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BEFORE THE
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RAILROAD COST OF CAPITAL --	)	Ex Parte No. 558 (Sub-No. 19)
2015	)	

REPLY STATEMENT OF THE WESTERN COAL TRAFFIC LEAGUE

WESTERN COAL TRAFFIC LEAGUE

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RAILROAD COST OF CAPITAL --) Ex Parte No. 558 (Sub-No. 19)
2015)

WCTL appreciates that the AAR's calculations show significant declines in railroad cost of equity ("COE") and cost of capital ("COC") for 2015 relative to 2014. While the AAR appears to have followed the Board's established methodology for estimating the COE and COC, there is no reason to believe that the AAR's resulting values are anywhere near accurate, and abundant reason to conclude those values remain substantially overstated due to known flaws in the Board's methodology, including the presence of buybacks and use of an overstated market risk premium.

¹ WCTL is a voluntary association, whose regular membership consists entirely of shippers of coal mined west of the Mississippi River that is transported by rail. WCTL members currently ship and receive in excess of 125 million tons of coal by rail each year. WCTL's members are: Ameren Missouri, Arizona Electric Power Cooperative, Inc., Austin Energy (City of Austin, Texas), CLECO Corporation, CPS Energy, Entergy Services, Inc., Kansas City Power & Light Company, Lower Colorado River Authority, MidAmerican Energy Company, Minnesota Power, Nebraska Public Power District, Omaha Public Power District, Western Fuels Association, Inc., and Wisconsin Public Service Corporation.

WCTL acknowledges the Board's past statements that the EP 558 proceedings are not an ideal vehicle to consider substantive changes in the Board's methodology and that Board is reviewing its COE methodology in EP 664 (Sub-No. 2). However, EP 664 (Sub-No. 2) has not been moving quickly.² The annual proceedings must provide some opportunity to consider the integrity of the inputs and whether those inputs yield values that are at all realistic. This filing also provides a vehicle for WCTL to provide updated information and developments pertaining to the Board's methodology. WCTL will focus on new information and data that the Board should consider, and minimize repetition of matters previously addressed.

1. THE AAR'S ESTIMATED VALUES SUBSTANTIALLY OVERSTATE THE VALUES USED BY THE FINANCIAL AND INVESTMENT COMMUNITY

Additional evidence recently became available that further confirms the overstatement in the Board's COC. In February, Morgan Stanley issued a Freight Transportation report, *Rails: End of the Pricing Renaissance? Time for Quality and Defense* (Feb. 23, 2016), excerpts included as Exhibit A. The report presents values for the WACC (weighted average cost of capital or COC) for most of the major United States and Canadian railroads. (NS and CP are not included, presumably because Morgan Stanley was at the time advising NS with respect to CP's acquisition overtures.) The report specifies the following COC values for five carriers:

² WCTL filed its petition to initiate the proceeding over 32 months ago and reply comments over 18 months ago. The Board held a public hearing almost ten months ago. No action date for the proceeding is identified on the Board's most recent regulatory agenda.

Table 1 <u>Morgan Stanley COC Values</u>	
Railroad	COC
(1)	(2)
1. CN	6.5% (p. 30)
2. UP	7.2% (p. 33)
3. KCS	7.4% (p. 36) ³
4. CSX	6.7% (p. 38)
5. GWR	7.5% (p. 41)

Morgan Stanley’s report is dated as of February 23, 2016, very close to the December 31, 2015 date used in most of the AAR’s calculations. The Board’s MSDCF uses stock prices, market capitalization, growth rates, and other data as of the end of the year. The Board’s CAPM also uses a five-year beta and a MRP (albeit flawed) as of the end of the year, and a risk-free rate that reflects an annual average for the prior year. Timing differences do not explain the large divergence in values.

The report does not specify if Morgan Stanley used a tax shield for the debt component that lowers the COC. Even if it did, the impact should be modest. The tax shield equals the percentage of debt times the tax rate times the cost of debt (“COD”). Conservatively assuming a capital structure with 35% debt, a 35% corporate tax rate, and a 4% COD, the tax shield is 0.49% or 49 basis points ($0.35 \times 0.35 \times 0.04 = 0.0049$). Using the AAR’s capital structure (18.16% debt) and COD (3.55%) reduces the tax shield by over half, to 23 basis points ($0.1816 \times 0.35 \times 0.0355 = 0.0023$).

³ The report comments that the 7.4% for KCS is “the highest among Class I rails, also because of KSU’s MX exposure” (p. 36).

A conservative estimate of the COC for the Class I industry as a whole based on the Morgan Stanley report is 7.5%, using the 7.2% COC for UP and an imputed tax shield of 30 basis points. UP has the median COC value of the three domestic carriers. CSX's COC is lower by 50 basis points, KCS's is higher by 20 basis points, and CSX's market value is three times KCS's (Gray VS at 24). Using the UP value as the starting point is thus conservative.

The AAR's 9.61% after-tax estimate thus appears to be at least 28% overstated relative to the values utilized by the financial and investment community ($9.61\%/7.5\%=1.28$). The Board should not adopt such an overstated value without further analysis. A reasonable analysis, presented below, shows that the MSDCF is flawed and that the CAPM should utilize a lower market risk premium.

2. BUYBACKS RESULT IN EVEN GREATER MSDCF DISTORTION

WCTL has previously explained how buybacks distort the MSDCF. The MSDCF uses earnings per share ("EPS") growth rates as a proxy for growth in firm-wide cashflows, which are discounted by the COE to equal the market cap. However, an accurate EPS forecast reflects changes in shares as well as changes in earnings. If, for example, buybacks reduce the number of shares by 3% and overall earnings (or cashflow) stay the same, the result is a 3.1% increase in EPS despite no change in earnings or associated cashflow. If earnings are \$100 and shares are reduced from 100 to 97, EPS are \$1 in the first period and \$1.031 in the second ($\$100/97 \text{ shares}=\1.031 EPS).

CSX provides a useful example of the impact of buybacks. CSX's firm-wide earnings grew from \$1.927 billion in 2014 to \$1.968 billion in 2015, an increase of

2% ($1.968/1.927=1.02$). (Relevant pages from the 2014 and 2015 annual reports of CSX and other carriers are included in Exhibit B.) However, net EPS per diluted share grew by 4%, twice as much, from \$1.92 in 2014 to \$2.00 in 2015 ($2/1.92=1.04$). The additional increase in EPS was due to the reduction in shares from 1,002 million in 2014 to 984 million in 2015, a decrease of 2% ($984/1,002=0.98$, $0.98-1.0=0.02$). The decrease in shares contributed 2% (reciprocal of 0.98) to the increase in EPS.⁴

Professor Ibbotson recently co-authored a paper addressing the need to recognize the impact of buybacks on growth in EPS in analyzing growth in returns.⁵ The authors describe the impact of buybacks on returns as follows:

In these traditional supply models, payouts via buybacks lead to structural increases in *per-share* growth rates (e.g., earnings per share) as the number of shares get decreased by buybacks, even as per-share growth exceeds the underlying corporate cash flow growth [p. 2; original emphasis].

.... Previous studies measure historical growth rates based on per-share statistics (e.g., earnings-per-share) without adjusting for the impact of buybacks on share count... While annualized growth of [real total payout-per-share growth] was 7.70%, the buyback-share-decrease-adjusted growth rate was only 3.16%. The difference is attributable to the buyback yield over the period, suggesting that a significant portion (32% between 1980 and 2014) of growth measured by per-share statistics is due to buybacks, not growth of the underlying cash flows of the businesses. This example

⁴ The math can be shown as follows: Growth in EPS from Year 1 to Year 2 equals $EPS_{Year2} \div EPS_{Year1} = (Earnings_{Year2}/Shares_{Year2}) \div (Earnings_{Year1}/Shares_{Year1}) = (Earnings_{Year2}/Shares_{Year2}) \times (Shares_{Year1}/Earnings_{Year1}) = (Earnings_{Year2}/Earnings_{Year1}) \times (Shares_{Year1}/Shares_{Year2})$.

⁵ Philip U. Straehl and Roger G. Ibbotson, *The Supply of Stock Returns: Adding Back Buybacks* (working paper Dec. 17, 2015), available at <http://corporate.morningstar.com/ib/asp/detail.aspx?xmlfile=1409.xml>, and included as Exhibit C.

suggests that the buyback share decrease adjustment of per-share growth rates has important implications for the measurement of fundamental corporate flow growth [p. 14].

The role of buybacks in railroad growth rates increased in 2015. AAR witness Gray noted in his Verified Statement (“Gray VS”) at p. 41 that there was a “huge drop,” more than 50%, in the median growth rates from the 12.68% in 2014 to the 5.49% in 2015.⁶ Railroad stock prices also declined in 2015. *Id.* at 24, 25. As a result, the same buyback dollars bought a larger number of shares, and the increased buybacks amounted to a larger percentage of the reduced growth rates.

Two tables illustrate the relationship. The following table depicts the reduction in shares outstanding for each of the four railroads used in the composite sample, based on shares outstanding as reported in the 10-K reports for 2014 and 2015.

Table 2 <u>Net Reduction in Shares Outstanding from 2015 to 2015</u>				
<u>Carrier</u> (1)	<u>2014 10-K Shares Outstanding</u> (2)	<u>2015 10-K Shares Outstanding</u> (3)	<u>Percentage Reduction in Shares 1/</u> (4)	<u>Impact on Growth 2/</u> (5)
1. CSX	990,564,824	963,150,011	-2.77%	2.85%
2. KCS	110,411,095	108,498,752	-1.73%	1.76%
3. NS	307,411,965	298,198,651	-3.00%	3.09%
4. UP	881,284,029	846,414,350	-3.96%	4.12%
1/ Column (3) ÷ Column (2) – 1 x 100.				
2/ Column (2) ÷ Column (3) – 1 x 100.				

⁶ The sharp drop in growth rates is an additional reason to reconsider use of the MSDCF. One should be wary of using a model whose inputs are subject to such fluctuations. WCTL has previously noted that EPS forecasts are not accurate.

Shares outstanding in columns (2) and (3) of Table 2 are taken from each carrier's annual report/10-K, excerpts of which are included in Exhibit B. The fourth column identifies the percentage reduction in shares between 2014 and 2015. The fifth column values identifies the impact on growth caused by the net reduction in shares. Calculations are shown in the electronic workpaper, available upon request.

The next table decomposes the AAR's median EPS growth rates into the impacts from (a) the reduction in the number of shares in 2015, and (b) "core" growth, meaning actual expected growth in firm-wide earnings (without buybacks):

Table 3 Separation of Median Growth Rates into <u>Growth from Share Reduction and Core Growth Components</u>				
<u>Carrier</u>	<u>Median Growth Rate</u>	<u>Growth from Share Reduction (from Table 2)</u>	<u>Core Growth</u>	<u>Verification</u>
(1)	(2)	(3)	(4)	(5)
1. CSX	6.2%	2.85%	3.26%	$1.062 = 1.025 \times 1.0326$
2. KCS	8.45%	1.76%	6.57%	$1.0845 = 1.0176 \times 1.0657$
3. NS	0.8%	3.09%	(2.22%)	$1.008 = 1.0309 \times 0.978$
4. UP	<u>6.5%</u>	<u>4.12%</u>	<u>2.29%</u>	$1.065 = 1.0412 \times 1.0229$
5. Average	5.49%	2.95%	2.47%	$1.0549 = 1.0295 \times 1.0247$
Calculations are shown in the e-workpaper.				

The impact of buybacks on the MSDCF is thus very substantial. The AAR's simple average of the median growth rates of the four railroads was 5.49%. The equivalent figure of using the core growth (after eliminating the 2015 buybacks) is 2.47%. In other words, the appropriate growth rate would be only 45% of the projected total growth rate (2.47%/5.49%). Alternatively, the AAR's growth rate is 122% greater than the underlying growth rate in core earnings (5.49%/2.47%). The impact is even

greater for NS, as its core growth rate is actually a negative 2.22%, after the impact of buybacks is removed.

Buybacks after 2015 may be higher or lower than in 2015, and information about the exact level of buybacks assumed or projected by analysts is not readily available. Nonetheless, ignoring buybacks is likely to lead to EPS projections that are more inaccurate. Railroad buybacks have been significant for a number of years, appear likely to continue (no railroad has suggested it will soon discontinue its buybacks), and have a substantial impact on the EPS projections, especially in a lower-growth environment.

Under the circumstances, a MSDCF model that depends heavily on such projections should not be utilized.

3. THE MSDCF IS FURTHER TAINTED BY INCLUDING USING KCS IN THE SIMPLE AVERAGE FOR THE SECOND STAGE GROWTH RATE

The growth rate used in the second stage of the MSDCF is the simple average of the median growth rates of the individual carriers. KCS and UP each receives the same weight, even though KCS has one-eighth (12.4%) the market value of UP. Gray VS at 24. However, KCS's growth rate (8.45%) is 30% greater than the next highest, that of UP (6.50%). Removing KCS reduces the median growth rate to 4.5%. A small carrier such as KCS should not have such a disproportionate impact on the average.

Consider a simplified example where an industry has two firms, with firm A having 2014 earnings of \$100 million and 2015 earnings of \$102 million, for a growth rate of 2%, and firm B having 2014 earnings of \$10 million and 2015 earnings of \$11

million, for a growth rate of 10%. The simple average of the growth rate is 6% (2% plus 10% divided by two), but the actual industry growth was 2.7% (113/110). Using the simple average distorts the industry-wide growth, which the second stage of the MSDCF purports to depict and utilize.

4. THE MRP REMAINS OVERSTATED

The AAR explains that it relied on Duff & Phelps for the 1926-based historical market risk premium (“MRP”) because Ibbotson/Morningstar no longer publishes those values. Gray VS at 29. However, Duff & Phelps recommends use of a lower MRP, 5% as of December 31, 2015 (and 5.5% as of January 31, 2016).

<http://www.duffandphelps.com/Assets/PDFs/publications/valuation/coc/ERP-and-RFR-Recommendation-Jan-31-2016.pdf>.

Using the 5.0% MRP with the AAR’s 1.2167 beta and 2.55% risk-free rate results in a COE of 8.63% ($(5\% \times 1.2167) + 2.55\%$). The resulting COC, using the AAR’s capital structure and COD, is 7.70% ($(8.63\% \times 0.8184) + (3.5\% \times 0.1816)$). The 7.70% COC is virtually identical to the Morgan Stanley UP-based figure. The closeness confirms that the Board would greatly improve its estimate of the opportunity cost of capital for the railroad industry by abandoning the MSDCF and relying on a more contemporary MRP instead of a higher, historical MRP.

5. THE AAR’S BETA INTERPRETATION IS SUSPECT

AAR witness Gray provides the following interpretation for the railroad industry beta:

The 2015 beta is lower, but not dramatically different, than the beta for 2014 (1.2503). Like the 2014 beta, the 2015 beta is between the 2012 and 2013 estimates, which were 1.1543 and 1.3499, respectively. This is the seventh consecutive year that the railroad beta has been above 1.0. Clearly, the equity market regards railroad stocks as consistently more volatile, and of higher risk, than the market in general. In the real investment world, this risk is a reflection of the declining traffic railroads are facing in coal markets, and the volatility of energy-related markets. The equity market regards these risks as a systemic part of railroad investment.

Gray VS at 34.

The statement is suspect in multiple respects. First, declining coal markets and volatile energy-related markets do not necessarily represent systemic risks. They represent specific markets. Lower energy prices can actually facilitate increased economic activity and an associated rise in the overall stock market, particularly as consumers have more cash to spend on other goods and services. Second, the railroad industry betas declined in both 2014 and 2015, and coal markets and energy markets varied substantially in those two years. In 2014, energy prices were high and the railroads could not satisfy the need of their customers for coal. In 2015, there was curtailed demand for coal, and energy prices were substantially lower. The fact that the railroad industry betas, measured over a five-year period (meaning that four of the five years in the two betas were the same), declined in both years suggests that railroad betas are not tied directly to coal prices or energy market volatility, that the high railroad beta of 2013 was an anomaly, and that lower and/or declining beta values may be more representative of a longer-term or emerging trend.

Also, the fact that railroad betas have been above 1.0 for seven consecutive years is not conclusive proof that the market views railroad stocks as carrying more risk than the market in general. The years 2009-2015 have been unusual years in multiple respects, including low inflation, low interest rates, and slow level of sustained recovery, and (perhaps) the railroads' ability to take rate increases exceeding the rate of inflation, etc. One should not necessarily make definitive conclusions based on even sustained beta performance over such an unusual period.

6. THE BOARD SHOULD PREPARE TO TREAT OPERATING LEASES AS DEBT

WCTL has previously noted that the financial and investment community treats operating leases as debt when evaluating the leverage of firms like railroads. The Board has insisted on continuing to treat operating leases as an expense and not as debt based on conformance to generally accepted accounting principles ("GAAP").

On February 25, 2016, the Financial Accounting Standards Board issued ASU (Accounting Standards Update) No. 2016-02, *Leases (Topic 842)*, that calls for many operating leases to be treated as debt.⁷ Public business entities are required to adopt the new reporting for fiscal years beginning after December 15, 2018, but may start the treatment earlier. The Board thus appears to have the discretion under GAAP to have the new rules apply starting from an earlier date, and it is possible that the railroads will opt for earlier reporting, as some carriers already do for non-GAAP purposes. *See, e.g.,*

7

http://www.fasb.org/jsp/FASB/FASBContent_C/CompletedProjectPage&cid=1176167904031 (copy included as Exhibit D).

UP 2015 Annual Report at 33-34 (included in Exhibit B) (noting capital structures of 40.7% debt treating operating leases as debt, and 45.7% debt also treating unfunded pensions and other post-employment benefits as debt). The Board should promptly initiate a rulemaking to address the matter.

7. CONCLUSION AND SUMMARY

The Board's hybrid methodology continues to yield COC values substantially exceeding those used by the financial and investment community. Even if it were otherwise sound, the MSDCF remains plagued by buybacks, a problem that is exacerbated by the lower growth rates and lower stock prices. The MSDCF is further tainted by the simple average growth rate in the second stage, where KCS counts as much as UP, even though UP is eight times larger. The CAPM is flawed by the use of an overstated MRP. Using a more moderate MRP would, by itself, eliminate the divergence between the Board's COC and those recently presented by Morgan Stanley. The AAR's beta explanation is suspect. The Board should commence a proceeding to treat operating leases as debt, in accordance with the rules recently adopted by FASB.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 11th day of May 2016, I have caused true and accurate copies of the foregoing Reply Statement of the Western Coal Traffic League to be served upon all parties on the service list in Ex Parte No. 558 (Sub-No. 19), by first class mail, postage prepaid, and by email.

/s/ Robert D. Rosenberg

Exhibit A

Excerpts from Morgan Stanley Freight Transportation Report,
Rails: End of the Pricing Renaissance? Time for Quality and Defense,
February 23, 2016

February 23, 2016

Freight Transportation

Rails: End of the Pricing Renaissance? Time for Quality and Defense

The big Rail debate in 2016 is whether coal and uncertain macro can allow inflation+ pricing. However, we believe pricing concerns are more endemic due to structural issues at multiple end markets. Only the highest-quality Rails appear best positioned to respond. CNR is our top pick.

2016: rebound or recession? The emerging debate around Rails is whether easy comps in 2H16 and M&A catalysts make the Rails a buy after a dismal 2015 or whether further macro deterioration could make 2016 another disappointing year for volumes which, in turn, could affect pricing. The only things we know for certain are that visibility into 2016 is exceptionally poor and both investors and Rail management teams are going to react to data in real time. However, we believe the more pressing concerns around Rails could be more structural and longer-term in nature.

What if the rebound never comes? The general consensus is that 2016 may be a gap year at worst and the industry should rebound from 2017 onward. Our work on key Rail end markets (in collaboration with Morgan Stanley sector analysts) leaves us skeptical. Coal and energy are under pressure today and while we do not take a view on the long-term direction of these end markets, we do not expect a snapback either. Furthermore, Auto and Intermodal could come under pressure as well driven by technology disruption. Together, these four end markets represent nearly 50% of direct revenues and 60% of volumes at class I Rails – **structural weakness here could mean virtually no volume growth for Class I Rails.**

For those who believe the Rail story has always been about pricing and not volume growth, we concur. The issue is that, oligopoly or not, we believe it could be challenging for Rails to pass through inflation+ pricing (3-4%) to secularly challenged customers (as currently demonstrated by emerging coal pricing pressure). **Contrary to the consensus view that transportation costs are only a fraction of overall unit cost for main Rail end markets, our proprietary analysis shows that transportation cost can be much more meaningful (up to ~40% of end market unit cost).** We believe the Rail pricing renaissance – the key investment pillar for the Rails for the past 5 years driving double-digit EPS growth – may be over. The good news is that the Rails may have instruments to fight back – we expect slowing end markets to catalyze Rail consolidation in an attempt to reduce costs and maintain capex.

We prefer the highest-quality, defensive Rails that have the best operating performance, the least exposure to at-risk end markets and the strongest balance sheets/management to drive industry consolidation. CNR is our top pick at Overweight, followed by UNP, KSU and GWR at Equal-weight and CSX

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Freight Transportation

North America

IndustryView

In-Line

Debate 1: What is the near and long-term outlook for Rail end markets?

Debate 2: Can rails continue to grow EPS?

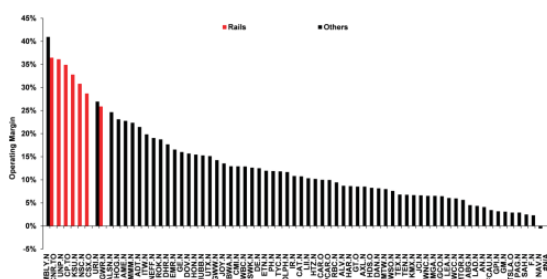
Debate 3: Are the rails cheap enough to buy again?

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

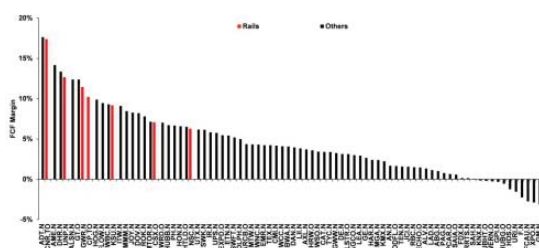
at Underweight. We believe secular concerns mean Rail valuations should de-rate at least 3-4x toward the 10-14x range, on average, consistent with other Industrials growing EPS at a mid-single digit rate.

Exhibit 61: Operating Margins for Industrials vs. Rails: Rails pack the top quartile....



Source: Company Data, Morgan Stanley Research; Note: Chart based on 2014 actual data

Exhibit 62: FCF Margins for Industrials vs. Rails: Rails are more distributed among top half



Source: Company Data, Morgan Stanley Research; Note: Chart based on 2014 actual data

4. We use a 10-year DCF over multiples for valuation. Using a DCF, we attempt to capture the true operating position of the business over a full cycle including the impact of secular change in the out years. We believe this presents a much more holistic picture of the company's growth prospects and quality over time, vs. using a point in time multiple based on historical valuation. We use perpetual growth rates of 1-2%, Risk free rate of 3% all Rails and a WACC range of 6-8%.

Where we could be wrong. It is possible that Rail stocks could rally hard if there is a near-term improvement in first or second derivative data given their declines in the past 6 months. However, we would fade the rally until longer term growth questions are resolved. We also acknowledge that Rails could benefit from autonomous trucking in their Intermodal business, as well though the closer gap in costs vs. trucking could still curb incremental growth. If Rail technology progresses to the extent that PTC evolves into driver/crew-less trains, this could drive a huge improvement in Rail operating costs vs. other modes of Freight Transportation. Finally, if Rail M&A is successfully consummated in the near-term, this could lift sentiment in the group.

Canadian National: The Highest-Quality Class I Rail

Why Overweight?

1.CNR has the best operating metrics in Class I Rails. CNR's 2015 operating ratio of 58.2% is comfortably the lowest among Class I Rails and the only sub-60% OR for now. This is a testament to the company's Precision Railroading model that focuses on operating efficiency as well as strong mix/RTM on the topline. CNR also has one of the lowest balance sheet leverage in the group (net debt to EBITDA of 1.6x, second only to UNP) and the highest FCF margin among peers (19%, comfortably above UNP). If the Rails are heading into a secular storm, CNR is best positioned to succeed, in our view, followed by UNP.

2.Ag exposure gives it end-market defensiveness. CNR has the lowest exposure to the four most challenged end markets with only 61% of volumes (vs. Class I average of 68%) and 46% of revenues (only KSU is lower, Class I average 48%). This is largely due to the huge Canadian Ag franchise – CNR has the highest Ag exposure of any Class I Rail – and Ag is arguably the least vulnerable Rail end market. While CNR's end-market exposure may not be as balanced as UNP, its peer-low exposure to the four most challenged end markets helps make it our top Rail pick. This is reflected in our growth estimates for CNR – with 3.5% revenue CAGR through 2020, it is the second fastest-growing Class I Rail in our coverage after KSU.

3.Balance Sheet should allow it to participate in industry M&A. If end-market weakness indeed starts to drive consolidation in the space, we expect CNR to be a significant player given its class-leading balance sheet, strong/stable ag franchise, Canadian network footprint (and related FX which should help numbers – a 4% revenue tailwind expected in 2016), and strong management team. For the time being, however, management commentary has implied that the current regulatory environment could be a headwind to M&A.

Where we could be wrong

1.Forward visibility no better than peers. While CNR may have the lowest exposure to the four most challenged end markets, those markets are still a significant part of revenue and CNR depends on Intermodal and Auto for future growth, like all the other Rails. Also, while Ag may be a defensive end-market, forward visibility is no better given changeable weather conditions. However, we believe CNR's defensive footprint should drive better relative performance than other Rails more exposed to challenged verticals.

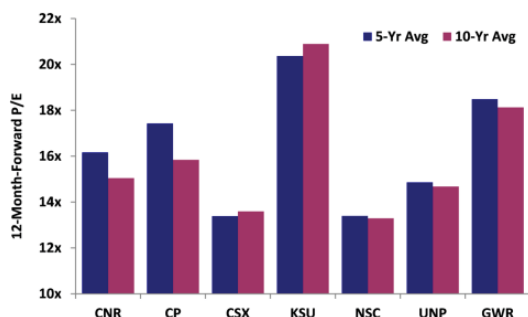
2.Little room to improve. A traditional pushback against CNR is that the operations are already so efficient that there is probably not much more room to improve. After all, how low can OR go? However, we believe the high OR and FCF margin should serve as defensive buffers if volumes and pricing slow down. Also, management continues to implement productivity initiatives and service improvements which should drive OR gains over time.

3. Stock is not cheap. CNR currently trades at ~16.5x TMF PE, about 1.5x higher than the group average (~2.0x ex-KSU and GWR). It is the only Rail stock that is trading above its historical multiple (15.0x) and its 10-yr median relative to S&P valuation. There may be little room for the multiple to expand or for error at these valuation levels.

Our estimates vs. consensus

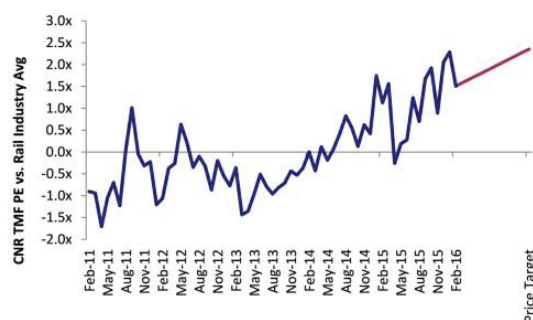
Our FY17 EPS estimate for CNR is ~C\$5.28, which is 5% above consensus. We look for a ~1.5% growth in carloads through 2018, higher than peers due to favorable mix (Ag heavy). Our estimates for CNR's Coal, Auto, Energy, and Intermodal franchises are similar to peers. We look for a ~2.5% increase in pricing and a mid-50s OR through 2018. Our FY17 revenue estimate of C\$13.4 bn is 2% below consensus though EBIT of \$6.08 bn is 3.8% above consensus, implying better cost performance than consensus expects when challenged with a tougher top line. We expect CNR to trim its workforce by 1-1.5% per year and a 3-3.5% growth in purchased services through 2018.

Exhibit 63: Rail Long-term Average PE



Source: Thomson Reuters, Morgan Stanley Research

Exhibit 64: CNR TMF PE vs. Rail Industry Average



Source: Thomson Reuters, Morgan Stanley Research; Note: Rail Industry Average is the average of CNI, CP, CSX, KSU, NSC, UNP, and GWR.

Valuation (PT\$85, 8% upside): Our 10-year DCF for CNR implies a 12-month PT of \$85 or ~16x PE (1x higher than CNR's 10 year average PE and inline with 5-year average PE). We believe the 5-year multiple is more relevant for CNR as it has traded at a meaningfully different valuation range in that time. We assume a terminal growth rate of 1.5% and WACC of 6.5% in our DCF. We believe the valuation premium over peers is consistent with the 5-year trend and is justified given the quality of management, operational execution, and defensive footprint in the face of the growth concerns we see at key end markets and the knock-on impact on pricing power. This leaves us relatively OW despite relatively limited upside to PT, as we see downside to PT/de-rating at other Rail stocks.

Risk Reward

Canadian National Railway (CNR, Overweight, PT C\$85)



Source: Thomson Reuters, Morgan Stanley Research Estimates

Exhibit 65: Bull, Base, and Bear Case

	YE2016	YE2017	Bull Case		
Carload Growth	0.4%	4.8%	Underlying fundamentals at the four most challenged end markets improve and overall industry volume growth accelerate as the economy picks up momentum. Pricing exceeds expectations. Given volume and pricing growth, CNR is able to generate operating leverage beyond expectations.		
Yield Growth	3.5%	4.8%			
Freight Revenue Growth	3.9%	9.8%			
Non-Freight Revenue Growth	(4.5%)	1.0%			
Operating Ratio	55.3%	53.6%			
Sharecount	779	757			
EPS Estimate (\$CAD)	\$4.96	\$5.82	Fwd P / E Multiple	18.0	Valuation Level \$105
	YE2016	YE2017	Base Case		
Carload Growth	(2.6%)	1.8%	Structural headwinds at the four most challenged end markets will not only pressure industry volumes (we expect no to very little vol growth in 2016/17), but will also challenge inflation plus pricing. We believe the rails with the best op. metrics and least exposure to at-risk markets will have the most potential to expand margins.		
Yield Growth	3.0%	4.3%			
Freight Revenue Growth	0.3%	6.2%			
Non-Freight Revenue Growth	(4.5%)	1.0%			
Operating Ratio	56.3%	54.5%			
Sharecount	780	761			
EPS Estimate (\$CAD)	\$4.65	\$5.28	Fwd P / E Multiple	16.1	Valuation Level \$85
	YE2016	YE2017	Bear Case		
Carload Growth	(4.6%)	(0.7%)	In addition to the four most challenged end markets, other end markets face structural pressures and economic growth decelerates, driving volume declines and core pricing below inflation. Rails see significant deceleration in productivity as cost control slips in the face of lackluster volumes. Investor concerns drive multiples lower.		
Yield Growth	2.5%	3.3%			
Freight Revenue Growth	(2.3%)	2.6%			
Non-Freight Revenue Growth	(4.5%)	1.0%			
Operating Ratio	58.6%	58.0%			
Sharecount	780	761			
EPS Estimate (\$CAD)	\$4.26	\$4.51	Fwd P / E Multiple	14.0	Valuation Level \$63
Valuation Discussion					
We use a 10-year DCF assuming 6.5% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 9.0x). Our DCF valuation implies January 2017e TMF PE of 16.1x, which is below CNR's 5-year average given our cautious outlook on rails.					

Source: Morgan Stanley Research

Investment Thesis

- We are Overweight CNR. We see CNR as a best-in-class, defensive Rail, that should be able to deploy its operating superiority and relatively defensive end-market footprint to deliver returns superior to peers in a challenging environment for Rails, where we expect key end-markets to slow.

Investment Positives

- Best-in-class margins along with history of solid FCF and large, consistent share buybacks
- Significant Canadian operations and Ag footprint may insulate somewhat against slower growth in key end markets including Coal, energy, auto and intermodal as well as a choppy macro
- Balance sheet can allow CNR to be an M&A player

Risks to our Price Target

- CNR is already best of breed - how much better can margins get?
- Valuation premium to US Class I's may not be sustainable
- Forward visibility no better than peers

Union Pacific: A High-Quality and Defensive Rail...for Now...

Why Equal-weight?

1. Mixed end-market exposure. While few Rails can escape near-term macro trends, we prefer Rails that have the most defensive end-market exposure in the face of the longer-term secular trends that we highlighted. We are looking for the least exposure to a combination of coal+energy+auto as well as intermodal business. We understand that every Rail has significant exposure to these combined end markets (and hence our relatively low rank for Rails within Freight Transportation verticals), but within the Class I Rails that we cover, we see some as better than others.

UNP's footprint is a bit of a mixed bag. It has the second highest exposure to the four most challenged end markets (coal + energy + auto + intermodal) end markets accounting for 72% of carloads. However, that statistic may be slightly misleading as UNP's footprint within these end markets may be more defensive, given its geographic distribution. For instance, 50% of its intermodal is international with a strong Mexico presence. We expect the autonomous trucking revolution to remain in developed markets of the US and Canada for the time being where the highway infrastructure is better, trucks are newer, and regulations are more supportive of the technology. Furthermore, West coast coal is likely to come back first in the event natural gas prices rise. On the whole, we believe UNP's revenue growth potential and pricing power are mid-pack among class I rails.

2. UNP is an excellent operator but not as good as CNR. UNP's operating ratio in the low 60s is better than the industry average and behind CNR. This comes despite the highest cost per carload ex-fuel of any Class I Rail (\$1,295 in 2015 vs. Class 1 average of \$1,025) and is driven primarily by best-in-class RTM/carload (at \$54k) which in turn is a function of strong pricing and superior mix of business. The higher cost vs. peers is primarily a function of non-core costs (i.e. costs other than employee costs and fuel) particularly purchased services and equipment rents, which leaves UNP with room to cut cost relatively easily in the event that Rail pricing does come under pressure, in our view. The latter two categories cost UNP \$400 per carload vs. the Class I average of \$340. UNP also has the least levered balance sheet (net debt/EBITDA <1.5, net debt/capital of 37%), strong cash flow generation with FCF/revenue of 12% (behind CNR,CP) and nearly best-in-class cash return with the most shares bought back in the last four years and the third highest dividend yield. If the environment gets really tough for Rails, UNP has a strong set of instruments in its arsenal to fight back.

3. Coal could get a lot worse for UNP. UNP has a sizeable coal franchise with very different economics and dynamics vs. Eastern coal. As we outline in our Coal end-market overview, if natural gas prices fall below \$2.40, a sizeable number of coal plants in the Midwest and western USA would consider switching. While the Eastern coal-exposed Rails may have seen a bulk of their Coal headwinds already, the headwinds may be just getting started for UNP. Furthermore, rail/transportation cost per unit is much higher for these plants than for Eastern plants. If this happens, UNP (and KSU) are likely to see significantly larger pricing headwinds than even the Eastern coal exposed Rails have seen, where a large number of plants have already switched to natural gas.

4. Management's steadfast pricing discipline could result in rapid share erosion. UNP and CNR are probably the two highest-quality names in Rails and also seem to be the most steadfast with holding their ground on pricing. While this may ordinarily be a good thing, we believe Rail management teams may need to be more flexible in their pricing outlook in the future. We believe the secular pressures facing key Rail end markets may impact volumes but would have a much bigger impact on the Rails' ability to pass through price increases. Coal market pricing behavior in the past year serves as a relevant template for what can happen in the other challenged markets in coming years. If UNP continues to remain steadfast on pricing, it could lose significant share and have to embark on drastic cost cutting/restructuring to resize its operations, which can carry execution risk. An all-out competitive war with BNSF or other Rails could erode defensive traits. Management also appears to be firmly against M&A, at least in the current environment, and it is unclear to us if that will change in the future.

5. Valuation is about average for the group. UNP trades in-line with the Class I average PE of ~14.5x (or

0.5x discount incl-KSU and GWR) and at a slight discount to its historical multiple, which is also consistent with peers of its quality. We cannot make a valuation case for UNP in either direction.

Where could we be wrong?

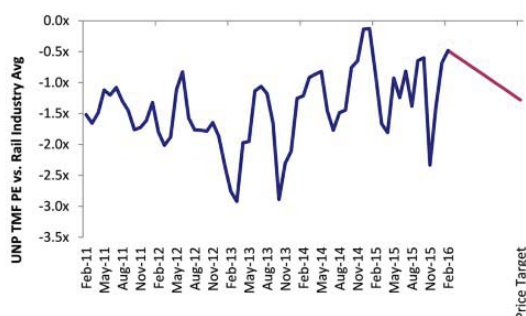
1. Defensiveness could become a liability with short-term cyclical swings. The direction that we see for challenging end markets are secular shifts that we expect to play out between now and 5 years from now, but we could be wrong about these secular shifts or the cycle – which is under significant pressure today – but could temporarily swing higher in the short/medium term. UNP would almost certainly participate in such a rebound but could underperform peers that have a more concentrated exposure to end markets like coal (CSX), energy (CNR), auto (KSU) or intermodal.

2. Panama canal expansion. The Panama canal is currently going through an expansion project and despite delays, once completed, could be a headwind to UNP's Intermodal business. UNP estimates that once the expansion is complete ~3% of market share would go to Panama rather than through the West coast – others have noted that around 10% of the cargo moving from Asia to the US could shift to the East coast.

MS estimates vs. consensus

Our EPS estimates for UNP are about 1% below consensus for FY17 and 4% below consensus for FY18. Our revenue estimates for both years are about 2-3% below consensus likely reflecting our relatively bearish view on key end-market growth and pricing. However, we give UNP credit back on the cost front which allows our EPS estimate to close the gap to consensus.

Exhibit 66: UNP TMF PE vs. Rail Industry Average



Source: Thomson Reuters, Morgan Stanley Research; Note: Rail Industry Average is the average of CNI, CP, CSX, KSU, NSC, UNP, and GWR.

Valuation

Our DCF-derived PT for UNP is \$74 or 7% downside to the current stock price. Our PT translates to 12.5x FY17 PE vs. the historical multiple at ~14.7x and the current multiple at ~14.5x and the current group average of 15.6x. We believe the de-rating is warranted given our concerns around long-term growth at key end markets (especially coal) and UNP's high exposure to it as well as its willingness to respond to competitive actions. We continue to expect a 1.5x discount to the LT group average multiple, consistent with historical trend. Our DCF uses a terminal growth rate of 1.5% and WACC of 7.2%.

Risk Reward

Union Pacific Corp. (UNP, EW, PT \$74)



Source: Thomson Reuters, Morgan Stanley Research

Exhibit 67: Bull, Base, and Bear Case

	YE2016	YE2017	Bull Case			
Carload Growth	(1.5%)	1.9%	Underlying fundamentals at the four most challenged end markets improve and overall industry volume growth accelerate as the economy picks up momentum. Pricing exceeds expectations. Given volume and pricing growth, UNP is able to generate operating leverage beyond expectations.			
Yield Growth	(0.6%)	3.5%				
Freight Revenue Growth	(2.1%)	5.5%				
Non-Freight Revenue Growth	(2.0%)	2.0%				
Operating Ratio	61.5%	59.6%				
Sharecount	828	795				
EPS Estimate	\$5.76	\$6.64	Fwd P / E Multiple	15.0	Valuation Level	\$100
	YE2016	YE2017	Base Case			
Carload Growth	(3.0%)	0.4%	Structural headwinds at the four most challenged end markets will not only pressure industry volumes (we expect no to very little vol growth in 2016/17), but will also challenge inflation plus pricing. We believe the rails with the best op. metrics and least exposure to at-risk markets will have the most potential to expand margins.			
Yield Growth	(1.6%)	3.0%				
Freight Revenue Growth	(4.5%)	3.5%				
Non-Freight Revenue Growth	(2.0%)	2.0%				
Operating Ratio	62.8%	61.8%				
Sharecount	830	801				
EPS Estimate	\$5.40	\$5.94	Fwd P / E Multiple	12.5	Valuation Level	\$74
	YE2016	YE2017	Bear Case			
Carload Growth	(4.2%)	(1.4%)	In addition to the four most challenged end markets, other end markets face structural pressures and economic growth decelerates, driving volume declines and core pricing below inflation. Rails see significant deceleration in productivity as cost control slips in the face of lackluster volumes. Investor concerns drive multiples lower.			
Yield Growth	(3.2%)	1.4%				
Freight Revenue Growth	(7.2%)	0.0%				
Non-Freight Revenue Growth	(2.0%)	2.0%				
Operating Ratio	64.6%	65.5%				
Sharecount	833	809				
EPS Estimate	\$4.95	\$4.94	Fwd P / E Multiple	12.0	Valuation Level	\$59
Valuation Discussion						
We use a 10-year DCF assuming 7.2% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 7.0x). Our DCF valuation implies January 2017e TMF PE of 12.5x, which is below UNP's historical average reflecting secular growth headwinds.						

Source: Morgan Stanley Research

Investment Thesis

- We are Equal-weight UNP. We see UNP as a high-quality, defensive Rail which has room to improve its already strong operating metrics, if we see slowing end markets (especially Coal, energy, auto, intermodal) as we expect. However, UNP has high exposure to these four end markets and valuation is not particularly compelling either.

Investment Positives

- Despite high exposure to most challenging end markets we see some defensive traits
- Very strong operator behind CNR
- Disciplined management team

Risks to our Price Target

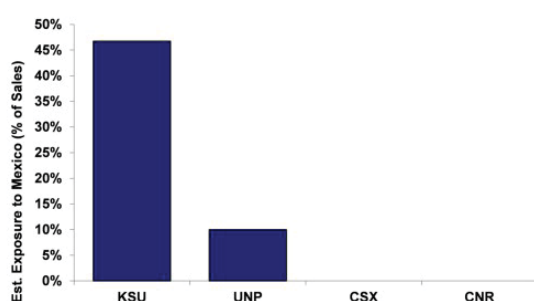
- Disciplined pricing means some volume losses can occur
- End market exposure could get incrementally tougher
- Valuation not particularly compelling

Kansas City Southern: The Only Rail That Can Still Claim Secular Growth – at a Price

Why Equal-weight?

1. We like the low exposure to the four most challenged end-markets. KSU generates just 35% of its revenue from the four most challenged end markets, significantly lower than the 45% exposure of the next-lowest (CP, CNR). KSU has relatively low exposure to coal and energy sectors though it does have Auto and Intermodal exposure.

Exhibit 68: Estimated Mexico Exposure (% of Sales)



Source: Company Data, Morgan Stanley Research

2. Mexico still has secular growth potential but also some risks.

KSU has been able to deliver the highest revenue growth of any Rail in the last 10 years, largely driven by a secular shift in production to Mexico. This has largely been driven by Auto production, which has contributed ~10% of the ~80% growth in KSU's revenues. Mexico as an auto production hub continues to remain a positive catalyst with new capacity coming on from 7 automakers which is set to boost Mexico auto output by ~60% between 2015 and 2020. However, as we note in our Autos outlook earlier in this report, with the auto cycle peaking (either from a value or volume perspective), there is a meaningful risk that new Mexico projects could be slowed or stalled. If our Autos team's view of a secular shift in automotive use and the role of

traditional OEMs plays out, this could have a meaningful negative impact on long term auto production levels. This is by no means an issue isolated to KSU alone nor will it be significantly negative to KSU; however, as the Class I Rail most exposed to Auto (along with CSX) and carrying high expectations of large growth, a slowdown would not be well received by the market. Also, while most Rails have limited near-term visibility into end market outlooks, we believe its Mexico footprint adds an additional layer of uncertainty to KSU's outlook.

3. Operating metrics are mid pack. KSU leads Class I Rail peers in revenue growth (6% 10-year CAGR vs. group at 4%) driven by the Mexico growth story so far. However, the rest of its operating metrics are midpack amongst its peers, including operating ratio (66% vs. group average 65%), leverage (2.1x vs. group average 1.9x), cash flow generation (9% FCF margin vs. group average 11%) and cash return (4% total yield vs. group average 6%). This has led to 2nd highest EPS growth despite its class leading revenue growth. KSU's lower cost base (cost per carload ex. fuel of \$585 vs. group average of \$1,027, primarily due to lower employee cost of \$67K vs. group average of \$97K) is primarily due to its Mexico exposure and probably subject to inflation more than deflation. We believe KSU's operating efficiency and footprint give it middle-of-the-pack ability to deal with challenging end market growth and pricing pressure on Rails.

4. Valuation gap to peers closing but still high. KSU has historically been the most expensive Class I Rail as the secular Mexico growth story has generated the highest revenue and EPS growth among Class I Rails. While KSU's valuation premium has fallen from the mid-twenties to the high teens, with the overall outlook for Rails looking somewhat cautious, slowing near-term macro risks and the midpack metrics at KSU, we believe the multiple should be much closer to the group average (~15x) than the current level.

5. Strategic Optionality. With its large Mexico footprint and potential for growth, it's plausible that KSU could participate if consolidation were to take place within Rails. Unlike other smaller Eastern Rails, we believe KSU would enter any potential consolidation phase from a position of relative strength and not weakness, despite its high multiple. However, this is a well known thesis and expectations around KSU's strategic optionality are already relatively high. But, unlike all other Rails, KSU does not own its network and operates on the basis of the operating agreement with the Mexican government – significantly increasing the uncertainty around the long

term outlook of the business and potentially reducing its strategic value.

Where we could be wrong

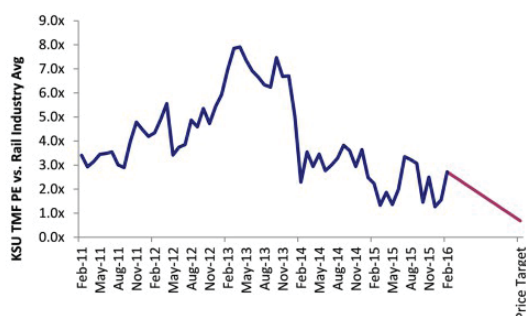
1. Execution has been uneven and could get worse. In the past 12-18 months, KSU management significantly rightsized its footprint in Mexico to take out costs. However, in 2H15, it became evident that they had gone too far and together with the resulting poor relationship with the union, led to severe service issues. The result was OR of 64% and revenue decline of 7% in 2H15. After resolving their union issues and bringing in new local managers, KSU management now believes this is behind them and operating metrics should be back to normal in 2H16. KSU could also be somewhat of a wildcard in the sustainability of Rail pricing power.

2. We may be too bearish on Mexico. Even in the face of slowing macro, secular end market changes and potential political concerns, Mexico could continue to be the go-to manufacturing destination in North America. If Mexico could recapture its growth potential, KSU could close the gap vs. its historical multiple and significantly outperform peers.

Our estimates vs. consensus

Our EPS estimates for KSU are 3% above consensus for FY17 and 1% below consensus for FY18. Our revenue and EBIT estimates are both relatively in-line with consensus. This implies that the biggest difference between our view on KSU and the market/consensus is the multiple that is to be applied to those earnings, given the wide range between its current (17.8x), historical (21x) and peak (37x) multiples.

Exhibit 69: KSU TMF PE vs. Rail Industry Average



Source: Thomson Reuters, Morgan Stanley Research; Note: Rail Industry Average is the average of CNI, CP, CSX, KSU, NSC, UNP, and GWR.

Valuation

Our DCF derived PT for KSU is \$76 or about 8% downside to the current price. We use a terminal growth rate of 3% (the highest in the group given KSU's MX exposure) and a WACC of 7.4%, the highest among Class I rails, also because of KSU's MX exposure. Our PT translates to ~14.5x FY17e PE, just slightly below CNR for the highest multiple in the group given its growth potential but a significant discount to its historical multiple (21x) and closing in on group average valuation (though consistent with recent trend that has seen the gap closing), given our concerns around MX auto and recent execution.

Risk Reward

Kansas City Southern (KSU, Equal-weight, PT \$76)



Source: Thomson Reuters, Morgan Stanley Research Estimates

Exhibit 70: Bull, Base and Bear Case

	YE2016	YE2017	Bull Case			
Carload Growth	1.2%	4.8%	Underlying fundamentals at the four most challenged end markets improve and overall industry volume growth accelerate as the economy picks up momentum. Pricing exceeds expectations. Given volume and pricing growth, KSU is able to generate operating leverage beyond expectations.			
Yield Growth	(2.2%)	4.7%				
Freight Revenue Growth	(1.0%)	9.7%				
Non-Freight Revenue Growth	0.0%	2.0%				
Operating Ratio	64.2%	63.1%				
Sharecount	107	106				
EPS Estimate	\$4.77	\$5.49	Fwd P / E Multiple	20.0	Valuation Level	\$110
	YE2016	YE2017	Base Case			
Carload Growth	(0.8%)	3.8%	Structural headwinds at the four most challenged end markets will not only pressure industry volumes (we expect no to very little vol growth in 2016/17), but will also challenge inflation plus pricing. We believe the rails with the best op. metrics and least exposure to at-risk markets will have the most potential to expand margins.			
Yield Growth	(2.3%)	4.3%				
Freight Revenue Growth	(3.0%)	8.2%				
Non-Freight Revenue Growth	0.0%	2.0%				
Operating Ratio	64.5%	63.1%				
Sharecount	107	107				
EPS Estimate	\$4.62	\$5.27	Fwd P / E Multiple	14.4	Valuation Level	\$76
	YE2016	YE2017	Bear Case			
Carload Growth	(5.8%)	(1.2%)	In addition to the four most challenged end markets, other end markets face structural pressures and economic growth decelerates, driving volume declines and core pricing below inflation. Rails see significant deceleration in productivity as cost control slips in the face of lackluster volumes. Investor concerns drive multiples lower.			
Yield Growth	(4.2%)	2.4%				
Freight Revenue Growth	(9.7%)	1.1%				
Non-Freight Revenue Growth	0.0%	2.0%				
Operating Ratio	65.2%	65.3%				
Sharecount	108	108				
EPS Estimate	\$4.18	\$4.21	Fwd P / E Multiple	13.5	Valuation Level	\$57
Valuation Discussion						
We use a 10-year DCF assuming 7.4% WACC and terminal cash flow perpetual growth rate of 3.0% (implying an exit EBITDA multiple of 8.0x). Our DCF valuation implies January 2017e TMF PE of 14.4x, which is below KSU's historical average given our cautious outlook on rails.						

Source: Morgan Stanley Research

Investment Thesis

- We are Equal-weight KSU. KSU's growth opportunity in Mexico is one of the best secular themes in Rails though we are somewhat concerned about high Auto exposure when the cycle might be peaking and the industry faces secular threats. Operating quality has been somewhat of a mixed bag in the past year and while KSU is still one of the most expensive Rails, it has de-rated significantly from its historical valuation level.

Investment Positives

- Lowest exposure to the most challenged end markets and exposure to Mexican industrialization a secular positive for volume growth
- Operating metrics have room to improve
- Multiple has de-rated from historical levels
- Reduced regulatory hurdles for M&A vis-à-vis Class I's provide strategic optionality

Risks to our Price Target

- Mexico exposure is not without risk
- Still one of the most expensive Class I Rails
- Execution has been spotty
- High capex requirements

CSX: The "Other" Eastern Coal Rail

Why Underweight?

1. Operating metrics are at the bottom of the group. CSX ranks toward the bottom of the group in terms of operating metrics. CSX has an OR of 70% (the highest among most Class I rails), FCF margin of 7% (lower than most peers), net debt / EBITDA of 2.2x (comparable to CP at 2.5x) and the lowest number of shares repurchased. Together, we believe this leaves CSX lesser room to maneuver through a tough macro and structural end market challenges, as compared to other rails.

2. Higher than average exposure to challenged end markets. At 69% of volumes and 51% of revenues, CSX has higher than average exposure to the four most challenged end markets of coal, energy, auto and intermodal. While not as high as UNP, we believe CSX's revenue exposure does not have as many defensive traits as UNP.

3. Sentiment/valuation could be worse. CSX was among the worst performing Rail stocks in the past 3 months and are the cheapest stocks in the group (CSX is trading at ~13 TMF P/E respectively vs. the Class I average of ~14.5x) reflecting coal performance. However, investor expectations may not have bottomed on fundamentals. Furthermore, given our expectation that the Rail stocks deserve to trade closer to a 10-14x PE range than the historical 12-16x range, we believe CSX has further room to de-rate.

Where we could be wrong.

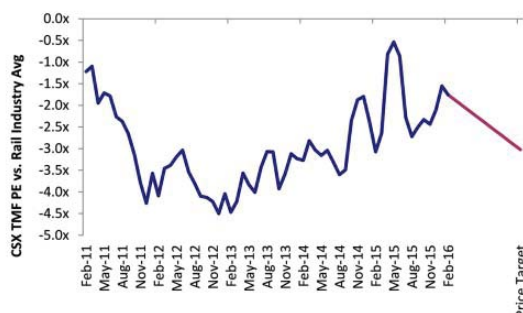
1. Management responding to the environment. CSX management has done a decent job of responding to the environment especially structural coal weakness by taking steps to cut costs that go beyond some peers. Given continued end-market pressure as well as peer pressure, we believe management could take bigger steps.

2. Strategic Optionality. In the event of consolidation activity in the space, a smaller rail like CSX could potentially participate before end markets deteriorate further.

MS estimates vs. consensus

Our FY17e EPS is \$1.87 and FY18e EPS is \$2.04, both about 7-8% below consensus. We look for revenue decline of -3.5% in FY16, followed by 3-3.5% growth in FY17-18. Our FY17-18 revenue is slightly below consensus, with much of the gap coming in the OR expectations. We see earnings growth slowing to the low single digits in the out years though we give CSX credit by pulling back on capex.

Exhibit 71: CSX TMF PE vs. Rail Industry Average



Valuation

Our DCF-derived PT for CSX is \$20, which translates to ~11x FY17e PE. This is below the LT average multiple of ~13.5x and the current multiple of ~13x, reflecting our view on secular pressures. This translates to a ~3x discount to the group average multiple, which is consistent with historical trends. We use a terminal growth rate of 1.5% and WACC of 6.7% in our 10-year DCF model.

Source: Thomson Reuters, Morgan Stanley Research; Note: Rail Industry Average is the average of CNI, CP, CSX, KSU, NSC, UNP, and GWR.

Risk Reward

CSX Corporation (CSX, UW, PT \$20)



Source: Thomson Reuters, Morgan Stanley Research

Exhibit 72: Bull, Base, and Bear Case

	YE2016	YE2017	Bull Case			
Carload Growth	(1.7%)	1.3%	Underlying fundamentals at the four most challenged end markets improve and overall industry volume growth accelerate as the economy picks up momentum. Pricing exceeds expectations. Given volume and pricing growth, CSX is able to generate operating leverage beyond expectations.			
Yield Growth	0.3%	2.9%				
Freight Revenue Growth	(1.4%)	4.2%				
Non-Freight Revenue Growth	(0.3%)	2.5%				
Operating Ratio	70.1%	70.9%				
Sharecount	948	923				
EPS Estimate	\$1.90	\$1.97	Fwd P / E Multiple	15.0	Valuation Level	\$30
	YE2016	YE2017	Base Case			
Carload Growth	(3.7%)	0.3%	Structural headwinds at the four most challenged end markets will not only pressure industry volumes (we expect no to very little vol growth in 2016/17), but will also challenge inflation plus pricing. We believe the rails with the best op. metrics and least exposure to at-risk markets will have the most potential to expand margins.			
Yield Growth	0.1%	2.7%				
Freight Revenue Growth	(3.6%)	3.0%				
Non-Freight Revenue Growth	(0.3%)	2.5%				
Operating Ratio	70.7%	71.2%				
Sharecount	950	927				
EPS Estimate	\$1.80	\$1.87	Fwd P / E Multiple	10.7	Valuation Level	\$20
	YE2016	YE2017	Bear Case			
Carload Growth	(4.7%)	(2.7%)	In addition to the four most challenged end markets, other end markets face structural pressures and economic growth decelerates, driving volume declines and core pricing below inflation. Rails see significant deceleration in productivity as cost control slips in the face of lackluster volumes. Investor concerns drive multiples lower.			
Yield Growth	(1.3%)	0.6%				
Freight Revenue Growth	(5.9%)	(2.1%)				
Non-Freight Revenue Growth	(0.3%)	1.5%				
Operating Ratio	72.1%	73.2%				
Sharecount	959	951				
EPS Estimate	\$1.63	\$1.52	Fwd P / E Multiple	9.0	Valuation Level	\$14
Valuation Discussion						
We use a 10-year DCF assuming 6.7% WACC and terminal cash flow perpetual growth rate of 1.5% (implying an exit EBITDA multiple of 6.0x). Our DCF valuation implies January 2017e TMF PE of 10.7x, which is below CSX's historical average reflecting secular pressures.						

Source: Morgan Stanley Research

Investment Thesis

- We are Underweight CSX. CSX has high exposure to the most challenged Rail end markets, below-average operating metrics and while cheaper than some peers, we do not see enough value to get constructive at this time.

Investment Positives

- Management team attempting to work around secular and cyclical challenges
- Amongst the cheapest stocks in the group

Risks to our Price Target

- Operating metrics bring up the rear of the group
- Higher than average exposure to challenged end markets. Coal has already been a big headwind
- Sentiment/valuation may not have bottomed

GWR: Outsized energy/industrial exposure already reflected in valuation (Covered by Alex Vecchio)

Why Equal-weight?

1) Exposure to North America energy/industrial commodities as well as Australia would continue to weigh on earnings in the near-term. GWR has significant exposure to industrial / commodity end markets which have deteriorated through 2015 given the fall in commodity prices and headwinds from a stronger dollar (coal, metals, petroleum products, minerals & stone, pulp & paper account for 50%+ of total North America volumes). While YoY comparisons are easier relative to Class Is in 2016 (GWR's SSS traffic declined 10%+ YoY in 2015 vs. ~3% at Class Is), considering there is little evidence to suggest the underlying fundamentals of the US industrial energy complex is improving, we do not believe GWR's North America carload growth would inflect into positive territory in 2016 (We forecast GWR's North America carloads to be down ~5% in 2016, slightly below management's guidance for a 3% decline). Furthermore, unlike other Class I rails who have limited direct international exposure, GWR's Australia exposure would likely continue to be a headwind to volumes and earnings through 2016 given low iron ore / manganese prices and associated mine closures as well as FX headwinds from a weaker AUD. To be fair, Australia's contribution to GWR's consolidated operating income has declined from ~35% in 2012 to ~14% in 2015, thus the case can be made that GWR's Australia / FX headwinds are an increasingly well understood and smaller risk today vs. three years ago. Finally, GWR's recent announcement to restructure the company's UK coal franchise in light of coal declines being greater than management's original expectations makes it difficult to envision Europe being a source of upside surprise in the near term.

2) Higher leverage amidst uncertain macro backdrop creates greater risk to equity and limits potential for "needle-moving" acquisitions. Generally, our preference lies with companies whose capital structure is optimized for their business risk with respect to a reasonable expected range of macro situations. At 3.7x net debt / EBITDA, GWR's leverage is higher than the avg. Class I rail of ~2-2.5x and skews toward the higher end of our broader coverage universe as well. We don't think 3.7x leverage is necessarily an unsustainably high amount, but it still is a risk factor that could drive underperformance if the broader underlying end market fundamentals continue to deteriorate. That said, GWR's favorable tax attributes (short-line tax credit) and lower capex requirements relative to Class Is support a more attractive FCF profile (70-100% FCF/NI conversion vs. ~40-50% at Class Is in recent years). We expect GWR to continue to generate relatively strong FCF (\$250M in 2016, or ~120% of net income, inline with management's expectations) and prioritize paying down debt throughout 2016, but in the near-term we see a constrained balance sheet limiting GWR's ability to do meaningfully accretive transactions. Acquisitions have historically been a significant contributor to GWR's earnings growth and have served as positive catalysts for shares in the past, so the prospect for smaller, less accretive deals in the near-term makes it hard for us to get excited about the stock. Note we have no knowledge of any potential transactions and management has not commented.

3) Recent multiple compression is justifiable, but downside risk limited from here. At ~14x TMF P/E, GWR is trading ~400 bps below its 10-year avg. multiple of 18x. Furthermore, GWR is now trading inline with the avg. Class I (ex. KSU) multiple, significantly below the company's 10-year avg. 4x relative premium. While lower prospects for organic growth given greater exposure to weaker end markets / geographies and a more limited near-term opportunity for needle-moving potential acquisitions makes a relative discount to Class I rails seem merited, as a short-line railroad GWR still has several uniquely structural positive attributes which should be considered when assessing GWR's multiple, namely – (1) Lower customer risk than Class I rails, (2) Lower capex and maintenance requirements; (3) Lower labor costs / less restrictive unions; and (4) Favorable tax attributes. Furthermore, GWR's current ~8% FCF yield, is already significantly above the Class I avg of ~3-4%. As such we believe further downside to GWR's multiple is likely limited from here.

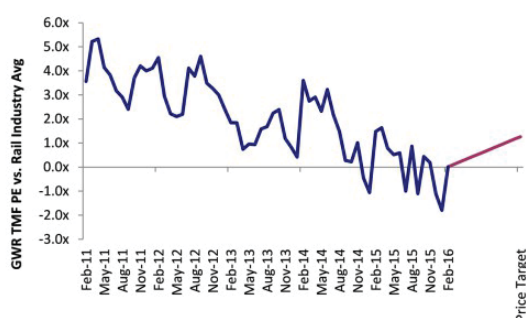
Where we could be wrong

1) Rebound in commodity prices / USD depreciation supports volume reacceleration and strong

margin expansion. If prices for crude, natural gas, iron ore, etc. rebound and / or the USD weakens, this would naturally improve demand for many energy/industrial commodities to which GWR is levered in North America, Australia as well as the UK. Given GWR's lower operating margin base relative to Class I rails (GWR's North America and Australia segments operate at a ~75% OR vs. the avg. of ~65% at Class Is), GWR would have relatively more upside to earnings growth from margin expansion relative to its larger Class I peers if volumes were to rebound.

2) GWR engages in potential strategic alternatives. While GWR's leverage may preclude the company from completing needle-moving acquisitions in the near-term, there are other strategic alternatives GWR could potentially pursue as a means of maximizing shareholder value. In fact there is increasing evidence of large infrastructure funds deploying capital as demonstrated by Brookfield Infrastructure Partners' acquisition of Australian rail-and-port operator, Asciano, in 2015.

Exhibit 73: GWR TMF PE vs. Rail Industry Average

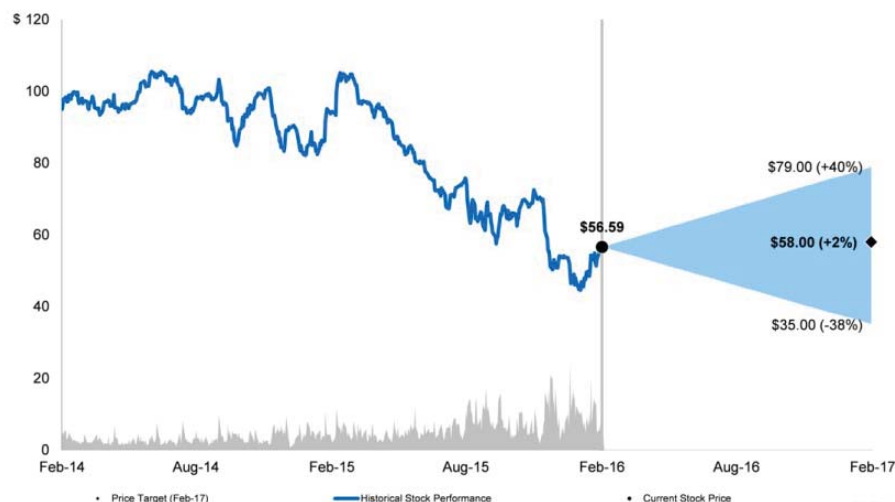


Valuation - GWR's TMF PE multiple has ranged from 10x-22x over the past 5 years, with an average of 18.5x, or a ~2.5x relative premium to Class I rails. We apply a 15x TMF PE multiple, slightly above the multiples we apply to Class I rails, but below GWR's historical 2.5x premium, to our 2017 EPS estimate to generate a \$58 PT. Our valuation is further supported by our DCF analysis which assumes a 7.5% WACC and a 2.0% perpetual growth rate.

Source: Thomson Reuters, Morgan Stanley Research; Note: Rail Industry Average is the average of CNI, CP, CSX, KSU, NSC, UNP, and GWR.

Risk Reward

Genesee & Wyoming (GWR, EW, PT \$58)



Source: Thomson Reuters, Morgan Stanley Research

Exhibit 74: Bull, Base, and Bear Case

	YE2016	YE2017	Bull Case			
Carload Growth	9.5%	4.8%	Industry volumes rebound and growth exceeds expectations in 2016/17 as the N. American and Australian economies pick up momentum. Pricing exceeds expectations. Given robust volume and pricing growth, GWR is able to generate operating leverage beyond expectations. GWR capitalizes on several accretive M&A opportunities and multiple expands.			
Yield Growth	14.3%	3.4%				
Freight Revenue Growth	25.3%	8.3%				
Operating Ratio	80.9%	79.9%				
Sharecount	58	55				
EPS Estimate	\$3.85	\$4.14	Fwd P / E Multiple	19.0	Valuation Level	\$79
	YE2016	YE2017	Base Case			
Carload Growth	7.5%	1.8%	Volumes declines moderate in 2016/17 as energy/industrial commodities remain weak, but GWR begins to lap easy comps. Core pricing decelerates moderately to 3% in 2016/2017, but remains above inflation. GWR prioritizes debt pay down with FCF and focuses on small tuck-in opportunities rather than large scale acquisitions.			
Yield Growth	13.8%	2.9%				
Freight Revenue Growth	22.4%	4.7%				
Operating Ratio	81.3%	80.2%				
Sharecount	58	56				
EPS Estimate	\$3.66	\$3.85	Fwd P / E Multiple	15.0	Valuation Level	\$58
	YE2016	YE2017	Bear Case			
Carload Growth	4.4%	0.6%	A stagnant economy drives slower volume growth and pricing is below expectations. 2016/17 see a significant deceleration in productivity as cost control slips in the face of lackluster volumes. Weaker iron ore prices / AUD FX rates are greater risk to earnings than in base case. Investor concerns drive multiples lower.			
Yield Growth	12.3%	0.5%				
Freight Revenue Growth	17.3%	1.0%				
Operating Ratio	82.1%	81.9%				
Sharecount	58	56				
EPS Estimate	\$3.34	\$3.21	Fwd P / E Multiple	11.0	Valuation Level	\$35
Valuation Discussion						
We apply a 15x multiple to our January 2017e TMF EPS estimate to generate our price target valuation of \$58. Our January 2017e TMF P/E multiple is inline with GWR's historical trading range. Our valuation is supported by our DCF which assumes a 7.5% WACC and 2% perpetual growth rate.						

Source: Morgan Stanley Research

Investment Thesis

- GWR's proven track record of acquiring short-line railroads at attractive prices and improving margins has made the company the best-of-breed play on short-lines. However, exposure to energy/industrial commodities would be an ongoing headwind to organic growth and GWR's relatively high leverage reduces the potential for needle-moving deals in the near-term. Given the recent compression in GWR's multiple, we see limited downside to valuation from here. As such we rate shares Equal-weight.

Investment Positives

- Institutional knowledge, transaction experience, and relationships in short-line M&A
- Willingness to deal in int'l markets could offer unique growth opportunities
- Reduced capex supports strong FCF generation
- Diminishing downside to profitability from Australia weakness as Australia contributes smaller percentage to total earnings

Risks to our Price Target

- FX and int'l exposure add volatility to financial results
- Weak energy/industrial backdrop could continue to weigh on organic growth
- Relatively high leverage reduces potential for needle-moving M&A in the near-term
- Continuous uncertainty regarding short-line tax credit renewal

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INDUSTRY COVERAGE: Freight Transportation

COMPANY (TICKER)	RATING (AS OF)	PRICE* (02/22/2016)
Alexander Vecchio, CFA		
ArcBest Corp (ARCB.O)	E (10/06/2011)	\$20.43
C.H. Robinson Worldwide Inc. (CHRW.O)	U (06/09/2013)	\$70.07
Canadian National Railway Co. (CNR.TO)	E (10/31/2008)	C\$78.81
Canadian Pacific Railway Ltd. (CP.TO)	++	C\$174.46
CSX Corporation (CSX.O)	O (06/11/2009)	\$25.30
Echo Global Logistics Inc (ECHO.O)	O (07/16/2012)	\$24.34
Expeditors International of Washington I (EXPD.O)	E (02/25/2015)	\$46.75
FedEx Corporation (FDX.N)	E (06/20/2013)	\$135.39
Genesee & Wyoming Inc. (GWR.N)	O (07/24/2012)	\$58.03
Heartland Express Inc. (HTLD.O)	U (05/06/2011)	\$18.95
Hub Group Inc (HUBG.O)	E (07/16/2012)	\$36.45
J.B. Hunt Transport Services Inc. (JBHT.O)	E (05/06/2011)	\$77.33
Kansas City Southern (KSU.N)	O (05/10/2010)	\$83.01
Knight Transportation Inc. (KNX.N)	U (05/06/2011)	\$25.30
Landstar System Inc (LSTR.O)	E (07/16/2012)	\$59.88
Norfolk Southern Corp. (NSC.N)	++	\$75.96
Old Dominion Freight Line Inc (ODFL.O)	O (10/06/2011)	\$63.84
Saia, Inc. (SAAO)	E (07/09/2012)	\$26.83
Swift Transportation (SWFT.N)	E (01/26/2011)	\$17.45
Union Pacific Corp. (UNP.N)	O (05/07/2007)	\$81.61
United Parcel Service (UPS.N)	E (03/11/2013)	\$98.02
Werner Enterprises (WERN.O)	U (06/11/2009)	\$26.50
XPO Logistics, Inc. (XPO.N)	O (11/16/2015)	\$27.22

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.

Exhibit B

Excerpts of Railroad Annual Reports/10-Ks for 2014 and 2015

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K

(X) ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 26, 2014

OR

() TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-8022

CSX CORPORATION

(Exact name of registrant as specified in its charter)

Virginia

62-1051971

(State or other jurisdiction of incorporation or organization)

(I.R.S. Employer Identification No.)

500 Water Street, 15th Floor, Jacksonville, FL

32202

(904) 359-3200

(Address of principal executive offices)

(Zip Code)

(Telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class

Name of exchange on which registered

Common Stock, \$1 Par Value

New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes (X) No ()

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

Yes () No (X)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes (X) No ()

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

Yes (X) No ()

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. (X)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. (as defined in Exchange Act Rule 12b-2).

Large Accelerated Filer (X) Accelerated Filer () Non-accelerated Filer () Smaller reporting company ()

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2).

Yes () No (X)

On June 27, 2014 (which is the last day of the second quarter and the required date to use), the aggregate market value of the Registrant's voting stock held by non-affiliates was approximately \$31 billion (based on the New York Stock Exchange closing price on such date).

There were 990,564,824 shares of Common Stock outstanding on January 23, 2015 (the latest practicable date that is closest to the filing date).

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement (the "Proxy Statement") to be filed no later than 120 days after the end of the fiscal year with respect to its annual meeting of shareholders scheduled to be held on May 6, 2015.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K

☒ (X) ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 25, 2015

OR

☐ () TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-8022

CSX CORPORATION

(Exact name of registrant as specified in its charter)

Virginia

62-1051971

(State or other jurisdiction of incorporation or organization)

(I.R.S. Employer Identification No.)

500 Water Street, 15th Floor, Jacksonville, FL

32202

(904) 359-3200

(Address of principal executive offices)

(Zip Code)

(Telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class

Name of exchange on which registered

Common Stock, \$1 Par Value

Nasdaq Global Select Market

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes (X) No ()

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

Yes () No (X)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes (X) No ()

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

Yes (X) No ()

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. (X)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. (as defined in Exchange Act Rule 12b-2).

Large Accelerated Filer (X) Accelerated Filer () Non-accelerated Filer () Smaller reporting company ()

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2).

Yes () No (X)

On June 26, 2015 (which is the last day of the second quarter and the required date to use), the aggregate market value of the Registrant's voting stock held by non-affiliates was approximately \$33 billion (based on the New York Stock Exchange closing price on such date).

There were 963,150,011 shares of Common Stock outstanding on January 22, 2016 (the latest practicable date that is closest to the filing date).

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Definitive Proxy Statement (the "Proxy Statement") to be filed no later than 120 days after the end of the fiscal year with respect to its annual meeting of shareholders scheduled to be held on May 11, 2016.

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

Form 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2014

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission file number: 1-4717

KANSAS CITY SOUTHERN

(Exact name of registrant as specified in its charter)

Delaware
*(State or other jurisdiction of
incorporation or organization)*

**427 West 12th Street,
Kansas City, Missouri**
(Address of principal executive offices)



44-0663509
*(I.R.S. Employer
Identification No.)*

64105

(Zip Code)

816.983.1303

(Registrant's telephone number, including area code)

None

(Former name, former address and former fiscal year, if changed since last report)

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Preferred Stock, Par Value \$25 Per Share, 4%, Noncumulative	New York Stock Exchange
Common Stock, \$.01 Per Share Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of common stock held by non-affiliates of the registrant was \$11.70 billion at June 30, 2014. There were 110,411,095 shares of \$.01 par common stock outstanding at January 23, 2015.

DOCUMENTS INCORPORATED BY REFERENCE

Kansas City Southern's Definitive Proxy Statement for the 2015 Annual Meeting of Stockholders which will be filed no later than 120 days after December 31, 2014, is incorporated by reference in Parts III.

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549
Form 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2015

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission file number: 1-4717

KANSAS CITY SOUTHERN

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)
427 West 12th Street,
Kansas City, Missouri
(Address of principal executive offices)



44-0663509
(I.R.S. Employer
Identification No.)

64105
(Zip Code)

816.983.1303

(Registrant's telephone number, including area code)

None

(Former name, former address and former fiscal year, if changed since last report)

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Preferred Stock, Par Value \$25 Per Share, 4%, Noncumulative	New York Stock Exchange
Common Stock, \$.01 Per Share Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐

(Do not check if a smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of common stock held by non-affiliates of the registrant was \$10.00 billion at June 30, 2015. There were 108,498,752 shares of \$.01 par common stock outstanding at January 22, 2016.

DOCUMENTS INCORPORATED BY REFERENCE

Kansas City Southern's Definitive Proxy Statement for the 2016 Annual Meeting of Stockholders which will be filed no later than 120 days after December 31, 2015, is incorporated by reference in Parts III.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
FORM 10-K

(X) ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the fiscal year ended **DECEMBER 31, 2014**

() TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the transition period from _____ to _____

Commission file number 1-8339



NORFOLK SOUTHERN CORPORATION
(Exact name of registrant as specified in its charter)

Virginia
(State or other jurisdiction of incorporation)
Three Commercial Place
Norfolk, Virginia
(Address of principal executive offices)
Registrant's telephone number, including area code:

52-1188014
(IRS Employer Identification No.)
23510-2191
Zip Code
(757) 629-2680

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class
Norfolk Southern Corporation
Common Stock (Par Value \$1.00)

Name of each exchange on which registered
New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes (X) No ()

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes () No (X)

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or Section 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes (X) No ()

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulations S-T during the preceding 12 months. Yes (X) No ()

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of the Form 10-K or any amendment to this Form 10-K. (X)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer or smaller reporting company. See definitions of "large accelerated filer," "accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer (X) Accelerated filer () Non-accelerated filer () Smaller reporting company ()

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes () No (X)

The aggregate market value of the voting common equity held by non-affiliates at June 30, 2014, was \$31,787,780,476 (based on the closing price as quoted on the New York Stock Exchange on that date).

The number of shares outstanding of each of the registrant's classes of common stock, at January 31, 2015: 307,411,965 (excluding 20,320,777 shares held by the registrant's consolidated subsidiaries).

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of the Registrant's definitive proxy statements to be filed electronically pursuant to Regulation 14A not later than 120 days after the end of the fiscal year, are incorporated herein by reference in Part III.

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549
FORM 10-K

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the fiscal year ended **DECEMBER 31, 2015**

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
for the transition period from _____ to _____

Commission file number 1-8339



NORFOLK SOUTHERN CORPORATION
(Exact name of registrant as specified in its charter)

Virginia
(State or other jurisdiction of incorporation)

Three Commercial Place
Norfolk, Virginia

(Address of principal executive offices)

Registrant's telephone number, including area code:

52-1188014
(IRS Employer Identification No.)

23510-2191
Zip Code
(757) 629-2680

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class
Norfolk Southern Corporation
Common Stock (Par Value \$1.00)

Name of each exchange on which registered
New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: NONE

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes (X) No ()

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes () No (X)

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or Section 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes (X) No ()

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulations S-T during the preceding 12 months. Yes (X) No ()

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of the Form 10-K or any amendment to this Form 10-K. (X)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, or a non-accelerated filer or smaller reporting company. See definitions of "large accelerated filer," "accelerated filer," and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer (X) Accelerated filer () Non-accelerated filer () Smaller reporting company ()

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes () No (X)

The aggregate market value of the voting common equity held by non-affiliates at June 30, 2015, was \$26,243,199,266 (based on the closing price as quoted on the New York Stock Exchange on that date).

The number of shares outstanding of each of the registrant's classes of common stock, at January 31, 2016: 298,198,651 (excluding 20,320,777 shares held by the registrant's consolidated subsidiaries).

DOCUMENTS INCORPORATED BY REFERENCE:

Portions of the Registrant's definitive proxy statements to be filed electronically pursuant to Regulation 14A not later than 120 days after the end of the fiscal year, are incorporated herein by reference in Part III.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2014

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 1-6075

UNION PACIFIC CORPORATION

(Exact name of registrant as specified in its charter)

UTAH

(State or other jurisdiction of
incorporation or organization)

13-2626465

(I.R.S. Employer
Identification No.)

1400 DOUGLAS STREET, OMAHA, NEBRASKA

(Address of principal executive offices)

68179

(Zip Code)

(402) 544-5000

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class

Name of each exchange on which registered

Common Stock (Par Value \$2.50 per share)

New York Stock Exchange, Inc.

- Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. ☒ Yes ☐ No
- Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. ☐ Yes ☒ No
- Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ☒ Yes ☐ No
- Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). ☒ Yes ☐ No
- Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐
- Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐
- Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). ☐ Yes ☒ No

As of June 30, 2014, the aggregate market value of the registrant's Common Stock held by non-affiliates (using the New York Stock Exchange closing price) was \$89.4 billion.

The number of shares outstanding of the registrant's Common Stock as of January 30, 2015 was 881,284,029.

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549**

FORM 10-K

(Mark One)

**[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2015

OR

**[] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission File Number 1-6075

UNION PACIFIC CORPORATION

(Exact name of registrant as specified in its charter)

UTAH

(State or other jurisdiction of
incorporation or organization)

13-2626465

(I.R.S. Employer
Identification No.)

1400 DOUGLAS STREET, OMAHA, NEBRASKA

(Address of principal executive offices)

68179

(Zip Code)

(402) 544-5000

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class

Name of each exchange on which registered

Common Stock (Par Value \$2.50 per share)

New York Stock Exchange, Inc.

- Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

☒ Yes ☐ No

- Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

☐ Yes ☒ No

- Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

☒ Yes ☐ No

- Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).

☒ Yes ☐ No

- Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

☒

- Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐

- Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

☐ Yes ☒ No

As of June 30, 2015, the aggregate market value of the registrant's Common Stock held by non-affiliates (using the New York Stock Exchange closing price) was \$82.7 billion.

The number of shares outstanding of the registrant's Common Stock as of January 29, 2016 was 846,414,350.

Employees – Employee levels increased 1% in 2015 compared to 2014, driven by more employees in training and an increase in capital project work. More employees were in training as a result of the number of transportation employees hired during the last half of 2014 and early 2015 to handle expected volume increases, and who continued receiving training in 2015, most of which occurred in the first nine months of the year.

Employee levels increased 2% in 2014 versus 2013. A decrease in our capital workforce due to improved productivity and project mix partially offset the larger train and engine workforce required for higher volume levels and a slower network. We successfully managed the growth of our full-time equivalent train and engine force levels at a rate less than our volume growth in 2014.

Return on Average Common Shareholders' Equity

<i>Millions, Except Percentages</i>		2015	2014	2013
Net income	\$	4,772	\$ 5,180	\$ 4,388
Average equity	\$	20,946	\$ 21,207	\$ 20,551
Return on average common shareholders' equity		22.8%	24.4%	21.4%

Return on Invested Capital as Adjusted (ROIC)

<i>Millions, Except Percentages</i>		2015	2014	2013
Net income	\$	4,772	\$ 5,180	\$ 4,388
Interest expense		622	561	526
Interest on present value of operating leases		135	158	175
Taxes on interest		(285)	(273)	(264)
Net operating profit after taxes as adjusted (a)	\$	5,244	\$ 5,626	\$ 4,825
Average equity	\$	20,946	\$ 21,207	\$ 20,551
Average debt*		12,807	10,469	9,237
Average present value of operating leases		2,814	2,980	3,077
Average invested capital as adjusted (b)	\$	36,567	\$ 34,656	\$ 32,865
Return on invested capital as adjusted (a/b)		14.3%	16.2%	14.7%

* Adjusted for the retrospective adoption of Accounting Standard Update 2015-03 related to the presentation of deferred debt issuance costs.

ROIC is considered a non-GAAP financial measure by SEC Regulation G and Item 10 of SEC Regulation S-K, and may not be defined and calculated by other companies in the same manner. We believe this measure is important to management and investors in evaluating the efficiency and effectiveness of our long-term capital investments. In addition, we currently use ROIC as a performance criteria in determining certain elements of equity compensation for our executives. ROIC should be considered in addition to, rather than as a substitute for, other information provided in accordance with GAAP. The most comparable GAAP measure is Return on Average Common Shareholders' Equity. The tables above provide reconciliations from return on average common shareholders' equity to ROIC. Our 2015 ROIC decreased 1.9 points compared to 2014, primarily as a result of lower earnings and a higher invested capital base.

Debt to Capital

<i>Millions, Except Percentages</i>		2015	2014
Debt* (a)	\$	14,201	\$ 11,413
Equity		20,702	21,189
Capital (b)	\$	34,903	\$ 32,602
Debt to capital (a/b)		40.7%	35.0%

* Adjusted for the retrospective adoption of Accounting Standard Update 2015-03 related to the presentation of deferred debt issuance costs.

Adjusted Debt to Capital

<i>Millions, Except Percentages</i>	2015	2014
Debt	\$ 14,201	\$ 11,413
Net present value of operating leases	2,726	2,902
Unfunded pension and OPEB, after tax	463	523
Adjusted debt* (a)	\$ 17,390	\$ 14,838
Equity	20,702	21,189
Adjusted capital (b)	\$ 38,092	\$ 36,027
Adjusted debt to capital (a/b)	45.7%	41.2%

* Adjusted for the retrospective adoption of Accounting Standard Update 2015-03 related to the presentation of deferred debt issuance costs.

Adjusted debt to capital is a non-GAAP financial measure under SEC Regulation G and Item 10 of SEC Regulation S-K, and may not be defined and calculated by other companies in the same manner. We believe this measure is important to management and investors in evaluating the total amount of leverage in our capital structure, including off-balance sheet lease obligations, which we generally incur in connection with financing the acquisition of locomotives and freight cars and certain facilities. Operating leases were discounted using 4.8% and 5.3% at December 31, 2015 and 2014, respectively. The discount rate reflects our effective interest rate. We monitor the ratio of adjusted debt to capital as we manage our capital structure to balance cost-effective and efficient access to the capital markets with our overall cost of capital. Adjusted debt to capital should be considered in addition to, rather than as a substitute for, debt to capital. The tables above provide reconciliations from debt to capital to adjusted debt to capital. Our December 31, 2015 debt to capital ratios increased as a result of a \$2.8 billion increase in debt from December 31, 2014.

LIQUIDITY AND CAPITAL RESOURCES

As of December 31, 2015, our principal sources of liquidity included cash, cash equivalents, our receivables securitization facility, and our revolving credit facility, as well as the availability of commercial paper and other sources of financing through the capital markets. We had \$1.7 billion of committed credit available under our credit facility, with no borrowings outstanding as of December 31, 2015. We did not make any borrowings under this facility during 2015. The value of the outstanding undivided interest held by investors under the \$650 million capacity receivables securitization facility was \$400 million as of December 31, 2015, and is included in our Consolidated Statements of Financial Position as debt due after one year. Our access to this receivables securitization facility may be reduced or restricted if our bond ratings fall to certain levels below investment grade. If our bond rating were to deteriorate, it could have an adverse impact on our liquidity. Access to commercial paper as well as other capital market financings is dependent on market conditions. Deterioration of our operating results or financial condition due to internal or external factors could negatively impact our ability to access capital markets as a source of liquidity. Access to liquidity through the capital markets is also dependent on our financial stability. We expect that we will continue to have access to liquidity through any or all of the following sources or activities: (i) increasing the size or utilization of our receivables securitization, (ii) issuing commercial paper, (iii) entering into bank loans, outside of our revolving credit facility, or (iv) issuing bonds or other debt securities to public or private investors based on our assessment of the current condition of the credit markets. The Company's \$1.7 billion revolving credit facility is intended to support the issuance of commercial paper by UPC and also serves as an emergency source of liquidity. The Company currently does not intend to make any borrowings under this facility.

Exhibit C

Philip U. Straehl and Roger G. Ibbotson,

The Supply of Stock Returns: Adding Back Buybacks

Working paper December 17, 2015,

The Supply of Stock Returns

Adding Back Buybacks

Philip U. Straehl

Head of Capital Markets and Asset Allocation,
Morningstar Investment Management LLC
philip.straehl@morningstar.com

Roger G. Ibbotson

Professor in the Practice Emeritus of Finance,
Yale School of Management
Chairman & Chief Investment Officer, Zebra Capital Management LLC
roger.ibbotson@yale.edu

Working Paper
December 17, 2015

Abstract

The shift in corporate payout policy from dividends to buybacks creates the need for a new supply model of stock returns. Our study provides theoretical and empirical evidence for a total payout (dividends plus buybacks) model of stock returns. First, we show that long-run stock returns between 1871 and 2014 can almost entirely be attributed to the supply of total payouts. Second, we provide evidence that total payouts *per-share* (adjusted for the share decrease from buybacks) grow in line with economic productivity, and that *aggregate* total payouts grow in line with GDP. Third, we demonstrate that the dividend discount model (DDM), based on current yields and historical growth rates, significantly underestimates forward-looking equity return compared to a total payout model that includes both dividends and buybacks. Fourth, we show that the cyclically-adjusted total yield (CATY) is at least as good of a predictor of changes in expected returns as the cyclically-adjusted price-to-earnings ratio (CAPE).

Introduction

Stock returns are intrinsically linked to the cash flows they *supply* to investors. Ibbotson and Chen (2003) decompose historical returns based on corporate fundamentals such as dividends, earnings, and book value, and find that the majority of historical returns can be attributed to the supply of these components. In recent decades, a new source of stock market supply emerged as firms increasingly used share buybacks instead of dividends to return cash to shareholders. Skinner (2008) finds that in the U.S. stock market buybacks are now the dominant source of payout, while Boudoukh, Michaely, Richardson, and Roberts (2007) provide evidence that the payout yield, which includes both dividends and buybacks, is more predictive of changes in expected returns than the dividend yield. Von Eije and Megginson (2008) document a significant rise in buybacks of firms in the European Union, suggesting that buybacks are an increasingly important global phenomenon.

While a growing literature discusses the importance of buybacks as a form of payout, the impact of buybacks on the supply of stock returns has been relatively ignored in practice as many practitioners continue to rely on traditional supply models with dividends as the sole source of corporate payout. In these traditional supply models, payouts via buybacks lead to structural increases in *per-share* growth rates (e.g., earnings-per-share), as the number of shares get decreased by buybacks, even as per-share growth exceeds the underlying corporate cash flow growth. This structural change in per-share growth not only complicates the attribution of fundamental supply components to payout and fundamental growth, but it also leads to potentially biased return forecasts when current and historical market data are combined. In this article, we develop models of stock returns based on total payouts (i.e., dividends and buybacks), which not only provide a more consistent framework to examine the historical sources of returns, independent of changes in payout policy, but also provide a more robust return forecasting model, which can be related to the growth in the real economy.

This study extends the literature on the supply of equity returns in several directions.

1. We update the Ibbotson and Chen (2003) return decompositions with data through 2014, and extend their sample to 1871, adding 69 years to the sample. Our results are broadly consistent with those of Ibbotson and Chen (2003) in that we show that fundamentals account for an even larger portion of returns than in the original study, as the impact of P/E growth diminished over the longer sample.
2. We develop a supply model of stock returns based on total payouts, and find that U.S. stock returns between 1871 and 2014 can almost entirely be attributed to the supply of both dividends and buybacks.
3. We relate the growth in total payout to the real economy, and show that total payouts *per-share* (adjusted for the share decrease from buybacks) grow in line with economic productivity and that *aggregate* total payouts grow in line with aggregate GDP, suggesting that total payouts participate in the growth of the real economy.
4. We show that the dividend discount model (DDM) significantly underestimates the forward equity return, when current market information (e.g., yields) is combined with historical data (e.g., historical

growth). The *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* derived in this study apply universally across time periods due to their independence from payout regimes.

5. We demonstrate that the cyclically-adjusted total yield (CATY) is at least as predictive of changes in expected returns as the cyclically-adjusted price-to-earnings ratio (CAPE).

Overall, the total payout model represents a viable alternative to traditional supply models of stock return such as the dividend discount model (DDM), providing a framework to derive macro-consistent forecasts of long-run stock returns, as well as producing superior forecasts of short-term expected returns.

Data

We obtain monthly price, earnings-per-share, dividend-per-share, and inflation data for the period from January 1871 through December 2014 from Shiller.¹ Consistent with Ibbotson and Chen (2003), the risk-free rate is the income return of long-term U.S. government bonds. Starting in 1926, we use income return data from the Ibbotson® S&P® Classic Yearbook, and for 1871-1925 we infer returns from 10-year U.S. Treasury bond yields from Shiller. Specifically, we assume (at the beginning of each monthly holding period) a 10-year maturity, a bond price equal to par, and a coupon equal to one-twelfth of the beginning-of-period yield.

Following Ibbotson and Chen (2003), we obtain the starting book-to-market value for 1871 from Vuolteenaho (1999). The book-to-market at the end of 2014 for the S&P 500 Index is from Morningstar, Inc. GDP and population data from 1871 to 1947 is from the Maddison Project Database² and from the U.S. Bureau of Economic Analysis from 1948 to 2014.

For 1925 to 2014, motivated by Boudoukh, Michaely, Richardson, and Roberts (2007), we calculate net issuance for the S&P Composite based on constituent data from the Center of Research in Security Prices (CRSP) as the stock-level monthly change in shares outstanding times the share price summed across firms every month, divided by the monthly market capitalization.³ Prior to 1925, we estimate net issuance for the S&P Composite based on aggregate market value and net issuance data assembled by Wright (2004). In particular, we backcast the market values between 1900 and 1924 based on the 1925 market value for the S&P Composite from CRSP and the relation between price return, market value, and net issuance.

1 Robert Shiller's price data for 1871-2014 as well as earnings and dividend data starting in 1926 is from Standard & Poor's. Dividend and earnings data before 1926 are from Cowles & Associates: <http://www.econ.yale.edu/~shiller/data.htm>

2 <http://www.ggd.net/maddison/maddison-project/data.htm>

3 Specifically, the net issuance value for every firm i at time t is given by:

$$(prc_t / cfacpr_t) \times (shrout_t \times cfacshr_t - shrout_{t-1} \times cfacshr_{t-1})$$

where $shrout$ is the number of shares outstanding, $cfacshr$ is the cumulative factor to adjust shares, $cfacpr$ is the cumulative factor to adjust price, and prc is the month-end share price. We sum across firms in the S&P Composite every month to obtain the aggregate net issuance value.

Following Wright (2004), the share price (P) is related to the market value (MV) and net issuance (NI) such that:

$$\frac{P_t}{P_{t-1}} = \frac{MV_t - NI_t}{MV_{t-1}}$$

Solving for MV_{t-1} and dividing by MV_t we get an expression for the inverse of the change in market value, which we use to backcast market values for the period between 1900 and 1924:

$$\frac{MV_{t-1}}{MV_t} = \frac{P_{t-1}}{P_t} \frac{MV_t - NI_t}{MV_t}$$

We then calculate aggregate net issuance for 1900 to 1924 based on the geometric difference between the change in market value and the change in the price index.⁴

We calculate the buyback yield for the S&P Composite Index between 1971 and 2014 based on data from Compustat.⁵ Consistent with Fama and French (2001), we estimate buybacks based on the increase in a firm's treasury stock, excluding repurchased shares earmarked for compensation such as employee stock option programs or payment-in-kind such as acquisitions.⁶ Buybacks are assumed to be zero prior to 1971, and we linearly interpolate between annual buyback data points to obtain a monthly buyback time series.

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- 4 Our net issuance estimate is specific to the S&P Composite Index, which has a fixed number of constituents, and is different from net issuance estimated for the aggregate market. While aggregate market net issuance includes net issuance due to firm entry (e.g., IPOs) and firm exit (e.g., cash buyouts, cash mergers), net issuance specific to an index with fixed constituents captures firm-level net issuance (e.g., secondary offerings and buybacks). A potential weakness of our measure of firm-level net issuance for the period from 1900 to 1924 is that our measure is affected by the reconstitution of the index. Specifically, differences in the market capitalization of firms entering versus exiting the index impact our measure of net issuance.
- 5 Specifically, we estimate buybacks for each year as the change in common treasury stock (Compustat item #226) from the annual Compustat file. For the period between 1971 to 1982 before treasury stock data became available or if a firm uses the "retirement" method (assumed if current and prior year treasury stock is zero), buybacks are calculated as total expenditure on the purchase of common and preferred stocks (Compustat item #115) minus the sale of common and preferred stock (Compustat item #108). If either amount (the change in treasury stock or the difference between #115 and #108) is negative, buybacks are set to zero. The buyback yield is the sum of buybacks across firms in a given year divided by the year-end market capitalization.
- 6 An alternative measure of buyback activity is solely based on data from the cash flow statement (i.e., Compustat item #115). Unlike the treasury stock method, the cash flow method encompasses all cash flows generated from firms' buybacks, including repurchased shares earmarked for compensation or payment-in-kind. We estimate an average S&P Composite buyback yield for the period from 1983 to 2014 of 2.04% and 1.64% using the cash flow method and the treasury stock method, respectively.

Ibbotson & Chen (2003) Historical Return Decompositions Updated and Extended

In this section, we update the Ibbotson and Chen (2003) return decompositions for 1871 to 2014, extending the sample from the original study (1926-2000) by 69 years, thus providing a longer-term perspective of the drivers of U.S. equity returns spanning 144 years. Our results are broadly consistent with the findings of the original study.

The six return decomposition methods of geometric average returns $\bar{R}$ used by Ibbotson and Chen (2003) are restated below:⁷

Method 1 (Building Blocks): $\bar{R} = \overline{CPI} + \overline{Rf} + \overline{ERP} + \overline{Interaction}$

Where, CPI is the U.S. Consumer Price Index, Rf is the real risk-free rate, ERP is the equity risk premium, and $Interaction$ captures the reinvestment return and geometric interaction among the components.

Method 2 (Capital Gain & Income): $\bar{R} = \overline{CPI} + \overline{Cg} + \overline{Inc} + \overline{Interaction}$

Where, Cg is the real capital gain, and Inc is the dividend income return.

Method 3 (Earnings): $\bar{R} = \overline{CPI} + \overline{g_{EPS}} + \overline{g_{P/E}} + \overline{Inc} + \overline{Interaction}$

Where, g_{EPS} is the real EPS growth, $g_{P/E}$ is growth in P/E.

Method 4 (Dividends): $\bar{R} = \overline{CPI} + \overline{g_{P/E}} + \overline{g_{Div}} - \overline{g_{PO}} + \overline{Inc} + \overline{Interaction}$

Where, g_{Div} is the real dividend-per-share growth, g_{PO} is growth in the dividend-payout ratio.

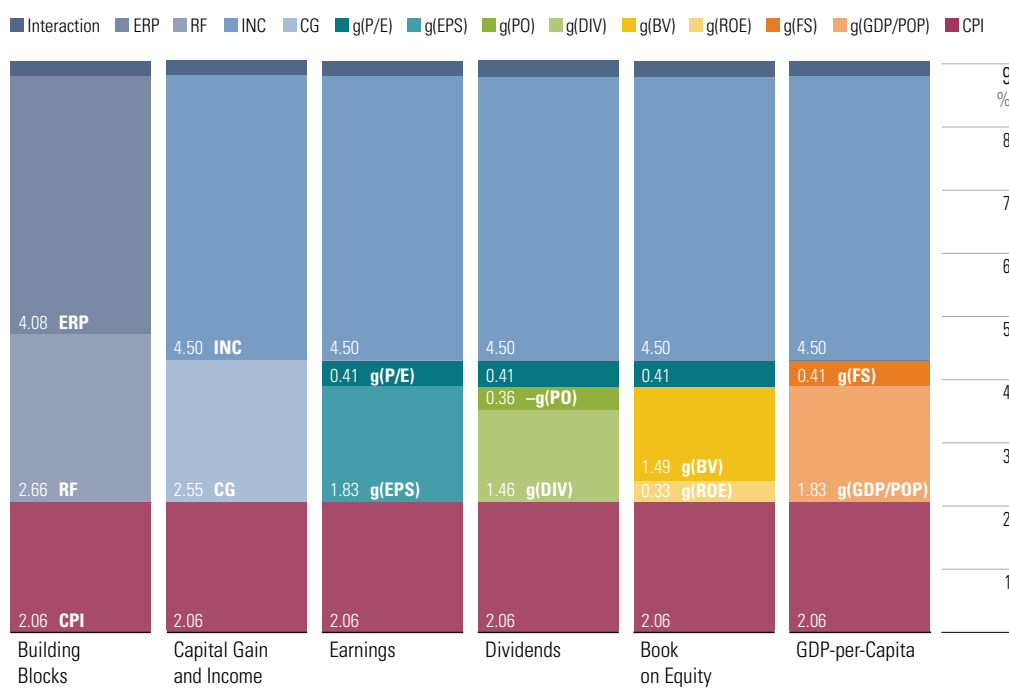
Method 5 (Book on Equity): $\bar{R} = \overline{CPI} + \overline{g_{P/E}} + \overline{g_{BV}} + \overline{g_{ROE}} + \overline{Inc} + \overline{Interaction}$

Where, g_{BV} is the real book equity value of equity growth, g_{ROE} is the growth of the return on the book value of equity.

Method 6 (GDP-per-Capita): $\bar{R} = \overline{CPI} + \overline{g_{GDP/POP}} + \overline{g_{FS}} + \overline{Inc} + \overline{Interaction}$

Where, $g_{GDP/POP}$ is the real growth in GDP-per-capita, g_{FS} is the increase in equity factor share in the overall economy.

⁷ The historical return decompositions are the same as in Ibbotson and Chen (2003). The names of the variables are generally consistent with the original study, except that we omit the "R" in our definition of real growth rates: i.e., we use g_{EPS} instead of g_{REPS} for real earnings growth. The geometric average returns are expressed as the sum of each return component. The *Interaction* terms capture the geometric interaction between the terms and the reinvestment return to ensure that the components sum to the geometric average return.

Figure 1 Decomposition of Historical Equity Returns by Six Methods, 1871-2014

Despite considering a significantly longer time period in this study (144 years versus 75 years), our results are broadly consistent with the findings of Ibbotson and Chen (2003). For instance, the results presented in Figure 1 confirm the observation by Ibbotson and Chen (2003) that the long-run growth in corporate productivity measured by earnings-per-share is in line with the long-run growth of overall economic productivity measured by GDP-per-capita. In fact, earnings-per-share and GDP-per-capita measures both grew at an annualized 1.83% rate between 1871 and 2014 (Method 6), highlighting the relation between real economic and corporate profit growth over our sample.⁸ Additionally, the annualized increase in P/E of 0.41% accounts for a smaller fraction of the realized return in our sample than in the original study (Methods 3-5), suggesting the majority of realized returns in our sample can be attributed to corporate fundamentals such as dividends and growth in fundamentals (i.e., earnings, dividends, and book value) which are supplied by companies. Finally, the annualized increase in equity factor share (g_{FS}) of 0.41% is accounted for by an equivalent increase in P/E over our sample period.

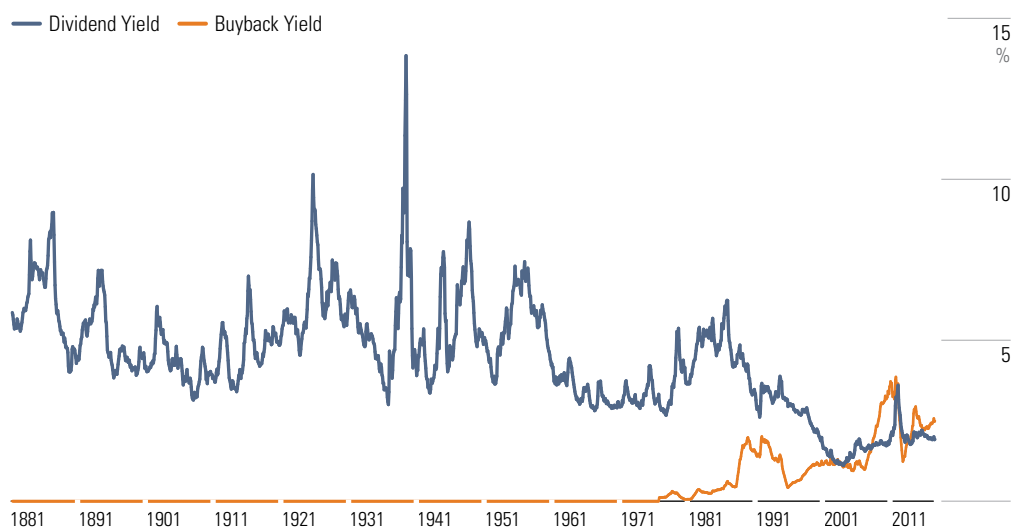
Table A1 in the Appendix shows the differences between our sample and the Ibbotson/Chen study for each of the six return methods. Equity total returns between 1871 and 2014 were an annualized 9.05%, which is 1.65% lower than the annualized 10.70% return observed in the original 1926 to

⁸ In the "Total Payouts and the Real Economy" section below we compare GDP-per-capita growth with growth in total payouts per-share (adjusted for the share decrease from buybacks). Excluding the share decrease from buybacks from the per-share growth is important to perform a consistent comparison between macroeconomic productivity growth and growth in corporate fundamentals.

2000 sample. The majority of the decrease in total return is attributable to a 1.02% lower inflation rate, while the balance is due to lower real returns. The Building Blocks approach (Method 1) suggests that the majority of the decrease in real equity returns can be attributed to a decrease of the equity risk premium by 1.16% and a simultaneous increase of the real risk-free rate by 0.61%. Based on the capital gains and income decomposition (Method 2), the decrease in real returns can be attributed to lower capital appreciation returns by 0.77%. Finally, Methods 3-5 break the capital gains component down further, and show that the decrease in capital gains is largely attributable to a 0.84% lower P/E growth ($g_{P/E}$).

A potential weakness of the Ibbotson/Chen return decompositions (except for the Building Blocks method) is the fact that the return components are sensitive to firms' payout method (i.e., dividends versus buybacks), leading to structural breaks in the underlying supply components as buybacks have become the dominant form of payout.⁹ For instance, while a payout via dividend in the Earnings Method is captured in the income return component (Inc), share buybacks increase earnings-per-share growth (g_{EPS}), as the number of shares is diminished by the buybacks. As such, the advent of share buybacks as the dominant form of payout, leads to a structural decrease in Inc , and a structural increase in per-share growth. This structural break complicates the attribution of fundamental supply components to payout and true fundamental growth. It also makes it difficult to relate growth in the stock market to growth in the real economy.

Figure 2 Dividend and Buyback Yield, 1871-2014.



9 Traditional supply models such as the dividend discount model (DDM) are not inaccurate per se. For instance, Figure 1 shows that traditional supply models fully account for historical total returns. However, traditional supply models are often wrongly applied in practice, given investors' tendency to combine current dividend yields with historical per-share growth rates when forecasting returns. Historical per-share growth rates, measured over a time frame that includes the period before buybacks were prevalent, underestimate forward-looking per-share growth by underestimating the impact of buybacks on ex-ante growth rates. In other words, by relying on historical per-share growth rates as proxy for future growth, investors underestimate the fact that in addition to benefiting from the underlying growth in firms' cash flows, buybacks increase a buy-and-hold investor's proportion in the company over time.

The drastic change in payout policy over the last few decades is highlighted in Figure 2, which plots dividend and buyback yields since 1871.¹⁰ The figure shows that the gradual substitution of buybacks for dividends started in the early 1980s, until ultimately buybacks exceed dividends over the more recent history. Buybacks surpassed dividends in 8 of the last 10 calendar years, supporting the claim that buybacks have become the primary way for U.S. companies to return cash to shareholders. Grullon and Michealy (2002) provide evidence that the structural change in the firms' payout policy, among other factors, coincided with the adoption of rule 10b-18 by the Securities and Exchange Commission in 1982, which provided a safe harbor for firms to conduct share buybacks without a suspicion of share price manipulation.

Overall, the updated Ibbotson and Chen (2003) return decompositions presented in this section validate the original study's claim that corporate fundamentals such as dividends and earnings are the main source of long-run equity returns. However, the change in corporate payout policy from dividends to buybacks creates the need for a new supply model of stock returns. Therefore, it is the aim of the remainder of this paper to develop models of the supply of stock returns that are independent of the payout method.

Total Payout Models of Stock Returns

We derive three supply models of stock returns based on total payouts (dividends and buybacks) that are distinguished by how they are affected by share buybacks and share issuance. The *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* derived in this section are independent of firms' choice of payout method, providing a more consistent way to analyze historical returns. We relate each model to a hypothetical investor type who is differentiated by how he/she participates in share buybacks or share issuance.

The one-period total return R of a stock over period $t-1$ to t is given by:

$$R_t = \frac{D_t}{P_{t-1}} + \frac{P_t - P_{t-1}}{P_{t-1}} = \frac{D_t}{P_{t-1}} + \frac{P_t}{P_{t-1}} - 1 \quad (1)$$

Where D is the dividend-per-share and P is the share price. The first right-hand term is the income return and the second term is the price return.

Total payouts refer to the payouts that investors receive from both dividends and buybacks. The advantage of measuring corporate performance based on payouts instead of accounting measures such as earnings is that payouts are not affected by changes in accounting standards or transitory factors such as special items, providing a better measure of structural drivers of the supply of stock return. We can write the price return in (1) as a function of the change in price-to-total payout ratio and the change in total payout-per-share (TP), where the latter is the sum of dividend-per-share and buybacks-per-share.

¹⁰ The buyback yield is assumed to be zero prior to 1971, consistent with Boudoukh, Michaely, Richardson, and Roberts (2007).

$$R_t = \underbrace{\frac{D_t}{P_{t-1}}}_{(2.1)} + \underbrace{\frac{TP_t}{TP_{t-1}}}_{(2.2)} \underbrace{\frac{\frac{P_t}{TP_t}}{\frac{P_{t-1}}{TP_{t-1}}}}_{(2.3)} - 1 \quad (2)$$

We can simplify (2), and write geometric average returns as follows:

$$\overline{R} = \overline{DY} + \overline{g_{TP}} + \overline{g_{P/TP}} + \overline{CPI} + \overline{Interaction} \quad (3)$$

Where DY is the dividend yield (2.1), g_{TP} is the real total payout-per-share growth (2.2), $g_{P/TP}$ is the change in price-to-total payout (2.3), CPI is inflation, and $Interaction$ captures the reinvestment return and geometric interaction among the components. Note that buybacks do not affect the dividend yield but increase total payout-per-share growth (g_{TP}) as the investor's proportion in the company increases. The buyback impact captured in this model is akin to that of a hypothetical "Buy-and-Hold Investor," who holds on to his/her shares as other investors tender their shares, thereby getting a bigger fractional ownership in the company as corporate cash is used to decrease share count. Similar to the traditional supply models discussed in the previous section, the choice of payout method (i.e., dividends versus buybacks) matters in this model since dividends are captured as a cash payout (2.1), while buybacks affect the growth term (2.2). Although this model is not independent of the payout method, we include it as a reference point for the other models. We refer to this model as the *Dividend-Per-Share Model*.

To obtain a measure that is independent of firms' payout method, we need to normalize (2) to account for the effect of buybacks on payouts and total payout-per-share growth. We use both the buyback yield and net issuance to adjust the model for the impact of buybacks.

The buyback yield is defined as:

$$1 + \text{Buyback Yield}_t = 1 + \frac{P_t B_t}{P_t S_t} = \frac{B_t + S_t}{S_t} \quad (4)$$

where S is the number of shares outstanding, B is the number of shares repurchased, and P is the share price.

Conversely, the net issuance is defined as:

$$1 + \text{Net Issuance}_t = 1 + \frac{P_t(S_t - S_{t-1})}{P_t S_{t-1}} = \frac{S_t}{S_{t-1}} \quad (5)$$

Notice that expression (5) is the change in share count. It implicitly consists of the shares issued less share buybacks. The two definitions (4) and (5), allow us to derive two different return models based on total payouts.

On the one hand, we can rewrite (2) as a function of (4) and get:

$$R_t = \underbrace{\frac{D_t}{P_{t-1}}}_{(6.1)} + \underbrace{\frac{B_t + S_t}{S_t}}_{(6.2)} \underbrace{\frac{TP_t}{TP_{t-1}}}_{(6.3)} \underbrace{\frac{S_t}{B_t + S_t}}_{(6.4)} \underbrace{\frac{\frac{P_t}{TP_t}}{\frac{P_{t-1}}{TP_{t-1}}}}_{(6.5)} - 1 \quad (6)$$

We can simplify (6), and write geometric average returns as follows:

$$\bar{R} = \bar{TY} + \bar{g_{TP_{ExB}}} + \bar{g_{P/TP}} + \bar{CPI} + \bar{Interaction} \quad (7)$$

Where the total yield (TY) is the dividend yield (6.1) plus the buyback yield (6.2), $g_{TP_{ExB}}$ is the real total payout-per-share growth adjusted for the share decrease from buybacks (geometric sum of 6.3 and 6.4 adjusted for inflation)¹¹, $g_{P/TP}$ is the change in price-to-total payout (6.5), CPI is inflation, and $Interaction$ captures the reinvestment return and geometric interaction among the components. Note that both TY and $g_{TP_{ExB}}$ are independent from the payout method as both dividends and buybacks are captured in the total yield term and the growth term is adjusted for the share decrease from buybacks. The buyback impact captured in this model is analogous to that of a hypothetical “Pro Rata Buyback Investor,” who tenders a proportional amount of his/her shares and gets cash in return for participating in the buyback. Whether a company performs a payout via dividends or buybacks, this investor gets cash in both cases. We refer to this model as the *Dividend and Cash Buyback Model*.

Conversely, we can rewrite (2) as a function of (5) and obtain:

$$R_t = \underbrace{\frac{D_t}{P_{t-1}}}_{(8.1)} + \underbrace{\frac{S_{t-1}}{S_t}}_{(8.2)} \underbrace{\frac{TP_t}{TP_{t-1}}}_{(8.3)} \underbrace{\frac{S_t}{S_{t-1}}}_{(8.4)} \underbrace{\frac{\frac{P_t}{TP_t}}{\frac{P_{t-1}}{TP_{t-1}}}}_{(8.5)} - 1 \quad (8)$$

Expression (8) can be simplified to the following geometric average return components:

$$\bar{R} = \bar{NTY} + \bar{g_{TP_{Agg}}} + \bar{g_{P/TP}} + \bar{CPI} + \bar{Interaction} \quad (9)$$

Where net total yield (NTY) is the dividend yield (8.1) plus the inverse of net issuance (8.2) (arithmetically, dividend yield less net issuance), $g_{TP_{Agg}}$ is the real aggregate total payout growth (geometric sum of 8.3 and 8.4 adjusted for inflation), $g_{P/TP}$ is the change in price-to-total payout (8.5), CPI is inflation, and $Interaction$ captures the reinvestment return and geometric interaction among the components. NTY implicitly consists of dividends and buybacks less shares issued. Equation (9)

¹¹ While the $g_{TP_{ExB}}$ term excludes the effect of buybacks on the share count, it includes the impact of buybacks on aggregate total payout growth. In particular, since the total payout-per-share growth (6.3 in equation 6) can be broken into aggregate total payout growth and the inverse of net issuance, by multiplying total payout-per-share growth (6.3) by the inverse of the buyback yield (6.4) to get to $g_{TP_{ExB}}$, we are implicitly making an adjustment for the effect of buybacks on the change in share count.

is similar to the stock return forecasting model proposed by Grinold, Kroner, and Siegel (2011). The return impact captured in this model can be related to that of a hypothetical “Cap-Weighted Index Investor,” who participates proportionally in both the buyback and issuance of shares. Similar to the previous case, independent of whether a company performs the payout via dividends or buybacks, the hypothetical investor gets cash. Additionally, this investor adds new capital to an issuing company, and therefore benefits in the aggregate growth of the company. We therefore refer to this model as the *Dividend Less Net Issuance Model*.

The *Dividend-Per-Share Model* (3), *Dividend and Cash Buyback Model* (7), and *Dividend Less Net Issuance Model* (9) together provide the basis for the analysis of the historical supply sources of returns and stock return forecasts discussed in the subsequent sections. While in the *Dividend-Per-Share Model* buybacks increase the growth term consistent with the traditional supply models discussed in the previous section, in the *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* buybacks impact the payout term and are thus independent of the payout method. The key difference between the *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model*, is the treatment of issuance. While in the *Dividend and Cash Buyback Model* issuance is captured in the growth term (g_{TPexB}), all changes in share count (buybacks and issuance) are captured in the net total yield term (NTY) in the *Dividend Less Net Issuance Model*. In the *Dividend and Cash Buyback Model*, buybacks are accounted for in the payout term (TY).

Historical Return Decompositions

In this section we examine the return decompositions of the three supply models based on total payouts. Both *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* models allow for an examination of the return drivers independent of the payout method, providing a consistent framework to study the historical supply components of stock returns over time. The results for the historical return decompositions for 1871-2014 and 1901-2014 are shown in Table 1.¹²

The central insight from Table 1 that applies to all three models is that the supply of total payouts almost entirely explains realized returns over the 1871-2014 and 1901-2014 periods. The change in the price-to-total payout, which is the return component unrelated to the supply of total payouts common to all three models, accounts for only 0.20% for the period from 1871 to 2014, suggesting that over 97% of realized returns are related to the supply of total payouts. The total payout model thus provides a better description of long-term historical return than the earnings model in Figure 1, where the annualized growth in P/E ($g_{P/E}$) was 0.41%. Overall, this suggests the realized *level* of returns is almost entirely attributable to the *supply* of total payouts.

The results in Table 1 specific for the *Dividend-Per-Share Model* and *Dividend and Cash Buyback Model* in Table 1 show that the payout terms (i.e., dividend yield and total yield) account for the majority of historical returns. Total yields, which includes both dividends and buybacks, accounts for

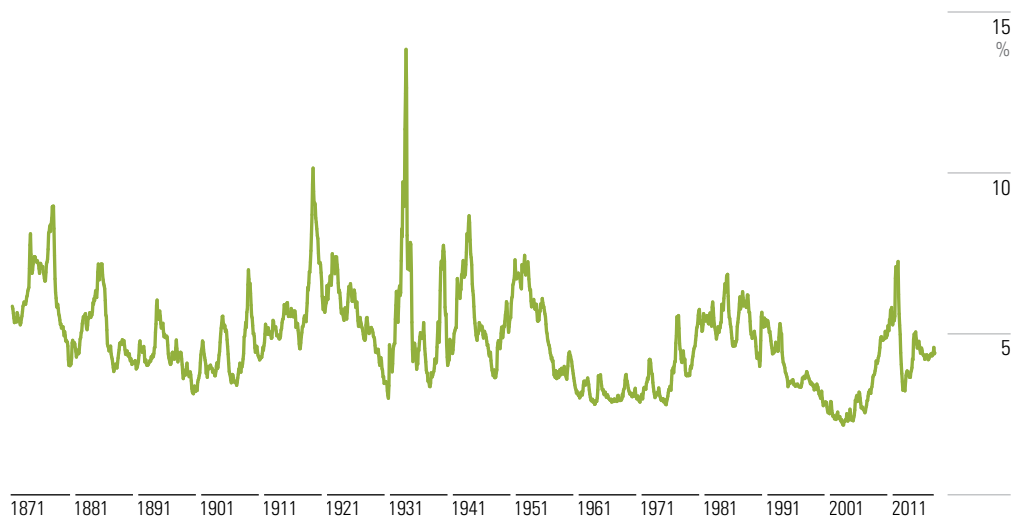
¹² Our market value series starts in 1900, which makes 1901 the earliest period we can calculate a return decomposition based on the *Dividend less Net Issuance Model*.

over two-thirds of the real return for the period between 1871 and 2014. Despite the fact that share buybacks only became prevalent over the last three decades of the sample, explicitly accounting for buybacks as a “payout” increases the return attributed to payouts from 4.50% (dividend yield) to 4.89% (total yield). Notably, in the period from 1980 to 2014, including share buybacks along with dividends in the payout terms, dramatically raises the payout yield from 2.73% (dividend yield) to 4.26% (total yield), highlighting the important role buybacks play as way of returning cash to shareholders in recent decades. In contrast to the *Dividend-Per-Share Model* and *Dividend and Cash Buyback Model*, the net total yield payout term (*NTY*) in the *Dividend Less Net Issuance Model* is net of share issuance, thus lowering the payout term. Over the period from 1901 to 2014, the return attributable to *NTY* is 3.03%. *NTY* can be further decomposed into a dividend yield of 4.29%, buyback yield of 0.47% and, and a negative contribution from issuance of 1.70%.

Table 1 Historical Return Decompositions

		1871-2014	1901-2014
Dividend-Per-Share Model (Buy and Hold Investor)			
Dividend Yield %	DY	4.50	4.29
TP Growth %	g_{TP}	2.05	2.02
Change in Price-to-TP %	$g_{P/TP}$	0.20	-0.01
Inflation %	CPI	2.06	3.06
	Interaction	0.25	0.28
Dividend and Cash Buyback Model (Pro Rata Buyback Investor)			
Total Yield %	TY	4.89	4.78
TP Growth % (Buyback Share Decrease Adjusted)	g_{TPexB}	1.67	1.54
Change in Price-to-TP %	$g_{P/TP}$	0.20	-0.01
Inflation %	CPI	2.06	3.06
	Interaction	0.24	0.27
Dividend Less Net Issuance Model (Cap-Weighted Index Investor)			
Net Total Yield %	NTY	—	3.03
Aggregate TP Growth %	g_{TPAgg}	—	3.27
Change in Price-to-TP %	$g_{P/TP}$	—	-0.01
Inflation %	CPI	—	3.06
	Interaction	—	0.29
Total Return		9.05	9.64

Note: *DY* is the dividend yield, *TY* is the dividend yield plus the buyback yield, *NTY* is the dividend yield plus the inverse of net issuance, g_{TP} is the real total payout-per-share growth, g_{TPexB} is the real total payout-per-share growth adjusted for the share decrease from buybacks, g_{TPAgg} is the real aggregate total payout growth, *CPI* is inflation, and $g_{P/TP}$ is the change in price-to-total payout.

Figure 3 Total Yield, 1871-2014

Note: Total yield is the dividend yield plus the buyback yield depicted in Figure 2.

Figure 3 shows the total yield of U.S. stocks from 1871 to 2014. The total yield series, which includes both dividends and buybacks, appears to be fairly consistent over time, generally reverting around its long-term mean. Boudoukh, Michaely, Richardson, and Roberts (2007) examine the time-series properties of dividend and total yield, and find that total yields follow a stationary time-series process, while dividend yields experienced a structural break in the early 1980s. We examine the stationarity of our monthly total yield and dividend yield series from 1871 to 2014, and confirm that total yield is more stationary than the dividend yield.¹³ Over the more recent period from 1926 to 2014, we cannot reject the hypothesis that the dividend yield is nonstationary, suggesting that the dividend yield series underwent a structural change in recent history due to the changes in firms' payout policies. The fact that total yields follow a more stationary time-series process than dividend yields, in turn, suggests that total payouts are a more stable measure of the supply of corporate payouts.

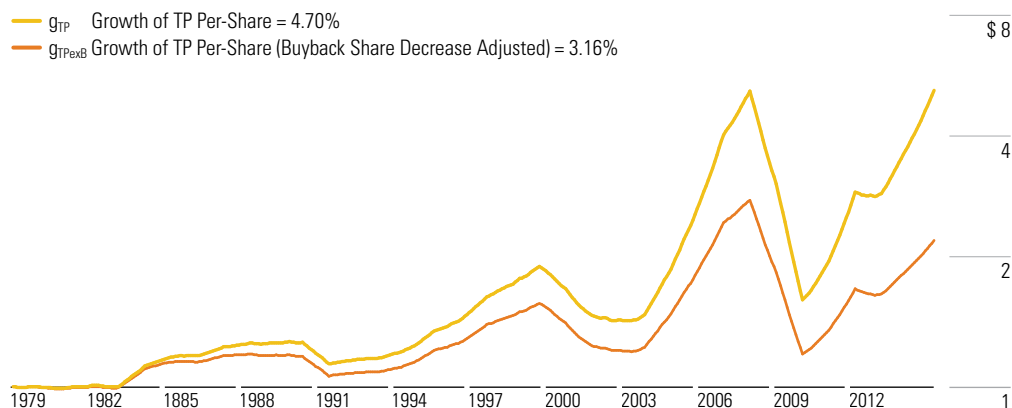
The growth term is another key differentiator among the three models. In general, the per-share impact due to buybacks and issuance on the growth term is the opposite to that of the payout term, as the three models mechanically add up to the same total return, $g_{TP\>B}$, which excludes the impact of buybacks on the share decrease but includes issuance; this growth term ($g_{TP\>B}$) amounted to 1.67% from 1871 to 2014. Aggregate growth ($g_{TP\>B}$) excludes buybacks and issuance, contributing 3.27% to return from 1901 to 2014. By contrast, total payout-per-share growth (g_{TP}), which

13 Following Boudoukh, Michaely, Richardson, and Roberts (2007), we run a Dickey-Fuller (1979) test for nonstationarity for our monthly total yield series between 1871 and 2014 (assuming an AR(1) model with a constant), and get a highly significant Dickey-Fuller statistic of -3.80 at the 1% significance level, indicating stationarity since the yield series is converging toward its long-term mean. Conversely, the Dickey-Fuller statistic for the monthly dividend yield series between 1871 and 2014 is lower at -2.90 , but still significant at a 5% level. However, if we choose the more recent start date of 1926 of our sample as in Michaely, Richardson, and Roberts (2007), we get a Dickey-Fuller statistics of -3.28 and -2.50 for total yield and dividend yield, respectively. While the former is significant at the 5% level, the latter is insignificant at the 10% level.

amounted to 2.05% from 1871 to 2014, is net of issuance, but includes the impact of buybacks on the decrease in share count. Since g_{TP} is inclusive of buybacks, the structural shift from dividend to buybacks which started in the 1980s also led to a structural change in total payout-per-share growth. Therefore, g_{TPexB} and g_{TPAgg} allow for a more consistent analysis of historical growth trends over time, which is a key contribution of the *Dividend and Cash Buyback Model* and the *Dividend Less Net Issuance Model* introduced in this study.

Figure 4 shows the impact of adjusting the per-share growth rate by the share decrease from buybacks. Previous studies measure historical growth rates based on per-share statistics (e.g., earnings-per-share) without adjusting for the impact of buybacks on share count (e.g., see Figure 1). Figure 4 plots the real total payout-per-share growth (g_{TP}) and the real total payout-per-share growth adjusted for the share decrease from buybacks (g_{TPexB}). While annualized growth of the former was 4.70%, the buyback-share-decrease-adjusted growth rate was only 3.16%. The difference is attributable to the buyback yield over the period, suggesting that a significant portion (32% between 1980 and 2014) of growth measured by per-share statistics is due to buybacks, not growth of the underlying cash flows of the businesses. This example suggests that the buyback share decrease adjustment of per-share growth rates has important implications for the measurement of fundamental corporate cash flow growth.

Figure 4 Growth of \$1—Impact of Buyback Share Decrease Adjustment on Per-Share Growth, 1980-2014



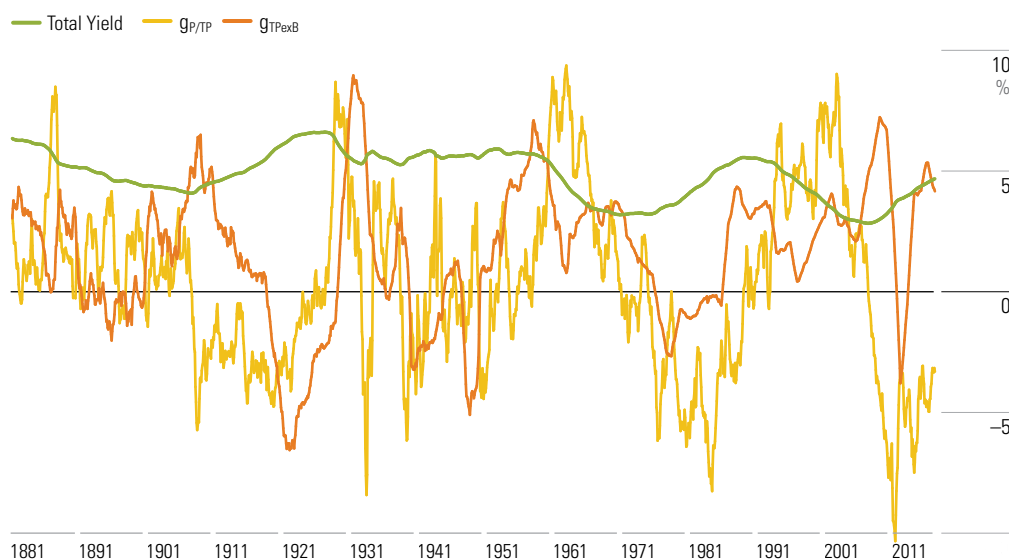
Note: g_{TPexB} is the real total payout per-share (adjusted for the share decrease from buybacks) growth, and g_{TP} is the real total payout-per-share growth.

Return decompositions in Table 1 highlight the long-term drivers of stock return, but long-run averages mask the variations in the return components over shorter periods. To examine how the various return components vary over shorter-term market cycles, Figure 5 shows the return

decomposition based on the *Dividend and Cash Buyback Model* for rolling 10-year real returns. Total yield (TY) is the most stable component of real returns, generally fluctuating between approximately 4% to 6%. In turn, the growth term (g_{TPexB}) is significantly more volatile than total yields, with the 10-year growth rate ranging from 8.96% to -6.56% over the sample period. The volatility in growth rates can be attributed to the fact that corporate payouts are sensitive to the business cycle, with firms paying out more of their earnings during good economic times when profits are high and cutting back payouts during recessions. Note that although g_{TPexB} excludes the effects of buybacks on the share count, buybacks are still a component of aggregate total payout growth. For instance, Skinner (2008) finds that buybacks are more sensitive than dividends to variations in a firm's earnings, as buybacks offer greater flexibility to make short-term adjustments than dividends, suggesting that buybacks are a key driver of the short-term volatility in the growth term in recent history. Finally, growth in price-to-total payout ratio ($g_{P/TP}$) varies most significantly in the short-run. Although the contribution of $g_{P/TP}$ to long-run returns in Table 1 is only 0.20%, $g_{P/TP}$ varies materially in the short-term. Classical financial theory assumes a constant equity premium, but a growing body of research suggests that expected returns vary over time in ways that are predictable (e.g., see Cochrane, 2011). Time-varying expected returns are a potential explanation for the observed variation in changes in valuations in the short-term.

A variance decomposition of 10-year real log return in Table 2 confirms that the change in valuation $g_{P/TP}$ is the most variable return component in the short-run. In particular, changes in valuation explain more than half of the variance in real return, while changes in real growth rates explain almost a third of the variability. Conversely, only 3.8% of the variance is explained by changes in total yield. Therefore, while total yield and the growth of total payouts explain the majority of the return *level* in Table 1, the analysis of 10-year returns suggests that changes in valuation account for a significant portion of the *variance* of returns in the short-run.

Overall, the historical return decompositions based on the total payout models examined in this section show that long-term historical stock returns can almost fully be attributed to the supply of total payouts, and that total payouts have been more stable than dividends over time.

Figure 5 Rolling 10-Year Real Return Decomposition, 1871-2014

Note: Total yield is the dividend yield plus the buyback yield, g_{TPexB} is the real total payout-per-share growth adjusted for the share decrease from buybacks, and $g_{P/TP}$ is the change in price-to-total payout. The geometric sum of the three components equals the real total return over the period.

Table 2 Variance Decomposition Rolling 10-Year Real Log Returns, 1871-2014

Dividend and Cash Buyback Model		(%) Contribution to Variance
Total Yield	TY	3.80
TP Growth (Buyback Share Decrease Adjusted)	g_{TPexB}	32.55
Change in Price-to-TP	$g_{P/TP}$	56.09
	Interaction	7.56

Note: TY is the dividend yield plus the buyback yield, g_{TPexB} is the real total payout-per-share growth adjusted for the share decrease from buybacks, and $g_{P/TP}$ is the change in price-to-total payout.

Total Payouts and the Real Economy

Following prior research on the supply of stock returns, we now examine the relation of growth in total payouts and the growth in the real economy. Unlike previous studies, however, the growth rates in our model are adjusted for changes in payout policy, allowing for an apples-to-apples comparison of growth trends over time. Diermeier, Ibbotson and Siegel (1984) relate the return of aggregate financial assets to the performance of the real economy and stress the importance for capital market forecasts to be “macroconsistent”: long-run growth expectations for financial assets need to be anchored in reasonable growth expectations for the economy overall. After all, financial assets cannot outperform the economy indefinitely since the asset would ultimately become the economy itself! Applying the supply model to stocks, Ibbotson and Chen (2003) show that growth in earnings-per-share for U.S. stocks is in line with U.S. GDP-per-capita growth.

To think about growth in the real economy and stock market payouts in a consistent manner, we start with a simple model for the aggregate economy and then derive growth rates that are consistent with our definition of growth in our equity forecasting model. In other words, we derive macroeconomic equivalents of the growth terms in our equity forecasting model.

We assume that aggregate output (Y) of the economy follows a standard Cobb-Douglas production function:

$$Y = AK^{1-\beta}L^\beta \quad (10)$$

A is the total factor productivity—the amount not explained by labor and capital and often attributed to improvements in technology, K is the capital stock, and L is the labor hours worked. β is the output elasticity, which is assumed to be <1 and constant over time. Taking logs (denoted in small letters) and the first difference (i.e., difference between $t+1$ and t) in (10), we get an expression for the drivers of aggregate output growth (i.e., GDP):

$$\Delta y = \Delta a + (\beta - 1)\Delta k + \beta \Delta l \quad (11)$$

Equation (11) suggests that GDP growth (Δy) is a function of the change in total factor productivity (Δa), the change in capital stock (Δk) and the change in labor hours worked (Δl) with β determining the sensitivity of aggregate growth to changes in the factor inputs (i.e., changes in labor and capital input).

Relating the macroeconomic output in equation (11) to the stock payouts, a stock represents a claim on the residual product of the economic process that is available to owners of capital after all other claims have been satisfied. In theory, the owner of capital chooses factor inputs (e.g., labor and capital) to maximize his/her share in the economic process (i.e., expected profits), which are ultimately returned to the owner of capital via dividends and buybacks. Therefore, since the choice of the factor inputs (i.e., Δl and Δk) is driven by a firm's expected payouts and the firm also benefits from improvements in productivity (Δa), it is reasonable to expect that aggregate total payouts (g_{TPAgg}) grow in line with the overall economic process (Δy), barring changes in factor share.

A portion of the overall economic output (Δy) is financed with new capital, represented by the change in the capital stock (Δk) in equation (10). For example, the owner of the firm may issue more stock to buy a new machine. In this way, the growth available to owners of capital is the growth per unit of capital invested. To obtain income per unit of capital, we need to divide equation (9) above by K :

$$\frac{Y}{K} = \frac{AK^{1-\beta}L^\beta}{K} = A\left(\frac{L}{K}\right)^\beta \quad (12)$$

As in equation (11), taking logs and first differences we obtain growth rates:

$$\Delta y - \Delta k = \Delta a + \beta(\Delta l - \Delta k) \quad (13)$$

Equation (13) shows that the growth in income per unit of invested capital is the growth in overall output (Δy) minus new capital investment (Δk), which equals the growth in productivity (Δa) plus the relative growth of labor versus capital. If the labor-to-capital ratio is constant (i.e. $\Delta k = \Delta l$), the last term in (13) goes to zero, and GDP-per-unit of capital reduces to the growth in total factor productivity (Δa).

From the perspective of a stock market index such as the S&P Composite examined here, new capital investments take the form of new share issuance. Since the number of constituents in the S&P Composite is fixed (i.e., for every stock added to the index, another stock leaves the index), firm-level issuance such as secondary offerings by existing companies are the key drivers of new issuance in our dataset. For stock market indexes that cover the overall universe of stocks such as the Wilshire 5000¹⁴, IPOs are an additional source of new issuance. New issuance increases the number of shares outstanding, which for a given level of earnings leads to lower earnings-per-share. Thus per-share growth such as the growth of earnings-per-share (adjusted for the share decrease from buybacks) is the natural stock market equivalent of the growth in income per invested capital in equation (12). Buybacks, on the other hand, constitute a “payout” similar to a dividend with the money that investors receives from tendering the shares to the repurchasing company flowing back into the economy and thus need to be excluded from our stock-market measure of “invested” capital. Previous studies on the supply of equity returns did not make an adjustment for the share decrease from buybacks in their growth terms.

Having identified the macroeconomic equivalents of the growth rates in our total payout models from a theoretical perspective, we now examine the relation between economic growth and total payout growth of stocks empirically. Specifically, we compare aggregate real total payout growth ($g_{TPA_{agg}}$) to GDP growth, and real total payout-per-share (adjusted for the share decrease from buybacks) growth ($g_{TP_{exB}}$) to GDP-per-capita growth.¹⁵ We choose GDP-per-capita as a proxy for productivity growth because it has history since 1872.

Figure 6 shows that for 1901 to 2014, as predicted, aggregate total payouts and GDP grew at roughly similar annualized rates of 3.27% and 3.36%, respectively.¹⁶ Similarly, Figure 7 demonstrates that the total payout-per-share (adjusted for the share decrease from buybacks) annualized growth of 1.67% was approximately in line with GDP-per-capita growth of 1.83% for 1872 to 2014. We also test statistically whether the annual growth rates of total payouts are significantly different from

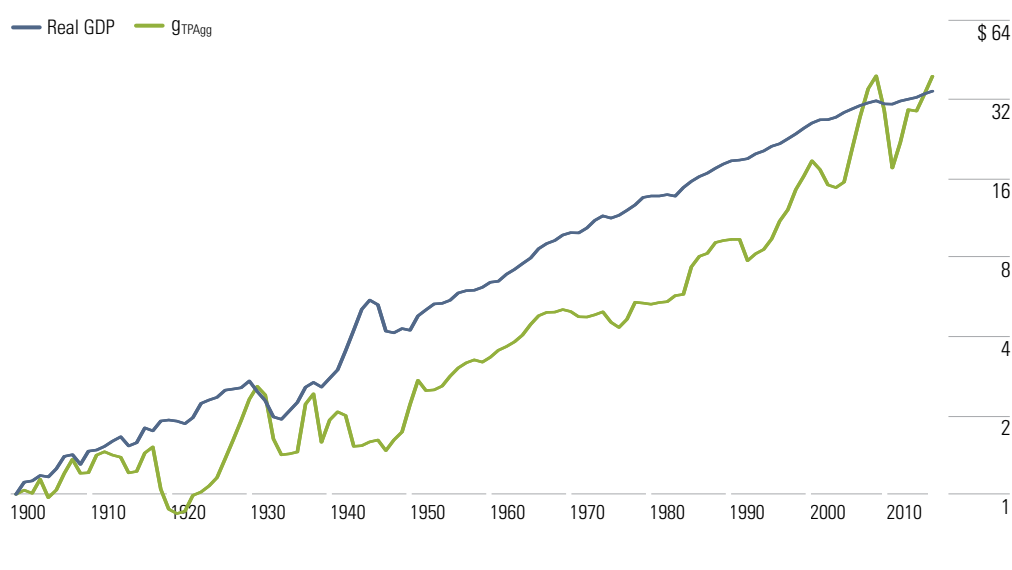
¹⁴ Despite its name, the Wilshire 5000 is not limited to 5000 constituents and attempts to represent the entire U.S. stock market.

¹⁵ The comparison is based on annual data because the GDP and GDP-per-capita series have annual frequency.

¹⁶ Our market capitalization data starts in 1900, which means 1901 is the earliest we can compare aggregate total payout growth to GDP growth.

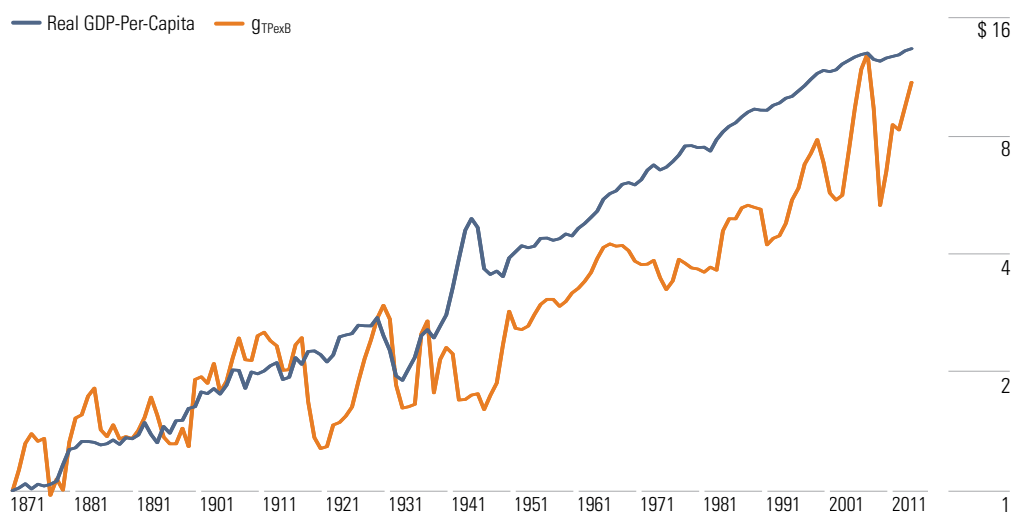
their macroeconomic equivalent. Both statistical tests are insignificant with a t-statistic for GDP vs. aggregate total payout growth of 0.75, and GDP-per-capita versus total payout-per-share (adjusted for the share decrease from buybacks) growth of 0.61, suggesting that the hypothesis that the two growth rates are the same cannot be rejected. Arnott and Bernstein (2002) assume that the growth of dividends is structurally slower than GDP-per-capita growth. We do not find significant evidence that total payout (adjusted for the share decrease from buybacks) growth is structurally lower than productivity growth. Overall, Figures 6 and 7 provide empirical evidence that the long-run growth in total payouts can be approximated by the growth in the real economy.¹⁷

Figure 6 Growth of \$1—Aggregate Total Payout vs. GDP Growth, 1901-2014



Note: g_{TPAgg} is the real aggregate total payout growth.

¹⁷ The difference between aggregate growth (g_{TPAgg}) and per-share growth (g_{TPexB}) is commonly referred to as “dilution,” as existing shareholders’ share in a firm is reduced by the issuance of new shares (e.g., see Bernstein and Arnott, 2003). The macroeconomic equivalents examined in this section provide some intuition as to what creates the wedge between the aggregate and per-share measures of growth. While aggregate growth measures the growth independent of factor inputs, productivity growth is growth per unit of input. Viewed from this perspective, the term “dilution” is a misnomer because, while existing shareholders’ share in a firm is reduced, they benefit from the payoffs that the issued capital generates. In other words, the fact that firms raise new capital should not make existing shareholders worse off, even though the shareholder’s portion in the firm declines: i.e. shareholders get an asset in return for new issued capital. This is not to say that firms’ capital allocation decisions are always optimal, but new capital is not “dilutive” per se.

Figure 7 Growth of \$1—Total Payout-Per-Share (Share Decrease Adj.) vs. GDP-Per-Capita Growth, 1872-2014

Note: g_{TPexB} is the real total payout per-share (adjusted for the share decrease from buybacks) growth.

While the long-run trend growth rates examined in Figures 6 and 7 are closely related, there are significant differences in the short run. On one hand, these differences can be attributed to compositional differences between the stock market and real economic measures, with the stock market tracking only listed companies and real economic measures tracking the entire economy. On the other hand, there are obvious differences because total payouts measure only the residual part of the economics process that accrues to owners of capital after all other claims have been paid, while the GDP measures the economic value added of the economy overall. We refer to this driver as changes in factor share. Greenwald, Lettau and Ludvigson (2014) identified changes in factor share of workers versus shareholders as one of the three key stylized factors explaining stock price movements over time. Total factor productivity and changes in risk aversion are the other two.

In this section, we've provided both theoretical and empirical evidence of the relation between corporate total payout growth and the growth in the real economy. In particular, we identified macroeconomic growth measures that correspond to the two total payout growth measures. We further showed that long-run total payout growth rates are statistically indistinguishable from the macroeconomic growth rate.

Forecasting Equity Returns

Our total payout model can be used to generate forecasts of equity returns, and in this section we will evaluate its ability to do so. Given that expected returns are time-varying, we can distinguish between long-term (i.e., unconditional) and short-term (i.e., conditional) expected returns. We first

discuss the long-term expected return, before turning to the model's ability to predict changes in expected returns (i.e., predicting short-term expected returns).

The long-run expected return of any of the supply models discussed in this paper can be expressed in terms of two basic components: *payout yield* and *growth*. Previous studies such as Ibbotson and Chen (2003) used dividends as the only measure of payout. Our study along with Grinold, Kroner, and Siegel (2011) expand the definition of payouts to stock buybacks. Consistent with Ibbotson and Chen (2003) and Arnott and Bernstein (2002), we exclude the change-in-valuation term from long-term expected returns. Long-run expected real returns are given by:

$$\text{Expected Real Return} = \text{Payout Yield} + \text{Real Growth} + \text{Interaction}$$

To isolate the impact of using total yield as opposed to dividends as the basis of our long-term forecast, we apply the formula to both dividends and total payouts. In the dividend case, payout is the average dividend income return (Inc) for 1871 to 2014, and the growth term is the growth in real dividends per-share (g_{Div}). Conversely, for the total payout case, the payout is the historical total yield over the sample period, while the growth term is total payout-per-share (adjusted for the share decrease from buybacks) growth (g_{TPexB}). Following Ibbotson and Chen (2003), we also include the *Interaction* term.

Table 3 Long-Run Expected Returns

	Historical (1871-2014)		Current Yield & Historical Growth	
	Dividend	Total Payout	Dividend	Total Payout
Payout Yield %	4.50	4.89	1.92	3.21
Growth %	1.46	1.67	1.46	1.67
Interaction %	0.26	0.24	0.26	0.24
Expected Real Return	6.21	6.79	3.63	5.11
Diff. Dividend vs Total Payout Model		-0.58		-1.48

Note: The current total yield is based on the 10-year average real total payout per-share divided by the current market price as of December 2014.

Table 3 compares the real return forecasts of the dividend and total payout model based on historical values. The expected real return based on the historical dividend and total payout model is 6.21% and 6.79%, respectively. The difference can be attributed to the fact that the dividend model does not account for buybacks in the payout yield term, and the dividend-per-share growth was lower than total payout-per-share (adjusted for the share decrease from buybacks) growth, as buybacks were substituted for dividends in recent decades. Therefore, based on historical payout yields and growth rate, the dividend model leads to an expected real return that is 0.58% lower than that of the total payout model.

Next, we estimate an expected return based on current yields and the historical growth rate. Since current yields are sensitive to current market valuations, we technically need to include an additional term to account for the potential future change in valuations (e.g., $g_{P/TP}$ in equation 6 above). For the purpose of this analysis though, we assume no change in valuation to focus on the impact of the different definitions of payout on the forward-looking equity return.

As of December 2014, the dividend yield is 1.92% and cyclically-adjusted total yield is 3.21% (Note that this is the same measure as CATY discussed below). Total payouts tend to be more cyclical than dividends due to the greater volatility of buybacks, so we estimate the total yield based on the average of the prior 10-year real total payouts. The current (i.e., not cyclically-adjusted) total yield is 4.41% as of year-end 2014. We use the same growth and interaction terms as in the historical scenario.

The combination of current yields with the historical growth rates, leads to significantly different estimates of forward equity returns between the two models. The expected real return based on the dividend model is 3.63%, while the expected real return based on total payout model is 5.11%. Not surprisingly, the bulk of the 1.48% difference can be attributed to the fact that the dividend yield is 1.29% lower than the total yield. The difference in historical growth rates of 0.21% is small by comparison.

Overall, the dividend model leads to a lower estimate of expected equity returns for both the historical scenario as well as when current yields are combined with historical growth rates. Not only does the dividend model exclude buybacks from the payout yield, it also underestimates historical growth due to the substitution of buybacks for dividends. The total payout model, in contrast, provides a more complete forecast of equity returns because each supply component is independent from changes in the payout method, providing a more precise forecast even if current yields are combined with historical growth rates.

Having discussed long-term expected returns, we now examine the total payout model's ability to forecast shorter-term changes in expected return. In particular, we compare the short-term predictability of total payout yields to other valuation measures such as the dividend yield or the price-to-earnings ratio. The variance decomposition of 10-year log returns in Table 2 highlights that the majority of the variability in shorter-term returns is attributable to changes in valuation. Total payout yields (i.e., TY and NTY) capture the variability in the payout term and the change in valuation term since the latter is just the inverse of the total payout yield ($P/TP = 1/TY$). To evaluate the extent our variables predict changes in future returns, we run predictive regressions of current market measures, such as yields, on non-overlapping one-year-ahead real equity total returns as measured by the S&P Composite Index. The results of the predictive regression are shown in Table 4.

Table 4 Predictive Regressions of One-Year Forward Returns

	Simple Variables				Cyclically-Adjusted Variables	
	P/E	Div. Yield (DY)	Total Yield (TY)	Net Total Yield (NTY)	P/E (CAPE)	Total Yield (CATY)
Since 1871						
Intercept	11.34	1.34	-2.48	—	—	—
Tstat	2.98	0.32	-0.47	—	—	—
Coeff.	-0.19	1.60	2.27	—	—	—
Tstat	-0.83	1.80	2.18	—	—	—
R ² %	0.49	2.24	3.27	—	—	—
Since 1881						
Intercept	10.80	0.64	-3.83	—	17.97	-2.19
Tstat	2.69	0.14	-0.69	—	4.24	-0.50
Coeff.	-0.17	1.75	2.55	—	-0.60	2.31
Tstat	-0.71	1.82	2.26	—	-2.49	2.56
R ² %	0.38	2.46	3.77	—	4.51	4.78
Since 1901						
Intercept	10.68	0.85	-3.82	2.31	17.69	-1.86
Tstat	2.48	0.18	-0.63	0.77	3.92	-0.40
Coeff.	-0.16	1.72	2.54	1.95	-0.58	2.24
Tstat	-0.64	1.66	2.09	2.44	-2.29	2.35
R ² %	0.37	2.43	3.78	5.08	4.53	4.72

Note: Our data sample starts in 1871. 1881 is the first year we can calculate the cyclically-adjusted (10-year average) valuation measures, CAPE and CATY. 1901 is the earliest we have data to estimate NTY.

The first column set in Table 4 shows the regression results for simple valuation ratios such as price-to-earnings ratio (P/E), dividend yield, total yield and net total yield. The last two terms are identical to the total yield and net payout terms in equations (6) and (8) above, respectively. The regression results show that the total yield and the net total yield are more predictive than the simple P/E and dividend yield over every sample period tested. For instance, over the period since 1871, the total yield has an R-squared of 3.27% compared to an R-squared of only 2.24% and 0.49% for the dividend yield and P/E, respectively. Additionally, the regression coefficient of the total yield variable is statistically significant with a t-statistic of 2.18, while the coefficient on the dividend yield is only marginally significant. For the sample period from 1901 to 2014, when net payout data is first available, the net total yield has the highest R-squared and a highly significant coefficient with a t-stat of 2.44, while both the P/E and dividend yield have insignificant coefficients at the 5% level. Our results showing the superior predictive power of total yield and net total yield are broadly consistent with those of Boudoukh, Michaely, Richardson, and Roberts (2007), who perform similar predictive tests of payout yields.

In the second column set in Table 4 we examine the return predictability of cyclically-adjusted valuation measures. Following Campbell and Shiller (1998), we take a 10-year average of the real total payout-per-share to construct cyclically-adjusted yield measures. We refer to the cyclically-

adjusted total yield as CATY. CAPE is the Shiller P/E from the Shiller dataset. It makes sense to cyclically-adjust the total payouts because buybacks, which are part of total payouts, tend to be more volatile than dividends.

The predictive regressions based on the cyclically-adjusted measures in Table 4 show that CATY is marginally more predictive than the CAPE. Over both the sample periods starting 1881 and 1901, CATY has a higher R-squared and a more significant coefficient than CAPE. As such, our analysis suggests that CATY is a highly predictive alternative to traditional valuation measures such as CAPE. In contrast to CAPE, CATY does not rely on accounting profits as its proxy of firms' fundamental value, but uses distributable cash flows (i.e., dividends and buybacks) instead.¹⁸

Overall, this section provides evidence that the total payout models not only provide a more complete forecast of long-run returns when current yields are combined with historical growth rates, but they are also superior predictors of changes in expected returns.

Conclusions

The advent of buybacks as the dominant source of corporate payout creates the need for a new supply model of stock returns. The study makes several important contributions to the literature on the supply of equity returns.

1. We apply the Ibbotson and Chen (2003) return decompositions to the 1871-2014 sample of equity returns, and we find results that are in line with those of the original study. In particular, we show that supply components account for an even larger portion of realized returns due to the smaller contribution of P/E growth over the longer sample period.
2. We develop a *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* of the supply of stock returns which are independent of the change in payout policy, and find that historical equity returns can almost entirely (97%) be attributed to the supply of total payouts.
3. We compare the growth of *aggregate* total payouts and total payout *per-share* (adjusted for the share decrease from buybacks) to their macroeconomic equivalents, GDP and productivity growth, and find that total payouts grow in line with the real economy. Thus the total payout models provide a framework to derive long-run expected returns that are anchored in macroconsistent growth expectations.
4. We show that the dividend discount model (DDM), based on current dividend yields and historical per-share growth rates, significantly underestimates expected returns relative to the total payout model.

¹⁸ We ran the same predictive regressions for the inverse of the CAPE (i.e., the cyclically-adjusted earnings yield; E/P ratio) and got qualitatively similar results as for the CAPE. The R-squared and the t-stat are marginally lower (i.e., less significant) than for the CAPE.

5. We provide evidence that total payout yields are better predictors of changes in expected returns than dividend yields. Additionally, we demonstrate that the cyclically-adjusted total yield (CATY) is at least as predictive as the cyclically-adjusted price-to-earnings ratio (CAPE).

This study has important practical implications for return forecasting. Corporate substitution of buybacks for dividends caused a secular decrease in dividend yields, and an analogous increase in per-share growth, leading to a structural break in the return components of traditional supply models such as the dividend discount model. The *Dividend and Cash Buyback Model* and *Dividend Less Net Issuance Model* developed in this paper are independent of these changes in corporate payout policy. Therefore, these supply models not only provide a more consistent framework to attribute historical returns to the supply of payout and fundamental growth, but they also provide superior forecasts of long- and short-term expected returns.

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References

- Arnott, Robert D., and Peter L. Bernstein. 2002. "What Risk Premium is 'Normal'?" *Financial Analysts Journal*, vol 58, no. 2 (March/April): 64-84.
- Bernstein, William J., and Robert D. Arnott. 2003. "Earnings Growth: The Two Percent Dilution." *Financial Analysts Journal*, September/October 2003.
- Boudoukh, Jacob, Roni Michaely, Matthew Richardson, and Michael R. Roberts. 2007. "On the Importance of Measuring Payout Yield: Implications for Empirical Asset Pricing." *The Journal of Finance*, 62: 877–915.
- Campbell, John Y., and Robert J. Shiller. 1998. "Valuation Ratios and the Long-Run Stock Market Outlook." *Journal of Portfolio Management*, Vol. 24, No. 2: pp. 11–26.
- Dickey, David A., and Wayne A. Fuller. 1979. "Distribution of the estimators for autoregressive time series with a unit root." *Journal of the American Statistical Association* 74, 427-431.
- Cochrane, John H. 2011. "Presidential Address: Discount Rates." *Journal of Finance*, 66: 1047–1108.
- Diermeier, Jeffrey J., Roger G. Ibbotson, and Laurence B. Siegel. 1984. "The Supply of Capital Market Return." *Financial Analysts Journal*, Vol. 40, No. 2 (Mar. - Apr., 1984), pp. 74-80.
- Fama, Eugene F., and Kenneth R. French. 2001. "Disappearing dividends: Changing firm characteristics or lower propensity to pay?" *Journal of Financial Economics* 60, 3–43.
- Greenwald, Daniel, L., Martin Lettau, and Sydney C. Ludvigson. 2014. "Origins of Stock Market Fluctuations." *NBER Working Paper* No. 19818.
- Grullon, Gustavo, and Roni Michaely. 2002. "Dividends, Share Repurchases, and the Substitution Hypothesis." *Journal of Finance*, 57: 1649–1684.
- Grinold, Richard, C., Kenneth F. Kroner, and Laurence B. Siegel. 2011. "A Supply Model of the Equity Premium." *Research Foundation of CFA Institute*, Vol. 2011, No. 4.
- Ibbotson, Roger G., and Peng Chen. 2003. "Long-Run Stock Returns: Participating in the Real Economy." *Financial Analysts Journal*, January/February, 88-89.
- Skinner, Douglas, J. 2008. "The Evolving Relation between Earnings, Dividends, and Stock Repurchases." *Journal of Financial Economics*, March 2008, 87(3), pp. 582-609.

Vuolteenaho, Tuomo. 1999. "Understanding the Aggregate Book-to-Market Ratio." *SSRN Working paper*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=161911

Von Eije, Henk, and William L. Megginson. 2008. "Dividends and share repurchases in the European Union." *Journal of Financial Economics*, Vol 89, Issue 2, August 2008, Pages 347–374.

Wright, Stephen. 2004. "Measures of Stock Market Value and Returns for the US Nonfinancial Corporate Sector, 1900-2002." *Review of Income and Wealth*, 50 (4) pp 561-584 December 2004.

Appendix

Table A1 % Difference in Return Decompositions: This study versus Ibbotson/Chen (2003)

	Building Blocks	Capital Gain and Income	Earnings	Dividends	Book on Equity	GDP per Capita
Interaction	-0.08	-0.08	-0.09	-0.09	-0.06	-0.07
ERP	-1.16					
RF	0.61					
INC		0.22	0.22	0.22	0.22	0.22
CG		-0.77				
g(P/E)			-0.84	-0.84	-0.84	
g(EPS)			0.08			
-g(PO)				-0.15		
g(DIV)				0.23		
g(BV)					0.03	
g(ROE)					0.02	
g(FS)						-0.55
g(GDP/POP)						-0.21
CPI	-1.02	-1.02	-1.02	-1.02	-1.02	-1.02
Nominal Total Return	-1.65	-1.65	-1.65	-1.65	-1.65	-1.65

Note: This table shows the difference in the historical return decompositions in this study versus Ibbotson and Chen (2003). The six historical return decompositions were first introduced by Ibbotson and Chen (2003), and were updated in this study using a longer sample period from 1871 to 2014. The original study was based on a sample from 1926 to 2000. Both studies rely on the same methodology to derive the return decompositions. Equity total returns between 1871 and 2014 were an annualized 9.05%, which is 1.65% lower than the 10.70% annualized return observed in the original 1926 to 2000 sample. The majority of the decrease in total return is attributable to a 1.02% lower inflation rate, while the balance is due to lower real returns. The lower real return in our sample is largely due to a smaller contribution from the growth in the price-to-earnings ratio. The results of the return decompositions presented in this study are depicted in Figure 1.

Exhibit D

Financial Accounting Standards Board

Accounting Standards Update) No. 2016-02, *Leases (Topic 842)*

February 25, 2016

FASB Home » PROJECTS » **Recently Completed Projects**

LEASES

ASU 2016-02 LEASES (TOPIC 842)

Overview

On February 25, 2016, the FASB completed its Leases project by issuing ASU No. 2016-02, *Leases (Topic 842)*. The new guidance establishes the principles to report transparent and economically neutral information about the assets and liabilities that arise from leases.

To that end, the new guidance:

- ▶ Results in a more faithful representation of the rights and obligations arising from leases by requiring lessees to recognize the lease assets and lease liabilities that arise from leases in the statement of financial position and to disclose qualitative and quantitative information about lease transactions, such as information about variable lease payments and options to renew and terminate leases
- ▶ Results in fewer opportunities for organizations to structure leasing transactions to achieve a particular accounting outcome on the statement of financial position
- ▶ Improves understanding and comparability of lessees' financial commitments regardless of the manner they choose to finance the assets used in their businesses
- ▶ Aligns lessor accounting and sale and leaseback transactions guidance more closely to comparable guidance in Topic 606, Revenue from Contracts with Customers, and Topic 610, Other Income
- ▶ Provides users of financial statements with additional information about lessors' leasing activities and lessors' exposure to credit and asset risk as a result of leasing
- ▶ Clarifies the definition of a lease to address practice issues that were raised about the previous definition of a lease and to align the concept of control, as it is used in the definition of a lease, more closely with the control principle in both Topic 606, and Topic 810, Consolidation

The new guidance affects any organization that enters into a lease, or sublease, with some specified exemptions. Because a lease is defined as a contract, or part of a contract, that conveys the right to control the use of identified property, plant, or equipment (an identified asset) for a period of time in exchange for consideration, this guidance does not apply to any of the following:

- ▶ Leases of intangible assets (see Topic 350, Intangibles—Goodwill and Other).
- ▶ Leases to explore for or use minerals, oil, natural gas, and similar nonregenerative resources (see Topics 930, Extractive Activities—Mining, and 932, Extractive Activities—Oil and Gas). This includes the intangible right to explore for those natural resources and rights to use the land in which those natural resources are contained (that is, unless those rights of use include more than the right to explore for natural resources), but not equipment used to explore for the natural resources.
- ▶ Leases of biological assets, including timber (see Topic 905, Agriculture).
- ▶ Leases of inventory (see Topic 330, Inventory).
- ▶ Leases of assets under construction (see Topic 360, Property, Plant, and Equipment).

Effective Dates

The new guidance is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years, for any of the following:

1. A public business entity, as defined in U.S. GAAP
2. A not-for-profit entity that has issued, or is a conduit bond obligor for, securities that are traded, listed, or quoted on an exchange or an over-the-counter market

3. An employee benefit plan that files financial statements with the U.S. Securities and Exchange Commission (SEC).

For all other organizations, the new guidance is effective for fiscal years beginning after December 15, 2019, and interim periods within fiscal years beginning after December 15, 2020.

Early application is permitted for all organizations.

Additional Information

- Download the [Accounting Standards Update](#)
- Read the [Press Release](#) introducing the ASU

To Learn More

- Read the [FASB In Focus](#)—a summary of the ASU
- Read the [FASB: Understanding Costs and Benefits](#)
- Watch [Why a New Leases Standard?](#)—a video featuring FASB Members Jim Kroeker, Hal Schroeder, and Tom Linsmeier
- Watch [Putting Leases on the Balance Sheet](#)—a video featuring FASB Member Daryl Buck and FASB Senior Project Manager Danielle Zeyher discuss how organizations that lease assets can apply FASB's new guidance on leases.
- Watch the [FASB Webcast](#)—*IN FOCUS: FASB Accounting Standards Update on Leases*. The webcast provided an overview of the ASU and the Board and staff answered questions submitted by viewers.

Post-Issuance Activities

- None.

Have A Question?

Submit questions about the new requirements using our [Technical Inquiry System](#).

Table 2

Net Reduction in Shares Outstanding from 2015 to 2015

<u>Carrier</u>	2014	2015	Percentage	Impact on
(1)	<u>10-K Shares</u>	<u>10-K Shares</u>	<u>Reduction in</u>	<u>Growth 2/</u>
	<u>Outstanding</u>	<u>Outstanding</u>	<u>Shares 1/</u>	<u>(5)</u>
	(2)	(3)	(4)	
1 CSX	990,564,824	963,150,011	-2.77%	2.85%
2 KCS	110,411,095	108,498,752	-1.73%	1.76%
3 NS	307,411,965	298,198,651	-3.00%	3.09%
4 UP	881,284,029	846,414,350	-3.96%	4.12%

1/ $\text{Column (3)} \div \text{Column (2)} - 1 \times 100$.

2/ $\text{Column (2)} \div \text{Column (3)} - 1 \times 100$.

Table 3
Separation of Median Growth Rates into
Growth from Share Reduction and Core Growth Components

<u>Carrier</u>	<u>Median</u>	<u>Growth from</u>	<u>Core</u>	<u>Verification</u>
(1)	<u>Rate</u>	<u>(from Table 2)</u>	<u>Growth</u>	(5)
(2)	(3)	(4)		
1 CSX	6.20%	2.85%	3.26%	$1.062 = 1.025 \times 1.0326$
2 KCS	8.45%	1.76%	6.57%	$1.0845 = 1.0176 \times 1.0657$
3 NS	0.80%	3.09%	-2.22%	$1.008 = 1.0309 \times 0.978$
4 UP	<u>6.50%</u>	<u>4.12%</u>	2.29%	$1.065 = 1.0412 \times 1.0229$
5 Average	5.49%	2.95%	2.47%	$1.0549 = 1.0295 \times 1.0247$

Calculations are shown in the e-workpaper.