 8 q er s he e ge q er y rn s 65% 08% of h s CF ne s nd 80% of h s DR ne s heore c y s nce he DR s me n re e ng he e ge DR ne s he rn d e of he ch nge of d sco n e – sho d e zero f he s mp e s ong eno gh he

pos e erge DR ne s s d e o he f t h d r ng o r s mp e per od here s dec ne of he DR

As he n es men hor zon ncre ses he er ge CF ne s gro s f s er h n he er ge DR ne s A q er y hor zon he er ge CF ne s s ess h n h f of he DR ne s se en-ye r hor zon he er ge CF ne s s o hree mes of he er ge DR ne s h s s he n es men hor zon ncre ses n ncre s ng y rger por on of he c p g n s c sed y he CF erence d r ng he per od

e nd s m r r nce p ern n P ne B n h ch c se e repor he r nces co r nces nd corre ons of r rns CF ne s nd DR ne s he fo o ng eq on sho d e s s ed

$$VAR(\text{r rn}) \quad VAR(\text{CF ne s}) + \times COV(\text{CF ne s, DR ne s}) + VAR(\text{DR ne s}) \quad (\ )$$

he q r er y r rn r nce s 0 56% h ch corresponds o n nn zed o y of 7% yp c for he m r e por fo o Of he 0 56% 0 % s d e o CF ne s r nce nd 0 5 % s d e o DR ne s r nce – DR ne s s m ch more o e nd p ys gger ro e As he me hor zon ncre ses h e he r nces of o h CF ne s nd DR ne s c m CF ne s ecomes more nd more mpor n A o-ye r freq ency he CF ne s r nce s 0 % ers s 8% for DR ne s se en-ye r hor zon he CF ne s r nce s 30 75% ers s 3 % for DR ne s

herefore for o h he me n nd he r nce he ro e of he CF ne s ncre ses h hor zon nd gr d y dom n es he DR ne s he mo ng mpor nce of CF ne s h hor zon s n e nce he DR m s e s on ry he c m e mp of s re s on – he erence of DR hro gh me – m s e m n m f he CFs re he d cons n P erен y he P 500 nde es e ch q r er d e o o h CF ne s nd DR ne s o e er m or re son hy he P 500 nde h s more h n do ed n he p s 5 ye rs s h he e pe ed CFs (n do rs) for he op 500 comp n es h e mped p

For he s me re son B ns D m r nd (006) rg e h he co r nce een s oc r rns nd he s och s c d sco n f or m s represen more nd more he CF s he me hor zon ncre ses n he ong-r n m ne s m s e CF ne s nd m s e CF (see so nsen e on nd L (005)) he ncre s ng mpor nce of CF ne s (h hor zon) s por on of s oc r rns s h s f nd men proper y rrespe e of econom c mode s he me n nd r nce p erns n e re cons en h h s proper y

e form y es he re e mpor nce of CF ne s/DR ne s n dr ng pr ce r nce n P ne C n p r c r e regress CF ne s nd DR ne s on r rn respe e y he s ope coe c en s s

sho n n eq t. on (r 3 y e t he pot on of s oc k rte rn \ r nce t ht. s dr \en y e ch componen A q r er y hor zon r 6% off he re rn \ r t. on off he m r k e pot fo o s e p ned y CF ne s h s percen ge ncre ses t o 6% t. nn hor zon 6% t t o-ye r hor zon 63% t t hree-ye r hor zon nd 80% t. se \en-ye r hor zon

A s ope coe ic en s re s gn c n t. r% ccord ng t he Ne ey- e t -s t. s cs No e ht. t he regress ons t h hor zons more h n one q r er se o \er pp ng d t. o e \er n k e he s ong-hor zon pred t \e regress ons s ng o \er pp ng d t. here he coe ic en s nd t -s t. s cs do no mech n c y ncre se t h hor zon (see Bo do h R ch rdson nd h e (006)) h s s ec se e do no r n pred t \e regress ons n h t. ed res s e s m t. e nd nd t ht. s ng o \er pp ng d t. (t no pred t \e regress ons) does no e nd o ses n he coe ic en s or t -s t. s cs ht. \ry syst emt. c y t h n \es men hor zon

n s m fon he m r k e -pot fo o t here s s gn c n componen of CF ne s n re rns h ch ncre ses t h n \es men hor zons For hor zons more h n t hree ye rs CF ne s f r e ceeds DR ne s

Link to the literature

nce ne her CF ne s nor DR ne s s o ser \ e t he common pr ce n he c rren t ert. re st o g. get he r re t. \e mpor nce sed on pred t. t y he gener. nd ng st ht. fort he pos r per od s oc k rte rns re m ch more pred t. et h n d \ dend gro t h rt. es re he con \en on. conc s on sed on s ch . nd ng st ht. mos . re rn \ r t. ons off he m r k e pot fo o re dr \en yt he DR ne s mos none yt he CF ne s (e g Cochr ne (r 00r 006) C mp e nd Ammer (r 3) nd C mp e nd h er (r 8)) mpor n y no et ht. t h s conc s on ho ds e \en for ong n \es men hor zons ec se h one-per od nd m t -per od re rns re m ch more pred t. et h n d \ dend gro t h

O r nd ng t ht. t he DR ne s s more mpor n t h n he CF ne s n he shor r n s cons s en t ht h s t ert. re O r nd ng t ht. t he CF ne s gr d y dom n t. est he DR ne s st he n \es men hor zon ncre ses represen s m or mpro \emen o \er t he c rren t ert. re fort o re sons F rs t rge y m gt. est he concern ht. tt e CF ne s seems t o e s t. t he ggregt. e e \e o n cet o d e" n Cochr ne s (00r 006) ords

econd t he dom n nce off he CF ne s t. t he ong hor zon s n h t \e prope t yt ht. sho d e st. s ed h ch pro \ des n mpor n y rds c k o ssess t he s ccess off he es m t. es ht. s t s no s . ot he her CF ne s or DR ne s s more mpor n t s . ot h ch componen

the horizon is more important and the high point CE ness

marginal investors and financial analysts. Crucially, since the correlation between CF news and returns is positive, this suggests that stock prices do go up, but not to the full extent, when there is positive CF news; this is forcing a negative DR news at the same time. Therefore, regardless of the interpretation, the key point is that the negative DR news does not dominate the CF news and does not make the correlation between return and CF news negative.

Third, the correlation between CF news and DR news becomes 0.[illegible]7 at the three-year horizon and steadily increases to 0.58 at the seven-year horizon. This suggests that at business cycle frequencies, the CF news and DR news are positively correlated and are also positively correlated with the stock returns. That is, when there is positive CF news, the DR goes down and both CF news and DR news contribute to stock price in the same direction.

Link to the literature

Prior evidence on the correlation between stock returns and CF news is mixed. Some studies find a positive relation between stock returns and *realized* CF news (e.g., Roll (1988), Fama (1990), Kothari and Shanken (1992), and [illegible] (1990)). On the other hand, Kothari, Lewellen, and Warner (2006) document the robust and yet surprising finding that aggregate returns are negatively related to *realized* earnings news. Since the CF news is positive in this case, the DR must have gone up to such an extent that it dominates CF news and makes returns negative. As Kothari, Lewellen, and Warner (2006) point out, this finding is counter-intuitive and against the asset pricing theory. While it is not hard to imagine that the CF news and DR news can be negatively related at times – this happens when CF news rises more than price – it is difficult to believe that the DR news can dominate at good times and reverse the positive relation between returns and CF news.[6]

Our finding sheds new light on this puzzle in the literature. First, we find a significantly positive correlation between stock return and CF news even in the short run. Crucially, even though the CF news and DR news could be negatively related in the short run, the DR news does not dominate the CF news. This finding largely mitigates the puzzle raised in Kothari, Lewellen, and Warner (2006).

Second, the correlation between stock returns and CF news should be positive in the long run. Therefore, any conclusion regarding this correlation must be conditional on the investment horizon. That is, if a negative relation is found, the remaining challenge is to show how this relation turns positive with longer investment horizons. Ultimately, if one finds that the DR news plays a dominant

[6] A significantly negative relation between the aggregate return and the CF news would suggest a procyclical expected risk premium, which seems counter-intuitive.

role in stock returns. The remaining challenge is to show how the DR news is yields to CF news in terms of importance as the investment horizon increases. This issue of investment horizon has been largely omitted in the current literature. [illegible]

Why do we get results so different from those in [illegible] (2006)? In [illegible] results, we confirm their finding that when realized earnings news is used, the contemporaneous correlation between returns and earnings news is not positive. Therefore the difference might mainly stem from our use of analysts forecasts, which we believe contain a clear advantage. In particular, both returns and CF news should be forward-looking, incorporating expected cash flows in all future periods. However, realized earnings news is backward-looking with information continually updated in the financial market. Stock returns could have reflected future earnings news long before this news is formally reported and realized. In comparison, because both returns and analysts forecasts are forward-looking, they are essentially in line with respect to time. Therefore, by using forward-looking measures, we are able to reach an intuitive conclusion and alleviate the concern by [illegible] (2006).

4 Firm level evidence

How are returns, CF news, and DR news related at firm level? If returns are driven by both CF news and DR news at the firm level, which component is relatively more diversified away when an increasingly more diversified portfolio is held? These are important issues that help us understand the nature of the financial market and portfolio management.

To examine these issues, we conduct the same time series analysis as we have done for the aggregate portfolio for each firm separately. To do so, we require that each firm should have at least [illegible]6 quarters of data. We then report the cross-sectional average of firm-specific results in Table 3.

We first note that stock returns and CF news have a correlation of 0.[illegible]5 (significant) at the quarterly horizon, 0.[illegible]5 at the annual horizon, and 0.[illegible]7 at the seven-year horizon. Therefore, consistent with the evidence that the aggregate level stock returns and CF news are significantly positively correlated at the firm level, and this correlation increases monotonically with investment horizon.

At the quarterly horizon, a significant [illegible]5% of firm stock returns is related to CF news. In comparison, the corresponding number at the aggregate level is [illegible]6% (Table [illegible]). Therefore CF news is diversified away more than the DR news. But this relative diversification is secondary in that it does not reverse the overall pattern. At the quarterly horizon DR news is more important in driving

stock returns at both the firm and aggregate levels.

At annual-horizon, 5[illegible]% of firm stock return is related to CF news. This number increases to 76% at three-year horizon and 8[illegible]% at seven-year horizon. In comparison, the corresponding numbers at the aggregate level are [illegible]6%, 63%, and 80%, respectively. So CF news becomes more important at the firm level as the investment horizon increases, the same pattern as we observe at the aggregate level.

The bottom line is that we observe very similar patterns at the firm and aggregate levels. DR news seems to be more important at short horizons, but CF news dominates at the long horizons. There seems relatively more diversification of CF news from the firm to the aggregate level, but this effect is secondary in that it does not change the overall patterns.

Link to the literature

The widely held view, based on the literature on return volatility at firm and portfolio levels (e.g., Vuolteenaho (2002), Cohen, Polk, and Vuolteenaho (2003), Callen and Segal (2004), Callen, Hope, and Segal (2005), and Callen, Livnat, and Segal (2006)) and the literature on the aggregate portfolio, is that CF news dominates at the firm level, but most of it can be diversified away, leading to the dominance of DR news at the aggregate level. This is consistent with the intuition that CF news is more related to firm-specific risks, but DR news is more related to systematic risks.[7] There is a complete flip of the relative importance of CF news and DR news because of diversification.

Since our finding suggests that such a flip does not exist, we proceed to reconcile our results with the current literature. We show below that the widely accepted flip in the current literature is mainly driven by the difference between cross-sectional and time-series predictability. Basically, the cross-sectional heterogeneity in earnings persistence is well documented with respect to value versus growth stocks (e.g., Lakonishok, Shleifer, and Vishny (1994), Fama and French (1995), and Cohen, Polk, and Vuolteenaho (2003)). It is thus relatively easy to predict CF growth cross-sectionally: growth firms tend to have higher CF growth in the following period. As a result, panel data studies, as is usually used for firm and portfolio analysis, tend to find that CF news is more important. On the other hand, CF is difficult to predict in a pure time series regression, and this lack of CF predictability results in the finding that DR news dominates, a conclusion often found at the aggregate level. As we show below, using annual data, the fit of pure time series regressions are

[7] When summarizing the results in Vuolteenaho (2002), Cochrane (2001) points out, “Much of the expected cashflow variation is idiosyncratic, while the expected return variation is common, which is why variation in the index book/market ratio, like variation in the index dividend/price ratio, is almost all due to varying expected excess returns.”

based DR news is more important at all levels. In other words, the existing conclusions at various levels are not comparable because they are more related to the cross-section and time-series differences than related to diversification.

Vuolteenaho (2002) shows that one can linearize the book-to-market ratio as

$$bm_t = constant + \sum_{j=1}^{\infty} \rho^{j-1} (r_{t+j-1} - roe_{t+j-1}), \tag{15}$$

where bm_t is the log book-to-market ratio, r_t is log stock return and roe_t is the log return on book equity (ROE). It is the parallel version of the well-known Campbell-Shiller (1988) decomposition, with the dividend-price ratio replaced by the book-to-market ratio and the dividend growth replaced by ROE.

We then assume that the vector $z_t = [r_t\ roe_t\ bm_t]'$ following a first order VAR

$$z_{t+1} = \Gamma z_t + u_{t+1}. \tag{16}$$

We choose the vector because these variables are mechanically related and it is consistent with the literature on the aggregate portfolio (e.g. Cochrane (2006)). Return and ROE can then be predicted through the VAR and DR news and CF news can be estimated.[8] We report the following statistics: (1) the VAR coefficient of r_t on bm_{t-1} and its t-statistic, (2) the VAR coefficient of roe_t on bm_{t-1} and its t-statistic, and (3) the ratio of DR/CF variance. A ratio higher than one means that the DR news is more important than the CF news.

Following Vuolteenaho (2002) and Cohen, Polk and Vuolteenaho (2003), we combine the COMPUSTAT annual data with the CRSP annual data. We include in this analysis only firms that have at least 16 years of available data.

We first conduct a VAR analysis for each firm and then report the cross-sectional mean of the above statistics in the first row of Panel A of Table [illegible]. The average return coefficient is 0.[illegible]8 (t-statistic 1.68) and the average ROE coefficient is -0.11 (t-statistic 1.13). Therefore returns is much more likely to be predictable than earnings. Accordingly, the average DR/CF variance ratio is [illegible].71. That is, when time-series analysis is conducted firm by firm, DR news is more important at the firm level.

We next repeat the above analysis using a panel VAR as in the current literature and report the results in the second row of the same panel, where the ROE coefficient is much more significant

[8] For details see Vuolteenaho (2002), Campbell and Vuolteenaho (2004), and Chen and Zhao (2006).

ndt he r nce rt o ecome 0 one o d conc det ht CF ne s dom nt es t rm e e y oppos et ot het me-ser es n ys s e re cht he s me conc s on nt het h rd ro t h t he r es cross-set on y demeaned

P ne B repot s s m r comp r sons tt he pot fo o e e In P ne B ers sot rms h o t en oo k o-m r k e pot fo os nd repet t het me-ser es n ys s for e ch oft hem E cep fot he gro t hrmst he r nce rt o s t een nd 6 36 n h her ords for mots pot fo os DR ne s p ys gger ro e t t he pot fo o e e f me-ser es n ys s s cond t ed et hen cond t t he p ne n ys s s ng het en pot fo os s p ne nd repot t he res t s nt he ro of p ne B ere g n ROE ecomes m ch more pred t e ndt he r nce rt o s 0 60 one o d conc det ht CF ne s s more mpot nt he pot fo o e e f p ne dt s sed

o f t her c r fy o r po n t ht he pre o s res t s s ng p ne dt s re dr en yt he cross-set on d erence n CFs e cond t t o more e erc ses F rts s n Cohen Po k nd o een ho (002) ers deme nt he r es n he cros s-set on d mens on ndt hen r n t he p ne AR nt h s c set he rt o of DRt o CF ne s r nce s 0 8 g nt he CF ne s s more mpot nt econd ers deme nt he r es n het me-s er es d mens onfor e ch pot fo o ndt hen r nt he p ne AR h s e erc se s eq en t o ed e et p ne regress on No t he r nce rt os 3 73 t ht s once he erge cross-set on d erences ofCFs ret en y DR ne s ecomes more mpot nt [9]

In P ne B e sot t rms h ot o oo k o-m r k e pot fo os he r nce rt o fot hero t h t rms s 7 0 and fot he r ot rms s 6 88 DR ne s s more mpo t nt n o ht me ser es hen e poot het o pot fo os s p ne t he r nce rt o s 0 76 t he res t s g n re ersed hen e r nt he p ne AR t h r es cross-set on y demeaned t he r nce rt o s 0 By con rt hen e r nt he p ne AR t h r es me-ser es y demeaned t he r nce rt o s 6 8 F n y en yze t he m r k e pot fo o np ne B3 t heret he r nce rt o s 5 3 DR ne s s more mpot nt fot he ggreg t e pot fo o

t s no c e t ht pre o s res t s re m n y dr en y het her p ne ot me-ser es n ys s s cond t ed f p ne dt s sed t hen CF ne s s more mpot nt ft me-ser es n ys s s cond t ed t hen DR ne s s more mpot nt t t het rm pot fo o nd ggreg t e e e s Cr c y t he p ne res t s re dr en yt he erge cross-set on d erences n CFs rt hert h n yt he

[9]Note we did not run the panel VAR, with variables time-seriesly demeaned, at trm level. This is because different trms have different sample sizes. The time-series means of different trms would cover different sample perios and thus are difficult to compare. At portfolio level all time series have equal length, and thus the time-series means cover the sample perios.

conditions and that the operational performances of most firms are cyclical. CF news even at the firm level could be quite systematic. Indeed, there is a growing literature stressing the systematic nature of CF risk at the firm and portfolio levels (e.g. Campbell and Vuolteenaho (2004), Bansal, Dittmar and Lundblad (2005), and Lettau and Wachter (2005)). For these reasons, whether CF news or DR news is more systematic at the firm level, and which one is more likely to be diversified away, is an empirical issue.

5 Robustness checks

We conduct a last set of robustness checks to gain further insights into the sources from which our main results come.

5.1 Decomposition of CF news

Equation ([illegible]) suggests that the CF news can be decomposed into four parts: the revisions of cash flow forecasts for one year ahead, two years ahead, three years ahead (which uses the long term growth rate), and for the rest of the years (which uses the long term earnings growth rate and the GDP growth rate). Naturally, one asks whether the updates on these forecasts are consistent, and whether they all contribute to the positive relation between stock returns and CF news.

Table 5 reports the correlation between the aggregate return and the four CF news components from one quarter to seven years. All correlations are positive and mostly significant. For example, the correlation between aggregate returns and the CF news for two-year-ahead is 0.[illegible]7 at quarterly horizon. This correlation increases to 0.[illegible] at two-year horizon and 0.8[illegible] at seven-year horizon. This pattern is fairly consistent for all the four CF news components.

We also report the correlation between aggregate returns and simple changes of earnings per share forecasts for one year ahead, two years ahead, and simple changes of the long term earnings growth rate. These simple changes do not go through present value calculations, and thus can give us a good sense of the robustness of our results. Again the correlation between the aggregate returns and the simple forecast changes are mostly significantly positive, and increases with investment horizon. For example, the correlation for long term CF forecasts is 0.[illegible] at quarterly horizon, and increases to 0.8[illegible] at seven-year horizon.

Overall, the evidence in Table 5 suggests that the importance of the CF news comes from consistent revisions of cash flow forecasts across horizons.

5.2 Monthly horizon

h s f r c conc s ons re sed on n yts forec ts s t q t er y freq ency nce h ese forec ts s re pro ded y /B/E/ t mon h y freq ency e c n so ets m t e CF ne s nd DR ne s t mon h y freq ency e fo o t he s me proced re s efore ndt r s cco n ng dt t ot he pre o s q t er

P ne A of e 6 repot st he s ope coe ic en s of regress ng t he CF ne s nd DR ne s ont he ggregt e rt rn A mon h y hor zont he CF ne s coe ic en s 0 07 ndt he DR ne s coe ic en s 0 o comp redt o q t er y hor zon e en s sm er pot on of rt rn s re t edt o CF ne s t mon h y hor zon he CF ne s coe ic en gro st o 0 3 t nn hor zon 0 6 t t hree-ye r hor zon nd 0 7 t e-ye r hor zon hese pt erns re ery s m rt ot hose ot ned s ng q t er y forec ts s

P ne B repot st he corre t on t een ggregt e rt rns nd CF ne s cross hor zons h s corre t on s 0 6 t mon h y hor zon t ncre ses o 0 85 t t hree-ye r hor zon nd 0 6 t s -ye r hor zon ht s rt rns nd CF ne s re ys pos e y re t ed ndt he corre t on ncre ses mono on c y t h hor zon

P ne C repot st he er ge s ope coe ic en s t rm e e A mon h y hor zont he CF ne s coe ic en s 0 ery c oset ot he 0 07 t t he ggregt e e e A t hree-ye r hor zon t he CF s ope coe ic en s 0 65 gn ery c oset ot he 0 6 t t he ggregt e e e h s s gges st ht d ers ct on p ys s econd ry ro e m t he re t e mpot nce of CF/DR ne s n dr ng ts oc pr ce mo emen

n s m s ng mon h y dt o d re cht he s me conc s ons s s ng q t er y dt

5.3 Steady state growth rate

e h e fo o ed P ts or nh nd m nt h n (006) y ss m ng ht t he ts e dy ts t e e rn- ngs gro t h rt e st he ong erm GDP gro t h rt e for rms nce h s ss mp on st o some e en d hoc t s mpot nt o chec he her o r conc s ons re dr en yt h s ss mp on Ge h rd Lee nd m nt h n (00) t ernt e y ss met ht t he ts e dy ts t e gro t h rt e s t he med n nd ts ry gro t h rt e e dopt h s ss mp ont o mod fyt he mode nd repot t he res t s n e 7

he d erence c sed yt h s ch nge s q t e sm r nt he shot hor zon For e mp e n P ne A of e 7 t q t er y hor zont he CF ne s s ope coe ic en s 0 8 comp redt o 0 6 n e A t hree-ye r hor zont he CF coe ic en s 0 88 comp redt o 0 63 n e t se en-ye r

hor zon he CF coe ic en s 0 comp red o 0 80 n e

In P ne B of e 7 he corre ons een ggreg e r rn nd CF ne s re mos den c o hose n e In P ne C he er ge CF coe ic en rm e e s 0 6 (0 5 n e 3) q r er y hor zon 0 8 (0 76 n e 3) hree-ye r hor zon nd 0 86 (0 8 n e 3) se en-ye r hor zon

O er s ng he nd s r gro h r e s he s e dy s e gro h r e e ds o s gh y s ronger ro e for CF ne s B conc s ons s y he s me

5.4 Steady state plowback rate

e h e fo o ed P s or nh nd n h n (006) y ss m ng h he s e dy s e p o - c r e s eq o he ong erm GDP gro h r e d ded y he cos of eq y (g/q) o ens re h h s s no he ey ss mp on dr ng o r res s e ern e y ss me h he s e dy s e p o c r e s he correspond ng nd s ry med n p o c r e for e ch rm he nd s ry med n p o c r e s es m ed s ng COMP A d e dop h s ss mp on o mod fy he mode nd repor he res s n e 8

Comp r ng e 8 h e nd e 3 e nd h he CF s ope coe ic en s re s gh y o er for ery ong hor zons O her se he o her res s re ery s m r e re ch he s me con- c s ons s efore here s s gn c n componen of CF ne s n s oc r rns hose mpor nce ncreases h n es men hor zon For n es men hor zons o er hree ye rs CF ne s f r e ceeds DR ne s n dr ng s oc r rns hese conc s ons ho d o h rm nd he ggreg e e e s D ers c on p ys secondary ro e n dr ng he re e mpor nce of CF/DR ne s

herefore o r m n conc s ons re no dr en y he p r c r ss mp on n he or g n mode reg rd ng he s e dy s e p o c r e

5.5 Other issues

L ngq s M oy nd M s on (007) nd norm n ys s oc recommend on ch nges for he I/B/E/ d h ch r ses concerns for he re y of d he c on needs o e e erc sed e e e h s concern s e y o e second ry for o r res s F rs I/B/E/ h s res ored s or g n d A o r res s re sed on he mos recen ers on of he d econd e se n ys forec s s for e rn ngs gro h no recommend ons h rd e nd cons s en nd s rong res s rm nd ggreg e e e s I seems n e y h s ch cons s en res s re dr en y d on cer n s oc s

A key assumption of our approach is that marginal investors (who determine prices) and financial analysts share similar views on expected future CFs. We do not need them to have identical forecasts on CFs so long as the changes of the forecasts of the two groups are significantly related or main messages are key to get through. This is a reasonable assumption since the professionals paid to predict CFs. It is difficult to imagine that their forecasts on CF changes deviate completely from investors' forecasts.

Nor do we assume that stock prices respond to changes in analysts' forecasts. It could be the other way around. So long as the changes of financial analysts' forecasts pick up changes of expected CFs as projected by investors, our results are likely to hold.

Finally, since we decompose returns into CF news and DR news by identity, any bias/imprecision in the expected CF measures are forced into the "DR news", and work against our finding of the importance of CF news. As we have discussed earlier, this suggests that our estimates on the importance of the CF news should be regarded as a lower bound.

6 Conclusion

A central issue in asset pricing is whether stock prices move due to the revisions of expected future cash flows or/and of expected discount rates, and by how much. Since neither expectation term is observable, the traditional literature relies on return and cash flow predictability to draw inference on their relative importance. However, the lack of predictability is not equivalent to the lack of price volatility. In addition, tests based on predictability are challenged by the small sample bias, weak predictive power, and are sensitive to the fundamental difference between cross-sectional and time-series predictability.

We avoid the reliance on predictability by using direct expected cash flow measures. In particular, we use firm-specific market consensus analysts' forecasts, coupled with prices, to back out the discount rates. In this way the cash flow news and discount rate news can be identified by construction without resorting to predictability.

We reach four conclusions in this paper. First, there is a significant component of CF news in stock returns. Second, the importance of CF news increases with investment horizon. At horizons more than three years, CF news far exceeds DR news in driving stock returns. Third, the first two conclusions hold at both firm and aggregate levels. Accordingly, diversification plays a secondary role in affecting the relative importance of CF/DR news in driving stock returns. We further show that the conventional wisdom that CF news dominates at firm level but discount rate news

dom nt es t t he ggregt e e e s my h dr en y es mt on mt hods

A ey ss mp on n o r p per s ht t he n yts e rn ngs forec ts s me y re et t he m rg n n ets ors e ef reg rd ng f t re CFs Any de t on from t h s ss mp on pre en s from nd ng ts rong ro e of CF ne s n dr ng ts oc k rt rns nt h s sense o r ets mt es ont he mpot nce of CF ne s n t he shot r n sho d e reg rded s o er o nd – t er CF ets mt es sho d m k e t he res t s ts ronger O r conc s ons reg rd ng t he mpot nce of t he CF ne s n t he onger hor zons (more t h nt hree ye rs) sho d no e ec ed m ch s nce t he CF ne s re dy dom nt es m r y t hese ses/de t ons re n e y t o ec ny of o r t her conc s ons

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Table 1 : Sample Summary by Year

The sample consists of firms, at quarterly frequency, on the I/B/E/S Summary files with earnings forecasts for years +1, +2, and a long-run earnings growth estimate. The net payout ratio includes dividends, equity repurchases, and issuances. All per share numbers are multiplied by the number of shares outstanding (from I/B/E/S) to obtain amounts at the firm level. This table reports the aggregate amount at the market level for each year. Cost of equity is estimated using the present value model in Pastor, Sinha, and Swaminathan (2006). All amounts, except for the net payout ratio and cost of equity, are in millions of dollars.

Year	Number of Firms	Quarterly Earnings	Net Payout(%)	Market Capitalization	Cost of Equity(%)
1985	1,076	23,984	46	1,195,240	13.95
1986	1,184	25,106	46	1,553,134	11.83
1987	1,059	28,601	48	1,766,071	12.34
1988	1,130	38,074	49	1,652,185	13.22
1989	1,189	36,033	47	1,984,368	12.63
1990	1,248	35,413	46	2,060,453	13.39
1991	1,300	29,249	50	2,402,193	11.96
1992	1,443	32,901	48	2,765,262	11.28
1993	1,674	44,503	46	3,216,490	10.99
1994	1,925	58,326	43	3,600,743	11.61
1995	2,135	71,622	44	4,440,807	11.38
1996	2,324	81,811	44	5,551,846	11.07
1997	2,633	90,361	46	7,755,864	10.90
1998	2,825	98,078	47	9,588,017	11.53
1999	2,623	113,165	50	10,930,810	12.23
2000	2,139	122,833	53	13,199,870	12.77
2001	2,054	49,914	50	11,731,150	11.21
2002	2,145	107,733	47	10,892,410	10.57
2003	2,267	152,788	47	11,814,770	9.65
2004	2,339	199,037	47	14,189,760	9.17
2005	2,376	229,067	49	15,413,340	9.31
2006	2,105	264,351	53	16,534,530	9.70

Table 2 : Cash Flow News and Discount Rate News at Aggregate Level

Panel A reports, for the value-weighted market portfolio, the mean of cumulative capital gain return (CG), cash flow (CF) news, discount rate (DR) news, from one quarter up to 28 quarters. Panel B reports the variances, covariances, and correlations of these three components. The means, variances, and covariances are all in percentage. The correlations are in actual digits. Panel C reports the slope coefficients of regressing CF news or DR news on the aggregate return; the row beneath the coefficients reports the Newey-West t-statistics. The sample is quarterly from 1985 to 2006.

	Horizons (Quarters)								
	1	2	4	8	12	16	20	24	28
Panel A: Means of aggregate return and components (%)									
CG return	2.65	5.40	11.37	24.06	37.74	54.36	72.74	96.11	123.91
CF news	0.84	2.27	5.83	14.89	25.13	37.46	52.34	70.14	90.10
DR news	1.80	3.11	5.52	9.14	12.57	16.86	20.40	25.96	31.78
Panel B: Variance and covariances of aggregate return components									
Var(CG)	0.56	1.12	1.99	5.16	10.15	17.99	27.14	36.36	46.04
Var(CF)	0.21	0.43	0.78	2.04	5.33	9.71	16.53	24.03	30.75
Var(DR)	0.59	0.90	1.75	2.48	2.79	2.79	2.78	2.57	3.43
Cov(CF, DR)	-0.12	-0.11	-0.27	0.32	1.03	2.78	3.97	4.95	6.01
Corr(CF, DR)	-0.35	-0.17	-0.23	0.14	0.27	0.53	0.59	0.63	0.58
Corr(CG, CF)	0.26	0.47	0.41	0.73	0.86	0.94	0.97	0.98	0.98
Corr(CG, DR)	0.82	0.79	0.79	0.78	0.72	0.78	0.78	0.78	0.75
Panel C: Slope coefficients									
CF news	0.16	0.29	0.26	0.46	0.63	0.69	0.75	0.80	0.80
T-stat	(3.42)	(4.44)	(2.11)	(4.70)	(9.63)	(17.68)	(29.73)	(21.08)	(16.85)
DR news	0.84	0.71	0.74	0.54	0.37	0.31	0.25	0.21	0.20
T-stat	(18.24)	(10.96)	(6.13)	(5.55)	(5.76)	(7.90)	(9.88)	(5.47)	(4.34)

Table 3 : Cash Flow News and Discount Rate News at Firm Level

Panel A reports the average firm-specific variances, covariances, and correlations of return (CG), cash flow (CF)

Table 4 : Cash Flow News and Discount Rate News Using Return Data

Vuolteenaho (2002) shows that

$$bm_t = \text{constant} + \sum_{j=1}^{\infty} \rho^{j-1} \left(r_{t+j-1} - roe_{t+j-1} \right),$$

where bm_t is the log book-to-market, r_t is stock return, and roe_t is the log return on book equity (ROE). We assume that a vector of [r roe bm] following a first order VAR:

$$z_{t+1} = \Gamma z_t + u_{t+1}.$$

Then both the cash flow news and discount rate news can be estimated (see Campbell and Vuolteenaho (2004) and Chen and Zhao (2006)). We report the VAR coefficient of r and roe on the lagged book-to-market and their t-statistics respectively. We then report the ratio of discount rate (DR) news variance to cash flow (CF) news variance. The tests are conducted at annual frequency using the combined COMPUSTAT and CRSP data, covering 1954-2006. On the first row of panel A we conduct the above exercise for every firm separately and report the cross-sectional means of the above statistics. To be included a firm should have at least 16 years of data. We then estimate a panel VAR with all firms included and report the results on the second row; we repeat the panel VAR with all variables cross-sectionally demeaned and report the results on the third row. In panel B1 we sort firms into ten book-to-market portfolios. As in panel A we report the analysis for each portfolio and for the panel of portfolios. We then repeat the panel VAR with all variables cross-sectionally demeaned and the panel VAR with all variables time-seriesly demeaned. In panel B2 we sort firms into two book-to-market portfolios and repeat the analysis as in Panel B1. In panel B3 we report the results for the value-weighted market portfolio.

	Coe(r)	t(r)	Coe(roe)	t(roe)	Var(DR)/Var(CF)
Panel A: Firm level analysis					
Firm	0.28	1.68	-0.11	-1.13	2.71
Panel	0.06	31.33	-0.10	-70.00	0.14
Panel cross-sectionally demeaned	0.04	20.94	-0.11	-75.40	0.05
Panel B: Portfolio analysis					
Panel B1: Ten book-to-market portfolios					
Growth	0.15	1.46	-0.27	-5.37	0.51
2	0.13	1.90	-0.03	-1.79	2.14
3	0.08	1.29	0.00	-0.10	16.36
4	0.11	1.40	0.04	1.86	5.81
5	0.11	1.68	-0.02	-1.05	4.74
6	0.18	2.59	0.00	0.23	12.10
7	0.22	3.08	0.02	0.95	7.10
8	0.30	4.01	0.00	-0.17	7.34
9	0.33	3.64	0.01	0.40	7.83
Value	0.08	1.74	-0.01	-0.44	3.42
Panel	0.05	4.79	-0.06	-13.20	0.60
Panel cross-sectionally demeaned	0.03	4.19	-0.07	-14.29	0.18
Panel time-seriesly demeaned	0.13	5.69	-0.04	-4.29	3.73
Panel B2: Two book-to-market portfolios					
Growth	0.13	1.84	0.00	-0.30	7.10
Value	0.19	2.86	-0.01	-0.34	6.88
Panel	0.08	2.50	-0.03	-4.53	0.76
Panel cross-sectionally demeaned	0.00	0.02	-0.08	-11.33	0.14
Panel time-seriesly demeaned	0.16	3.20	-0.01	-0.44	6.89
Panel B3: Value-weighted market portfolio					
	0.15	2.18	0.00	-0.10	5.43

Table 5 : Correlations between Returns and Cash Flow Components

We decompose the CF news into four parts: the revisions of cash flow forecasts for one year ahead, two years ahead, three years ahead, and for the rest of the years. We then report the correlation between the aggregate return and the four CF news components, from one quarter to seven years. We also report the correlation between aggregate return and simple changes of earnings per share forecasts for one year ahead, two years ahead, and simple changes of the long-term growth rate. The sample is quarterly from 1985 to 2006.

	Horizons (Quarters)								
	1	2	4	8	12	16	20	24	28
1-year CF news	0.08	0.14	0.07	0.27	0.40	0.54	0.75	0.83	0.88
P-value	(0.46)	(0.19)	(0.53)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2-year CF news	0.27	0.41	0.28	0.42	0.51	0.65	0.82	0.86	0.89
P-value	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
3-year CF news	0.27	0.43	0.32	0.51	0.63	0.75	0.86	0.89	0.90
P-value	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Rest of CF news	0.30	0.46	0.38	0.72	0.86	0.92	0.95	0.95	0.95
P-value	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Chg. in 1-year CF forecast	0.21	0.29	0.08	0.14	0.20	0.19	0.19	0.19	0.11
P-value	(0.06)	(0.01)	(0.49)	(0.21)	(0.08)	(0.12)	(0.11)	(0.13)	(0.39)
Chg. in 2-year CF forecast	0.21	0.34	0.18	0.23	0.27	0.25	0.28	0.28	0.19
P-value	(0.05)	(0.00)	(0.11)	(0.04)	(0.02)	(0.03)	(0.02)	(0.03)	(0.14)
Chg. in LT CF forecast	0.12	0.30	0.47	0.69	0.75	0.80	0.84	0.86	0.84
P-value	(0.27)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table 7 : Robustness Check Using Industrial Growth Rate

Pastor, Sinha, and Swaminathan (2006) assume that the steady-state earnings growth rate is the long-term GDP growth rate. We modify the model by assuming that the steady-state earnings growth rate is the median long-term industry earnings growth rate. Panel A reports, for the value-weighted market portfolio, the slope coefficients of regressing cash flow (CF) news and discount rate (DR) news on returns respectively. Panel B reports the correlation between returns (CG) and CF news. Panel C reports the average firm-level slope coefficients of regressing CF news and DR news on returns respectively. The row beneath the slope coefficients reports the Newey-West t-statistics. The sample is quarterly from 1985 to 2006.

	Horizons (Quarters)								
	1	2	4	8	12	16	20	24	28
Panel A: Slope coefficients for the value-weighted market portfolio									
CF news	0.18	0.30	0.36	0.65	0.88	0.91	0.93	0.95	0.94
T-stat	(3.64)	(3.45)	(2.12)	(3.95)	(7.28)	(13.00)	(22.86)	(34.59)	(20.64)
DR news	0.82	0.70	0.64	0.35	0.13	0.09	0.07	0.05	0.06
T-stat	(16.78)	(8.03)	(3.79)	(2.11)	(1.05)	(1.31)	(1.74)	(1.88)	(1.44)
Panel B: Correlation between return and CF news for the value-weighted portfolio									
Corr(CG, CF)	0.26	0.40	0.42	0.71	0.86	0.94	0.97	0.98	0.97
P-value	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Panel C: Slope coefficients for an average firm									
CF news	0.26	0.39	0.55	0.73	0.81	0.82	0.83	0.87	0.86
T-stat	(1.49)	(2.33)	(3.71)	(6.09)	(8.00)	(9.48)	(10.95)	(12.95)	(14.56)
DR news	0.74	0.61	0.45	0.26	0.19	0.18	0.17	0.13	0.14
T-stat	(4.85)	(4.17)	(3.62)	(2.61)	(2.09)	(1.91)	(1.75)	(1.53)	(1.57)

Table 8 : Robustness Check Using Industrial Plowback Rate

Pastor, Sinha, and Swaminathan (2006) assume that the steady-state plowback rate is the ratio of long-term GDP growth rate to the cost of equity. We modify the model by assuming that the steady-state plowback rate is the median long-term industry plowback rate. Panel A reports, for the value-weighted market portfolio, the slope coefficients of regressing cash flow (CF) news and discount rate (DR) news on return respectively. Panel B reports the correlation between returns (CG) and CF news. Panel C reports the average firm-level slope coefficients of regressing CF news and DR news on returns respectively. The row beneath the slope coefficients reports the Newey-West t-statistics. The sample is quarterly from 1985 to 2006.

	Horizons (Quarters)								
	1	2	4	8	12	16	20	24	28
Panel A: Slope coefficients for the value-weighted market portfolio									
CF news	0.16	0.28	0.25	0.45	0.61	0.66	0.70	0.73	0.72
T-stat	(3.50)	(3.95)	(2.03)	(4.17)	(9.15)	(15.17)	(27.37)	(19.68)	(13.52)
DR news	0.84	0.72	0.75	0.55	0.40	0.34	0.30	0.27	0.28
T-stat	(18.31)	(10.30)	(6.02)	(5.11)	(5.84)	(7.78)	(11.78)	(7.73)	(5.33)
Panel B: Correlation between return and CF news for the value-weighted portfolio									
Corr(CG, CF)	0.25	0.44	0.40	0.69	0.85	0.93	0.96	0.98	0.97
P-value	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Panel C: Slope coefficients for an average firm									
CF news	0.25	0.38	0.52	0.67	0.73	0.75	0.76	0.79	0.78
T-stat	(1.58)	(2.56)	(4.08)	(6.69)	(8.66)	(10.20)	(11.61)	(13.32)	(14.43)
DR news	0.75	0.62	0.48	0.33	0.27	0.25	0.23	0.20	0.22
T-stat	(5.40)	(4.78)	(4.53)	(3.70)	(3.30)	(3.24)	(3.17)	(3.07)	(3.25)