That is, each cash flow is now assumed to grow at a constant rate, g_s The discounted cash flow equation simplifies to the following

$$PV_s = \frac{CF_1}{(k_s - g_s)}$$

Rearranging the terms to solve for the equity cost of capital results in·

$$k_s = \frac{CF_1}{PV_s} + g_s$$

where.

$$CF_1 = CF_0(1+g_s)$$

k_s = the cost of equity for company s,
CF_0 = the current period dividend or cash flow earned by shareholders in company s,
CF_1 = the expected dividend or cash flow to be earned in the next period by shareholders in company s,
PV_s = the current market value of company s, and
g_s = the expected dividend or cash flow growth rate into perpetuity

The discounted cash flow model in this form is simple to use. The value of a stock is directly observable as its price in the market. One difficulty with this model, however, is obtaining an accurate perpetual dividend or cash flow growth forecast because dividends and cash flows do not in fact grow at stable rates forever. It is typically easier to forecast a company-specific or project-specific growth rate over the short run than over the long run One way of obtaining such a forecast is to use a consensus of security analysts' estimates, which generally cover a short period of time.

For example, assume that a company has a current market price of $50 and a recent annual dividend of $2, and that the consensus of the security analysts' growth estimates is 8 percent. The estimated cost of capital would be·

$$CF_1 = CF_0(1+g_s) = \$2(1+0\,08) = \$2\,16$$

$$k_s = \frac{CF_1}{PV_s} + g_s = \frac{\$2\,16}{\$50} + 0\,08 = 0\,0432 + 0\,08 = 12\,32 \text{ percent}$$

In this example, we made the assumption that the analysts' growth rate is constant

Another difficulty with implementing the single-stage growth model is that it does not allow the growth rate to exceed the cost of equity Recall that in the original equation, the term $(k_s \quad g_s)$ was in the denominator If g_s exceeds k_s, the result is a negative present value. Growth can exceed the cost of equity for some rapidly growing firms. A model that allows the growth rate to change over time and to exceed the cost of equity can produce a better estimate of the equity cost of capital

The Two-Stage Growth Model
To produce a better estimate of the equity cost of capital, one can use a multi-stage discounted cash flow model. All multi-stage discounted cash flow models allow for the growth rate to exceed the cost of equity in all but the last stage. The two-stage growth model can be expressed as follows:

$$PV_s = \sum_{i=1}^{n} \frac{CF_0(1+g_1)^i}{(1+k_s)^i} + \frac{\frac{CF_n(1+g_2)}{(k_s - g_2)}}{(1+k_s)^n}$$

where:
k_s = the cost of equity for company s,
PV_s = the current market value of company s.
i = a measure of time (in this example the unit of measure is a year),
n = the number of years in the first stage of growth,
CF_0 = the dividend or cash flow amount (in $) in year 0,
CF_n = the expected dividend or cash flow amount (in $) in year n,
g_1 = the expected dividend or cash flow growth rate from year 1 to year n, and
g_2 = the expected perpetual dividend or cash flow growth rate starting in year $(n + 1)$

The equity cost of capital is given by the value of k_s, which makes the right-hand side of the above equation equal to the current stock price (PV_s) The first summation term denotes the present value of dividends expected over the first n years, and the second term denotes the present value of dividends expected over all the years thereafter. For the resulting cost of capital estimate to be useful, the growth rate over the latter period should be sustainable indefinitely. An example of an indefinitely sustainable growth rate is the expected long-run growth rate of the economy

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To illustrate the two-stage growth model, we can alter the growth assumptions of the example found under the single-stage model Assume that the analysts' growth rate of 8 percent applies only to years one through five For years six and onwards, assume a growth rate of 5 percent.

Year	Growth Rate (%)	Annual Dividend ($)	Present Value Factor @ 9 78 %	Present Value of Dividend ($)
0		2 00	1 00	
1	8 0	2 16	0 91	1 97
2	8 0	2 33	0 83	1.94
3	8 0	2 52	0 76	1 90
4	8 0	2 72	0 69	1 87
5	8 0	2.94	0.63	1 84
6–forever	5.0	3.09	13 12	40 48
			Total	$50 00

We arrive at the current stock price of $50 by discounting this stream of cash flows at an estimated rate of 9 78 percent This is a considerably different estimate compared to the 12 32 percent we arrive at using a constant growth rate of 8 percent Therefore, the growth rate assumptions can have a significant impact on the cost of equity estimate

Year	Growth Rate (%)	Annual Dividend ($)	Present Value Factor @ 10 03%	Present Value of Dividend ($)
0		2 00	1.00	
1	8 0	2 16	0 91	1 96
2	8 0	2 33	0 83	1 93
3	8 0	2 52	0 75	1 89
4	8 0	2 72	0 68	1 86
5	8 0	2 94	0 62	1 82
6	6 5	3 13	0 56	1 76
7	6 5	3.33	0.51	1 71
8	6 5	3 55	0 47	1 65
9	6 5	3 78	0 42	1 60
10	6.5	4 03	0.38	1 55
11–forever	5 0	4 23	7.63	32 27
			Total	$50 00

The Three-Stage Growth Model

Additional growth stages can be used but, in practice, only one-, two-, or three-stage discounted cash flow models are usually employed The three-stage model is denoted as follows

$$PV_s = \sum_{i=1}^{n1} \frac{CF_0(1+g_1)^i}{(1+k_s)^i} + \sum_{i=n1+1}^{n2} \frac{CF_{n1}(1+g_2)^{i\, n1}}{(1+k_s)^i} + \frac{\dfrac{CF_{n2}(1+g_3)}{(k_s - g_3)}}{(1+k_s)^{n2}}$$

where:

k_s = the cost of equity for company s,

PV_s = the current market value of company s,

i = a measure of time (in this example the unit of measure is a year),

n_1 = the number of years in the first stage of growth,

n_2 = the last year in the second stage of growth,

CF_0 = the dividend or cash flow amount (in $) in year 0,

CF_{n1} = the expected dividend or cash flow amount (in $) in year n_1

CF_{n2} = the expected dividend or cash flow amount (in $) in year n_2

g_1 = the expected dividend or cash flow growth rate from year 1 to year n_1,

g_2 = the expected dividend or cash flow growth rate from year $(n_1 + 1)$ to year n_2 and

g_3 = the expected perpetual dividend or cash flow growth rate starting in year $(n_2 + 1)$

To illustrate the three-stage growth model, we alter the growth assumptions of the two-stage model example (see table on left) Again we assume that the analysts' growth rate of eight percent applies only to years one through five For years 6 through 10, we assume a growth rate of 6.5 percent. In the last stage, from year 11 and beyond, we assume a perpetual growth rate of 5 percent

By discounting this stream of cash flows at a rate of 10 03 percent, we arrive at the current stock price of $50.

Timing Differences and Discount Rates

Year	Growth Rate (%)	Annual Dividend ($)	Periodic Dividend ($)	Reinvestment ($)	Total Dividend ($)	Present Value Factor @ 9 96%	Present Value of Dividend ($)
0		2 00				1 00	
1	8 0	2 16	0 54	0 08	2 24	0 91	2 04
2	8 0	2 33	0 58	0 09	2 42	0 83	2 00
3	8 0	2.52	0 63	0 10	2 62	0.75	1 97
4	8 0	2 72	0.68	0.10	2 82	0 68	1 93
5	8 0	2 94	0 73	0 11	3 05	0 62	1.90
6–forever	5 0	3 09	0 77	0 12	3 20	12 54	40 16
						Total	$50 00

Quarterly Dividend Adjustment

When valuing a stock, one should remember that even though dividends grow and are declared annually, they are usually paid in equal quarterly installments In order to account for this in the discounted cash flow model, each cash flow can be replaced by the following term

$$CF \times \frac{1 + (1+k)^{\cdot 1 4} + (1+k)^{\cdot 1 2} + (1+k)^{3 4}}{4}$$

If we look at the same example that was used for the two-stage discounted cash flow model but use the quarterly dividend adjustment the cost of equity estimate becomes 9 96 percent instead of 9 76 percent The higher discount rate reflects the difference in timing of the cash flows, as shown below

Estimating Growth Rates

One of the advantages of a three-stage discounted cash flow model is that it fits with life cycle theories in regards to company growth In these theories companies are assumed to have a life cycle with varying growth characteristics Typically the potential for extraordinary growth in the near term eases over time and eventually growth slows to a more stable level

In the *Ibbotson Cost of Capital Yearbook* the three-stage growth model is used In the first stage (the first five years), analysts' consensus estimates of earnings growth are used These should reflect any extraordinary near-term growth potential Over years 6 through 10, an average of the analysts' consensus estimates of growth for the entire industry is used (we assume that over a middle horizon, growth of any particular company will lie more in line with the industry as a whole) Finally, in years 11 and beyond a growth rate estimate for the entire economy is used reflecting the belief that even in a rapidly growing industry there will come a time when growth slows to be more in line with the overall economy

Short-term growth rates are generally available from security analysts who follow a particular company or industry Long-term growth rates can be estimated in a number of ways One rudimentary estimate of long-term growth is the sustainable-growth model This model relies on two accounting concepts return on equity and the plow-back ratio

Sustainable growth is then given by

$$g_s = b_s \cdot ROE$$

where

g_s = the sustainable growth rate for company **s**

b_s = the plow-back ratio of company **s** calculated as follows

$$\frac{\text{Annual Earnings} - \text{Annual Dividends}}{\text{Annual Earnings}} \quad \text{and}$$

ROE_s = the return on book equity of company **s** calculated as follows

$$\frac{\text{Annual Earnings}}{\text{Book Value of Equity}}$$

This model relies on a number of assumptions that may or may not hold The first of these assumptions is that ROE and the plow back of earnings are constant over time That is, there exists a forecast of these two accounting ratios that is sustainable in the long term Though the model appears simple to implement at first glance, finding a forecast of the ratios that is sustainable indefinitely is extremely difficult Dividend policy and potential investment opportunities change over time and have a direct impact on these ratios

The model assumes that the only possible source of corporate earnings growth is the reinvestment of earnings into the existing business and that any investment of funds in the firm will earn the same rate of return as existing projects However, firms generally seek projects that have a higher return than existing projects The sustainable growth model may therefore underestimate a firm's future growth Other problems may arise because the model relies on accounting practices that can distort earnings

In addition, other sources of growth may exist that do not require the plow back of earnings Changes in technology can advance growth with little capital expenditure by a firm For instance, efficiency in the transfer of information has improved tremendously over the years as a result of internet technology Many companies benefit from this increased efficiency with little direct investment in the internet A company may also grow at the rate of inflation without retaining any earnings The growth rate that the model estimates is a nominal growth rate not a real growth rate If retained earnings are zero, the model predicts zero growth, however a firm could still grow at the general rate of inflation

Another approach to estimating long-term growth rates is to focus on estimating the overall economic growth rate Again this is the approach used in the *Ibbotson Cost of Capital Yearbook* To obtain the economic growth rate, a forecast is made of the growth rate's component parts Expected growth can be broken into two main parts expected inflation and expected real growth By analyzing these components separately, it is easier to see the factors that drive growth

Treasury Inflation-Protected Securities (TIPS), a relatively new investment vehicle in the U S can be used in conjunction with traditional long-term government bonds to estimate the market expectation for inflation Theoretically the yield on inflation indexed bonds is equal to the real default-free rate of return

To estimate long-term inflation, we can start with the current yield on a government bond with approximately 20 years to maturity of 2 41 percent and subtract the current yield on an inflation-indexed bond with approximately 20 years to maturity of 0 15 percent for an inflation estimate of 2 26 percent

Once the long-term expected inflation rate is estimated the real growth rate must be determined The growth rate in real Gross Domestic Product (GDP) for the period 1929 to 2012 was approximately 3 22 percent Growth in real GDP (with only a few exceptions) has been reasonably stable over time, therefore its historical performance is a good estimate of expected long-term (future) performance

By combining the inflation estimate with the real growth rate estimate, a long-term estimate of nominal growth is formed

2 26 percent + 3 22 percent = 5 48 percent

Endnotes

This relationship does not seem to hold empirically with small company stocks. This size effect is discussed in Chapter 7

In general small company betas are expected to be higher than large company betas. This, however, does not hold for all time periods Chapter 6 discusses in more detail the measurement of beta for small stocks. The beta adjusted size premia are different from the small stock premia or the beta adjusted premia shown in previous editions of the Ibbotson Stocks Bonds Bills and Inflation yearbook prior to the 1995 Yearbook The size premia reported in earlier editions of Stocks Bonds Bills and Inflation is the difference in long term average returns between the large company stock total return series (currently represented by the S&P 500 and the small company stock total return series (currently represented by the Dimensional Fund Advisors U S Micro Cap Portfolio) The size premia given here are based on slightly different baskets of stocks from the CRSP (Center for Research in Security Prices) data and more importantly, they are adjusted for beta. Thus small stocks in general have higher betas than large stocks. The return advantage that might be expected because of the higher beta is then removed. These size premia are related to the capitalization of the company, see Chapter 7 for a description of these premia in more detail

Beta estimate is based on the full information beta for SIC code 26 from the Ibbotson Industry Cost of Capital Reports as of December 31 2012 and December 31 1996 This beta estimation methodology is described in detail in Chapter 6 For more information visit http://corporate.morningstar.com/Reports/Stats

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Vol. 36, No. 12, December 1, 2017

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A December FOMC Hike, Followed By Maybe 75 Basis Points More In 2018

Domestic Commentary As expected, the Federal Reserve's Open Market Committee (FOMC) left interest rates unchanged at its October 31st-November 1st meeting. Minutes of the meeting did not contain explicit guidance on future changes in policy. However, the discussion among policymakers suggested that barring a surprise policymakers will enact their third 25-basis-point increase of the year at their December 12th-13th meeting.

That is clearly the belief among our panelists. In response to a special question asked as part of our November 21st-22nd survey, the panelists unanimously predicted that at the December meeting the FOMC will hike its target range for the federal funds rate by a further 25 basis points to 1.25%-1.50%.

Minutes of the FOMC meeting noted that labor market conditions had generally continued to strengthen since its mid-September meeting and that real GDP growth expanded at a solid pace during Q3 despite the hurricane-related disruptions. Additionally, "many" meeting participants believed that the slowdown in inflation over the spring and summer months was largely the result of temporary or idiosyncratic factors; and that "most" felt that cyclical pressures would produce a pickup in inflation over the medium term. High frequency data released since the FOMC's most recent meeting have tended to underscore these views.

Job growth rebounded sharply in October following the hurricane-induced softness in September and most economists look for another solid increase in November payrolls. Moreover, October's unemployment rate fell to a fresh 17-year low of 4.1%. While the year-over-year (y/y) change in average hourly earnings slipped back a bit in October, most economists look for a rebound over coming months as labor market conditions continue to tighten as the economy grows at an above-trend pace.

Industrial production and consumer spending also have exhibited signs of solid growth. The y/y change in total industrial production increased to 2.8% in October, the fastest pace since early 2012. Retail sales grew at an annual rate of 3.5% over the three-months ending in October and most signs point to strong holiday spending this year. Moreover, shipments of core capital goods – a proxy for capital spending – were up 12.0% at an annual rate over the three months ending in October. Residential investment, too, has recently exhibited some much needed strengthening. Housing starts surged nearly 14% in October and replacement and recovery efforts following the hurricanes now seems likely to ensure that real residential investment posts positive growth in the current quarter after contracting in each of the two prior quarters.

The consensus this month forecasts that real GDP would grow at an above-trend rate of 2.7% (saar) in the final quarter of this year. That forecast is unchanged from a month ago, but risks to it might be to the upside. Indeed, as of November 22nd the Atlanta Federal Reserve Bank's GDPNow forecast estimated that real GDP will grow 3.4% (saar) this quarter. Furthermore, a good many of our panelists believe that real GDP growth in Q3 – currently estimated by the Bureau of Economic Analysis at 3.1% (saar) – will be revised up by a couple of tenths on November 29th.

The most plausible roadblock standing in the way of a rate hike in mid-December is the possibility of a federal government shutdown that might prompt FOMC members to delay action. The Senate needs 60 votes to pass another short-term budget extension prior to December 8th to avoid a shutdown. However, Democrats are unlikely to agree without concessions, such as an extension of the Deferred Action for Childhood Arrivals (DACA) program and/or renewal of the Children's Health Insurance program.

Failure to agree on a budget extension would not only lead to a partial shutdown of the federal government, but make it all but impossible for Republicans to meet their deadline for passing tax reform legislation prior to the Christmas recess. President Trump and top congressional leaders are scheduled to meet the week following Thanksgiving in an attempt to hammer out a deal on a temporary budget extension. Stay tuned.

Beyond this December, the prospect for additional rate hikes from the FOMC becomes more clouded. The FOMC's September "dot plot" continued to suggest an additional 100 basis points of tightening in 2018. However, minutes of the FOMC's most recent meeting hint that at least some policymakers are concerned that longer-term inflation expectations have fallen, thereby necessitating a slower-than-previously assumed pace for interest rate normalization. For example, "a number of these participants were worried that a decline in longer-term inflation expectations would make it more challenging for the Committee to promote a return of inflation to 2 percent over the medium term". This has led some to suspect that the "dot plot" released in conjunction with the December FOMC meeting might imply fewer rate increases in 2018 than did the September "dot plot". However, we suspect that will not occur given the economy's current strength, the grudging upturn in inflation, and the rich valuations seen across a host of asset classes.

As for our panelists' view on 2018 rate changes, this month's special questions showed 11.9% of those responding predicted only one 25 basis point hike in rates next year; 35.7% forecast 50 basis points of tightening, 23.8% expected 75 basis points of rate hikes, and 28.6% forecast a full 100 basis points of rate increases next year.

Real GDP still is predicted by the consensus to grow 2.4% (saar) in Q1 of next year, but the forecast for growth in Q2 rose another 0.1 of a percentage point this month to 2.6% (saar). Real GDP is forecast to grow 2.3% (saar)in Q3 and Q4 of next year, the Q3 estimate dipping by 0.1 of a percentage point over the past month. The consensus forecast of real GDP growth in Q1 2019 remained at 2.1% (saar) this month. These forecasts will be subject to revision not only if and when Congress acts on tax reform, but what the legislation ultimately entails. The consensus this month puts the odds that tax reform legislation will be passed by Congress prior to the end of this year at only 41%, but the odds of it passing in 2018 rose to 61%.

Consensus forecasts of inflation this quarter and next rose this month. After increasing 2.0% (saar) in Q3 of this year, the Consumer Price Index (CPI) is now forecast to increase 3.0% in the current quarter, 0.4 of a percentage point faster than predicted last month. The GDP price index is forecast to increase 2.2% (saar) this quarter, the same as in Q3, but 0.2 of a percentage point faster than forecast last month. The CPI is forecast to increase 2.2% (saar) in Q1 2018, up 0.2 of a percentage point from last month, while the forecast of the change in the GDP price index rose 0.1 of a point to 2.0% (saar). Forecasts of the Q2 2018 change in the CPI and GDP price index fell 0.1 of a percentage point to 1.9%. The consensus forecasts that the GDP price index and the CPI will increase at respective rates of 2.1% and 2.2% in Q3 and Q4 of next year. Both still are predicted to increase at respective rates of 2.2% and 2.3% in Q1 2019

Consensus Forecast Real GDP will continue to grow at an above-trend pace through Q1 2019, tightening labor markets, and lifting inflation toward the FOMC 2.0% target. The FOMC will hike interest rates by 25 basis points this December and maybe 75 basis points more in 2018. The Treasury yield curve is likely to narrow by a bit more over the forecast horizon. After falling by about 10% this year on a trade-weighted basis, the U.S. dollar is predicted to be relatively stable over the forecast horizon *(see page 2)*
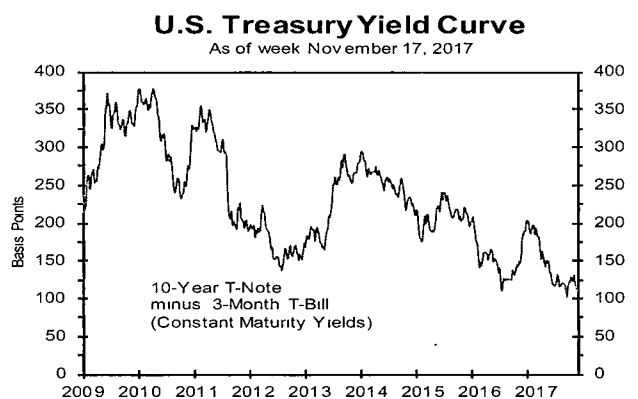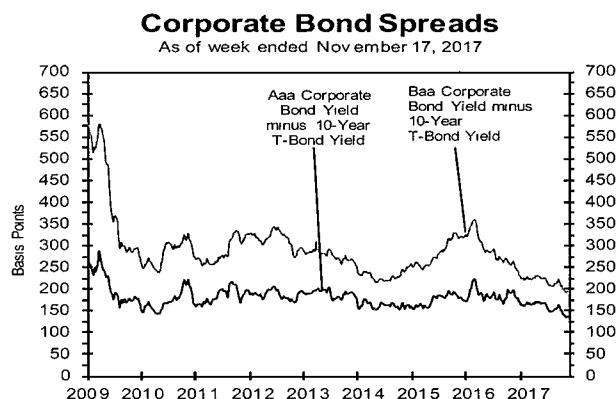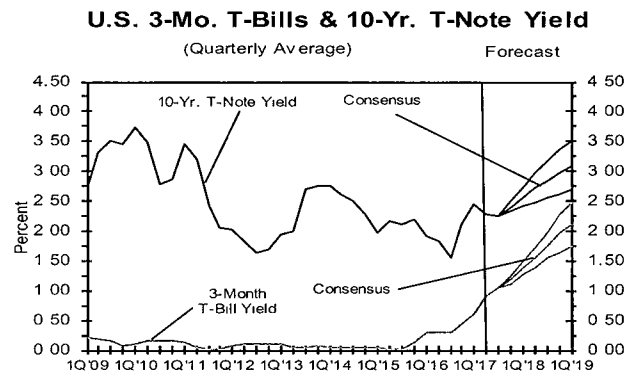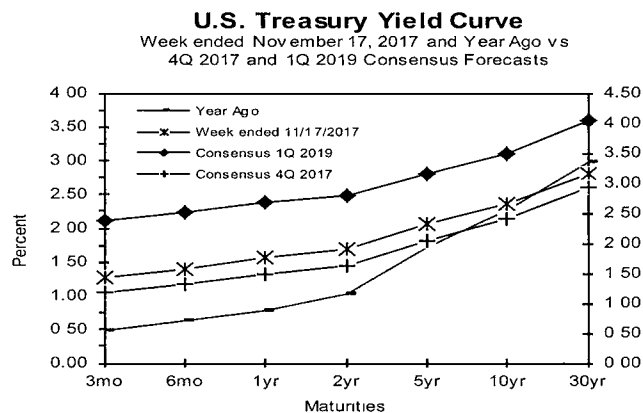
Special Questions On page 14 of this issue are results of our twice-yearly, long-range survey with consensus estimates for the years 2019 through 2023 and averages for the 5-year periods 2019-2023 and 2024-2028

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Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

	------------------------------History------------------------------							Consensus Forecasts-Quarterly Avg.					
	-------Average For Week Ending------			----Average For Month---			Latest Qtr	4Q	1Q	2Q	3Q	4Q	1Q
Interest Rates	Nov. 17	Nov. 10	Nov. 3	Oct. 27	Oct	Sep	Aug	3Q 2017	2017	2018	2018	2018	2018	2019
Federal Funds Rate	1 16	1.16	1.15	1.16	1.15	1.16	1.16	1.16	1.2	1.4	1.6	1.8	2.0	2.2
Prime Rate	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.3	4.5	4.7	4.9	5.1	5.2
LIBOR, 3-mo.	1.43	1.41	1.39	1.37	1.36	1.33	1.31	1.32	1.4	1.6	1.8	2.0	2.2	2.4
Commercial Paper, 1-mo.	1.15	1.16	1.14	1.14	1.13	1.12	1.10	1.11	1.2	1.4	1.6	1.8	2.0	2.2
Treasury bill, 3-mo.	1.26	1.22	1.16	1.11	1.09	1.06	1 04	1.05	1.2	1.4	1.6	1.7	2.0	2.1
Treasury bill, 6-mo.	1.40	1.34	1.28	1.27	1.25	1.19	1.13	1 17	1.3	1.5	1.7	1.9	2.1	2.2
Treasury bill, 1 yr.	1.57	1.52	1 45	1.43	1.40	1.31	1.23	1.28	1.5	1.7	1.9	2.0	2.3	2.4
Treasury note, 2 yr.	1.70	1.64	1.61	1.60	1.54	1.46	1.34	1.41	1.6	1.8	2.0	2.2	2.3	2.5
Treasury note, 5 yr.	2.06	2.01	2.00	2.04	1.98	1.89	1.79	1.85	2.0	2.2	2.4	2.5	2.7	2.8
Treasury note, 10 yr.	2 37	2 34	2 36	2.42	2.36	2.28	2.23	2 26	2.4	2.6	2.7	2.8	3.0	3.1
Treasury note, 30 yr.	2.81	2 81	2.85	2.93	2.88	2.83	2.81	2.82	2.9	3.1	3.3	3.4	3.5	3.6
Corporate Aaa bond	3.74	3.71	3.71	3.77	3.75	3.75	3.76	3.76	3.8	4.0	4.2	4.3	4.5	4.6
Corporate Baa bond	4.32	4.29	4.29	4.35	4.32	4.32	4.34	4.33	4.4	4.6	4.9	5.1	5.2	5.3
State & Local bonds	3.41	3.37	3.40	3.38	3.37	3.34	3.35	3.34	3.5	3.7	3.9	4.0	4.2	4.3
Home mortgage rate	3.95	3.90	3.94	3.94	3.90	3.82	3.88	3.85	4.0	4.2	4.4	4.5	4.6	4.8

	-------------------------------History-------------------------------							Consensus Forecasts-Quarterly					
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q
Key Assumptions	2015	2016	2016	2016	2016	2017	2017	2017	2017	2018	2018	2018	2018	2019
Major Currency Index	93.1	93.3	89.6	90.3	93.7	94.4	93.0	88.3	88.7	89.0	89.1	89.1	88.9	88.5
Real GDP	0.5	0.6	2.2	2.8	1.8	1.2	3.1	3.0	2.7	2.4	2.6	2.3	2.3	2.1
GDP Price Index	0.8	0.3	2.4	1.4	2.0	2.0	1.0	2.2	2.2	2.0	1.9	2.1	2.1	2.2
Consumer Price Index	0.4	0.1	2.3	1.8	3.0	3.1	-0.3	2.0	3.0	2.2	1.9	2.2	2.2	2.3

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar) Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H 15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated. yield to maturity; Mortgage rates from Freddie Mac. 30-year, fixed; LIBOR quotes from Intercontinental Exchange All interest rate data is sourced from Haver Analytics Historical data for Fed's Major Currency Index is from FRSR H.10 Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS)

U.S. Treasury Yield Curve
Week ended November 17, 2017 and Year Ago vs
4Q 2017 and 1Q 2019 Consensus Forecasts

U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield
(Quarterly Average) — Forecast

Corporate Bond Spreads
As of week ended November 17, 2017

U.S. Treasury Yield Curve
As of week November 17, 2017

------------3-Month Interest Rates[1]----------------

	----------History---------		Consensus Forecasts Months From Now:		
	Month	Year			
Latest:	Ago:	Ago:	3	6	12
U.S.	1.45	1.37	0.92	1.66	1.91	2.14
Japan	-0.04	-0.03	-0.06	0.02	0.01	0.02
U.K.	0.44	0.35	0.38	0.60	0.63	0.81
Switzerland	-0.75	0.02	-0.75	-0.70	-0.70	-0.60
Canada	1.35	1.35	0.85	1.78	1.88	1.80
Australia	1.98	1.85	2.21	1.90	1.90	2.15
Eurozone	-0.33	-0.33	-0.31	-0.35	-0.32	-0.25

-----------10-Yr. Government Bond Yields[2]------

	----------History---------		Consensus Forecasts Months From Now:		
	Month	Year			
Latest:	Ago:	Ago:	3	6	12
U.S.	2.36	2.41	2.29	2.54	2.64	2.82
Germany	0.35	0.48	0.26	0.56	0.66	0.83
Japan	0.03	0.07	0.03	0.06	0.07	0.08
U.K.	1.33	1.35	1.46	1.48	1.57	1.72
France	0.66	0.88	0.71	0.93	1.02	1.19
Italy	1.77	2.04	2.13	2.09	2.13	2.28
Switzerland	-0.09	-0.73	-0.15	0.00	0.10	0.26
Canada	1.90	2.07	1.54	2.24	2.37	2.63
Australia	2.53	2 76	2.65	2.74	2.83	2.96
Spain	1.48	1.65	1 53	1.78	1.86	2.01

----------------Foreign Exchange Rates[1]-----------

	----------History---------		Consensus Forecasts Months From Now:		
	Month	Year			
Latest:	Ago:	Ago.	3	6	12
U.S.	88.916	88.759	94.965	89.4	89.8	89.0
Japan	111.98	113.50	110.51	114.4	114.8	114.8
U.K.	1.3222	1.3179	1.2327	1.33	1.34	1.36
Switzerland	0.9882	0.9844	1.0094	0.98	0.98	0.97
Canada	1.2785	1.2618	1.3518	1.27	1.26	1.25
Australia	0.7563	0.7812	0.7345	0.78	0.78	0.79
Euro	1.1799	1.1770	1.0600	1.18	1.18	1.21

	Consensus 3-Month Rates vs. U.S. Rate			Consensus 10-Year Gov't Yields vs. U.S. Yield	
	Now	In 12 Mo.		Now	In 12
Japan	-1.49	-2.12	Germany	-2.01	-1.98
U.K.	-1.01	-1.33	Japan	-2.33	-2.73
Switzerland	-2.20	-2.74	U.K.	-1.03	-1.09
Canada	-0.10	-0.34	France	-1 70	-1.62
Australia	0.53	0.01	Italy	-0.59	-0.54
Eurozone	-1.78	-2.38	Switzerland	-2.45	-2.56
			Canada	-0.46	-0.18
			Australia	0.17	0.14
			Spain	-0.88	-0.81

Forecasts of panel members are on pages 10 and 11. Definitions of variables are as follows [1]Three month rate on interest-earning money market deposits denominated in selected currencies. [2]Government bonds are yields to maturity. Foreign exchange rate forecasts for U K., Australia and the Euro are U.S. dollars per currency unit For the U S dollar, forecasts are of the U S. Federal Reserve Board's Major Currency Index.

International Commentary Eurozone real GDP growth grew a healthy 2.5% (saar) in Q3 and was up 2.5% y/y, the best pace since Q1 2011. Real GDP in Germany grew 3.3% (saar) in Q3 and was up 2.8% y/y while France's economy grew 1.9% (saar) and was up 2.2%, also the fastest since 2011. Spain's economy grew 3.2% (saar). Italy's economy grew 2.0% (saar) and was up 1.8%, also the best pace since Q1 2011. The unemployment rate in the Eurozone has fallen to 8.9%, the lowest since February 2009, but varies widely within the currency zone. Headline consumer price inflation in the Eurozone fell back to 1.4% y/y in October and core inflation dropped to 0.9%. The European Central Bank's (ECB) monthly bond purchases will fall to 30 billion euros beginning in January, but its purchase program has been extended until at least September 2018. No interest rate increases are expected from the ECB until 2019.

U.K. real GDP grew 1.6% (saar) in Q3 as consumers pushed spending to the fastest pace in a year. On a y/y basis, it was up 1.5% in Q3. However, growth is expected to slow in Q4 as consumer spending softens in the face of inflation that continues to exceed wage gains, high levels of consumer debt, Brexit worries, and political uncertainty. The release of the latest Q3 growth estimate came a day after the Office for Budget Responsibility (OBR), the independent fiscal watchdog, slashed its forecasts of future productivity and GDP growth. It now predicts real GDP growth next year of 1.4% and 1.3% in both 2019 and 2020. Consumer price inflation remained at 3.0% (y/y) in October, besting growth in average weekly earnings by almost a percentage point. The Bank of England raised interest rates by 25 basis points in November, the first increase in more than a decade. However, the prospect of slower economic growth, coupled with expectations that inflation will slow, has most analysts predicting the BoE will hike rates perhaps just once or twice in 2018.

After growing at a blistering pace of 3.7% clip over the four quarters ending in Q2, annualized real GDP growth in Canada appears to have slowed to about half that rate in Q3. Real GDP contracted 0.1% in August after being unchanged in July. Slower export growth and softer consumer spending appears to have been the biggest culprits behind the slowdown, but a further pullback in residential investment also likely occurred as the housing sector continues to come off its previous boil. The Bank of Canada (BoC) left interest rates unchanged at its October meeting after surprising markets with a second, consecutive 25 basis point rate hike in early September that lifted its overnight policy rate to 1.0%. Moreover, the October policy statement was decidedly more cautious than its September counterpart, citing concerns about NAFTA negotiations, weak exports, and the sensitivity of households to higher interest rates given record levels of debt. Most analysts suspect the BoC will delay until spring another hike in rates.

Real GDP in Japan grew 1.4% (saar) in Q3, marking the seventh consecutive quarter of expansion, the longest streak in 16 years. Growth in Q3 was driven by exports that rose at an annualized rate of 6.0%, coupled with a nice add from inventories. Private consumption actually fell in Q3, contracting 1.8% (saar). Also contracting during the quarter were residential construction and government consumption. Business investment grew 1.0% (saar), about half the pace seen during the first half of the year. Despite solid GDP growth and record low unemployment, inflation remains very low. As a result, the Bank of Japan is widely expected to maintain its very accommodative policy stance throughout the coming year.

At its November meeting, the Reserve Bank of Australia (RBA) left its cash rate unchanged at a record low of 1.5% for a 15th consecutive time. While GDP growth has held up reasonably well average hourly earnings are growing at their slowest pace since the 1960s despite near full employment, frustrating RBA policymakers worried about low inflation. Worrisome to many analysts is that home mortgage debt has soared to four times the size of Australia's GDP, much higher than in the U.S. prior to the America's housing crisis. Most analysts think RBA policy is likely to remain on hold well into next year *(see pages 10-11 for individual panelists' forecasts)*

TNMP_LK 1-4_Attachment E.005

Fourth Quarter 2017

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas. Bills 6-Mo	7 Treas Bills 1-Yr	8 Treas. Notes 2-Yr	9 Treas Notes 5-Yr.	10 Treas. Notes 10-Yr	11 Treas. Bond 30-Yr	12 Aaa Corp Bond	13 Baa Corp Bond	14 State & Local Bonds	15 Home Mtg Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons Price Index
Scotiabank Group	1 5 H	4 5 H	na	na	1 3	na	na	1.7	2 1	2.4	2.9	na	na	na	na	na	2.8	1.5	2 0
Chase Wealth Management	1 4	4 5 H	1 6 H	1 4 H	1 3 H	1.5 H	1 6 H	1.7	2 1	2.5	3 0	3 9	4 5	3 5	4 1	89 0	2 5	2 1	2 4
Nomura Securities, Inc	1 4	4 5 H	1 5	na	na	na	na	1 6	2 1	2.5	3 0	4 0	4 5	na	4 0	na	2 7	2.0	3 8
RBC Capital Markets	1.4	na	na	na	na	na	na	1 9 H	2 3 H	2 7 H	3.2	na	na	na	na	na	3 4	2 7	2 1
J P Morgan Chase	1 4	na	1.4	na	na	na	na	1,6	2 0	2.4	2.9	na	na	na	na	na	2.5	2.8	3 9
BNP Paribas Americas	1 4	na	1.4	na	na	na	na	1.6	2 0	2.3 L	na	na	na	na	na	na	3.0	na	3 2
Barclays Capital	1 4	4 5 H	na	na	na	na	na	na	na	na	na	na	na	na	na	na	2 5	2 9	3.7
Georgia State University	1 3	4 3	na	na	1 2	1 4	1 6 H	1.6	2 0	2 4	3.0	3 9	4 6	na	4,1	na	3 5	2 4	2.4
RidgeWorth Investments	1 3	4 3	1 5	1 3	1 2	1 3	1 4	1 7	1 9 L	2.3 L	2.8 L	3.7	4 4	3 4	3 9 L	88 0	2.5	2 0	1 5 L
Goldman Sachs & Co	1 3	na	1 5	na	1 2	na	na	1.6	2 1	2.5	2 9	na	na	na	4 1	na	2 6	2 2	3 0
Swiss Re	1.3	4 4	1.5	1.3	1 2	1.3	1 4	1 6	2 1	2 5	3 0	3 9	4 7 H	na	4.3 H	na	2 7	3 5 H	4 5
AIG	1.2 L	4 3	na	na	1 2	1.3	1.5	1.6	2.1	2.4	4.0 H	na	4 4	na	4.1	na	2.6	1 7	2 8
Wells Capital Management	1.2 L	4 3	1 5	1 2 L	1 3 H	1.4	1 6 H	1 7	2 1	2.4	2 9	3 6	4 3 L	3 8 H	4 0	88 9	2.9	2 4	3 3
GLC Financial Economics	1 2 L	4 3	1 4	1 2 L	1 2	1 3	1,4	1 6	2 0	2.5	3 1	4.0 H	4 6	3 6	4 2	88 1	2 9	1 7	3 0
Regions Financial Corporation	1 2 L	4 3	1.5	1 3	1 2	1 4	1 5	1 7	2 1	2 4	2 9	3.9	4.6	3 7	4 1	89 1	3 0	1 8	1.8
Economist Intelligence Unit	1 2 L	4 3	1 3 L	1 2 L	1 2	1 4	1 5	1 7	2 1	2 4	2 9	na	na	na	3.9 L	na	2 6	na	2 3
BMO Capital Markets	1 2 L	4 3	1 5	na	1 2	1.4	1.5	1 7	2.1	2 4	2 9	na	na	na	3 9 L	89 4	2 9	1.7	3 3
Action Economics	1 2 L	4 3	1 5	1 2 L	1 3 H	1 4	1 5	1 8	2.1	2 4	2.9	3 6 L	4.3 L	3.6	3 9 L	88.3	3.0	2 2	3 8
Cycledata Corp.	1 2 L	4.3	1.4	1.2 L	1.2	1.4	1.6 H	1.7	2 0	2.4	2 8	3 7	4 6	3 4	3 9 L	88.0	2 9	1 9	2 1
Chmura Economics & Analytics	1 2 L	4 3	1.4	1.2 L	1.2	1.4	1.5	1.6	2.0	2.4	2.9	3 9	na	na	4 0	92.2 H	2.5	2.1	2 1
Nat'l Assn of Realtors	1 2 L	4 3	1 4	1 2 L	1 2	1 3	1 5	1.6	2 0	2.4	2 9	3 7	4 4	3.6	4 0	na	2.5	1.9	2 2
Naroff Economic Advisors	1.2 L	4 3	1 3 L	1 3	1 2	1 3	1 5	1 6	2 0	2 4	2 9	4 0	4 6	3.4	4.0	89 2	2 5	2 0	2 2
MacroFin Analytics	1.2 L	4 3	1 4	1 2 L	1 2	1.4	1 4	1 6	2 1	2 4	2 9	3 7	4 3 L	3 6	4.0	89 2	2.7	1 8	2.4
Societe Generale	1.2 L	4.3	na	na	na	na	na	1 6	2 1	2 4	2 9	na	na	na	na	na	2 1 L	2 2	2 9
Wells Fargo	1.2 L	4 3	1.4	1 2 L	1 2	1.3	1 5	1 7	2 1	2 3	2 9	3 6 L	4.3 L	3.5	3.9 L	89 0	2 4	2 2	3 0
Daiwa Capital Markets America	1.2 L	4 3	1.4	1 2 L	1.2	1.3	1 5	1.7	2.1	2.4	2.9	na	na	na	4 0	89 0	2.8	2 5	3 2
RDQ Economics	1.2 L	4 3	1 4	1 2 L	1 1 L	1,3	1 5	1 7	2.1	2.4	2.9	3 7	4.3 L	3 5	4 1	89 1	2.6	2.1	3.5
Amherst Pierpont Securities	1.2 L	4 3	1 4	1 2 L	1 2	1 4	1 5	1.7	2.1	2.4	2 8 L	3.6 L	4.3 L	3.6	4 0	89 1	3 6 H	2 2	3 7
NatWest Markets	1.2 L	4 3	1 4	1 2 L	1 2	1 3	1 5	1 6	1.9 L	2 3 L	2.8 L	3.7	4.3 L	3 4	3.9 L	90 0	2 7	2 5	3.9
DePrince & Associates	1.2 L	4.3	1.5	1.2 L	1 2	1.4	1.5	1 7	2 0	2 4	2 9	3.6 L	4 3 L	3 6	4 0	88 0	2.5	2 1	2 5
Fannie Mae	1.2 L	4.3	na	na	1.2	1 4	1.5	1 6	2 0	2 4	2 8 L	na	na	na	3 9 L	na	2 5	1 7	2 8
Moody's Analytics	1.2 L	4.3	1.4	1.2 L	1.1 L	1 2 L	1.5	1 7	2 1	2 5	3 2	3 9	4 7 H	3.3 L	4.1	na	2 7	0 9 L	3 0
PNC Financial Services Corp.	1.2 L	4.3	1.5	na	1.2	1 3	1 5	1 7	2 1	2 4	3 0	na	4.4	3 6	4.0	87 2	3 1	2 1	1.9
Comerica Bank	1 2 L	4 3	1 4	na	1 2	1 3	1,5	1.6	2.0	2.4	2 8 L	na	na	na	4 0	na	3.1	1.9	2.4
DS Economics	1 2 L	4 3	1 4	1 3	1 1 L	1 3	1 4	1 6	2.1	2.4	2.9	3.8	4 4	3 3 L	4 1	87 3	2 5	1.5	2 8
Loomis, Sayles & Company	1 2 L	4 3	1 4	1 2 L	1 1 L	1 2 L	1 3 L	1.3 L	2 0	2.4	2 8 L	3 8	4 5	3 4	4 0	89 4	2 6	1 5	3 1
The Northern Trust Company	1.2 L	4.3	1.3 L	1 2 L	1 2	1.4	1 5	1 7	2 0	2 4	2 9	3 6 L	4 3 L	3 5	4 0	na	2.7	3 2	3 3
High Frequency Economics	1.2 L	4 3	na	na	1.2	1.4	1.6 H	1.9 H	2 2	2.5	3 0	na	na	na	na	na	2.5	2 7	2.7
Stone Harbor Investment Partners	1 2 L	4 3	1 3 L	1 3	1 1 L	1 2 L	1 4	1 5	2.0	2.3 L	2 9	3 7	4 3 L	na	4 0	87 0 L	2.7	1 9	2 9
Oxford Economics	1.2 L	4.2 L	1 3 L	na	1 1 L	1 2 L	1 3 L	1 4	2 0	2 4	3.0	na	na	na	4.0	88 5	2 8	2 9	4 0
S&P Global	1 2 L	4 4	1 5	na	1 1 L	1 2 L	1 4	1 5	1 9 L	2 3 L	2 9	na	na	na	4.0	87.4	2 8	2 9	5 6 H
Moody's Capital Markets Group	1 2 L	4 3	1 4	1 2 L	1 2	1 4	1 6 H	1 7	2.1	2 4	2 8 L	3.7	4.3 L	3.3 L	4.0	89.1	2 7	2 1	3 6
MUFG Union Bank	1 2 L	4 3	1 4	1 2 L	1 1 L	1 2 L	1 5	1,6	2 0	2 3 L	2 9	3.7	4.4	3 6	3 9 L	88 0	2 8	2 0	3 4
December Consensus	**1.2**	**4.3**	**1.4**	**1.2**	**1.2**	**1.3**	**1.5**	**1.6**	**2.0**	**2.4**	**2.9**	**3.8**	**4.4**	**3.5**	**4.0**	**88.7**	**2.7**	**2.2**	**3.0**
Top 10 Avg	1 4	4 4	1.5	1 3	1.3	1.4	1 6	1.7	2 1	2 5	3.1	3.9	4.6	3.6	4.1	89 6	3 2	2 9	4 1
Bottom 10 Avg	1.2	4 3	1.3	1.2	1 1	1.2	1 4	1.5	2.0	2.3	2 8	3 6	4.3	3.4	3.9	87.7	2.5	1.6	2 0
November Consensus	1 2	4 3	1 4	1 2	1 2	1 3	1 4	1 6	2 0	2.4	3 0	3 8	4.5	3 5	4 0	88 4	2 7	2.0	2.6

Number of Forecasts Changed From A Month Ago:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	A	B	C	D
Down	5	6	9	10	5	6	3	5	5	16	24	16	17	13	19	10	10	10	5
Same	28	27	13	8	11	6	8	9	9	15	9	5	6	6	10	4	12	11	11
Up	10	6	13	8	21	23	24	28	28	11	8	5	4	4	7	11	21	20	26
Diffusion Index	56 %	50 %	56 %	46 %	72 %	74 %	80 %	77 %	77 %	44 %	30 %	29 %	26 %	30 %	33 %	52 %	63 %	62 %	75 %

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First Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas Bills 6-Mo	7 Treas Bills 1-Yr	8 Treas Notes 2-Yr	9 Treas Notes 5-Yr	10 Treas Notes 10-Yr	11 Treas Bond 30-Yr	12 Aaa Corp Bond	13 Baa Corp Bond	14 State & Local Bonds	15 Home Mtg Rate	A Fed's Major Currency $ Index	B Real GDP	C GDP Price Index	D Cons Price Index
Nomura Securities, Inc	17 H	48 H	1.7	na	na	na	na	1.7	2.2	26	3.1	41	46	na	42	na	23	2.0	23
RBC Capital Markets	1.6	na	na	na	na	na	na	2.1 H	25	2.9 H	3.3	na	na	na	na	na	2.1	1.4 L	18
J P Morgan Chase	16	na	17	na	na	na	na	1.8	22	25	29	na	na	na	na	na	20	22	25
BNP Paribas Americas	16	na	15	na	na	na	na	16	20 L	2.3 L	na	na	na	na	na	na	2.0	na	16
Scotiabank Group	15	45	na	na	14	na	na	1.8	2.2	2.5	3.0	na	na	na	na	na	2.3	1.8	1.9
Daiwa Capital Markets America	15	4.7	1.7	15 H	1.5 H	16	18	1.9	2.3	25	29	na	na	na	4.1	89 0	26	20	21
Goldman Sachs & Co	15	na	18 H	na	14	na	na	19	2.4	27	3.1	na	na	na	42	na	23	2.3	28
NatWest Markets	15	46	18 H	15 H	1.5 H	17 H	1.9 H	1.9	2.2	2.4	2.9	3.7 L	4.3 L	3.5	4.1	91 0	2.5	2.1	2.7
Action Economics	15	4.6	1.6	15 H	1.5 H	16	18	19	23	26	31	38	45	37	40 L	88 8	27	19	27
Amherst Pierpont Securities	15	46	17	15 H	15 H	16	18	19	23	2.7	3.1	3.9	4.6	38	4.3	90 3	29	2.4	27
Economist Intelligence Unit	15	45	15	14	14	16	18	19	23	26	3.1	na	na	na	41	na	20	na	22
DePrince & Assoc.	1.4 L	44 L	1.8 H	15 H	15 H	16	18	19	23	26	3.0	40	4.8	3.8	4.2	89.2	2.5	1.8	18
MacroFin Analytics	14 L	46	16	15 H	1.5 H	16	1.7	19	2.4	26	3.1	3.9	46	3.9	42	89 5	19	2.0	19
Regions Financial Corporation	14 L	44 L	16	14	1.4	15	1.7	1.9	2.3	26	31	41	47	38	42	89 3	1.8	19	22
Chase Wealth Management	1.4 L	45	1.6	15 H	1.4	15	16	17	21	25	31	40	45	35	41	88 8	20	20	21
Oxford Economics	1.4 L	45	1.7	na	1.4	15	15	17	22	26	3.1	na	na	na	41	88 5	2.8	1.4 L	14
High Frequency Economics	1.4 L	45	na	na	15 H	16	18	21 H	2.4	27	33	na	na	na	na	na	23	19	19
Naroff Economic Advisors	14 L	45	15	15 H	1.4	15	1.7	19	2.3	27	3.3	43	4.9	37	4.3	88 5	27	2.3	2.4
GLC Financial Economics	14 L	4.5	1.6	14	1.3	1.4	1.5	1.7	22	27	3.2	42	48	38	45 H	88 3	34 H	16	2.4
AIG	1.4 L	45	na	na	1.3	1.5	1.7	18	2.2	26	31	na	45	na	42	na	2.4	16	18
Moody's Analytics	1.4 L	45	16	14	12 L	14	17	20	25 H	29 H	3.7 H	44 H	5.4 H	36	45 H	na	29	2.9	20
Chmura Economics & Analytics	1.4 L	45	1.6	14	1.4	15	1.7	18	23	27	31	42	na	na	42	93 1 H	33	17	21
RidgeWorth Investments	1.4 L	4.5	16	14	13	14	15	19	21	25	2.9	39	46	37	41	90 0	20	20	16
DS Economics	14 L	45	1.4 L	13 L	1.3	15	1.7	1.9	2.3	26	3.1	38	4.5	34	4.2	88 4	1.8	1.7	18
Societe Generale	1.4 L	45	na	na	na	na	na	18	22	26	3.0	na	na	na	na	na	22	2.2	19
Wells Fargo	1.4 L	45	16	14	13	14	16	18	23	25	30	38	45	35	40 L	87 8	22	1.8	21
Cycledata Corp	14 L	45	1.6	14	1.3	15	1.7	1.8	22	25	3.0	40	48	37	42	88 0	25	20	21
RDQ Economics	14 L	45	17	15 H	1.4	16	1.7	18	23	2.8	33	41	4.7	4.0	4.5	88 1	24	22	2.2
Nat'l Assn. of Realtors	1.4 L	45	16	14	1.4	15	16	18	22	26	3.1	3.9	4.6	38	42	na	2.6	2.0	25
MUFG Union Bank	14 L	45	1.6	15 H	1.4	15	1.8	1.8	23	27	32	40	46	39	44	86 0 L	29	18	31
Loomis, Sayles & Company	1.4 L	45	16	14	13	14	16	17	20 L	24	2.9	37 L	4.5	34	40 L	90 1	2.4	18	19
S&P Global	14 L	47	1.8	na	1.2 L	1.3 L	14 L	17	21	25	31	na	na	na	41	88 6	22	14 L	15
Fannie Mae	1.4 L	45	na	na	1.5 H	16	17	18	21	24	28 L	na	na	na	40 L	na	2.0	1.6	18
The Northern Trust Company	14 L	4.5	1.5	14	1.4	1.5	1.7	1.9	2.2	26	3.2	39	46	38	42	na	2.1	18	19
Wells Capital Management	1.4 L	4.5	1.6	14	15 H	17 H	1.9	20	24	27	32	40	4.7	41 H	43	89 0	28	19	23
Georgia State University	14 L	44 L	na	na	1.3	15	16	17	2.0 L	26	33	41	48	na	43	na	23	26	23
PNC Financial Services Corp.	14 L	45	17	na	14	16	16	18	22	26	3.2	na	4.7	3.6	41	87 4	2.4	2.1	2.4
Comerica Bank	14 L	45	16	na	14	15	16	18	22	25	3.0	na	na	na	42	na	2.9	2.1	2.4
BMO Capital Markets	1.4 L	4.5	1.6	na	1.3	15	1.7	19	22	25	29	na	na	na	40 L	90 4	1.9	24	28
Swiss Re	14 L	45	16	15 H	1.4	15	16	18	2.3	27	32	43	51	na	45 H	na	17 L	38 H	38 H
Moody's Capital Markets Group	14 L	45	15	13 L	1.5 H	16	1.7	18	2.2	24	28 L	37 L	43 L	33 L	41	89 6	3.0	19	09 L
Barclays Capital	14 L	45	17	na	na	na	na	1.9	2.1	24	2.9	na	na	na	na	na	2.0	22	23
Stone Harbor Investment Partners	1.4 L	4.5	1.5	15 H	13	1.4	1.5	16 L	22	25	30	39	45	na	4.3	88.0	2.8	17	2.2
December Consensus	**1.4**	**4.5**	**1.6**	**1.4**	**1.4**	**1.5**	**1.7**	**1.8**	**2.2**	**2.6**	**3.1**	**4.0**	**4.6**	**3.7**	**4.2**	**89.0**	**2.4**	**2.0**	**2.2**
Top 10 Avg.	15	46	17	15	15	1.6	1.8	20	24	2.7	3.3	4.2	49	39	44	90 2	30	25	28
Bottom 10 Avg.	1.4	4.5	15	1.4	13	14	15	1.7	21	2.4	2.9	3.8	4.5	3.5	40	87.9	1.9	1.6	1.6
November Consensus	14	4.5	1.6	1.4	13	1.5	16	1.8	22	26	31	4.0	47	37	42	88.8	2.4	19	2.0
Number of Forecasts Changed From A Month Ago																			
Down	2	4	6	6	1	2	3	3	6	12	22	14	17	15	15	8	11	4	6
Same	35	32	19	15	21	14	15	17	16	20	13	9	6	4	13	5	19	17	22
Up	6	3	11	5	15	19	17	23	21	11	7	3	4	3	8	12	13	20	15
Diffusion Index	55 %	49 %	57 %	48 %	69 %	74 %	70 %	73 %	67 %	49 %	32 %	29 %	26 %	23 %	40 %	58 %	52 %	70 %	60 %

TNMP_LK 1-4_Attachment E.007

Second Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas Bills 6-Mo	7 Treas Bills 1-Yr	8 Treas Notes 2-Yr	9 Treas Notes 5-Yr	10 Treas Notes 10-Yr	11 Treas Bond 30-Yr	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg Rate	A Fed's Major Currency $ Index	B. Real GDP	C GDP Price Index	D Cons. Price Index
RBC Capital Markets	1.9 H	na	na	na	na	na	na	2 4 H	2 7	3 0	3 5	na	na	na	na	na	3.0	1.6	2 1
J P Morgan Chase	1 9 H	na	1 9	na	na	na	na	2.0	2.3	2.5	2.9	na	na	na	na	na	2 0	2 1	2 2
BNP Paribas Americas	1 9	na	1.7	na	na	na	na	1 7 L	2 1 L	2 5	na	na	na	na	na	na	4 0	na	1 3
Goldman Sachs & Co	1.8	na	2.1 H	na	1.7	na	na	2 1	2 5	2 8	3.1	na	na	na	4 3	na	2 8	1 8	1 9
Scotiabank Group	1 8	4 8	na	na	1 6	na	na	1.9	2 2	2.6	3.0	na	na	na	na	na	2.0	1 8	2 2
Daiwa Capital Markets America	1 8	4 9 H	2 0	1 8 H	1 7	1 9	2 0	2 1	2 5	2 7	3 1	na	na	na	4 3	89.0	2.6	2 2	2 2
NatWest Markets	1 7	4 8	2 1 H	1 8 H	1 8 H	2 0 H	2.2 H	2.1	2 4	2.6	3.1	3 9	4 5	3 7	4 4	9 2 0	2 7	1 4	0 5 L
Regions Financial Corporation	1.7	4 7	1 9	1 6	1 6	1 7	1 9	2 1	2 4	2 7	3.3	3.4 L	4 9	4 0	4 4	89.6	2.2	2 0	1 9
MacroFin Analytics	1 7	4 8	1 9	1 7	1 7	1 9	2.0	2.2	2.6	2.9	3.4	4 2	4 9	4 2	4.5	9 0 0	2 0	2 2	2.0
Moody's Analytics	1 7	4 8	1 9	1.7	1 5	1 6	2 0	2 3	2 8 H	3 2 H	4 0 H	4.8 H	5 7 H	3 8	4.7	na	3.3	2 6	2 1
Action Economics	1.7	4.8	1 8	1.7	1.8 H	1 8	1 9	2 1	2 4	2 7	3 2	3 9	4.5	3.8	4 2	89 0	2.8	2 7 H	2 2
RDQ Economics	1.7	4.8	2.0	1 8 H	1 6	1.9	2 1	2 2	2 7	3 1	3.6	4.5	5.1	4 3	4.8 H	89 1	2.1	2 2	2 3
Nat'l Assn of Realtors	1 7	4.7	1 9	1 7	1 6	1 7	1 8	2 0	2 4	2 8	3.4	4.3	5.0	4.1	4 4	na	3 0	2 1	2 5
Amherst Pierpont Securities	1.7	4.8	1.9	1.7	1.7	1 9	2 1	2 2	2 6	2 9	3.4	4.1	4.9	4 1	4 5	91 5	3.1	2.3	2.7 H
Societe Generale	1 7	4 8	na	na	na	na	na	2.0	2 2	2 6	3.1	na	na	na	na	na	1.9 L	1 7	0 5 L
DS Economics	1 7	4.8	1.5 L	1.4 L	1.5	1.8	2.0	2 1	2 5	2 8	3 3	3 9	4 7	3.6	4.3	89 3	2 1	1 7	1.3
DePrince & Assoc	1 7	4 7	2 0	1 8	1 7	1 8	2.0	2 2	2.5	2 8	3 1	4 4	5 3	4 2	4.5	89 6	2.6	2 0	2 2
Oxford Economics	1.7	4 8	1.9	na	1 6	1.7	1.8	1 9	2 3	2 6	3 2	na	na	na	4.1	88 5	2 2	1.5	1.5
High Frequency Economics	1 7	4 8	na	na	1 7	1.9	2.1	2.2	2 5	2 8	3 4	na	na	na	na	na	2 8	2 0	2.0
Nomura Securities, Inc	1 7	4 8	1 7	na	na	na	na	1.9	2.3	2.7	3 2	4 2	4 7	na	4.3	na	2 5	1 9	1.1
Chmura Economics & Analytics	1 7	4 8	1 9	1 7	1 6	1 8	1.9	2 0	2 5	2.9	3 4	4 5	na	na	4 5	92 5 H	3.2	1.8	2.1
Economist Intelligence Unit	1 7	4 7	1 7	1 7	1 6	1 8	2 0	2 1	2.5	2 8	3.3	na	na	na	4 3	na	2 8	na	2 2
Chase Wealth Management	1.7	4.8	1.8	1.7	1.6	1.7	1.9	1 9	2 3	2 7	3 3	4 2	4 7	3.8	4.3	88 5	2 2	2.0	2.1
Naroff Economic Advisors	1 7	4 8	1.7	1 8 H	1 8 H	1.9	2 0	2 2	2 5	3 0	3 6	4 5	5 2	4.0	4.5	86.3	3 2	2 6	2 7
Barclays	1 6	4 8	1 8	na	na	na	na	2 0	2 2	2 5	2 9	na	na	na	na	na	2.0	1.8	1.6
Stone Harbor Investment Partners	1 6	4 8	1.8	1.6	1.5	1.6	1.7	1 8	2 3	2 7	3 2	4 1	4.7	na	4 5	86 0	2.5	2.2	2.3
Cycledata Corp	1 6	4.7	1.8	1.6	1.5	1.7	1.8	2.0	2 4	2 8	3 3	4 3	5.1	4.0	4.5	88 0	2.5	2.1	2.2
MUFG Union Bank	1 6	4 8	1 9	1 7	1 6	1.7	2.1	2.0	2 4	2 8	3 4	4 2	4 8	4 0	4 5	85.0 L	3.0	2.5	2 6
Swiss Re	1 5	4 6	1 8	1 6	1 5	1.6	1 7	1 9	2 4	2 8	3 5	4.5	5.3	na	4 7	na	2 0	-0.3 L	0 7
AIG	1.5	4.6	na	na	1 4	1.7	1 9	2 1	2 5	2 7	3 3	na	4.7	na	4 3	na	2.1	1.8	1.3
RidgeWorth Investments	1 5	4 6	1.7	1 5	1.4	1.5	1 6	2 0	2 1 L	2.5	3.1	3.9	4.6	3.8	4 2	91 0	2 4	2 1	1.8
S&P Global	1.5	4.9	2 0	na	1 4	1 5	1 7	1 8	2 1 L	2.5	3 1	na	na	na	4 2	90.1	2.3	1.7	1 2
BMO Capital Markets	1 5	4 6	1 8	na	1 4	1.6	1 9	2.1	2.3	2.5	3.0	na	na	na	4 1	90 9	2.2	2 0	2 1
Wells Capital Management	1.5	4.6	1 7	1 6	1 7	1 8	2 1	2 1	2.7	3.2 H	3 9	4.7	5.4	4.9 H	4 8	89 4	2.4	2.0	2.2
The Northern Trust Company	1.4 L	4 6	1 7	1 4 L	1 5	1 6	1 7	2 0	2.4	2 9	3.6	4.3	5.1	4 2	4 5	na	2 1	1.8	1 9
Fannie Mae	1.4 L	4.5	na	na	1.7	1.7	1.8	1 8	2.2	2.4 L	2 8 L	na	na	na	4 0 L	na	2 1	1 8	1 3
Loomis, Sayles & Company	1 4 L	4 5	1 7	1 4 L	1 4	1 5	1 7	1 9	2 1 L	2 4 L	3 0	3 8	4.5	3.4	4.0 L	90.1	2.2	1 7	1 9
Comerica Bank	1 4 L	4 5	1 7	na	1.3 L	1 5	1.6	1.8	2 2	2.7	3 1	na	na	na	4 3	na	2 9	2 0	2 0
PNC Financial Services Corp	1 4 L	4 5	1 8	na	1 5	1 7	1.7	1 9	2 2	2.7	3 3	na	4 7	3 6	4 2	87.7	2 6	2 1	2 1
Moody's Capital Markets Group	1.4 L	4 5	1 7	1 4 L	1.5	1 6	1 8	1.9	2 2	2 5	2 8	3 6	4 4 L	3 3 L	4 1	89.8	4 4 H	1 8	1.3
GLC Financial Economics	1 4 L	4.5	1 6	1 4 L	1.3 L	1.4 L	1.5 L	1.7 L	2.2	2 8	3 3	4 4	5 1	4 0	4 7	88 0	3 0	2 2	2 4
Wells Fargo	1.4 L	4 5	1 7	1 5	1 4	1 5	1 7	1 9	2 4	2.6	3.1	3.9	4.6	3 6	4 1	86 5	2 6	1 8	2 1
Georgia State University	1 4 L	4.4 L	na	na	1 4	1 6	1 8	1 9	2 2	2.8	3.5	4 4	5 1	na	4 5	na	2.0	2.6	2 2
December Consensus	**1.6**	**4.7**	**1.8**	**1.6**	**1.6**	**1.7**	**1.9**	**2.0**	**2.4**	**2.7**	**3.3**	**4.2**	**4.9**	**3.9**	**4.4**	**89.1**	**2.6**	**1.9**	**1.9**
Top 10 Avg	1 8	4 8	2 0	1 7	1 7	1.9	2.1	2.2	2.6	3.0	3 6	4 5	5.2	4 2	4 6	90.8	3.3	2.4	2 4
Bottom 10 Avg.	1.4	4.5	1.6	1 5	1.4	1.5	1 7	1.8	2 2	2 5	3 0	3 9	4.6	3.6	4.1	87.4	2 0	1.5	1.1
November Consensus	1 6	4 7	1 8	1 6	1.5	1 7	1 8	1 9	2 3	2 7	3 3	4 2	4.9	3.9	4.4	89.0	2.5	2 0	2 0

Number of Forecasts Changed From A Month Ago.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	A	B	C	D
Down	3	3	6	7	4	3	4	3	4	7	18	10	12	11	15	9	10	11	18
Same	35	33	21	15	22	18	17	20	20	26	17	9	9	7	14	6	16	20	19
Up	5	3	9	4	11	14	14	20	19	10	7	7	5	4	7	10	17	10	6
Diffusion Index	52 %	50 %	54 %	44 %	59 %	66 %	64 %	70 %	67 %	53 %	37 %	44 %	37 %	34 %	39 %	52 %	58 %	49 %	36 %

TNMP_LK 1-4_Attachment E.008

Third Quarter 2018
Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas. Bills 6-Mo	7 Treas Bills 1-Yr.	8 Treas Notes 2-Yr	9 Treas Notes 5-Yr	10 Treas Notes 10-Yr	11 Treas Bond 30-Yr.	12 Aaa Corp Bond	13 Baa Corp Bond	14 State & Local Bonds	15 Home Mtg Rate	A Fed's Major Currency $ Index	B Real GDP	C GDP Price Index	D Cons Price Index
J P Morgan Chase	2.1 H	na	2.2	na	na	na	na	22	24	26	2.9	na	na	na	na	na	18	2.1	2.2
RBC Capital Markets	21 H	na	na	na	na	na	na	2.6 H	2.9	32	36	na	na	na	na	na	28	24	22
BNP Paribas Americas	2.1 H	na	1.8	na	na	na	na	18 L	22 L	26	na	na	na	na	na	na	33	na	2.4
Goldman Sachs	20	na	23	na	19	na	na	24	27	2.9	32	na	na	na	4.4	na	2.3	19	20
Daiwa Capital Markets America	20	52 H	22	20	2.0	2.1	23	2.3	27	29	32	na	na	na	4.5	90.0	24	23	23
NatWest Markets	20	51	2.5 H	2.0	2.1 H	2.3 H	25 H	2.4	25	27	3.3	40	46	38	45	93.0 H	28	20	18
Moody's Analytics	20	5.1	21	20	18	19	23	26 H	3.1 H	3.4 H	42 H	5.0 H	5.9 H	40	49	na	2.5	28	26
Action Economics	20	51	21	20	20	20	21	22	25	2.8	3.2	4.0	4.7	39	43	88 9	2.7	24	24
MacroFin Analytics	19	51	2.1	20	1.9	21	22	24	29	31	3.6	4.4	5.1	4.4 H	4.7	90 5	22	22	2.3
Amherst Pierpont Securities	19	51	22	20	20	2.1	2.3	24	28	32	37	43	51	44 H	4.8	92 5	30	24	29
Regions Financial Corporation	19	49	2.0	19	18	19	21	22	26	2.9	3.5	4.5	52	42	46	89 4	2.5	2.1	21
High Frequency Economics	1.9	50	na	na	20	21	23	23	26	2.9	3.5	na	na	na	na	na	24	26	26
Chmura Economics & Analytics	19	50	22	1.9	1.8	2.0	2.1	22	27	31	37	47	na	na	4.7	916	33 H	19	1.9
Nomura Securities, Inc	19	5.0	20	na	na	na	na	1.9	23	28	33	43	48	na	4.5	na	2.2	21	23
DePrince & Associates	1.9	4.9	2.2	2.0	19	20	22	24	27	3.0	3.3	47	5.7	44 H	47	90 0	2.7	20	22
Nat'l Assn of Realtors	1.9	49	2.1	1.9	1.7	1.8	20	22	26	3.1	35	4.4	5.1	42	45	na	26	2.1	2.4
RDQ Economics	19	50	23	20	20	2.3 H	2.4	2.5	2.9	3.3	3.7	47	54	44 H	50	90.0	2.0	23	2.4
DS Economics	19	50	15 L	14 L	17	2.1	2.2	2.3	26	2.9	35	41	49	38	4.5	88 8	20	20	18
Oxford Economics	1.9	5.0	2.1	na	19	19	20	21	2.4	2.7	3.3	na	na	na	42	88 5	2.1	1.4 L	1.6
Naroff Economic Advisors	1.9	5.0	19	21 H	20	21	22	2.5	28	3.1	36	47	53	43	49	85.0	2.1	24	26
Societe Generale	1.9	5.0	na	na	na	na	na	22	24	28	3.2	na	na	na	na	na	2.0	1.9	1.3
MUFG Union Bank	1.9	5.0	2.1	1.9	19	20	23	22	2.6	30	3.6	43	51	41	46	85 0	3.1	21	2.7
Scotiabank Group	18	48	na	na	17	na	na	2.0	23	2.7	31	na	na	na	na	na	2.0	18	2.2
Swiss Re	18	49	20	18	18	19	2.0	2.2	2.6	3.0	37	46	56	na	48	na	1.9	15	25
Wells Capital Management	17	48	20	18	19	2.1	23	24	27	29	34	42	50	42	45	89.7	2.3	18	19
BMO Capital Markets	1.7	4.8	20	na	1.7	1.8	2.1	2.3	25	2.7	31	na	na	na	4.2	90 3	21	21	2.2
Wells Fargo	1.7	4.7	19	17	15 L	16 L	18	20	24	26	32	39	47	37	41 L	85.0	2.6	1.8	2.3
Economist Intelligence Unit	1.7	4.7	1.8	1.7	17	18	21	22	25	29	3.4	na	na	na	4.3	na	22	na	2.3
The Northern Trust Company	1.7	48	17	17	17	18	1.9	2.2	2.6	3.0	38	45	54	43	46	na	2.1	18	19
Georgia State University	1.7	4.7	na	na	16	18	21	22	2.4	30	3.6	45	53	na	47	na	2.2	2.2	20
Chase Wealth Management	17	4.8	19	17	1.6	18	19	20	24	2.7	33	42	48	3.8	4.3	88.2	22	22	22
AIG	17	47	na	na	1.5 L	1.9	2.1	2.3	26	2.9	35	na	49	na	4.4	na	2.0	17	19
RidgeWorth Investments	1.7	4.8	19	17	16	17	18	21	23	27	33	41	48	41	44	92.0	2.4	2.2	2.0
PNC Financial Services Corp	17	48	20	na	17	18	1.9	20	2.3	2.8	34	na	48	36	43	87 7	23	2.1	2.3
S&P Global	16 L	50	21	na	16	1.7	1.8	2.0	23	26	32	na	na	na	42	90.3	25	15	11 L
Fannie Mae	16 L	48	na	na	18	18	18	19	22 L	24 L	28 L	na	na	na	4.1 L	na	20	21	1.9
Loomis, Sayles & Company	16 L	47	19	16	1.6	1.7	1.9	2.0	2.3	2.5	30	39	46	35	4.1 L	90.1	22	20	2.0
Comerica Bank	16 L	47	19	na	15 L	1.6	1.8	2.0	2.5	2.9	34	na	na	na	46	na	2.6	2.0	20
Moody's Capital Markets Group	16 L	48	19	16	17	1.8	1.9	19	23	25	28 L	37 L	44 L	32 L	4.2	90.0	00 L	18	19
Barclays	16 L	48	19	na	na	na	na	2.1	2.3	2.5	29	na	na	na	na	na	20	2.0	19
GLC Financial Economics	1.6 L	46 L	19	17	16	1.6 L	17 L	19	25	32	37	50	57	44	53 H	88.2	2.4	3.1 H	33 H
Stone Harbor Investment Partners	16 L	48	17	17	16	1.7	17	1.8 L	2.4	2.7	3.2	41	47	na	45	84.0 L	2.4	2.1	20
Cycledata Corp.	1.6 L	4.7	1.8	1.6	1.5 L	1.7		20	24	28	3.3	4.3	5.1	4.0	4.5	88 0	24	22	2.3
December Consensus	**1.8**	**4.9**	**2.0**	**1.8**	**1.7**	**1.9**	**2.0**	**2.2**	**2.5**	**2.8**	**3.4**	**4.3**	**5.1**	**4.0**	**4.5**	**89.1**	**2.3**	**2.1**	**2.2**
Top 10 Avg	2.0	5.1	2.2	2.0	2.0	21	2.3	24	28	3.2	37	47	5.5	4.3	4.9	91.0	29	25	2.6
Bottom 10 Avg	1.6	47	18	16	15	1.7	1.8	1.9	2.3	2.6	3.0	4.0	4.7	3.7	4.2	86.8	1.8	1.7	1.7
November Consensus	18	49	20	18	17	19	20	21	25	28	34	44	5.1	41	45	89 0	24	2.1	2.2
Number of Forecasts Changed From A Month Ago.																			
Down	3	2	6	6	4	6	7	5	8	10	16	13	15	12	15	5	9	8	11
Same	33	33	22	15	19	16	13	20	20	23	20	9	7	6	15	10	22	22	25
Up	7	4	8	4	14	13	15	18	15	10	6	3	4	4	6	11	12	11	7
Diffusion Index	55 %	53 %	53 %	46 %	64 %	60 %	61 %	65 %	58 %	50 %	38 %	30 %	29 %	32 %	38 %	62 %	53 %	54 %	45 %

TNMP_LK 1-4_Attachment E.009

Fourth Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas Bills 6-Mo	7 Treas Bills 1-Yr	8 Treas Notes 2-Yr	9 Treas. Notes 5-Yr	10 Treas Notes 10-Yr	11 Treas Bond 30-Yr	12 Aaa Corp Bond	13 Baa Corp Bond	14 State & Local Bonds	15 Home Mtg Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons Price Index
Moody's Analytics	2.5 H	5 6 H	2 6	2.4 H	2 2	2 3	2 7	2 9 H	3 4 H	3 7 H	4.4 H	5 3 H	6 2 H	4 2	5 2	na	2 4	3.2 H	2 8
RBC Capital Markets	2.4	na	na	na	na	na	na	2 7	3 0	3 4	3 8	na	na	na	na	na	2 7	1 9	1.8
J P Morgan Chase	2.4	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1 8	2 1	2 2
Goldman Sachs & Co	2 3	na	2 6	na	2.2	na	na	2 6	2 8	3 0	3 3	na	na	na	4 6	na	2.0	1 7	1 8
NatWest Markets	2 2	5 3	2 7 H	2 3	2.3	2.5	2.7	2 5	2 7	2 8	3 4	4 1	4.8	4.0	4 6	91 0	2 8	2.1	2 2
MacroFin Analytics	2 2	5 3	2 4	2 2	2.2	2 4	2 5	2 7	3 1	3 4	3 9	4 7	5.4	4.7 H	5.0	91 0	2.0	2.2	2 3
Naroff Economic Advisors	2 2	5 3	2 3	2 3	2.3	2 5	2 6	2 7	3 0	3 3	3 8	4 9	5.5	4.6	5 1	84 1	1 1 L	2.1	2 4
RDQ Economics	2 2	5 3	2 7 H	2 3	2.4	2.6	2.7	2 7	3 1	3 5	3 8	4.9	5.7	4.6	5 2	91 2	1.9	2.3	2 4
Amherst Pierpont Securities	2 2	5 3	2.4	2 2	2.2	2 4	2 5	2 6	3 1	3 4	3 9	4.7	5.5	4 7 H	5 1	93 0	2 9	2 4	3 0
High Frequency Economics	2 2	5 3	na	na	2 2	2 4	2 6	2 4	2 7	3 0	3 5	na	na	na	na	na	2 4	2.6	2 6
Regions Financial Corporation	2 2	5.2	2.2	2 0	2.0	2 1	2 2	2 4	2.8	3.1	3.7	4.6	5.4	4 3	4 7	89.2	2 2	2 0	2 2
Chmura Economics & Analytics	2.2	5.3	2 4	2 2	2 1	2 2	2 4	2 5	2 9	3 3	3 9	4 8	na	na	4 8	90.6	3 4 H	2 1	2.2
DS Economics	2 2	5.2	1 7 L	1 5 L	2 0	2 2	2 2	2 3	2.6	3.0	3.5	4 1	4 9	3 8	4 5	88.7	2 1	2.0	1.9
Daiwa Capital Markets America	2 2	5.3	2 3	2 1	2 1	2 2	2 4	2 5	2.8	3 0	3 3	na	na	na	4.7	90.0	2 4	2 3	2 3
Action Economics	2 1	5.3	2 3	2 1	2 2	2.2	2.3	2 4	2 6	2 9	3 3	4 1	4.8	3 9	4.4	89 0	2 4	2.4	2.4
BNP Paribas Americas	2 1	na	1 8	na	na	na	na	1 9 L	2 3 L	2 7	na	na	na	na	na	na	2 6	na	2 7
DePrince & Assoc.	2 1	5 1	2 4	2 2	2 1	2 2	2.4	2.6	2 9	3.2	3 4	5 0	6.0	4.7 H	4 9	90.3	2 6	2.2	2.4
MUFG Union Bank	2 1	5 3	2 4	2 2	2.2	2.3	2 6	2 5	2 8	3 2	3 7	4 4	5 2	4 2	4 8	84.0	3 3	2.1	2 8
Scotiabank Group	2 0	5.0	na	na	2 0	na	na	2.1	2 3 L	2 7	3.1	na	na	na	na	na	1 8	1 8	2.2
Nat'l Assn of Realtors	2.0	5.0	2 2	2 0	1 9	2 0	2.2	2.4	2 8	3.2	3.7	4 7	5 3	4 3	4.6	na	2 6	2 1	2 3
Swiss Re	2 0	5.1	2 3	2 1	2 0	2 1	2 2	2 4	2.8	3.1	3.9	4 8	5 8	na	5.0	na	2 0	2 1	3.1 H
Wells Capital Management	2.0	5.1	2 2	2 1	2 2	2.4	2 5	2.6	2 8	3.0	3 3	4 2	5 0	4 1	4.5	89.9	2 2	2 1	2 2
Economist Intelligence Unit	2.0	5.0	2.0	2 0	1 9	2 0	2.2	2 3	2 7	3.0	3.5	na	na	na	4 5	na	2 1	na	2.2
BMO Capital Markets	2.0	5 1	2.2	na	1 9	2 0	2.3	2.5	2 7	2.8	3 2	na	na	na	4.4	89.6	1 9	2 1	2 3
The Northern Trust Company	1.9	5 1	1 9	1 9	2 0	2 1	2 2	2 5	2 9	3.3	4 0	4 9	5 8	4.6	4.9	na	2.1	1 9	2.0
PNC Financial Services Corp.	1.9	5.1	2 2	na	1 9	2.1	2 1	2.2	2.5	2 9	3.5	na	5 0	3 7	4 5	87.6	2.4	2 1	2 4
Nomura Securities, Inc.	1.9	5 0	2 1	na	na	na	na	2 0	2.5	2.8	3 3	4 3	4 8	na	4 5	na	2 2	2 0	2.7
Wells Fargo	1.9	5 0	2 0	1.9	1 7	1 8	2.0	2.1	2 5	2 7	3 3	4 0	4 8	3.8	4 2	83 5	2 6	1 3 L	1.4 L
Chase Wealth Management	1 9	5 0	2 1	1 9	1 8	2 0	2.1	2.2	2.6	3.0	3 5	4 4	5 0	4.0	4 5	88.0	2 0	2 1	2.1
Oxford Economics	1 9	5 0	2 2	2 3	2 5 H	2.7 H	3.3 H	na	na	na	na	na	na	na	4.3	88.6	2 2	1 8	2.0
Barclays Capital	1.9	5 0	2 2	na	na	na	na	2 1	2 3 L	2.5 L	2 9	na	na	na	na	na	2 0	2 1	2 1
Georgia State University	1 9	4 9	na	na	1 8	2 0	2.2	2.3	2 6	3 2	3 8	4 7	5.7	na	5.1	na	2 4	2 0	1 9
Stone Harbor Investment Partners	1 9	5 0	2 0	2 0	1 8	1 8	1.9	2.0	2 5	2 8	3 3	4 2	4.8	na	4.6	830 L	2 2	2.3	2.3
Societe Generale	1.8	5 0	na	na	na	na	na	2.3	2 5	2 7	3 1	na	na	na	na	na	1 8	2 0	2 0
AIG	1 7	4 8	na	na	1.6	2.0	2 3	2.5	2.8	3 0	3 6	na	5 0	na	4.5	na	2 1	1 8	1.9
RidgeWorth Investments	1.7	4 8	1 9	1 7	1 6	1 8	1 8	2.2	2 4	2.8	3 4	4 2	4 9	4 2	4.4	93.0 H	2 5	2 2	2 4
S&P Global	1.7	5 0	2 1	na	1 7	1 8	1.9	2.1	2.4	2.7	3 3	na	na	na	4.3	90.6	2 4	1 9	1.9
Fannie Mae	1 7	4 8	na	na	1 8	1 8	1 8	1.9 L	2 3 L	2 5 L	2 9	na	na	na	4.1 L	na	1 8	2 0	1.9
Loomis, Sayles & Company	1 7	4 8	2 0	1 7	1 6	1.8	2 0	2.2	2.3 L	2 6	3 0	4 0	4 7	3 6	4.2	90 1	2 1	2 0	2.0
Comerica Bank	1.7	4 8	1.9	na	1.6	1 7	1 8	2 1	2.5	2 9	3 4	na	na	na	4 7	na	2 7	2 0	2 0
Moody's Capital Markets Group	1.7	4.8	1.9	1 7	1.8	1 9	1 9	1 9 L	2.3 L	2 5 L	2.8 L	3.7 L	4.4 L	3 2 L	4 2	89 7	2 1	1 8	1 4 L
GLC Financial Economics	1 7	4 7 L	1.9	1.7	1.6	1.7 L	1 7 L	1 9 L	2 6	3 3	3 8	5.1	5.9	4 5	5 5 H	88 5	3.0	2 7	3 0
Cycledata Corp	1 6 L	4.7 L	1.8	1.6	1.5 L	1.7 L	1 8	2 0	2 4	2 8	3 3	4.3	5.1	4.0	4 5	88 0	2 4	2.2	2.3
December Consensus	**2.0**	**5.1**	**2.2**	**2.0**	**2.0**	**2.1**	**2.3**	**2.3**	**2.7**	**3.0**	**3.5**	**4.5**	**5.2**	**4.2**	**4.6**	**88.9**	**2.3**	**2.1**	**2.2**
Top 10 Avg	2.3	5.3	2 5	2 3	2 3	2 4	2 7	2.7	3.0	3.4	3.9	4.9	5 7	4 5	5.1	91.1	2 9	2 5	2 8
Bottom 10 Avg	1 7	4 8	1.9	1.8	1.6	1.8	1.9	2.0	2 3	2 6	3 1	4 1	4.8	3.8	4.3	86.4	1 8	1 8	1.8
November Consensus	2 0	5.1	2 2	2 0	1 9	2.1	2 2	2 3	2.7	3.0	3.5	4 5	5.3	4.2	4 7	88 9	2 3	2 1	2 3
Number of Forecasts Changed From A Month Ago:																			
Down	3	3	5	7	6	7	5	6	8	9	15	11	14	9	15	7	10	9	10
Same	35	33	21	14	18	16	17	19	21	23	16	6	7	8	14	10	23	22	25
Up	5	3	8	5	13	12	13	14	10	7	7	8	5	5	7	9	10	10	8
Diffusion Index	52 %	50 %	54 %	46 %	59 %	57 %	61 %	60 %	53 %	47 %	39 %	44 %	33 %	41 %	39 %	54 %	50 %	51 %	48 %

First Quarter 2019
Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo	4 Com. Paper 1-Mo	5 Treas Bills 3-Mo	6 Treas Bills 6-Mo	7 Treas. Bills 1-Yr	8 Treas. Notes 2-Yr	9 Treas. Notes 5-Yr	10 Treas. Notes 10-Yr	11 Treas. Bond 30-Yr	12 Aaa Corp Bond	13 Baa Corp Bond	14 State & Local Bonds	15 Home Mtg Rate	A. Fed's Major Currency $ Index	B Real GDP	C GDP Price Index	D Cons Price Index
Moody's Analytics	3 0 H	6 1 H	3.1 H	2 9 H	2.6	2 8	3 1 H	3 3 H	3.7 H	4.0 H	4.7 H	5.5 H	6.5 H	4.4	5.4	na	2.3	3.4	2 9
MacroFin Analytics	2.6	5.8	2 8	2.7	2 7 H	2 8 H	2 9	3 1	3 6	3 8	4 3	5 1	5 8	5.1 H	5 4	91 5	2.0	2.2	2.2
J P Morgan Chase	2.6	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1 8	2 2	2 3
Goldman Sachs & Co	2 5	na	2 8	na	2 4	na	na	2 8	3 0	3 1	3.4	na	na	na	4.7	na	1.5	1.8	1.9
NatWest Markets	2 5	5.6	2.9	2.5	2.6	2.8	3.0	2.7	2 9	3 0	3 5	4 3	5 0	4 0	4.8	89.0	2.5	2 2	2 0
Naroff Economic Advisors	2 5	5 5	2 6	2 6	2 6	2 8	3.0	3.0	3 3	3 6	4.1	5.1	5 8	4.8	5 3	83 0	0.5 L	2.0	1 9
Amherst Pierpont Securities	2.4	5.6	2.6	2.5	2.4	2 6	2.8	2 9	3 3	3 6	4.1	4 9	5 8	4 9	5.3	93 5	2.5	2.4	3.2
Chmura Economics & Analytics	2 4	5 5	2.7	2 5	2 3	2 5	2.6	2.7	3.1	3 4	4.1	4.9	na	na	5 0	89 6	3.4 H	2 1	2 3
DS Economics	2 3	5.4	1 7 L	1.5 L	2 1	2.5	2 7	2.8	3 0	3 2	3 8	4 3	5 2	3 9	4.7	88.6	1 8	2 5	2 4
DePrince & Assoc.	2.3	5 3	2.6	2.4	2.3	2.4	2.6	2.8	3 1	3 4	3.6	5 3	6 2	4.9	5.2	90.7	2 7	2 2	2.4
Regions Financial Corporation	2 3	5 3	2 3	2 2	2 1	2 3	2 4	2.5	2 9	3 2	3 8	4.8	5.5	4 4	4 9	88 9	2.0	1 8	2 1
Daiwa Capital Markets America	2.3	5.4	2.5	2 3	2 2	2.4	2 5	2.7	3.0	3 1	3 4	na	na	na	4.8	90.0	2 1	2 4	2 3
MUFG Union Bank	2 3	5 5	2 6	2 4	2 4	2 5	2 9	2 7	2 9	3 3	3.9	3.5 L	5.3	4.2	4 9	83 0	2.9	2.3	3 0
Swiss Re	2.3	5.4	2.5	2.3	2.2	2.4	2 5	2 6	3.0	3 3	4.1	4 9	5 9	na	5 2	na	2 3	3 5 H	3.5 H
Wells Capital Management	2.2	5 3	2 5	2.4	2.5	2.6	2.7	2.8	3.0	3.1	3.3	4.2	5 1	4 0	4 6	90 0	2.4	2.0	2 3
Action Economics	2 2	5 3	2 5	2 2	2 3	2.3	2.5	2.6	2 7	2 9	3 4	4 2	4 8	3 9	4.5	89.2	2.3	2 0	2 4
BMO Capital Markets	2 2	5 3	2 5	na	2 1	2.2	2.5	2.7	2 9	3.0	3.4	na	na	na	4 6	89.0	1.9	2 2	2 4
Nat'l Assn of Realtors	2.2	5.2	2.4	2.2	2.1	2 2	2.3	2 5	2 9	3 3	3 8	4 8	5 4	4 4	4.7	na	2 6	2 1	2.3
Economist Intelligence Unit	2 2	5 3	2 3	2 2	2 1	2 2	2.4	2.6	2.9	3.2	3.7	na	na	na	4 7	na	2.1	na	2 3
The Northern Trust Company	2 2	5.3	2 2	2.2	2.1	2 2	2.4	2 6	3 0	3 4	4 2	5 0	5 9	4 7	5 0	na	1 9	2 0	2 2
PNC Financial Services Corp.	2 2	5 3	2 4	na	2 1	2 3	2 3	2.4	2.6	3.0	3 6	na	5 1	3 7	4 6	87 5	2.2	2.1	2.4
Barclays	2 1	5 3	na	na	na	na	na	na	na	na	na	na	na	na	na	na	2.0	2 2	2 3
Oxford Economics	2.1	5.2	2.4	na	2.1	2 2	2 2	2 4	2.6	2 8	3 4	na	na	na	4.4	88 6	1 7	1 7 L	1.8 L
Societe Generale	2.0	5.3	na	na	na	na	na	2.1	2 3 L	2 6	3.0	na	na	na	na	na	1 7	1 9	1.8 L
Scotiabank Group	2 0	5 0	na	na	2 1	na	na	2 2	2.4	2 8	3.1	na	na	na	na	na	1 6	2 0	2.2
Georgia State University	2.0	5.0	na	na	1.9	2.1	2 3	2.4	2.7	3 3	3 8	4 8	5 9	na	5 2	na	2.3	2.2	2.2
Stone Harbor Investment Partners	2.0	5.1	2.2	2.1	1.9	2.0	2 0	2 1	2 6	2 9	3 3	4 3	4 9	na	4.7	82.0 L	2 7	2 3	2.4
S&P Global	2.0	5.1	2.3	na	1.9	2.1	2.1	2.3	2.5	2.7	3.3	na	na	na	4.3	90.4	1.6	1.9	1.9
Chase Wealth Management	1.9	5 0	2.1	1 9	1 8	2 0	2 1	2 2	2.6	3.0	3.5	4 4	5.0	4.0	4 6	88.0	1 8	2 2	2.0
Nomura Securities, Inc	1 9	5 0	2 1	na	na	na	na	2.0	2.6	2 9	3 3	4.3	4 9	na	4.6	na	2.0	2.0	2 2
AIG	1 9	5 0	na	na	1 8	2 2	2.5	2.7	2 9	3.1	3 7	na	5 1	na	4 6	na	2.1	2.0	2.4
Loomis, Sayles & Company	1.9	5.0	2.2	1.9	1.8	2.0	2.2	2.3	2.5	2.8	3 0	4 1	4.9	3 8	4.4	90.1	1.9	2 5	2 0
Wells Fargo	1 9	5.0	2 1	2 0	1.8	1.9	2.1	2.2	2.6	2 8	3 5	4 1	4 9	3 9	4 2	82.0 L	2.4	2.0	2 2
RidgeWorth Investments	1.9	5.0	2.1	1.9	1.8	1.9	2.0	2 3	2 6	3 0	3 6	4 4	5.1	4.4	4.6	94.0 H	2.0	2 2	2 4
Comerica Bank	1 9	5 0	2 1	na	1.8	1.9	2 0	2.3	2 7	3.2	3.6	na	na	na	4 9	na	2.6	1 9	2 0
Fannie Mae	1 9	5 0	na	na	1 8	1 8	1.8 L	2.0	2 3 L	2 5	2.9	na	na	na	4 2	na	1.7	2.4	2.4
Moody's Capital Markets Group	1.9	5.0	2.2	1.9	1.9	2.0	1 9	1 9 L	2 3 L	2 4 L	2 7 L	3 6	4 4 L	3 1 L	4 1 L	89 2	1.4	1.9	1.8 L
GLC Financial Economics	1.8	4.8	2 0	1 8	1 7	1 8	1 9	2 1	2.7	3.4	3 9	5.1	5 9	4.7	5 6 H	88 8	2 2	1.9	2.6
Cycledata Corp	1 6 L	4.7 L	1 8	1 6	1 5 L	1 7 L	1 8 L	2.0	2.4	2.8	3.3	4.3	5.1	4.0	4 5	88 0	2.4	2.2	2.3
December Consensus	**2.2**	**5.2**	**2.4**	**2.2**	**2.1**	**2.2**	**2.4**	**2.5**	**2.8**	**3.1**	**3.6**	**4.6**	**5.3**	**4.3**	**4.8**	**88.5**	**2.1**	**2.2**	**2.3**
Top 10 Avg	2 5	5 6	2 7	2 5	2 5	2 6	2 8	2.9	3.2	3.5	4.1	5.1	5.9	4.7	5.2	90 9	2 7	2 6	2.7
Bottom 10 Avg	1.9	4 9	2.0	1 9	1.8	1.9	2.0	2.1	2.4	2.7	3.1	4.1	4.9	3.8	4.4	85 9	1 5	1.9	1.9
November Consensus	2.1	5.2	2.4	2.2	2.1	2.2	2.4	2.5	2.8	3.1	3 6	4 6	5.4	4 3	4 8	88 4	2.1	2.2	2 3
Number of Forecasts Changed From A Month Ago																			
Down	3	3	6	7	4	3	2	5	6	7	13	9	10	8	11	4	7	8	7
Same	34	31	21	14	19	19	20	20	22	24	18	11	10	8	14	9	26	23	27
Up	3	4	5	4	12	11	11	13	10	7	7	5	6	5	10	11	7	8	6
Diffusion Index	50 %	51 %	48 %	44 %	61 %	62 %	64 %	61 %	55 %	50 %	42 %	42 %	42 %	43 %	49 %	65 %	50 %	50 %	49 %

International Interest Rate And Foreign Exchange Rate Forecasts

United States

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			Fed's Major Currency $ Index		
	In 3 Mo	In 6 Mo.	In 12 Mo	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo
Barclays	na	na	na	2 40	2.45	na	na	na	na
BMO Capital Markets	1.60	1 75	2.20	2 45	2.50	2.80	90 4	91.0	89 6
IHSMarkit	na	na	na	na	na	na	na	na	na
ING Financial Markets	1 60	1 90	2 10	2.70	2 80	2 90	na	na	na
Mizuho Research Institute	1.80	2.10	2 10	2.40	2 50	2 50	89.0	90 0	88 0
Moody's Analytics	na	na	na	2 86	3 15	3.74	na	na	na
Moody's Capital Markets	na	na	na	2 40	2 45	2.35	89 5	89 7	89.7
Nomura Securities	na	na	na	na	na	na	na	na	na
Oxford Economics	na	na	na	2 58	2.63	2 75	88 5	88.5	88 6
Scotiabank	na	na	na	2.50	2 60	2 70	na	na	na
Wells Fargo	1 65	1 90	2 15	2 57	2 66	2 78	na	na	na
December Consensus	1.66	1.91	2.14	2.54	2.64	2.82	89.4	89.8	89.0
High	1.80	2 10	2 20	2.86	3.15	3.74	90 4	91 0	89.7
Low	1.60	1 75	2.10	2 40	2.45	2.35	88 5	88.5	88 0
Last Months Avg	1 60	1 71	2 02	2 46	2.57	2 76	88.4	88 4	87 3

Japan

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/YEN		
	In 3 Mo	In 6 Mo.	In 12 Mo	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo
Barclays	na	na	na	0 05	0.10	na	na	na	na
BMO Capital Markets	-0.05	-0 05	-0.05	0 05	0.05	0.10	115 0	116.0	117 0
IHSMarkit	na	na	na	na	na	na	114.9	115 6	117 3
ING Financial Markets	0 05	0 05	0 05	0 10	0 10	0 10	114.0	114 0	115 0
Mizuho Research Institute	0 06	0.06	0 06	0.05	0 05	0 05	114 0	115 0	115.0
Moody's Analytics	na	na	na	0 06	0 10	0 09	112 3	112 2	112 2
Moody's Capital Markets	na	na	na	0.06	0.01	0.06	112 5	112 8	112 7
Nomura Securities	na	na	na	na	na	na	120 0	120 0	114 0
Oxford Economics	na	na	na	0 07	0.07	0.07	113 2	113.6	115 0
Scotiabank	na	na	na	na	na	na	114.0	114 0	115 0
Wells Fargo	0 03	-0 01	0 01	0 05	0.07	0 12	na	na	na
December Consensus	0.02	0.01	0.02	0.06	0.07	0.08	114.4	114.8	114.8
High	0 06	0.06	0 06	0.10	0 10	0 12	120 0	120 0	117.3
Low	-0.05	-0.05	-0 05	0 05	0 01	0.05	112 3	112 2	112 2
Last Months Avg	0.03	0.03	0.04	0 06	0.08	0 08	113 7	114.6	114 9

United Kingdom

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gilt Yields %			GBP/USD		
	In 3 Mo.	In 6 Mo	In 12 Mo	In 3 Mo.	In 6 Mo	In 12 Mo	In 3 Mo.	In 6 Mo	In 12 Mo
Barclays	na	na	na	1 45	1 50	na	na	na	na
BMO Capital Markets	0 65	0.65	0.90	1 55	1.65	1.85	1 31	1 30	1 32
IHSMarkit	na	na	na	na	na	na	1 28	1.28	1 32
ING Financial Markets	0 60	0 60	0.60	1 40	1 45	1.50	1 36	1.39	1 48
Mizuho Research Institute	0 55	0 60	0 80	1.50	1 55	1 70	na	na	na
Moody's Analytics	na	na	na	1.59	1 67	1 88	1 29	1 28	1.25
Moody's Capital Markets	na	na	na	1.35	1 40	1.35	1 32	1 30	1 30
Nomura Securities	na	na	na	na	na	na	1 40	1.42	1 45
Oxford Economics	na	na	na	1 61	1.72	1.94	1 36	1.37	1 38
Scotiabank	na	na	na	na	na	na	1 35	1.35	1.37
Wells Fargo	0 60	0 65	0.95	1.40	1 60	1 85	na	na	na
December Consensus	0.60	0.63	0.81	1.48	1.57	1.72	1.33	1.34	1.36
High	0 65	0.65	0 95	1.61	1 72	1.94	1 40	1 42	1.48
Low	0.55	0.60	0.60	1 35	1.40	1.35	1 28	1.28	1 25
Last Months Avg	0.49	0 51	0.64	1 43	1.52	1 72	1 34	1.35	1 37

Switzerland

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/CHF		
	In 3 Mo	In 6 Mo	In 12 Mo.	In 3 Mo	In 6 Mo.	In 12 Mo	In 3 Mo	In 6 Mo	In 12 Mo
Barclays	na	na	na	na	na	na	1 00	0 99	na
BMO Capital Markets	na	na	na	na	na	na	na	na	na
IHSMarkit	na	na	na	na	na	na	1.00	1 00	0 98
ING Financial Markets	-0 70	-0 70	-0 60	-0.05	0 10	0 40	0.97	0 97	0.98
Mizuho Research Institute	na	na	na	na	na	na	na	na	na
Moody's Analytics	na	na	na	0.04	0 11	0 25	0.99	1 00	1.01
Moody's Capital Markets	na	na	na	-0.13	-0.08	-0.05	0 99	0 99	0 99
Nomura Securities	na	na	na	na	na	na	0.92	0 91	0 89
Oxford Economics	na	na	na	0 13	0.25	0 43	0.98	0 98	0 98
Scotiabank	na	na	na	na	na	na	na	na	na
Wells Fargo	na	na	na	na	na	na	na	na	na
December Consensus	-0.70	-0.70	-0.60	0.00	0.10	0.26	0.98	0.98	0.97
High	-0 70	-0.70	-0 60	0 13	0.25	0.43	1 00	1 00	1.01
Low	-0.70	-0.70	-0.60	-0 13	-0.08	-0.05	0 92	0 91	0 89
Last Months Avg	-0.70	-0 70	-0.70	0 06	0.09	0 25	0 97	0 97	0 98

Canada

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/CAD		
	In 3 Mo	In 6 Mo.	In 12 Mo	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo	In 6 Mo	In 12 Mo
Barclays	na	na	na	na	na	na	1 25	1.23	na
BMO Capital Markets	na	na	na	2.05	2 15	2 50	1 31	1.32	1 31
IHSMarkit	na	na	na	na	na	na	1.25	1.26	1.27
ING Financial Markets	1 90	2.00	1 60	2.30	2 40	2 70	1 27	1 22	1.20
Mizuho Research Institute	na	na	na	na	na	na	na	na	na
Moody's Analytics	na	na	na	2.56	2 85	3.55	1 25	1 25	1.23
Moody's Capital Markets	na	na	na	2 00	2.05	1.95	1 29	1 29	1.29
Nomura Securities	na	na	na	na	na	na	1 21	1.19	1.16
Oxford Economics	na	na	na	2.36	2 48	2 73	1 29	1.29	1 29
Scotiabank	na	na	na	2.20	2 25	2 45	1 28	1.27	1 25
Wells Fargo	1 65	1 75	2 00	2.20	2 40	2 55	na	na	na
December Consensus	1.78	1.88	1.80	2.24	2.37	2.63	1.27	1.26	1.25
High	1.90	2.00	2 00	2 56	2 85	3.55	1 31	1 32	1.31
Low	1.65	1 75	1.60	2.00	2 05	1.95	1 21	1.19	1 16
Last Months Avg.	1.35	1.53	1.75	2 29	2.44	2.70	1 24	1.23	1.22

International Interest Rate And Foreign Exchange Rate Forecasts

Blue Chip Forecasters	3 Mo. Interest Rate %		
	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na
BMO Capital Markets	na	na	na
IHSMarkit	na	na	na
ING Financial Markets	1.90	1.90	2.15
Mizuho Research Institute	na	na	na
Moody's Analytics	na	na	na
Moody's Capital Markets	na	na	na
Nomura Securities	na	na	na
Oxford Economics	na	na	na
Scotiabank	na	na	na
Wells Fargo	na	na	na
December Consensus	**1.90**	**1.90**	**2.15**
High	1 90	1 90	2.15
Low	1.90	1 90	2 15
Last Months Avg.	1.65	1.65	1.90

Australia

Blue Chip Forecasters	10 Yr. Gov't Bond Yield %		
	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na
BMO Capital Markets	na	na	na
IHSMarkit	na	na	na
ING Financial Markets	2.80	2.90	3.10
Mizuho Research Institute	na	na	na
Moody's Analytics	2.65	2.81	3.15
Moody's Capital Markets	2 55	2.60	2 50
Nomura Securities	na	na	na
Oxford Economics	2.95	3.01	3.08
Scotiabank	na	na	na
Wells Fargo	na	na	na
December Consensus	**2.74**	**2.83**	**2.96**
High	2.95	3 01	3.15
Low	2.55	2 60	2 50
Last Months Avg.	2.78	2.83	2.99

	AUD/AUD		
	In 3 Mo.	In 6 Mo.	In 12 Mo.
	0.76	0.76	na
	na	na	na
	0.76	0.75	0 73
	0.80	0.84	0.88
	na	na	na
	0.78	0 77	0.77
	0 76	0 75	0.75
	0 80	0.82	0.84
	0.76	0.75	0.74
	0.79	0 79	0.80
	na	na	na
****	**0.78**	**0.78**	**0.79**
	0.80	0.84	0.88
	0.76	0 75	0.73
	0.79	0 80	0.80

Blue Chip Forecasters	3 Mo. Interest Rate %		
	In 3 Mo	In 6 Mo.	In 12 Mo
Barclays	na	na	na
BMO Capital Markets	-0.40	-0.40	-0.40
IHSMarkit	na	na	na
ING Financial Markets	-0 33	-0.33	-0 33
Mizuho Research Institute	-0.30	-0.30	-0.30
Moody's Analytics	na	na	na
Moody's Capital Markets	na	na	na
Nomura Securities	na	na	na
Oxford Economics	na	na	na
Scotiabank	na	na	na
Wells Fargo	-0 35	-0.25	0.05
December Consensus	**-0.35**	**-0.32**	**-0.25**
High	-0.30	-0.25	0.05
Low	-0.40	-0.40	-0.40
Last Months Avg	-0.35	-0.33	-0.27

Eurozone

	USD/EUR		
	In 3 Mo.	In 6 Mo.	In 12 Mo
	1.17	1.19	na
	1.16	1.15	1.19
	1.15	1.15	1.16
	1.20	1 22	1.27
	1.16	1.16	1.19
	1.16	1.15	1.14
	1.17	1.16	1.16
	1.25	1 28	1.35
	1 20	1 20	1.20
	1.18	1.18	1.20
	na	na	na
****	**1.18**	**1.18**	**1.21**
	1.25	1.28	1.35
	1.15	1 15	1.14
	1.19	1.20	1 22

Blue Chip Forecasters	10 Yr. Gov't Bond Yields %											
	Germany			France			Italy			Spain		
	In 3 Mo.	In 6 Mo.	In 12 Mo	In 3 Mo	In 6 Mo	In 12 Mo	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	0.55	0.60	na	na	na	na	na	na	na	na	na	na
BMO Capital Markets	0.65	0.80	1.05	na	na	na	na	na	na	na	na	na
ING Financial Markets	0.50	0.65	0 75	0.92	0.97	1.15	2.35	2.25	2 35	1 85	1 85	1.95
Mizuho Research Institute	0.40	0 45	0 50	na	na	na	na	na	na	na	na	na
Moody's Analytics	0 66	0.79	1.12	0 99	1 10	1.34	1.96	2.00	2.25	1.80	1.93	2.23
Moody's Capital Markets	0.45	0.49	0 52	0.75	0 84	0 92	1 85	1.92	1 97	1.60	1 65	1.65
Nomura Securities	na	na	na	na	na	na	na	na	na	na	na	na
Oxford Economics	0 65	0.75	0.90	1.05	1.17	1.36	2.20	2 33	2 54	1 85	2.00	2.21
Wells Fargo	0.60	0.75	1.00	na	na	na	na	na	na	na	na	na
December Consensus	**0.56**	**0.66**	**0.83**	**0.93**	**1.02**	**1.19**	**2.09**	**2.13**	**2.28**	**1.78**	**1.86**	**2.01**
High	0.66	0 80	1 12	1.05	1.17	1.36	2.35	2.33	2.54	1.85	2.00	2.23
Low	0.40	0.45	0 50	0 75	0.84	0 92	1.85	1 92	1.97	1.60	1.65	1.65
Last Months Avg	0.56	0.63	0.86	0.92	1 03	1 25	2 19	2 48	2.57	1.78	1.94	2.16

Consensus Forecasts 10-year Bond Yields vs U.S. Yield				
	Current	In 3 Mo.	In 6 Mo.	In 12 Mo.
Japan	-2.33	-2.48	-2.57	-2.73
United Kingdom	-1.03	-1.06	-1.07	-1.09
Switzerland	-2.45	-2 54	-2 54	-2 56
Canada	-0.46	-0.30	-0.27	-0.18
Australia	0.17	0.20	0.19	0.14
Germany	-2.01	-1.98	-1.98	-1.98
France	-1.70	-1.61	-1.62	-1.62
Italy	-0.59	-0.45	-0.51	-0.54
Spain	-0.88	-0.77	-0.78	-0.81

Consensus Forecasts 3 Mo. Deposit Rates vs U.S. Rate				
	Current	In 3 Mo.	In 6 Mo.	In 12 Mo.
Japan	-1.49	-1.64	-1.93	-2 12
United Kingdom	-1 01	-1.06	-1.29	-1.33
Switzerland	-2.20	-2.36	-2.61	-2.74
Canada	-0.10	0.11	-0.04	-0.34
Australia	0.53	0.24	-0.01	0.01
Eurozone	-1 78	-2.01	-2 23	-2.38

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Viewpoints:	A Sampling of Views on the Economy, Financial Markets and Government Policy Excerpted from Recent Reports Issued by our Blue Chip Panel Members and Others

Inflation: Mystery And Brewing Risk

One theme that has emerged over the past few years has been the complete lack of traction in inflation among developed economies. Fed Chair Yellen has called it a mystery, while the Bank of Canada has said they are studying the issue closely. Whatever you want to call it, there's no debating that inflation pressures remain exceptionally subdued more than six years into the expansion (or over eight years since the recession trough). Indeed, U.S. CPI has risen just 1.25% annualized over the past five years, matching lows seen during a brief period in 2013 and a four-year span in the mid-1960s, with only the late-1950s sporting a meaningfully slower pace. The Canadian backdrop is similar with the five-year annualized rate also hovering near multi-decade lows. Market-based inflation expectations have fallen as well, adjusting to the persistent lack of inflation pressure. While we won't dispute the data, the complacency that's building around low and subdued inflation is a brewing risk for markets.

When breaking down inflation, it's important to differentiate between cyclical and secular drivers. The secular drivers have been hogging the headlines recently, with fears of job-stealing robots, artificial intelligence, technology-driven efficiencies, a lengthy recession hangover for workers, and worsening demographics just a few on a lengthy list of factors blamed for keeping inflation in check. Another potential factor is that the cost of producing goods continues to be very restrained. Through the early 2000s, it was reasonable to pin this trend on the opening of global trade and China joining the WTO in particular. While this factor is still at play, we'd point to increasing automation of goods production which keeps the marginal cost of incremental goods production relatively steady, in turn, limiting any inflation pressure. Indeed, goods (ex. food & energy) inflation has been nearly zero over the past 20 years. This phenomenon shows no sign of reversing any time soon. All of the above factors are likely to restrain inflation consistently for the foreseeable future, but that doesn't mean price pressures are gone forever.

The cyclical aspect of inflation is equally, if not more, important than the secular. The 2008/09 Great Recession was the worst global downturn since the Great Depression. That was true for the U S. and it was second to the early 1980s for Canada, creating a very wide output gap in both countries. It's taken more than six years of expansion, but the output gaps in the U.S. and Canada are arguably closed, or at least nearly so. Traditionally, inflation dynamics are driven by supply and demand. Assuming the basic laws of economics still hold, it's reasonable to expect inflation pressures will build through 2018. We've seen little to support that view yet, but there are two potential reasons for the delay: 1) the output gaps have only just closed, so inflation pressures haven't had time to build; 2) slack remains in the labour market.

This latter point has occupied policymakers at the Fed and BoC. The drop in employment in 2008/09 was even more severe than the decline in GDP Not only did jobless rates rise, but participation rates moved lower as many dropped out of the labour force. The latter was especially the case in the U.S. As the North American labour markets have made progress, the jobless rate has fallen at or close to prerecession lows. However, underemployment has yet to fully retrace all of its increase in Canada, suggesting that some slack in the labour market remains. The U.S. measure has only just reached pre-recession levels. Indeed, that would help explain why wage growth has been quite subdued despite consistently solid job growth. The Fed and BoC appear to have similar beliefs, but there are clearly lingering doubts (see this week's FOMC minutes). Assuming job growth holds up through 2018, wages look to

accelerate as the limited amount of labour market slack is taken up. What's clear is that this is an area of potentially meaningful upside for inflation over the coming year.

From a global perspective, the cyclical indicators are solid as well. The global economy looks like it will have its strongest performance in at least three years. Perhaps the best indicator of this improving macro backdrop is the rising trend in commodity prices and industrial metals in particular. While oil prices have historically been a good indicator of global growth, oil has not been as responsive to better growth due to the supply dynamic driven by U.S. shale, though prices have moved up in recent weeks. The better growth backdrop in 2017 is expected to persist into 2018 (we see no meaningful imbalances to derail growth at present, absent a black swan) which will be supportive of commodity prices. That in turn will help lift inflation.

Key Takeaway: Inflation has persistently surprised on the low side of forecasts in recent years, which is keeping market inflation expectations subdued. However, cyclical drivers suggest that risks are tilted to the upside for 2018, potentially shaking market participants out of their low-inflation complacency.

Benjamin Reitzes, BMO Capital Market, Toronto, Canada

The Yield Curve: Signal Or Noise?

A string of generally favorable economic statistics has pushed interest rates higher since September, with the sharpest move occurring in the short end of the maturity spectrum. The rate on two-year Treasury securities has increased approximately 40 basis points in the past three months and moved to its highest level since the recession; the 10-year rate has increased only 20 basis points over this span and has remained comfortably within its recent range. This combination of changes has led to a noticeable narrowing in the slope of the yield curve.

The slope of the yield curve is viewed by many as a reliable indicator of cyclical shifts in the economy: it usually steepens during recessions and the early portions of expansions before narrowing during the middle and latter portions of expansions and typically inverting before the onset of recession. The narrowing that has emerged recently might lead some to think that the eight-year expansion is beginning to show its age; in the extreme, the narrowing might stir thoughts of recession on the horizon.

We would dismiss thoughts of recession. Although the curve has flattened, it is far from the negative (inverted) readings that usually precede a downturn. Moreover, we do not view the narrowing of the curve as a sign that the expansion is entering an advanced stage that might bring a loss of momentum. The narrowing of the curve and slower economic growth that has occurred in past cycles were largely the result of the Federal Reserve aggressively tightening monetary policy. Thoughts of additional rate hikes have certainly been a factor behind the recent increase in short-term interest rates, but policy remains accommodative, and the Fed plans to move gradually in normalizing policy. If officials were to err in calibrating policy, we suspect that they would tighten too little rather than too much; they would probably tolerate inflation breaching target (slightly), and they are not likely to risk derailing the expansion.

Even if the curve were to continue narrowing and possibly invert, we would not necessarily conclude that a slowdown or recession is imminent. Although the slope of the yield curve *(continued on next page)*

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Viewpoints	A Sampling of Views on the Economy, Financial Markets and Government Policy Excerpted from Recent Reports Issued by our Blue Chip Panel Members and Others

has been a reliable guide to cyclical shifts in the past, historical guidelines might not be relevant in the current instance. Because of the quantitative easing programs of the Federal Reserve, the long end of the maturity spectrum -- and hence the slope of the yield curve -- is likely to behave differently than in the past. The Fed is now trimming its portfolio, which will lessen the distortions associated with QE, but officials are still in the early phases of this effort, and thus long-term interest rates are not market driven. That is, distortions in the long end remain in place and therefore the yield curve is likely to move differently than it has in the past.

In addition, the foreign sector is playing a larger role in U.S. financial markets than it did in the past. Economies and financial markets are now highly integrated, and therefore developments abroad are likely to have feedback effects on the United States. In particular, The European Central Bank and the Bank of Japan have active quantitative-easing programs in place that are constraining long-term interest rates in their markets. In response, investors with a global focus would shift portfolios toward the U.S., which would limit upward pressure on long-term interest rates that might have occurred in the past, disrupting the normal response of the yield curve to cyclical changes in the U.S. economy.

In short, the unconventional policies of central banks have altered the financial landscape, and therefore, past metrics and guidelines might not apply.

Michael Moran, Daiwa Capital Markets, New York

Is The Bond Market Telling The Fed To "Go" Or "Slow"?

The yield curve can be a good warning indicator for trouble ahead. When a central bank tightens and pushes short rates above long rates, this "inversion" signals that the bond market expects a weaker economy and rate cuts in the future. Conversely the yield curve is steep when monetary policy is accommodative and so economic activity is likely to accelerate in the future. For this reason, the slope of the yield curve has historically been viewed as a reliable recession predictor.

There is a vast amount of academic literature on this issue. However, studies have found that the yield curve has become less predictive of economic activity in recent decades, both in the US and in other developed economies. For example, the New York Fed's recession probability model, which is based on the 3-month/10-year US Treasury yield spread, has not predicted more than a 50% chance of a recession since the early 1980s.

While the disconnect between the yield curve and economic growth started in the 1990s, it was exacerbated by the bond conundrum of the mid-2000s. Despite the steady Fed tightening from 2004 to 2006, long-end Treasury yields refused to budge. These persistently low yields could be interpreted in one of two ways. On the one hand, they may have been a signal of weak growth ahead, suggesting further Fed hikes would be a mistake. On the other hand, they could have been interpreted as a sign of very accommodative financial conditions, suggesting the Fed should forge ahead. In the event, the Fed made the right call, blaming low yields on foreign capital inflows, taking note of the ongoing easing of credit conditions and forging ahead with rate hikes. Although the economy eventually fell into a deep recession, it was caused more by surging oil prices and a collapse in credit markets than the earlier Fed rate hikes.

More recently, with central banks manipulating both the short and long ends of the curve, its slope has become an even less reliable gauge of recession risk. Aggressive QE has helped drive term premiums to around zero. If near-zero term premiums persist then the yield curve should be inverted about half of the time. After all, if there is no term premium, then on average short and long rates should be equal.

At the extreme, the BOJ's yield curve control has made the Japanese curve almost meaningless as a measure of market views of the economy. The BOJ is keeping the curve upward sloping as a favor to financial firms; however, this tells us nothing about the prospects for Japanese growth and inflation. Taken literally, the Japanese curve suggests that the prospects for growth in Japan have been falling for 8 consecutive years. There was also a strong false signal of recession last year. In reality, however, Japanese growth is accelerating, not slowing.

In the Euro area the message from the curve has become very complicated. The recent steepening of the German curve is likely driven by both good news (an improving economy) and bad news (the winding down of QE). Meanwhile the yield curves in the periphery are even more complicated: credit risk premiums, QE, and growth and inflation expectations are all likely influencing yields. Is a steeper Italian yield curve a good or a bad sign? It depends on which story is dominating.

Adding to the complexity in interpreting local yield curves are cross-border effects. Surely, super-low yields in some countries are impacting yields in other countries, contaminating the signal about the domestic outlook.

Today the Fed faces the same dilemma as in the 2000s-are persistently low bond yields good news or bad news? In our view, the Fed is making the same choice today as back then: easy financial conditions argue for full-speed ahead. After all, low bond yields are not the only sign of easy financial conditions-equity and home prices are surging and growth momentum is strong in the US and globally. These easy financial conditions encourage the Fed to move ahead with its exit plans.

Easing financial conditions and stronger growth in the face of Fed hikes are signs that "r-star" -- the neutral or equilibrium real policy rate -- is probably starting to rebound. For a number of years, economists both at the Fed and elsewhere have been lowering their estimates of both the short-run and the long-run values of r-star. For example, when the FOMC first published its participants' estimates of long-run r-star in 2012, the median estimate was 2.25%; today the median forecast is 0.75%. Moreover, much of the Fed discussion seems to assume that the short-run r-star is currently roughly zero.

It will take time for model estimates of r-star to catch up to the new rising trend. Models such as that of Laubach and Williams use very simple structures and are heavily smoothed. However, the evidence for a higher r-star is building as a year of steady Fed exit has had no noticeable impact on financial conditions or growth. If r-star were really zero there should be some pain evident by now.

We have two messages for investors. First, the Fed is likely to stay the course. Second, we would not worry about the flat yield curve.

Ethan Harris and Aditya Bhave, Bank of America-Merrill Lynch, New York, NY

Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2019 through 2023 and averages for the five-year periods 2019-2023 and 2024-2028. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

Interest Rates		---Average For The Year---					Five-Year Averages	
		2019	2020	2021	2022	2023	2019-2023	2024-2028
1. Federal Funds Rate	CONSENSUS	2.5	2.7	2.9	2.9	2.9	2.8	3.0
	Top 10 Average	2.9	3.2	3.4	3 4	3.5	3.3	3 5
	Bottom 10 Average	2.1	2.0	2.3	2.3	2.4	2.2	2.4
2. Prime Rate	CONSENSUS	5.5	5.8	5.9	5.9	5.9	5.8	5.9
	Top 10 Average	5 9	6 3	6.4	6.5	6 6	6.3	6 5
	Bottom 10 Average	5.0	5 1	5.2	5.2	5 2	5.1	5 3
3. LIBOR, 3-Mo	CONSENSUS	2.8	3.1	3.2	3.1	3.2	3.1	3.2
	Top 10 Average	3.2	3.6	3 8	3 8	3 9	3 7	3.8
	Bottom 10 Average	2.4	2.6	2.6	2.5	2.6	2 5	2.6
4. Commercial Paper, 1-Mo	CONSENSUS	2.6	2.9	3.0	3.0	3.1	2.9	3.1
	Top 10 Average	3 1	3 5	3.6	3.7	3.8	3.5	3.8
	Bottom 10 Average	2.2	2.5	2.6	2 5	2.5	2.5	2.6
5. Treasury Bill Yield, 3-Mo	CONSENSUS	2.5	2.8	2.9	2.9	2.9	2.8	2.9
	Top 10 Average	2.9	3 3	3.4	3 4	3.5	3 3	3.5
	Bottom 10 Average	2 1	2 3	2.4	2.3	2 3	2.3	2.4
6. Treasury Bill Yield, 6-Mo.	CONSENSUS	2.6	2.9	3.0	3.0	3.0	2.9	3.1
	Top 10 Average	3.0	3.4	3 5	3.6	3.7	3 5	3.7
	Bottom 10 Average	2.2	2.4	2.5	2 4	2.4	2.4	2.5
7 Treasury Bill Yield, 1-Yr.	CONSENSUS	2.7	3.0	3.1	3.1	3.2	3.0	3.2
	Top 10 Average	3 2	3 6	3.7	3.7	3.8	3.6	3.9
	Bottom 10 Average	2 3	2.5	2.6	2.5	2.5	2.5	2.6
8. Treasury Note Yield, 2-Yr	CONSENSUS	2.8	3.1	3.3	3.2	3.3	3.1	3.3
	Top 10 Average	3.3	3.8	3 8	3 8	3.9	3.7	4.0
	Bottom 10 Average	2 4	2.6	2.7	2 6	2 6	2.6	2 7
10 Treasury Note Yield, 5-Yr.	CONSENSUS	3.1	3.4	3.5	3.5	3.5	3.4	3.6
	Top 10 Average	3.6	3.9	4 1	4.1	4.1	3 9	4.3
	Bottom 10 Average	2.6	2 8	2 9	2 9	2.9	2 8	3.0
11. Treasury Note Yield, 10-Yr.	CONSENSUS	3.3	3.6	3.7	3.7	3.8	3.6	3.8
	Top 10 Average	3 9	4.2	4.3	4.3	4 3	4.2	4 5
	Bottom 10 Average	2.8	2 9	3 1	3.1	3.1	3.0	3.2
12. Treasury Bond Yield, 30-Yr.	CONSENSUS	3.8	4.1	4.2	4.2	4.2	4.1	4.3
	Top 10 Average	4.4	4.7	4 7	4.7	4 8	4.7	5.0
	Bottom 10 Average	3.3	3 5	3.6	3.5	3 6	3.5	3.7
13 Corporate Aaa Bond Yield	CONSENSUS	4.9	5.1	5.2	5.2	5.3	5.1	5.4
	Top 10 Average	5.5	5.9	5.9	6 0	6.0	5 9	6.2
	Bottom 10 Average	4.3	4.5	4.5	4 5	4.6	4 5	4.7
13. Corporate Baa Bond Yield	CONSENSUS	5.7	6.0	6.0	6.0	6.1	6.0	6.2
	Top 10 Average	6.4	6.8	6.8	6.9	6 9	6.8	7.0
	Bottom 10 Average	5 0	5.2	5.3	5.2	5.3	5.2	5 4
14 State & Local Bonds Yield	CONSENSUS	4.4	4.5	4.6	4.5	4.6	4.5	4.8
	Top 10 Average	5.0	5.2	5 2	5.3	5.3	5.2	5.5
	Bottom 10 Average	3 9	4 0	4.0	3.9	4.1	4 0	4.1
15 Home Mortgage Rate	CONSENSUS	5.0	5.2	5.3	5.3	5.4	5.2	5.5
	Top 10 Average	5.5	5.8	5.9	6.0	6.0	5.8	6.1
	Bottom 10 Average	4.5	4 7	4.7	4 6	4.7	4 6	4.9
A. FRB - Major Currency Index	CONSENSUS	90.4	90.0	89.9	89.9	90.0	90.0	90.4
	Top 10 Average	94 7	94 8	95.0	95 1	95.3	95.0	95 4
	Bottom 10 Average	86.9	85.8	85 4	85 5	85.6	85 8	86.1

		---Year-Over-Year, % Change---					Five-Year Averages	
		2019	2020	2021	2022	2023	2019-2023	2024-2028
B Real GDP	CONSENSUS	2.2	1.9	2.0	2.0	2.0	2.0	2.0
	Top 10 Average	2 5	2.4	2.5	2.4	2 3	2 4	2.4
	Bottom 10 Average	1.8	1.4	1.7	1.6	1.7	1.6	1.7
C. GDP Chained Price Index	CONSENSUS	2.2	2.1	2.1	2.1	2.1	2.1	2.1
	Top 10 Average	2.5	2 3	2 3	2 3	2 3	2 3	2.3
	Bottom 10 Average	1.8	1.9	1.9	2.0	1.9	1.9	1.9
D. Consumer Price Index	CONSENSUS	2.3	2.3	2.3	2.2	2.2	2.3	2.2
	Top 10 Average	2.7	2.6	2.6	2.4	2.4	2.5	2.4
	Bottom 10 Average	1.9	1.9	2.0	2.0	2.0	2.0	2.0

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Databank:

2017 Historical Data

Monthly Indicator	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec
Retail and Food Service Sales (a)	0.5	-0.2	0.1	0.3	0.0	-0.1	0.5	-0.1	1.9	0.2		
Auto & Light Truck Sales (b)	17.33	17.33	16.72	16.97	16.70	16.61	16.69	16.02	18.47	18.00		
Personal Income (a, current $)	0.4	0.5	0.3	0.1	0.3	0.0	0.3	0.2	0.4			•
Personal Consumption (a, current $)	0.2	0.1	0.5	0.3	0.2	0.1	0.4	0.1	1.0			
Consumer Credit (e)	3.1	5.2	4.7	3.9	5.8	3.7	5.7	4.2	6.6			
Consumer Sentiment (U. of Mich.)	98.5	96.3	96.9	97.0	97.1	95.1	93.4	96.8	95.1	100.7	98.5	
Household Employment (c)	-30	447	472	156	-233	245	345	-74	906	-484		
Non-farm Payroll Employment (c)	216	232	50	207	145	210	189	208	18	261		
Unemployment Rate (%)	4.8	4.7	4.5	4.4	4.3	4.4	4.3	4.4	4.2	4.1		
Average Hourly Earnings (All, cur. $)	26.02	26.10	26.13	26.18	26.22	26.27	26.39	26.42	26.54	26.53		
Average Workweek (All, hrs)	34.4	34.3	34.3	34.5	34.4	34.5	34.5	34.4	34.4	34.4		
Industrial Production (d)	0.0	0.4	1.4	2.0	2.2	2.0	1.9	1.6	2.1	2.8		
Capacity Utilization (%)	75.7	75.8	75.9	76.6	76.6	76.6	76.5	76.1	76.4	77.0		
ISM Manufacturing Index (g)	56.0	57.7	57.2	54.8	54.9	57.8	56.3	58.8	60.8	58.7		
ISM Non-Manufacturing Index (g)	56.5	57.6	55.2	57.5	56.9	57.4	53.9	55.3	59.8	60.1		
Housing Starts (b)	1.236	1.288	1.189	1.154	1.129	1.217	1.185	1.172	1.135	1.290		
Housing Permits (b)	1.300	1.219	1.260	1.228	1.168	1.275	1.230	1.272	1.225	1.297		
New Home Sales (1-family, c)	599	615	638	590	606	614	582	561	667			
Construction Expenditures (a)	0.8	1.9	0.3	-1.8	1.6	-0.8	-0.9	0.1	0.3			
Consumer Price Index (nsa., d)	2.5	2.7	2.4	2.2	1.9	1.6	1.7	1.9	2.2	2.0		
CPI ex Food and Energy (nsa., d)	2.3	2.2	2.0	1.9	1.7	1.7	1.7	1.7	1.7	1.8		
Producer Price Index (n.s.a, d)	1.7	2.0	2.2	2.5	2.3	1.9	1.9	2.4	2.6	2.8		
Durable Goods Orders (a)	2.4	1.4	2.4	-0.8	0.0	6.4	-6.8	2.1	2.2	-1.2		
Leading Economic Indicators (g)	0.6	0.5	0.4	0.2	0.3	0.6	0.3	0.4	0.1	1.2		
Balance of Trade & Services (f)	-48.8	-44.5	-44.8	-47.4	-46.4	-43.5	-43.6	-42.8	-43.5			
Federal Funds Rate (%)	0.65	0.66	0.76	0.90	0.90	1.03	1.15	1.15	1.16	1.15		
3-Mo. Treasury Bill Rate (%)	0.51	0.53	0.73	0.80	0.90	1.02	1.09	1.04	1.06	1.09		
10-Year Treasury Note Yield (%)	2.43	2.43	2.47	2.30	2.31	2.19	2.32	2.33	2.28	2.36		

2016 Historical Data

Monthly Indicator	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec
Retail and Food Service Sales (a)	-1.0	0.7	0.0	0.8	0.3	0.8	0.0	-0.1	1.0	0.6	0.1	0.9
Auto & Light Truck Sales (b)	17.64	17.51	16.77	17.49	17.22	16.99	17.75	17.13	17.65	17.80	17.56	18.05
Personal Income (a, current $)	0.0	-0.1	0.3	0.5	0.3	0.3	0.4	0.2	0.4	0.4	0.2	0.3
Personal Consumption (a, current $)	0.1	0.2	0.0	1.1	0.3	0.5	0.4	0.1	0.7	0.5	0.3	0.6
Consumer Credit (e)	4.4	4.4	9.9	5.7	7.5	4.8	5.8	9.0	6.9	5.2	8.3	4.5
Consumer Sentiment (U. of Mich)	92.0	91.7	91.0	89.0	94.7	93.5	90.0	89.8	91.2	87.2	93.8	98.2
Household Employment (c)	503	510	258	-273	30	32	456	109	271	-24	146	63
Non-Farm Payroll Employment (c)	126	237	225	153	43	297	291	176	249	124	164	155
Unemployment Rate (%)	4.9	4.9	5.0	5.0	4.7	4.9	4.9	4.9	4.9	4.8	4.6	4.7
Average Hourly Earnings (All, cur. $)	25.37	25.38	25.46	25.54	25.59	25.62	25.71	25.74	25.81	25.90	25.91	25.97
Average Workweek (All, hrs)	34.6	34.5	34.4	34.4	34.4	34.4	34.4	34.3	34.4	34.4	34.3	34.4
Industrial Production (d)	-2.0	-2.0	-.25	-1.7	-1.4	-0.9	-1.2	-1.3	-1.2	-0.8	-0.5	0.9
Capacity Utilization (%)	76.1	75.9	75.4	75.6	75.6	75.8	75.9	75.8	75.6	75.7	75.5	76.0
ISM Manufacturing Index (g)	48.2	49.7	51.7	50.7	51.0	52.8	52.3	49.4	51.7	52.0	53.5	54.5
ISM Non-Manufacturing Index (g)	53.5	54.3	54.9	55.7	53.6	56.1	54.9	51.7	56.6	54.6	56.2	56.6
Housing Starts (b)	1.123	1.209	1.128	1.164	1.119	1.190	1.223	1.164	1.062	1.328	1.149	1.268
Housing Permits (b)	1.193	1.195	1.115	1.163	1.178	1.193	1.175	1.200	1.270	1.285	1.255	1.266
New Home Sales (1-family, c)	520	525	533	566	560	559	627	567	570	577	579	548
Construction Expenditures (a)	-0.3	1.4	1.6	-2.9	0.1	0.9	0.5	0.5	-0.2	0.8	1.5	-0.2
Consumer Price Index (s.a., d)	1.4	1.0	0.9	1.1	1.0	1.0	0.8	1.1	1.5	1.6	1.7	2.1
CPI ex Food and Energy (s.a., d)	2.2	2.3	2.2	2.1	2.2	2.2	2.2	2.3	2.2	2.1	2.1	2.2
Producer Price Index (n.s.a., d)	0.0	0.1	-0.1	0.2	0.0	0.2	0.0	0.0	0.6	1.1	1.3	1.7
Durable Goods Orders (a)	4.3	-3.3	2.0	3.2	-2.9	-4.3	3.6	0.2	0.3	5.0	-4.7	-0.9
Leading Economic Indicators (g)	-0.2	0.1	0.1	0.5	-0.2	0.2	0.5	-0.2	0.3	0.2	0.2	0.6
Balance of Trade & Services (f)	-43.4	-45.3	-37.4	-38.4	-41.5	-43.8	-41.3	-41.1	-38.5	-43.1	-46.4	-44.6
Federal Funds Rate (%)	0.34	0.38	0.36	0.37	0.37	0.38	0.39	0.40	0.40	0.40	0.41	0.54
3-Mo. Treasury Bill Rate (%)	0.26	0.31	0.29	0.23	0.27	0.27	0.30	0.30	0.29	0.33	0.45	0.51
10-Year Treasury Note Yield (%)	2.09	1.78	1.89	1.81	1.81	1.64	1.50	1.56	1.63	1.76	2.14	2.49

(a) month-over-month % change; (b) millions, saar; (c) month-over-month change, thousands; (d) year-over-year % change; (e) annualized % change; (f) $ billions; (g) level. Most series are subject to frequent government revisions. Use with care.

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Calendar Of Upcoming Economic Data Releases

Monday	Tuesday	Wednesday	Thursday	Friday
27 Markit Services PMI (Nov, Flash) New Home Sales (Oct) Dallas Fed Manufacturing survey (Nov)	**28** Advance Economic Indicators (Oct) S&P/Case-Shiller Home Price Index (Sep) FHFA Home Price Survey (Sep, Consumer Confidence (Nov, Conference Board) Dallas Fed Services (Nov) Richmond Fed Services (Nov)	**29** Real GDP (Q3, Second) Pending Home Sales (Oct) Beige Book EIA Crude Oil Stocks Mortgage Applications	**30** Personal Income and Consumption (Oct) Chicago PMI (Nov) Weekly Jobless Claims Weekly Money Supply	**December 1** Markit Manufacturing PMI (Nov, Final) ISM Manufacturing (Nov) Construction spending (Oct) Light Vehicle Sales (Nov)
4 Factory Orders (Oct)	**5** International Trade (Oct) Markit Services PMI (Nov, Final) ISM Non-Manufacturing (Nov) QFR (Q3)	**6** ADP Employment (Nov) Productivity and Costs (Q3) EIA Crude Oil Stocks Mortgage Applications	**7** Quarterly Spending Survey (Q3) Consumer Spending (Oct) Weekly Jobless Claims Weekly Money Supply	**8** Employment (Nov) Consumer Sentiment (Dec, Preliminary) Wholesale Trade (Oct)
11 JOLTS (Oct)	**12** **FOMC Meeting** NFIB survey (Nov) Producer Price Index (Nov) Federal Budget (Nov)	**13** **FOMC Meeting** **Statement and projections (2:00 pm)** **Press conference (2:30)** Consumer Price Index (Nov) EIA Crude Oil Stocks Mortgage Applications	**14** Retail Sales (Nov) IHSMarkit Manufacturing PMI (Dec, flash) Import Prices (Nov) Business Inventories (Oct) Weekly Jobless Claims Weekly Money Supply	**15** Industrial Production (Nov) Empire State Manufacturing (Dec) TIC data (Oct
18 IHSMarkit Services PMI (Dec, flash) NAHB survey (Dec) Business Leaders Survey (Dec)	**19** Housing Starts (Nov) Current Account (Q3)	**20** Existing Home Sales (Nov) EIA Crude Oil Stocks Mortgage Applications	**21** Real GDP (Q3, Third estimate) Philadelphia Fed Manufacturing survey (Dec) FHFA home price survey (Oct) Weekly Jobless Claims Weekly Money Supply	**22** Personal Income and Consumption (Nov) Durable Goods (Nov) New Home Sales (Nov) Philadelphia Fed manufacturing survey (Dec) Consumer Sentiment (Dec, final, University of Michigan) Kansas City Fed Survey (Nov)
25 **Christmas Day** **Markets Closed**	**26** S&P/Case-Shiller Home Price Index (Oct) Consumer Confidence (Dec, Conference Board) Dallas Fed Manufacturing (Dec) Richmond Fed Surveys (Dec)	**27** Pending Home Sales (Nov) Dallas Fed Services (Dec) EIA Crude Oil Stocks	**28** Chicago PMI (Dec) Advance Economic Indicators (Nov) Weekly Jobless Claims Weekly Money Supply	**29**
January 1 **New Year's Day** **Markets Closed**	**2** IHSMarkit Manufacturing PMI (Dec, Final)	**3** ISM Manufacturing (Dec) Construction Spending (Nov) Light Vehicle Sales (Dec) EIA Crude Oil Stocks **FOMC Minutes**	**4** ADP Employment (Dec) IHSMarkit Services PMI (Dec,Final) Weekly Jobless Claims Weekly Money Supply	**5** Employment (Dec) International Trade (Nov) ISM Non-Manufacturing (Dec) Factory Orders (Nov)

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Ibbotson® SBBI®
2013 Valuation Yearbook

Market Results for
Stocks, Bonds, Bills, and Inflation
1926–2012

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The relationship between systematic risk and expected return can also be expressed mathematically The CAPM describes the cost of equity for any company's stock as equal to the riskless rate plus an amount proportionate to the systematic risk an investor assumes

$$k_s = r_f + (\beta_s \times ERP)$$

where

k_s = the cost of equity for company s

r_f = the expected return of the riskless asset

β_s = the beta of the stock of company s and

ERP = the expected equity risk premium or the amount by which investors expect the future return or equities to exceed that on the riskless asset

Since the CAPM has only three variables—the expected return on the riskless asset, the beta of the stock, and the expected equity risk premium—it is one of the easiest models to implement in practice However, an estimate of each of the above three variables must be formed Like all components of the cost of capital these variables should be measured on a forward-looking basis Chapters 5 and 6 are devoted to estimating the equity risk premium and beta, respectively Factors to consider in estimating the risk ess rate are covered below

Risk-Free Rate

In general most valuators can agree that the risk-free rate is a forward looking rate that factors in long term expectations on growth and inflation The CAPM implicitly assumes the presence of a single riskless asset—that is, an asset perceived by all investors as having no risk The ability of the U S government to create money to fulfill its debt obligations under virtually any scenario makes U S Treasury securities practically default-free While interest rate changes cause government obligations to fluctuate in price investors face essentially no default risk as to either coupon payment or return of principal Asset values can vary significantly depending upon the type of risk-free interest rate selected and cash distribution characteristics of the subject asset being valued, the time horizon, and how a valuation practitioner applies this rate into his or her model

Type of Interest Rate

A common choice for the nominal riskless rate is the yield on a U S Treasury security Should the yield on a Treasury bond or a Treasury STRIPS be used to represent the riskless rate? In most cases, the yield on a Treasury coupon bond is most appropriate if the asset being measured spins off cash periodically, the Treasury bond most closely replicates this characteristic On the other hand, if the asset being measured provides a single payoff at the end of a specified term the yield on a Treasury STRIPS would be more appropriate

Time Horizon

The traditional thinking regarding the time horizon of the chosen Treasury security is that it should match the time horizon of whatever is being valued When valuing a business that is being treated as a going concern, the appropriate Treasury yield should be that of a long-term Treasury bond Note that the horizon is a function of the investment, not the investor If an investor plans to hold stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate, since the company will continue to exist beyond those five years

A different vantage point of the time horizon is that the risk-free rate should best match the distribution of the periodic cash flows of the asset being valued, in which case applying a yield curve may be more appropriate

Table 4-1: Current Yields or Expected Riskless Rates

Yield (Riskless Rate	
Long Term (20-year) U S Treasury Coupon Bond Yield	2 41
Long-Term (10 year) U S Treasury Coupon Bond Yield	1 78
Intermediate-Term (5 year) U S Treasury Coupon Note Yield	0 46
Short-term (30 day) U S Treasury Bill Yield	0 02

Data as of December 31 2012
*Maturities are approximate

It is also important to note that in February 1977 the Treasury began to issue 30-year Treasury securities Prior to this date, the longest-term Treasury security was 20 years, which was the standard Ibbotson used for its data series To remain consistent with Ibbotson's historical data series, the *Ibbotson Stocks Bonds, Bills, and Inflation Classic Yearbook* continued to base the yield

An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry

Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan

Farris M. Maddox is Principal Financial Analyst. Donna T. Pippert is Manager of Finance. Both are in the Division of Economics and Finance at the Virginia State Corporation Commission, Richmond, VA. Rodney N. Sullivan is Manager of Inventory and Productivity at Circuit City Stores, Inc. Richmond, VA.

This study examines the relationship between interest rates and utility equity risk premiums. We found that an inverse relationship exists, with the equity risk premium changing by 37 basis points for each 100 basis-point change in the 30-year Treasury bond yield. The inverse relationship is stable, however, changes in the relative risk of debt and equity securities produce shifts in the level of risk premiums, regardless of the behavior of Treasury bond yields. We also found that the equity risk premiums were consistently positive over the study period, which conforms to the basic risk/return tenet of finance.

■ Several studies published in recent years support an inverse relationship between utility equity risk premiums and interest rates during the first half of the 1980s. Our study provides a more current examination of this relationship. Our findings support the conclusion that equity risk premiums for utility stocks continue to vary inversely with interest rates. Further, the inverse relationship between interest rates and risk premiums appears stable over the sample period, however, market behavior at certain points in the sample period appears to reflect changes in the market's evaluation of the relative risk of Treasury bonds and utility stocks. For instance, significant differences in the level of the risk premium were observed during certain periods, irrespective of the level of interest rates. Considering the dynamic nature of risk premiums, we discuss how the study may be applicable for estimating the cost of equity for utilities.

Section I provides background information and a literature review. Section II describes the research methodology and the data. Section III provides the empirical results. Section IV furnishes an example to illustrate the model's usefulness. Section V furnishes conclusions.

I. Background and Literature Review

The determination of an appropriate cost of equity is a controversial issue in utility rate proceedings. Bond yields provide a readily observable, definitive measure of the market's required return on that investment; however, such a measure is not readily available for stocks. The indefinite life and uncertainty of a firm's future earnings make it necessary to employ theoretical models to arrive at an estimate of the cost of equity. All theoretical models have strengths and weaknesses, and the focus in utility rate proceedings is often on what is wrong with a particular approach rather than what is right. However, the nebulous nature of the true cost of equity provides no definitive way to assess the superiority of one method's results over another's. Consequently, several cost of equity models are typically used to develop a final estimate.

The risk premium method is an alternative approach to the prevalent discounted cash flow (DCF) model in estimating the cost of equity. A fundamental tenet of financial theory is that riskier investments should command a higher expected return than less risky investments. The risk premium may be defined as the difference, or spread, between expected returns on alternative investments. Financial textbooks usually illustrate risk premiums based on a theoretical risk-free rate and the rate for alternative-risk investments along the security market line.

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A widespread application of the risk premium method is based on an average of the realized spreads between total returns on equity and debt investments over some historical period. A refinement of this approach is to calculate the average spread between realized equity total returns and bond yields, in order to obtain a forward-looking measure of the required return on debt. Either type of average risk premium is then added to the current cost of debt to obtain a current cost of equity estimate. The assumption implicit in such approaches is that a constant risk premium is embodied in the current cost of equity. A corollary assumption is that the constant risk premium embodied in expected returns is equal to the average of risk premiums measured from realized returns. In actuality, the time period over which past returns are measured can result in significantly different risk premiums. However, many practitioners of this method argue that if the market risk premium is constant, then it is best approximated by realized returns over very long periods of time. These factors underlie the weaknesses of an ex post risk premium approach. Still, this method has cognitive appeal due to the almost tangible dimension added by the measurement of risk premiums from observed returns. There is also great practical appeal to this approach because it is easy to implement by using readily accessible data from sources like Ibbotson Associates (1993), which provide a regularly updated and consistently available compilation of various risk premiums based on holding periods beginning in 1926.

In recent years, an alternative risk premium model has been proposed. It relies on the expected cost of equity, rather than realized returns, as the appropriate basis for measuring risk premiums. Several studies empirically support the hypothesis that risk premiums, as measured by the expected cost of equity, are not constant but, instead, vary inversely with interest rates (Brigham, Shome, and Vinson, 1985; Harris, 1986, Harris and Marston, 1992, and Shome and Smith, 1988) Generally, studies supporting an ex ante risk premium approach are based on data from as early as the mid-1960s through the mid-1980s. The measurement of the ex ante risk premium holds conceptual appeal because it is consistent with the valuation of equity investments based on *expected* returns. However, a practical concern is the reliability of a risk premium measure that must be based upon an estimate of the cost of equity obtained by some other method, such as a DCF model. If problems exist in the formulation of the model used to estimate the cost of equity, those problems are transferred to the risk premium estimate.

An ex ante risk premium study by Brigham et al (1985) supported the existence of an inverse relationship between interest rates and utility stock risk premiums from 1980

through the first half of 1984. To determine these risk premiums, they employed a two-stage DCF model to obtain monthly cost of equity estimates for utility stocks. Risk premium measures for each month were then derived by deducting an appropriate Treasury bond yield each month. They found that, prior to 1980, the relationship between equity risk premiums and interest rates had been positive. Shome and Smith (1988) obtained similar results, finding an inverse relationship between interest rates and electric utility risk premiums that continued through 1985. Both studies discussed factors that reduced the impact of regulatory lag on utility stocks from the late 1970s into the early 1980s. Both studies concluded that reduced regulatory lag contributed to shifting the relative risk relationship between debt and utility stocks from positive to negative.

These studies were by and large an outgrowth of the market climate of the early 1980s. During that time, the risk of debt instruments rose in both an absolute sense and compared to stocks. This environment led many to conclude that the risk premium had narrowed and some to even argue it was negative.

Shome and Smith (1988) note that while stocks and bonds are both considered to be hedges against anticipated inflation, common stocks are considered to offer a partial hedge against unanticipated inflation. Therefore, during periods of greater inflation uncertainty, Smith and Shome argue that it would seem reasonable that equity risk premiums would decline as interest rates rise (see Gordon and Halpern, 1976). Stated another way, the risk and required return of the less complete hedge (i.e., debt) would increase at a relatively greater rate than the more complete hedge (i.e., equity), thereby reducing the risk premium during periods of higher uncertainty. However, Carleton, Chambers, and Lakonishok (1983) furnish empirical evidence that risk premiums for utility stocks tend to rise with inflation and interest rates if regulatory lag severely hampers earnings and prevents dividends from keeping pace with inflation.

Harris (1986) also finds an inverse relationship between interest rates and ex ante risk premium measures during the early to mid-1980s, based on utility and broader stock market indices. In a more recent study, Harris and Marston (1992) find an inverse relationship between interest rates and ex ante risk premiums for stocks in the S&P 500, based on data from 1982 to 1991. Blanchard (1993) studied real, rather than nominal, risk premiums between 1926 and 1993. Blanchard hypothesized that the persistence of relatively high risk premiums from the late 1930s through the 1940s could have been due to the market's reaction to the high stock market volatility in the late 1920s and early 1930s. Blanchard also

suggested that changes in inflation had a more temporal impact on the relative risk of debt and equity. He concluded that there was a declining trend in real risk premiums for the broad market since the 1950s, to a current level of about 2% to 3%. He also concluded that inflation contributed to a transitory increase above the trend in the 1970s and to a transitory decrease below the trend in the 1980s. However, Blanchard finds that real risk premiums were negative throughout much of the 1980s, which leads to the question as to whether the method he used to measure risk premiums is consistent with the basic risk/return tenet of financial theory.

II. Risk Premium Method and Data Sources

In our study, risk premiums for the electric utility industry are based on quarterly cost of equity estimates from 1980 through 1993 for a sample group of 30 electric utilities. Companies in the sample group met the following selection criteria over the review period: 1) principally remained an electric utility company, 2) did not file for Chapter 11 protection, and 3) continuously paid dividends.

Cost of equity estimates were obtained using the constant-growth form of the DCF model:

$$k_c = \frac{D_1}{P} + g \qquad (1)$$

where

k$_c$ – cost of common equity

D$_1$ = expected annual dividend per share in the coming year

P   = current stock price

g   = expected growth rate in dividends per share

Brigham et al. (1985) used a two-stage DCF model to estimate the cost of equity and noted that utility companies "meet the conditions of the constant growth DCF model rather well." The DCF model is also appropriate for utility stocks, perhaps more than for other stocks, because a significant portion of a utility stock's required return is reflected in the dividend yield component.[1] Constant-growth forms of the DCF model were also used by Harris (1986) and Harris and Marston (1992).

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[1] Hansen, Kumar, and Shome (1991) found that traditionally high dividend payout ratio in the electric utility industry provided cost effective means to monitor and manage agency costs related to stockholder manager and stockholder regulator conflict.

Data for the DCF model were obtained from *The Value Line Investment Survey*. Part 1, the Summary and Index section of *Value Line*, contains an estimate of the expected dividend yield (D$_1$/P) over the next 12 months. The dividend yield for each sample company was based on the *Value Line* yield figure published in the last week of each quarter.

Each company's quarterly growth rate estimate was based on the average of three projected measures: *Value Line*'s projected growth rate in earnings and dividends per share and the projected percentage of common equity retained. The last of the three growth measures is equivalent to the familiar b(r) method of estimating a growth rate. *Value Line*'s growth rates represented a readily available and consistent set of projected growth rates over the study period. Projected growth rates were used in order to be consistent with the ex ante measurement of risk premiums for the study.

The three-month average yield on 30-year Treasury bonds was used as the reference rate. It was subtracted from each company's quarterly cost of equity estimate to derive a risk premium. The risk premiums for each company were then averaged to develop a quarterly risk premium for the electric utility sample.

III. Empirical Results

Figure 1 provides a graph of the observed risk premiums and interest rates. It shows a general inverse trend between the two measures over the period studied. We note that the trend closely resembles the one observed by Brigham et al. (1985). The average interest rate over the study period was 9.77%, and the average risk premium was 3.21%.

To estimate the relationship between electric utility risk premiums and interest rates, we fit a simple linear regression model. Model 1 specifies the regression equation. The risk premium is the dependent variable, and the 30-year Treasury bond yield is the independent variable.

A. Model 1

$$RP_t = \alpha + \beta(TB_t) + \epsilon \qquad (2)$$

where

RP$_t$ = quarterly average risk premium for all utilities

TB$_t$ = quarterly average 30-year U.S. Treasury bond yield

Initially, we examined our data over the same 1980-1984 time period used by Brigham et al. (1985) and achieved similar results. Expansion of the study period through 1993 produced markedly different results. For example, the adjusted R^2 for Model 1 for the 1980-1993 period was only

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Figure 1. Observed Risk Premiums and Treasury Bond Yields Over the Sample Period
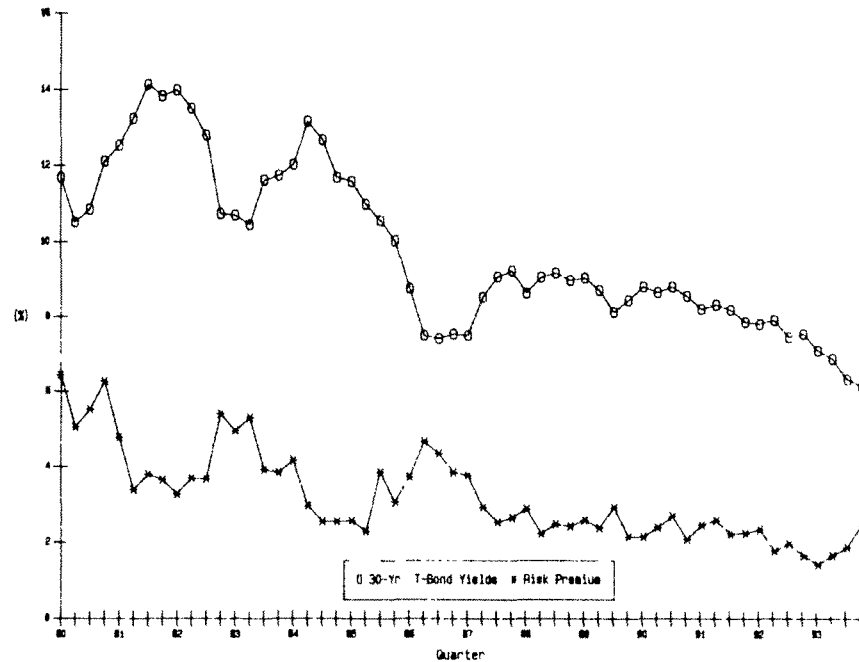
0 22. which sharply contrasts with the 0.73 R^2 reported by Brigham et al. (1995) for the 1980 1984 period

Figure 2 is a graph of all the risk premium data points in the study period for the electric utility industry, with respect to the interest rates at which they were observed. Figure 2 illustrates that there was a divergence in risk premiums that corresponded to interest rates of the same general level during the study period. If a single linear relationship held throughout the observation period, then one would expect very similar risk premium observations at the same general interest rates. This observation led to the hypothesis that perhaps the relative risks of debt and equity were changing over time.

Alternative models were tested to empirically capture the dynamic relationship between risk premiums and interest rates (see Johnston, 1984). We determined that the model specified below was more appropriate than Model 1 for estimating risk premiums over the study period because it would capture this dynamic relationship

B. Model 2

$$RP_t = \alpha_0 + \alpha_1(D1_t) + \alpha_2(D2_t) + \alpha_3(D3_t) + \alpha_4(D4_t) + \beta(TB_t) + \varepsilon \quad (3)$$

where

RP_t = quarterly average risk premium for all utilities

$D1_t$ = binary variable equal to 1 for Quarter 2 1984 through Quarter 4 1993, and 0 otherwise

$D2_t$ = binary variable equal to 1 for Quarter 1 1987 through Quarter 4 1993 and 0 otherwise

$D3_t$ = binary variable equal to 1 for Quarter 2 1991 through Quarter 4 1993 and 0 otherwise

$D4_t$ = binary variable equal to 1 for Quarter 3 1992 through Quarter 4 1993 and 0 otherwise

TB_t = quarterly average 30 year U.S. Treasury bond yield

The binary variables in Model 2 are included to account for major changes in the relative risks of debt and equity. These changes in relative risk would be reflected as shifts in the level or magnitude of the risk premiums regardless of the behavior of Treasury bond yields. We did not attempt to determine specific factors that might account for such shifts. Cumulative sum of error tests (see Hall Johnson, and Lilien 1990) and break point Chow tests (see Pindyke and Rubinfeld, 1991) were used to determine the placement

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Figure 2. Observed Risk Premiums Plotted Against Treasury Bond Yields
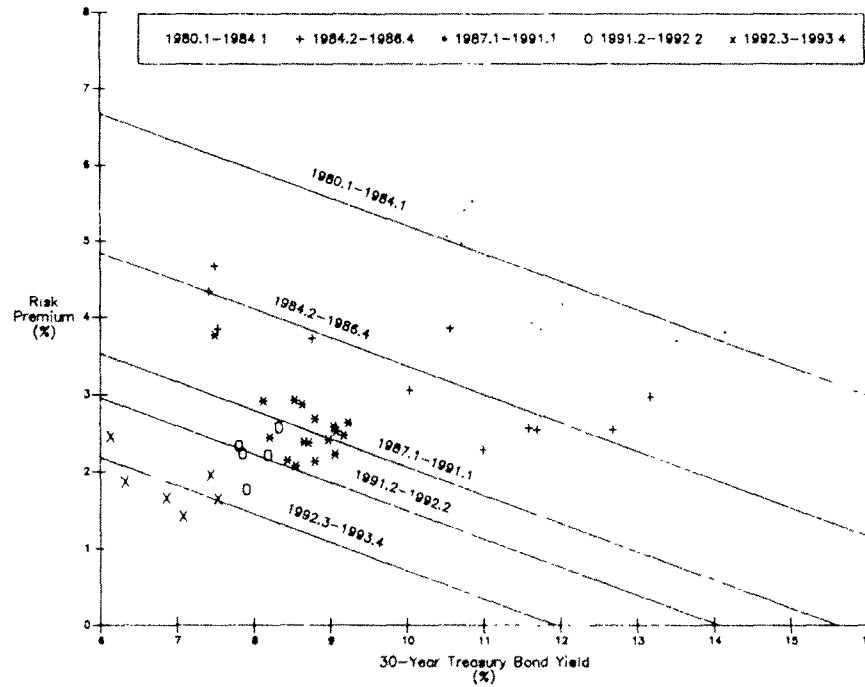
of the binary variables. These tests indicated that significant shifts in the market's evaluation of the relative risk of debt and equity most likely occurred in 1984, 1987, 1991, and 1992.

Table 1 reports the results of fitting Equation (3). These results indicate an inverse relationship between ex ante risk premiums and interest rates over the sample period. A first-order autoregressive correction was made to adjust for the possibility of serial correlation during the sample period (see Johnston, 1984, pp 321-324). The adjusted R² for Model 2 is 0.82. All variables are statistically significantly different from zero at the 0.01 level, except for D3 and D4, which are significant at the 0.05 level. As anticipated the coefficient estimate of the Treasury bond variable is negative, which indicates the existence of a general inverse relationship between interest rates and risk premiums over the study period.

It is important to note that Model 2 identifies the basic relationship between risk premiums and interest rates, which is defined by the slope coefficient β, as statistically stable over the sample period. Stability of the Treasury bond slope coefficient over the study period was supported by statistical tests that permitted the slope coefficient to change.

C. Interpretation of Empirical Results

The inverse relationship indicated in Table 1 represents approximately 37 basis points for each 100 basis point change in Treasury bond yields. This result is consistent with the Harris and Marston (1992) study, which found a 36 basis-point inverse relationship between long-term government bond rates and risk premiums for a broader sample of companies for the 1982-1991 period. However our utility risk premium values are lower than those reported by Harris and Marston for the broader market. One might expect such a difference between the risk premium for utility stocks and the broader market, due to the relatively lower risk of utility stocks.

Harris and Marston found that changes in relative risk as proxied by a yield spread variable, were important in explaining risk premium changes in subperiods between 1982 and 1991. They also noted, however, that the yield spread variable was more significant in the early 1980s and less significant in the latter 1980s. This phenomenon may be embedded within our intercept dummies, which also exhibited a declining level of magnitude and significance. Interestingly, the break-points for Harris and Marston's

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Table 1. Model 2 Regression Results

This table reports the results of fitting Equation (3). The risk premium is the dependent variable.

Variable	Coefficient	Standard Error	t-statistic
Intercept	8.550	0.776	11.444
TB	0.368	0.063	5.878
D1	1.828	0.250	7.318
D2	1.309	0.234	5.598
D3	0.569	0.27	2.051
D4	0.773	0.343	3.30
Adjusted R²	0.818		Durbin-Watson statistic	9.20

Significant at the 0.01 level

Significant at the 0.05 level

Regressions were corrected for the possible existence of serial correlation using the Cochran-Orcutt method.

sub-periods closely approximate the break points indicated by our tests.

Trends in the overall level of risk premiums provide one of the more intriguing comparisons between our results and those of Harris and Marston. Both studies support an inverse relationship throughout similar study periods. However, the late 1980s and early 1990s produced some of the highest risk premiums in Harris and Marston's study, while the same period produced some of the lowest risk premiums observed in our study. These results may be indicative of higher perceived risk for their broader sample relative to our utility stock sample during this period. Electric utility companies generally have significantly lower reported values for beta than would be reported for a broad market sample of companies. While beta is a somewhat controversial measure of risk, Harris and Marston report a significant positive relationship between beta and risk premiums.

Our results indicate that ex ante risk premiums for electric utility stocks remained inversely related to interest rates over the study period when changes regarding the market's evaluation of relative risk are taken into account. We acknowledge the limitation that our regression model is descriptive of the study period only, however, some measure of robustness would appear to be imparted by the fairly wide range of market climates in our study period.

During the study period, any number of events could have had an impact on the relative risks of debt and equity. In all likelihood, this relationship will continue to be affected by

innumerable future events. The projected growth rates for utility dividends and earnings during the early 1980s were viewed by some as too high to be sustainable and therefore not reasonable proxies for the long-run growth rate the DCF model requires. Interestingly, the projected dividend and earnings growth rates for the early 1990s have been viewed by some as too low. Therefore, results of a descriptive model developed from ex ante measures over a period of time can help to provide a reasonableness check concerning an estimate at one point in time.

IV. Usefulness of the Model

In developing cost of equity recommendations, the staff of the Virginia State Corporation Commission (VSCC) presently includes ex ante risk premium methods based on the information presented in this study as well as others. For example, the VSCC staff incorporated an earlier version of the model presented in this paper to formulate a cost of equity recommendation for The Potomac Edison Company in a 1993 rate case. At that time, the model included data from 1980 to 1991 which indicated two shifts in the level of risk premiums, one in the second quarter of 1994 and the other in the first quarter of 1987. The estimated slope coefficient at that time was 0.395, or roughly 40 basis points for each 100 basis point change in interest rates.

Using the 6.3% average yield on 30-year Treasury bonds from July 1993 to September 1993, the model indicated a risk premium of 3.4%. Combined with the 6.3% interest

rate. this risk premium produced a 9.7% cost of equity estimate The VSCC staff also adjusted the average risk premium for the study period based on the model's slope coefficient to obtain a cost of equity estimate for the current level of interest rates. Using this approach, the 3.9% difference between the average interest rate over the study period (10 2%) and the recent 3-month average rate (6.3%) was multiplied by the approximate slope coefficient of 0 4% The resulting 1.6% was then added to the 3.4% average risk premium for the study period to incorporate the inverse relationship between Treasury yields and utility equity risk premiums This approach indicated a current risk premium of 5.0%, which indicated a current cost of equity of 11.3% when combined with the 6.3% interest rate A 10 basis-point flotation cost adjustment was added to both estimates, thus providing cost of equity estimates of 9.8% and 11.4% from the risk premium study. The Potomac Edison Company's requested rate increase reflected a 12.50% return on equity (and increased rates had been in effect on an interim basis subject to refund since September 28, 1993). Ultimately, the VSCC authorized a cost of equity range of 10.4% to 11.4% in its Final Order issued on November 18, 1994

In addition to providing the basis for a supplemental cost of equity estimate, our risk premium study may be applicable in a more relaxed regulatory framework For example, in its investigation of alternative regulatory methods for local telephone companies, the VSCC established a number of regulatory options for local telephone companies in Case No PUE930036. The Earnings Incentive Plan option in that case included the provision for an annually authorized return on equity range that would span 300

basis points and be based on a risk premium approach that recognizes an inverse relationship between risk premiums and interest rates. The risk premium for the bottom of the range in each year would be established as 2.0%, plus 0.5 times the difference between 10.0% and the three-month average yield on 30 year Treasury bonds from September through November of the preceding year. The risk premium for the top of the range would be determined in the same manner, except that the calculation would start with a base level of 5.0% The resulting risk premiums (subject to the constraint that they cannot be less than zero) are added to the same three-month average yield on 30 year Treasury bonds in the risk premium formula to produce the cost of equity range The average interest rate and risk premium from a study such as ours could easily be incorporated within a plan like the one developed by the VSCC. While the VSCC's plan did not incorporate a provision for the sharing of earnings, one could be included so that returns above the banded range could be shared

V. Conclusions

This study furnishes evidence that equity risk premiums are not constant Our results indicate a statistically significant inverse relationship between interest rates and utility equity risk premiums Yet considering that our study covers a recent 14-year period, the hypothesis of a constant ex ante risk premium should also be tested over a longer period It would also be interesting to test whether the long term average of ex ante risk premiums converges with the long-term average of ex post risk premiums. ∎

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June 27, 2008

Industry Report Card:

Utility Sectors In The Americas Remain Stable, While Challenges Beset European, Australian, And New Zealand Counterparts

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Industry Credit Outlook

Creditworthiness has been somewhat mixed for the global utility universe since the beginning of 2008. The U.S., Canadian, and Latin American sectors continue to enjoy a period of relative ratings stability, while the credit environment for the European, Australian, and New Zealand utilities remains negative. The flurry of downgrades in the latter sectors can be traced predominately to accelerating merger and acquisition (M&A) activity. Additionally, increased pressures from national regulators and governments, coupled with sizeable construction programs, have weighed upon certain European utilities, while adverse weather conditions continue to negatively affect both Australian and New Zealand utilities.

Contributing to ratings stability for the U.S., Canadian, and Latin American sectors has been the focus on more conservative and lower-risk regulated operations, solid liquidity positions, steady capital market access, healthy cash flows, improving financial profiles overall, and rate orders from regulators that have generally supported utilities' creditworthiness. Nonetheless, the increasingly familiar challenges of escalating capital expenditures, declining generating reserve margins, aging infrastructure, environmental mandates, ongoing M&A activity, mounting requests for rate hikes, rising expenses, and volatile fuel prices will continue to dominate the credit picture for the foreseeable future.

Although these challenges and uncertainties may pressure financial performance, for the most part Standard & Poor's Ratings Services believes that the credit trend for these three sectors is likely to remain relatively steady. Yet in Europe, debt-financed acquisitions, weakening financial conditions, the need for substantial investment in generation, transmission and distribution and in midstream and upstream gas, and regulatory pressures will continue to threaten ratings. And, in the absence of normal rainfall, together with continuing M&A activity, the outlook for the Australian and New Zealand sectors will remain negative.

While some European utilities, especially hydroelectric and nuclear generators, will likely benefit from rising power prices and growth from renewable energy prospects, ratings are likely to remain under pressure due to M&A transactions and increasingly unsupportive regulation in Spain, Italy, and Germany. The Canadian utility sector continued its trend of stable credit quality, reflecting a focus on the expansion of lower-risk regulated core assets, modest M&A activity, and the absence of any indication of further material market restructuring in any of the provinces. The Australian utility sector remains under pressure due to increased M&A activity and ongoing drought, any worsening of which could restrict power station outputs causing high spot prices. However, ongoing sound liquidity and refinancing practices may temper these adverse conditions. In Latin America, utilities continue to benefit from economic growth, but are faced with relatively high capital outlays.

A very important dynamic for shaping the overall financial condition of the industry will be the quality of regulation. Future rate-setting actions in all sectors will weigh heavily on credit quality. In the U.S., recent rate

rulings have been supportive of new investment in power plant construction and of commodity pass-through via adjustment mechanisms. Still, regulators will likely be reluctant to authorize material rate increases. Substantial capital outlays, including environmental-related expenditures, high fuel and material costs, pension obligations, and health care expenses further exacerbate these pressures. In Europe, heightened regulatory pressures are stemming both from national regulators and the EU Commission. Adverse regulatory developments in Spain and Italy have recently dampened domestic utilities' earnings, while the regulatory environment in Germany has deteriorated markedly in recent months.

In the U.S. and Latin America, financial performance has been steady to moderately improving due to supportive rate actions, including the ability of most companies to pass on to customers higher fuel prices, deleveraging, and effective cost containment. However, this general improvement is likely to slow due to high energy costs and problems that could arise with fuel availability, the continuation of debt-financed acquisitions, and accelerating capital outlays. The global credit squeeze has had minimal effect on the credit quality of rated Australian and New Zealand utilities. Continued sound liquidity and refinancing practices of the Australian and New Zealand sectors will help to insulate these utilities, with fallout largely limited to some contraction of debt maturity profiles rather than in strained access to credit. In general, responsive and timely rate adjustments by regulators and credit-supportive actions by management will be necessary to prevent a decline in global bondholder protection.

United States

Rating activity for the U.S. investor-owned electric utility sector continued to moderate during the first half of 2008. Since the year began, Standard & Poor's downgraded nine holding companies and operating subsidiaries (four of which related to a single entity, Consolidated Edison Inc., and three to PNM Resources Inc., whose ratings were lowered twice during the second quarter) , and upgraded six (three of which were related to Sierra Pacific Resources).

The negative credit momentum experienced was attributable to predominately weakening financial conditions. In the case of PNM Resources, a trading misstep and operational challenges led to its downgrade to 'BB-' from 'BB+'. Consolidated Edison's (A-/Stable/A-2) lower ratings can be traced to insufficient rate relief and prospects for declining measures of bondholder protection. The positive credit actions were the result of reduced exposure to riskier unregulated activities, generally supportive rate decisions, deleveraging, and increasing free cash flow. The upgrades on Sierra Pacific Resources and its operating subsidiaries Nevada Power and Sierra Pacific Power reflect the company's substantial progress to secure additional generating resources and reduce short positions, adequately hedge market exposures, reduce debt leverage, and constructively manage regulatory risk by working with the Public Utilities Commission of Nevada and the legislature to support timely cost recovery.

A notable development affecting certain companies has been the fallout from failed auctions for auction rate securities: long-term debt securities whose interest rates are reset via an auction process every seven, 28 or 35 days. The failures were the result primarily of investor concern with the financial health of bond insurers. However, non-punitive indentures and strong liquidity positions enabled utilities to deal with failed auctions in a credit-neutral manner. Yet the penalty rate for failed auctions has varied significantly. Some companies experienced considerably higher interest rates while others experienced moderate increases in interest costs. Numerous companies have refinanced or remarketed these securities and implemented different maturities to avoid the need to conduct auctions, or are in the process of pursing other alternatives.

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Credit quality in the U.S. regulated electric utility industry continues a long shift to greater stability as companies have shed noncore operations and strengthened their balance sheets. Yet significant longer-term challenges to utilities' financial health remain and are intensifying. These challenges will be prolonged, and will include:

- Heavy construction programs to address demand growth, declining capacity margins, and aging infrastructure;
- Regulatory responsiveness to mounting requests for rate increases;
- Rising operations and maintenance expenses, as well as escalating construction and raw material costs;
- Volatile fuel costs, especially natural gas;
- Environmental compliance, including renewable portfolio standards mandates, and uncertainty over the rules that will address carbon emissions; and
- Financing flexibility and access to capital markets.

To sustain their current credit quality in the face of these long-lived challenges, utilities need to have established -- and be able to maintain -- a firm credit foundation. This will require a strong and effective working relationship among management, regulators, and increasingly legislators and governors, in the planning and execution of strategies. A comprehensive vetting and understanding of the risks associated with the regulatory mechanisms under which the utility will recover its investment, which could include a cash return during construction and timely recognition of volatile costs, will be paramount in preserving creditworthiness.

Recent rate orders have been relatively supportive of companies' credit quality. However, prospectively, regulators will be addressing large base-rate relief requests related to new generating capacity additions to meet incremental load and to replace aging infrastructure, environmental modifications on coal plants, and transmission and distribution improvements. Current cash recovery and/or return by means of construction work in progress support what would otherwise be a significant cash flow drain, and reduce a utility's need to issue debt during construction. Moreover, allowing rate recovery of projected costs with subsequent periodic updates for actual results reduces lag in cost recovery.

A favorable development for credit quality is that many regulatory rulings related to the construction of new base load follow comprehensive settlement negotiations among utilities, commission staff, consumer advocates, and other major intervenors. Such an approach limits the possibility of any subsequent review of utilities' expenditure decisions. Also supportive has been the adoption in a growing number of states of environmental-tracking mechanisms and other riders that allow companies to reflect in rates capital costs associated with environmental compliance equipment, without having to file a formal rate case. Finally, the greater the percentage of a utility's rates that are recovered through fixed charges, rather than volume-based charges, the greater the support for credit quality.

The environmental consequences of management decisions have assumed a very prominent role politically. The U.S. Senate has begun the process to advance a bill restricting greenhouse gas emissions and new administration in Washington will likely pass some form of legislation in the next few years, which will almost certainly have far-reaching implications for capital and operating expenses and for resource planning by utilities. Ultimately, companies' ability to fully recover environmentally mandated costs in authorized rates and consumers' willingness to pay them will determine the electric utility industry's future credit strength.

One very significant consequence of the increased focus on environmental concerns is reconsideration of new nuclear power capacity. At both the federal level -- through passage of the Energy Policy Act of 2005 -- and the state

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level -- through supportive cost recovery legislation -- public officials are displaying a level of support for the construction of new nuclear facilities not witnessed in decades. SCANA Corp. is the first investor-owned utility to actually file for a certificate of need, and once approved, will request recovery of financing costs during the construction period. Georgia Power Co. also plans to build two new units at an existing site and has filed with the Georgia Public Services Commission for recovery of pre-construction costs. Georgia does not have explicit legislation that provides for a cost recovery framework but rather relies on the approval by the Commission of the company's integrated resource plan. In addition, Georgia currently does not provide for recovery of financing costs on a current basis.

Europe

The general adverse trend continues for major European utilities, with three negative rating actions on the 20 largest utilities since the beginning of the year and no positive rating actions. Moreover, three utilities have negative outlooks while another three are on CreditWatch with negative implications, reflecting the risk of a potential imminent downgrade. In comparison, we only have two companies with either positive outlooks or positive CreditWatch implications.

M&A activity has continued to be a key rating factor: It was the main reason for all three negative CreditWatch placements. It has, however, taken various forms: Some rating actions, such as those on Italian utility Enel SpA and on Spanish utility Endesa S.A. earlier this year, are linked to mega-transactions concluded in 2007. The planned merger between French utilities Gaz de France S.A. (GDF) and Suez S.A., as a result of which both groups are on CreditWatch, also belongs to this mega-transaction category.

As the current environment is less conducive to such large transactions, European utilities are now pursuing more limited and targeted acquisitions. These can nevertheless prove credit-dilutive and lead to lower ratings. Recent CreditWatch placements illustrate some of the areas which major European utilities are especially targeting at the moment, such as renewables or emerging markets with strong growth potential: British utility Scottish and Southern Energy PLC (SSE) was placed on CreditWatch with negative implications in January 2008 following its acquisition of renewables company Airtricity Europe, while Finnish incumbent Fortum Oyj was placed on CreditWatch with negative implications in March 2008 following the announcement of its acquisition of Russian generator TGC-10. A number of major utilities, such as French incumbent Electricite de France S.A. (EDF) and major German utilities E.ON AG and RWE AG, is also seeking to participate in the budding nuclear revival in the U.K. and in Eastern Europe. Such interest has not so far resulted in any rating action. It could, however, especially if such interest entails debt-funded bids for nuclear operator British Energy, which is considered to have the best sites for new nuclear build in the U.K.

The substantial investment programs announced by most European utilities, even though mostly organic and hence less risky than external growth, have nevertheless also started to take their toll on ratings. This reflects that such investment programs are large scale and will thus significantly weigh on financial profiles. The scale of investment programs was the key factor in the recent downgrades of Italian utility Edison SpA, Spanish utility Gas Natural SDG, S.A., and major German utility RWE. In the case of RWE, higher investment program's impact on financial measures was compounded by a more shareholder-friendly financial policy. In general, however, shareholder pressure is not a significant rating factor at present among EU utilities.

While not yet a negative rating factor per se, regulatory pressure both from national authorities and from the EU is

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on the rise. The situation varies considerably, however, from one country to another. German utilities are particularly vulnerable, as demonstrated by the significant concessions E.ON, and to a lesser extent RWE, have offered to persuade the EU Commission to close pending antitrust cases against the group.

Nevertheless, major European utilities, especially generators, continue to benefit from a favorable outlook for power prices, which are continuing to rise in most markets. This is driven to a large extent by higher carbon dioxide (CO_2) and commodity prices, and hence does not automatically translate into higher margins for all players: While such a context is very beneficial for hydro and nuclear generators in liberalized markets, it is less so for carbon-intensive generators which are affected by the reduction of free CO_2 allowances in phase II of the Emissions Trading Scheme and the resulting increase in the price of CO_2 allowances. At RWE, which has the largest CO_2 allowance deficit of all European utilities, the cost of buying allowances has thus risen to €307 million in the first quarter of 2008 from €26 million in the same period of 2007.

Enel and Iberdrola S.A. were both downgraded to 'A-' from 'A' following their acquisition sprees in 2007. Iberdrola benefits, however, from a stable outlook as it has already completed a large share of its planned disposals with the partial IPO earlier this year of its renewables arm, which generated a cash inflow of €4.5 billion. Conversely, the negative outlook on Enel's rating indicates that, notwithstanding the announced €11.8 billion disposal of Enel and Endesa assets to E.ON, further significant divestments are necessary to shore up its financial profile and 'A-' rating.

Renewable energy is a key area of growth for European utilities, reflecting the carrot of generally supportive regulatory frameworks on the one hand and the stick of requirements to source power from renewables sources and the reduction of free CO_2 allowances on the other. Acquisitions in this field tend to be very credit dilutive given their high price in particular in relation to earnings and cash flow generated, but also given the capital expenditures required to increase capacity: SSE acquired Airtricity in February 2008 for an enterprise value of €1.455 billion. As most of Airtricity's wind turbines are at the pipeline stage, its earnings contribution is minimal, while it is expected to account for the bulk of SSE's £2.5 billion capital expenditure in renewables by 2013. Nevertheless, renewables are proving to be a source of financial flexibility for early movers, as demonstrated by Iberdrola's successful IPO of a minority stake in its renewable subsidiary; Portuguese incumbent, EDP - Energias de Portugal, S.A., and Enel are thinking of doing the same.

M&A is likely to continue to heavily influence ratings in coming months. This reflects the substantial financial firepower of some groups, in particular RWE, whose financial profile is currently robust after the sale of its water operations; GDF-Suez whose merger will be an all-share transaction; and E.ON, even though the rest of its massive €63 billion investment program should be essentially focused on organic growth (following the purchase of assets from Enel and Endesa). EDF has also stated its interest in the U.K. and Spain, but its €33 billion investment program between 2008 and 2011 leaves limited financial flexibility for significant debt-funded acquisition at the current rating level.

Other players still face strategic issues, such as RWE which needs to reduce the carbon intensity of its generation and plans to expand further outside Germany. Likewise, British utility Centrica needs to reduce its exposure to wholesale gas prices. In addition a large number of power utilities, including EDF, RWE, Edison, and EnBW Energie Baden-Wuerttemberg AG, is seeking to expand in gas in order to secure supplies at a time of growing recourse to gas-fired power generation and to be able offer competitive dual fuel offerings to their retail client base. Furthermore, utilities that have only recently started to expand in renewables, such as RWE or GDF-Suez, may consider acquisitions to speed up their growth in this area.

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Last, some markets, such as Spain, the Netherlands, and Italy, and possibly the U.K., continue to offer some consolidation opportunities.

The sizable investment programs announced by most major EU European utilities are triggered by:

- The declining reserve margin in most countries, which in turn reflects growing demand and the aging of generation fleets;
- Substantial investment in regulated distribution and transmission activities; and
- Investment in midstream and even upstream gas to secure gas supplies and participate in the electricity and gas convergence.

On top of the execution risks such large investment programs entail and their toll on credit measures, this new investment cycle is inherently more risky than previous ones because of the volatility of power prices in liberalized markets and of input prices. The uncertainty on long-term climate change policies adds a further layer of unpredictability as to the respective competitiveness of various forms of power generation. Moreover, the costs of power plant construction keep increasing as a result of higher commodity prices and strong demand. This has already led to the cancellation of a number of planned power plants.

Increased regulatory pressures are stemming both from national regulators and the EU Commission. Adverse regulatory developments in Spain and Italy have dampened domestic utilities' earnings in the first quarter, while the regulatory environment in Germany has deteriorated markedly in recent months.

The Spanish government announced a new regulation (Royal Decree 11/2007) based on the same principles as the measure introduced on Feb. 24, 2006 (Royal Decree 3/2006), which obliges the incumbent generators to deduct from generation revenues the cost of the CO_2 emission rights allocated for free. These deductions will directly impact these companies' earnings. With these measures the government is seeking to reduce the tariff deficit in the electricity system. In the absence of implementation rules, the companies have estimated the deduction in generation revenues in their first-quarter results. The hit to earnings represented €106 million for Endesa (out of EBITDA of €1.63 billion) and €84 million for Iberdrola (out of EBITDA of €1.79 billion). The impact depends on the market price of CO_2 rights and weather conditions, as these influence the generation mix in Spain and hence CO_2 emissions. This explains why the reduction in the first quarter of 2008 was large compared with the first quarter of 2007. In Italy, the regulator has not yet taken action over the reimbursement of CO_2 costs for CIP6 contracts, which hit Edison's earnings in the period. The group expects, however, that these costs will eventually be recovered, hence its guidance of 2008 earnings in line with those of 2007.

In Germany, the regulatory environment has deteriorated in 2008, with further tariff cuts for transmission and distribution networks, and the §29GWB amendment to the market abuse law passed at the end of 2007. This amendment targets utilities with dominant market positions. Utilities are considered dominant under the law when their prices exceed those of competitors by 10%, or if they inadequately reflect costs. In addition, the substantial concessions that E.ON has offered to the EU to close antitrust cases--disposal of its power transmission grid and of about 20% of its generation capacity--have increased pressures on the other major German utilities. To close a similar case, RWE has now offered to dispose of its gas transmission grid.

The EU is pursuing its two-pronged approach of seeking to liberalize the sector overall and launching cases against individual companies. The EU Commission is thus continuing to push for ownership unbundling of transmission networks, on which discussions are ongoing. With respect to cases against companies, the EU Commission has

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recently launched an in-depth antitrust inquiry on GDF over alleged gas supply restrictions. This inquiry comes on top of the one launched in July 2007 against GDF and E.ON for alleged market sharing in gas

Australia And New Zealand

The Australian utilities sector faces increased M&A activity, adverse climate conditions, and new regulations. Since the end of 2007, creditworthiness in the Australian sector has been subject to negative pressure due to the conclusion of a number of M&A transactions, resulting in an extraordinarily high 20 rating actions. The completion of the break-up of Alinta Ltd. (formerly rated 'BBB') resulted in nine rating actions. In contrast, credit quality of utilities in New Zealand has been relatively stable, with only two outlook changes: Transpower Ltd's (AA-/Stable/--) outlook was revised to stable from negative following reduced earnings risk as regulatory risks abate, and Watercare Ltd.'s (A/Negative/A-1) outlook was revised to negative from stable due to uncertainty in the company's ability to pass through capital expenditures to its end users.

Over the next 12 months we expect M&A activity to be the key determinant of credit quality. Major prospective transactions include the sale by New Zealand's Vector Ltd (BBB+/Stable/--) of its Wellington networks business to Hong Kong's CKI Group and the planned privatization by Australia's largest state, New South Wales, of its state-owned electricity assets. Of particular note was the vertically integrated utility Origin Energy Ltd's (Origin; BBB+/Stable/A-2) significant upgrade of its coal seam gas reserves that in the company's view represent an increase in value sufficient to warrant rejection of U.K.-based BG Energy Holdings Ltd's (BG; A/Watch Neg/A-1) takeover offer. The challenge for Origin will be to monetize the increased reserves to justify rejection of BG's offer.

Also weighing on the sector in both countries are ongoing adverse climate conditions. In the absence of normal winter and spring rainfall in Australia that will relieve generation constraints, there could be a return to the high wholesale prices of 12 months ago, resulting in the consequent erosion of retail margins and a cash-flow squeeze. In New Zealand, hydrological conditions are the worst since 1992, resulting in abnormally very high spot prices in this hydro dominated market. Nevertheless, we expect minimal impact on financial profiles in fiscal 2008 due to active management by the rated integrated generator-retailers. The nature of the "run of the river" market means conditions can turn around quickly and poor hydrology would need to persist for quite some months before cash flows are sufficiently adversely impacted to affect ratings.

Overlaying the sector's creditworthiness in both countries is the prospective introduction of carbon emission trading schemes. The Australian federal government has committed to decrease greenhouse gas emissions by 60% of 2000 levels by 2050. Both Australia and New Zealand plan to introduce their respective programs in 2010, but they currently lack detail, and the prospective impact on the energy sectors in both countries remains uncertain. Nevertheless, New Zealand retailers are likely to increase retail prices over the next 18 months in order to preserve profit margins in advance of inclusion of the energy sector in the country's carbon trading.

The global credit squeeze has had minimal effect on the credit quality of rated Australian and New Zealand utilities. Continued sound liquidity and refinancing practices of the sector will largely insulate the sector, with fallout largely limited to some contraction of debt maturity profiles rather than in limiting access to credit.

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Canada

The Canadian utility sector's credit quality remains stable, reflecting a focus on the expansion of lower-risk, regulated core assets. Nothing on the horizon suggests further material electricity market restructuring in any province. The sector remains solidly investment grade, with all issuer ratings falling within the 'A' and 'BBB' categories.

The pipeline sector continues to work on capacity expansion to accommodate oil sands growth. Enbridge Inc. remains very active, with a number of projects in Canada and the U.S. TransCanada PipeLines Ltd. (TCPL) also recently announced that it will begin construction of the Keystone pipeline in the second quarter. The pipeline has targeted completion in late 2009, and will convert part of its gas mainline into an oil sands pipeline. TCPL also has announced a proposal to build Keystone XL, a pipeline that would directly link the oil sands with refineries on the Gulf Coast. The company is seeking shipper commitments. If the project proceeds, construction would likely not begin until 2010.

On the M&A front, TCPL recently purchased for US$2.8 billion the Ravenswood Generating Station in New York City, following last year's acquisition of U.S.-based ANR Pipeline Co. TCPL has some existing familiarity with the New York electricity market through its ownership of hydroelectric generation assets in New York State. The company recently completed an equity issue to partially finance this purchase.

Electricity supply adequacy is being addressed across Canada, with major refurbishment of nuclear units in New Brunswick and Ontario and greenfield development across the country. Several gas-fired projects are underway in Ontario and Alberta, with more to come. Construction of the 450 MW Keephills supercritical coal-fired unit also in Alberta is progressing, with unit commissioning expected by first quarter 2011. Hydro-Quebec, Manitoba Hydro-Electric Board, and British Columbia Hydro & Power Authority, all government-owned monopolies, are engaged in the approval and construction of several major hydroelectric developments. Construction of small hydroelectric developments and wind farms, supported by long-term contracts with government-owned utilities, is gaining momentum across most regions. Planning and approvals for intra- and inter-provincial transmission system expansion have begun.

Sectorwide, liquidity remains adequate and contributes to the predominantly intermediate financial risk profiles of investment-grade Canadian utilities. There has been active bond issuance by participants in the second quarter. Several utilities have also increased their credit lines in preparation for upcoming capital spending programs.

Latin America

Latin American electric utilities continue to enjoy a benign rating environment despite the adverse global credit markets since the second half of 2007. Most of these companies enjoy adequate financial performance, which is supported by good cash flow generation fueled by solid demand for power deriving from economic growth, which partly reflects the positive environment for commodities in general.

The sector's big challenge has been to attract new investments to meet growing demand and offset the decreasing trend in capacity reserves in the last three to four years. In Chile, one of the most attractive markets in the region, potential new investments in power generation were delayed due to major uncertainties posed by increasing shortages of natural gas imported from Argentina since early 2004. However, the new legal framework defined in

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May 2005 mitigated those uncertainties and triggered several new power generation projects that are projected to start operations from 2009 onwards. In the meantime, lower capacity reserves, combined with poor hydrology, have resulted in a very tight supply demand balance in the largest electric system during 2008, which significantly increased the risk of outages or potential rationing. However, the companies remain in relatively good shape, which is reflected in the mostly stable outlooks for rated Chilean electric utilities.

The most important issues for the Brazilian electric sector during 2008 and 2009 will be power supply and costs, capacity expansions, acquisitions, and the completion of the second tariff revision for distribution companies under the current regulatory framework. Overall, we expect the good performance of the Brazilian economy to allow electric utilities to continue improving cash flow generation and debt service coverage ratios while maintaining good liquidity and financial flexibility, which could potentially result in positive rating actions.

Argentine electric utilities show an improved financial performance mainly due to certain tariff and price increases in 2007 although they remain at low levels on a global basis. The higher tariffs for distribution companies resulted in soaring capital expenditures, which should allow those companies to maintain their relatively good service quality and financial indicators. In addition, a new legal framework for new power generation capacity has triggered new projects that are targeting large power users at significantly higher prices than current spot prices in the wholesale electricity market, which concentrates a great portion of domestic demand. However, the weak ratings (generally in the 'B' category) in the sector continue to reflect high political and regulatory risk.

Overall, we expect Latin American electric utilities to continue performing well during the second half of 2008. They should enjoy good cash flow generation, though in certain cases they will be pressured by relatively high capital expenditures, and to continue accessing new financing mainly in the local capital markets and in the local or international bank market, but at a higher cost than during the last three years. However, we will continue to closely monitor the financial flexibility of those companies in a weaker financial condition, with a too aggressive capital expenditure plan or that face a high level of bond maturities in the coming months.

Issuer Review

Table 1

Company/Corporate Credit Rating*/Comments	Country	Analyst
U.S.		
American Electric Power Co. Inc.(BBB/Stable/A-2)		
AEP faces an almost constant cycle of regulatory proceedings in one or more of the 11 states in which it operates, as well as at the federal level. The mostly coal-burning company has spent a lot of money on environmental compliance and plans to spend more on new generation and transmission, a massive undertaking that heightens operating and regulatory risk and could possibly erode AEP's generation cost advantage Longer-term challenges include, most prominently, the prospect of climate change legislation and its effect on AEP's existing resources and planning decisions, and the evolving state of the regulatory compact in Ohio The company's response to the recently-passed legislation in Ohio will be an important harbinger of management's attitude toward risk throughout the organization and could affect the outlook on ratings	U.S	Todd Shipman
Consolidated Edison Inc.(A-/Stable/A-2)		
Con Edison's credit quality will be impacted by the firm's financial policy in regards to debt leverage and cash flow realization, combined with cost recovery of capital expenditures. Future debt and equity issuances will be required to fund annual capital spending of about $2.5 billion (2008 estimate), common dividends of more than $500 million per year ($350 million to $400 million of dividends paid annually to Con Edison from Con Edison's Consolidated Edison Co of New York Inc.), and debt maturities of $809 million in 2008 Importantly, any deviation in expected cash flows, delays in reducing leverage, or difficulty recovering environmental and stranded costs in a timely manner may weaken the financial profile, heightening the potential for outlook revision to negative or a downgrade.	U.S	John Kennedy

Dominion Resources Inc.(A-/Stable/A-2)
Fuel expenses, once not fully recoverable and a drag on credit metrics, are much less of an issue for the reconstituted Dominion U S   Todd
The company has sold most of its exploration and production assets and used sale proceeds in part to achieve financial   Shipman
measures that support credit quality The lower exposure to unregulated activities, along with re-regulation in Virginia, have
improved business risk. Aggressive capital plans will likely hold back any dramatic improvement in financial measures,
dampening further ratings uplift, but steadier financial performance is expected to support credit quality

Duke Energy Corp.(A-/Stable/--)
Duke's North Carolina operations continue to operate under the rate settlement reached in late 2007 As part of that settlement, U S   Dimitri
the company agreed to capitalize environmental compliance costs in excess of what was captured in the Clean Smokestacks   Nikas
Act for recovery at a later date The rate settlement in North Carolina should provide rate certainty over the next three years as
the company pursues a large capital spending program to address load growth and environmental compliance that may include
construction of new nuclear plants as well as a new coal- and gas-fired plant Duke Energy estimates that it will need to add
about 7,700MW of new generation over the next 10 years to satisfy demand. Duke Energy Ohio is preparing to file an Energy
Security Plan as required by the passage of the recent SB 221 energy legislation The plan is to take effect after the company's
current rate stabilization period ends in 2008 While the Public Utility Commission of Ohio will be providing the necessary
implementation details for the energy legislation, the legislation should address the uncertainty that has existed so far. Duke
Energy Indiana is proceeding with plans to build a 630 MW integrated gasification combined cycle plant that is estimated to
cost about $2 billion. The consolidated financial profile remains strong with $4 billion in funds from operations for the year
ended March 31, 2008, leading to FFO interest coverage of 5 9x and FFO/total debt of 30% Debt leverage remains modest at
about 38%

Edison International(BBB-/Stable/--)
Edison International produced sound consolidated credit metrics year to date due to good pricing and operational performance   U.S.   Anne
at its unregulated merchant operations owned by Edison Mission Energy and continued solid cash flows at Southern California   Selting
Edison (SCE), which provides about 75% of operating cash flows Consolidated FFO to debt and interest coverage were 19% and
2 9x respectively, as of March 31, 2008, with leverage in the range of 62% SCE is in the midst of a large capital program that
may nearly double its asset base by 2012 Its 2007 general rate case filing for 2009 through 2011 that requests a 6 2% increase
in overall rates (or 16 2% increase in base rates) is scheduled for hearings at the end of May and a final decision is likely by
year end 2008 Regulation continues to be supportive, although challenges exist in managing the capital program, flowing these
costs through to customers (many of whom benefit from a rate freeze under legislation) and the potential for the reintroduction
of direct access We also expect that procurement obligations faced by the utilities could increase, with the California Dept of
Water Resources recent announcements that it would like to assign power contracts to the utilities in advance of their
expiration

Entergy Corp.(BBB/Negative/--)
Despite some obstacles in the process, Entergy is moving along with the proposed spin-off of its merchant nuclear generation   U S   Dimitri
assets The transaction is expected to be completed in a tax-free manner through the spin-off of the business to existing   Nikas
Entergy shareholders The spin-off contemplates the leveraging up of the merchant business so that the entity will distribute
about $4 billion to Entergy, $2.5 billion of which will be used for share repurchases and the balance of $1 5 billion will be used
for modest debt reduction at the holding company. As part of the spin-off, Entergy will form a services company that will be
jointly owned with the spin-off entity, presenting some concern that Entergy may have some residual liability Financial
performance for the 12 months ending March 31, 2008 has weakened compared to year-end 2007, but still remains robust, as a
result of higher

Exelon Corp.(BBB+/Stable/A-2)
Exelon's low-cost generation, which accounted for 85% of operating earnings in 2007, has benefited from high energy prices,   U.S.   Aneesh
but continues to face long-term exposure to market risk, material exposure to nuclear assets, and moderate counterparty credit   Prabhu
exposure. We will monitor the developments of Pennsylvania's energy independence strategy to gauge potential influence of
the regulatory environment on Exelon Exelon generated meaningful discretionary free cash flow in 2007, most of which went
for share buybacks For first-quarter 2008, FFO interest coverage ratio improved significantly to 5.3x, while FFO debt and
leverage ratio improved marginally compared with last year. Liquidity, at over $5 9 billion, is adequate.

FirstEnergy Corp.(BBB/Negative/--)
The company's operating performance has been satisfactory, but lingering doubts in this area harm credit quality Legislative   U.S   Todd
and regulatory attention in Ohio on rates and the post-2008 market structure in Ohio harbor significant risk, but any resolution   Shipman
that pushes the transition out past this year could help resolve the negative outlook Financial metrics and liquidity have
improved as substantial debt was paid down in previous years, but share buybacks and capital spending have stalled the trend
A firm commitment to a market-based future for its generating assets in Ohio and Pennsylvania could dampen credit quality in
the long-term

FPL Group Inc.(A/Stable/--)

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FPL Group's ratings and stability rest on the strength of its utility operations at Florida Power & Light (FP&L) The integrated utility is a large contributor to the group's earnings and cash flow, and its robust business profile centers on a constructive regulatory environment and a very healthy service territory Targeted growth in the unregulated wholesale energy business, a high-risk merchant energy portfolio, and an appetite for acquisitions will constrain credit quality. Financials provide thin support for the ratings, but have been improving Florida regulators' decision last year to reject a proposed clean-coal plant has exacerbated FP&L's dependence on natural gas to produce electricity	U S	Todd Shipman

MidAmerican Energy Holdings Co. (A-/Stable/--)

MEHC's strong credit ratings reflects the explicit and implicit support afforded to it by its parent, Berkshire Hathaway Inc (AAA/Stable/A-1+), which holds 88% of MEHC's common voting stock Berkshire has provided MEHC a $3 5 billion equity commitment agreement that expires in March 2011. Without Berkshire's support, MEHC's current aggressive financial profile, while showing some improvement, would support a rating that is in the low 'BBB' category MEHC's FFO coverage of interest and debt stood at 2.9x and around 13%, respectively as of March 31, 2008. Consolidated MEHC debt to total capitalization is a weak 65% Consolidated cash flows from operations are provided by MEHC's eight business platforms which consist of two investor owned utilities (PacifiCorp and MidAmerican Energy Co) two FERC regulated interstate gas pipelines (Kern River Gas Transportation Co and Northern Natural Gas), a UK electric distribution company (CE Electric UK), project financed power plant investments both in the U S and overseas (CalEnergy Domestic and CalEnergy Asia) and a predominately Midwest real estate brokerage company (Home Services) While the overall quality of cash flow is adequate for the rating, in 2008 PacifiCorp and MEC continue to invest heavily in infrastructure at the operating subsidiary level which will result in cash flows to pay parent debt being more concentrated on the other MEHC businesses	U S	Anne Selting

Pacific Gas & Electric Co. (BBB+/Stable/A-2)

PG&E is expected to receive in the coming months a final decision from the California Public Utilities Commission in its cost of capital proceeding The proposed decision would link the authorized return on equity (ROE, now at 11 35%) through 2010 to changes in a bond index, causing ROE to change if the index changes by more than 100 basis points. The utility continues to benefit from the average 4.5% rate increase approved in 2007 and in place through 2010. Storm costs and an extended nuclear refueling outage to replace Diablo Canyon #2's steam generator modestly eroded earnings in the second quarter, but cash flows remain strong The company expects to spend $3.6 billion in capital investment this year and during the first quarter spent $853 million. Regulation continues to be supportive, although challenges exist in managing its capital program, flowing these costs through to customers (many of whom benefit from a rate freeze under legislation) and the potential for the reintroduction of direct access Consolidated (including parent PG&E Corp) FFO to debt and interest coverage were 28% and 3 6x, respectively, as of Mar. 31, 2008 with leverage at about 53%.	U.S	Anne Selting

Progress Energy Inc. (BBB+/Stable/A-2)

Progress Energy has disposed of all of its non-regulated operations, a process that began in 2006, materially moderating business risk along the way. In addition, the company has reached a number of constructive regulatory outcomes in both the Carolinas and Florida, providing further support to credit quality. The financial profile remains aggressive and in light of the projected significant capital spending program over the next three years, will necessitate timely recovery of the investments in order to preserve the current ratings For the year ended March 31, 2008 FFO/interest coverage of about 3.2x, while FFO to total debt was about 13.2% and debt leverage 57 7%	U S	Dimitri Nikas

Public Service Enterprise Group Inc. (BBB/Stable/A-2)

Revenue enhancements from strong prices associated with the recent wholesale electricity auctions, the reliability pricing model results, and operational improvements resulted in FFO increasing to $2 2 billion in 2007, up from about $1.4 billion in 2006. Credit measures for the period ending March 2008 have improved, with adjusted FFO to interest coverage of over 4.8x, FFO to total debt of about 24% and debt leverage of just over 53%. Significant increase in capital spending to support the company's transmission growth and environmental commitments could slow the pace of improvement in credit metrics As for regulation, PSE&G has agreed not to implement either an electric or gas rate case until November 2009, exposing it to cost increases in the interim The company's liquidity is adequate, with about $2 5 billion available under credit lines	U.S.	Aneesh Prabhu

Sempra Energy (BBB+/Stable/A-2)

The MOU signed by the company to acquire a 25% interest in the Sunstone pipeline project requires no immediate capital commitment as the proposed pipeline will not be in service until 2011. However, sector construction costs have increased considerably in recent years and unless curtailed, could influence the project and the amount of debt and equity Sempra would need to fund its portion of the project's costs. As such, Sempra's financing requirements for the project relative to its financial profile at this future point would need to be evaluated, considering the company's share repurchase plan will weaken credit metrics in the near term The formation of RBS Sempra Commodities substantially improves Sempra's business risk, however this improvement is offset by Sempra's intention to complete a $1 5 billion to $2 billion leveraged share-repurchase program through 2009 Recent project completions include construction and performance testing of the Costa Azul terminal in Baja California, Mexico, as well as full service of the REX West pipeline in May 2008. On the regulated side, general rate case filings at both San Diego Gas & Electric Co and Southern California Gas Co are the most significant near- term drivers of credit quality Key cash flow metrics at Sempra Energy for the 12 months ended March 31, 2008 were maintained, with FFO to total debt and FFO to interest coverage of approximately 26% and 4.6x, respectively	U S	Bill Ferara

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Southern Co.(A/Stable/A-1)

Southern's credit profile continues to benefit from constructive regulatory frameworks for its operating companies, service territories with growing customer bases and attractive demographics, and strong operations. During 2007, Georgia Power settled its rate case achieving a moderately supportive outcome to raise base rates by $100 million and recover $222 million in environmental compliance costs annually for the next three years. Deferred fuel balances have declined by about $150 million during the first quarter of 2008, and remain significant at about $950 million, benefiting cash flow, and should decline further over the next few years, assuming no material fuel cost increases. Capital spending needs will be significant over the next three years and total about $14.4 billion to address maintenance and growth prospects, as well as to meet increasingly stringent environmental compliance standards. Southern Company is also pursuing the construction of two new nuclear units and has entered into an engineering, procurement, and construction contract with Westinghouse Subsidiary Georgia Power will be a 45.7% owner of the units. The company still needs approval from the Georgia Public Service Commission to proceed. The financial profile remains robust, benefiting from recent rate increases in Georgia and Alabama as well as recovery of deferred fuel costs. FFO/interest coverage for the 12 months ended March 31, 2008 was 4.4x, FFO to total debt was 19.2% and debt leverage remained stable at 56.9%. | U.S | Dimitri Nikas

Canada

Brookfield Renewable Power Inc.(BBB/Stable/A-2)

The company reported first-quarter results were materially higher on a year-over-year basis It experienced favorable hydrology; production was about 18% above long-term-averages This, combined with higher power prices, led to a 29% increase in operating cash flows year-over-year. | Canada | Kenton Freitag

Canadian Utilities Ltd. (A/Stable/A-1)

First-quarter results increased by more than 10% on a year-over-year basis and were in line with our expectations The company benefited from a growing rate base and higher gas use at its utilities division. The company's midstream segment also benefited from higher margins from its natural gas liquids extraction business. | Canada | Kenton Freitag

Enbridge Inc. (A-/Stable/--)

Earnings were up about 10% year-over-year and were consistent with our expectations. Aside from continued growth in earnings from its liquid pipelines, the company's gas distribution subsidiaries benefited from a colder-than-normal winter. The company continues to advance several projects, which will result in elevated project management risk during the next few years | Canada | Kenton Freitag

Hydro One Inc.(A+/Stable/A-1)

Hydro One's first-quarter financial performance is consistent with our forecast of weaker-than-average cash flow credit metrics for the next few years. Capital expenditures are slightly higher than during the same period of 2007, in line with forecast. The company expects to invest about C$1.4 billion of capital in its regulated rate base in 2008 (compared with C$1 1 million in 2007) | Canada | Nicole Martin

Hydro-Québec¶ (A+, A-1+)

First-quarter (ended March 31) results were in line with our expectations. Recent regulated rate increases and favorable hydrology and electricity prices have largely offset the impact on consolidated earnings of higher water royalties payable to Quebec. The company continues its capital expansion program, including a 1,250 MW interconnection with Ontario to be completed in 2010, and the Eastmain Rupert Diversion project near James Bay (expected in service from 2009-2012). | Canada | Nicole Martin

TransCanada PipeLines Ltd. (A-/Stable/--)

First-quarter earnings were up about 30% on a year-over-year basis and were consistent with our expectations. The company benefited from the full quarter addition of earnings from ANR Pipeline Co. (purchased in early 2007) and from improved generation and prices from its hydro assets in New York. The company continues to advance its Keystone Pipeline, which will serve the oilsands and expects construction to commence in the second quarter. The company recently announced its purchase of the Ravenswood Generating Station in New York State. The acquisition represents higher risk than TCPL's traditional regulated pipelines but does not materially affect the company's overall credit profile given the substantial equity issued to finance the acquisition | Canada | Kenton Freitag

TransAlta Corp.(BBB/Stable/--)

We expect the US$303 million sale of TransAlta's Mexican assets (303 MW) to close in second-quarter. Management plans to use most of the proceeds to buy back shares. The negative impact on balance-sheet strength should not move the rating given the company's near-term cash flow strength At first quarter-end, TransAlta's liquidity resources to support operations (including trading activities) remained adequate. | Canada | Nicole Martin

Europe

E.ON AG(A/Stable/A-1)

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Industry Report Card: Utility Sectors In The Americas Remain Stable, While Challenges Beset European,
Australian, And New Zealand Counterparts

E ON has recently announced that it will buy assets in Spain, Italy, and France from Enel and Endesa for an enterprise value of €11 8 billion This large acquisition, which is the group's second-largest purchase ever, is part of its massive €63 billion investment program between 2007 and 2010 As a result of these substantial investments and a shareholder friendly policy--with a €7 billion share buyback to be completed this year and a 22% increase in the dividend per share to be paid this year--E ON's financial profile, which is currently solid, with FFO coverage of adjusted net of 32.7% in 2007, will sharply deteriorate from 2008. It is, however, expected to remain in line with the ratings E ON's offer to the EU to settle antitrust cases by divesting its power transmission grid and about 20% of its domestic generation capacity will weaken its position in Germany The earnings contribution of the power transmission operation is, however, modest, while the group will remain the clear No 2 in generation in its domestic market Moreover, E ON's intention is to exchange rather than sell these generation assets for assets outside Germany, which should enable it to strengthen its European coverage	Germany	Hugues de la Presle

EDP - Energias de Portugal, S.A.(A-/Negative/A-2)

EDP reported a strong 14% growth in EBITDA in 2007 driven by strong growth in its Brazilian unit (35%) as well as in its currently relatively small wind business (46%) The group also benefited from robust 12% EBITDA growth in its large Iberian generation and supply operation Thanks to a high volume of output sold forward, EDP's liberalized generation and supply operations were only moderately affected by the lower pool prices in Spain in 2007. The group has already contracted 58% of its 2008 output Following the acquisition of U.S. wind power operator Horizon in 2007, EDP's financial profile is weak for the ratings with FFO to net debt of about 16% at year-end 2007. However, the group is in the process of partially listing its wind operation with a view to using the proceeds to fund this unit's substantial capital expenditures	Portugal	Hugues de la Presle

Electricite de France S.A.(AA-/Stable/A-1+)

EDF posted a 6.1% increase in consolidated EBITDA in 2007, primarily driven by the 6 9% growth in EBITDA in its core French operations (66% of 2007 EBITDA), largely thanks to the savings derived from the Altitude cost-cutting program. These savings more than offset the negative impact of the lower availability of French nuclear plants The group's main European subsidiaries made more subdued contributions, reflecting lower gas sales because of mild weather, regulatory pressures, and intense competition in the U.K. The group has announced very high capital expenditure of €35 billion between 2008 and 2010, which will significantly limit its free cash flow generation over that period. The group thus has limited flexibility at the current rating level for any large debt-funded acquisitions. As a result we are closely monitoring EDF's apparent interest for British Energy. We could take negative rating actions on EDF if it became clear that its credit measures could weaken significantly and lastingly as a result of a bid for British Energy	France	Hugues de la Presle

Endesa S.A.(A-/Negative/A-2)

In March 2008, Endesa published the guidelines of its future business plan for the period 2008-2012, which include significant investments (€24.4 billion), particularly when taking into consideration the reduced size of the group once some of the European generation assets will have been sold to E ON and renewable assets are transferred to a company controlled by Acciona. We estimate that investments under this plan are about €7 billion higher than under the previous one. They will moreover be only partly funded by asset sale proceeds given the payment of a special dividend of up to €4.5 billion The company's board must still approve the business plan, and changes are possible. Although the company has not provided details on its future capital structure and credit metrics, we expect debt to increase in the coming years, mainly to finance Endesa's hefty investments and dividend payments Cash flow protection metrics should nevertheless remain adequate for the ratings, with FFO to total debt exceeding 20% Ultimately, future debt levels will depend on the evolution of operating cash flow and, even more so, on the business strategy and financial policy implemented by the shareholders Going forward Endesa's rating will be based on its stand-alone creditworthiness, but we cannot look at the ratings in complete isolation from the credit quality of Endesa's controlling shareholders Enel SpA (A-/Negative/A-2) and Acciona, which acquired respectively 67% and 25% of Endesa in October 2007 These owners will steer Endesa's growth and investment strategy, and its financial and dividend policies	Spain	Ana Nogales

Enel SpA(A-/Negative/A-2)

Following the acquisition of 67% in Endesa and close to 60% in Russian generator OGK5, Enel has become an international utility with substantial geographic and operational diversification It enjoys leading positions in Italy and Spain and is vertically integrated in most of its key markets Its capital structure, however, has weakened significantly. Reported gross debt at the end of 2007 was €60 billion and Enel's gearing (debt to equity plus debt) was 72%. Enel plans, however, to sell material assets (with a total enterprise value of about €18 billion) in the next couple of years Most of the sales should be completed during 2008, in particular, that of Endesa and Enel assets to E ON, which has been agreed at €11 8 billion. The other disposals are exposed to varying levels of execution risk Given Enel's commitment to maintain an 'A' category rating, we expect that if market conditions or other issues result in lower proceeds, the group will take the necessary measures to offset the impact. To sustain the current ratings, we expect Enel to achieve credit metrics in line with the 'A-' rating by year-end 2009--namely, FFO to debt of about 18% and FFO interest coverage of about 4x. These metrics factor in the investment of €37 billion over the next five years, as announced by the company in February 2008	Italy	Ana Nogales

Iberdrola S.A.(A-/Stable/A-2)

Following the acquisition of Scottish Power, Iberdrola has leading positions in Spain, the U.K., and Latin America. It is also seeking to finalize the €6.4 billion acquisition of U.S. utility Energy East Corp (BBB+/Negative/A-2) Over the next three years, Iberdrola will undertake a large investment program of €24.2 billion, with renewables accounting for about half of organic	Spain	Ana Nogales

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investments. Proceeds from the IPO of Iberdrola Renovables (€4 48 billion) will finance this growth and are key to maintaining credit metrics that are consistent with an 'A-' rating, namely gearing below 50%, FFO to debt of about 17%, and FFO interest coverage of about 4x Furthermore we expect Iberdrola to fund 72% of its cash outflows for the 2008-2010 period with operating cash flows, asset disposals of more than €3 billion, and the IPO proceeds. First-quarter results were strong, thanks to the consolidation of Scottish Power and to the good performance of all operations. The group reported EBITDA of €1 8 billion, a 64% increase in relation to the first quarter of 2007, thanks to the €500 million contribution from Scottish Power, and to an increase of 18% in the EBITDA contribution of the remaining operations Reported gross debt of €22 billion remains unchanged from Dec. 31, 2007

National Grid PLC(A-/Stable/A-2)	U K.	Mark Davidson

National Grid's ratings continue to be driven by the group's consistent focus on regulated networks in the U K and U S , with the proportion of regulated cash flows increasing again after the recently announced sale by U.S subsidiary KeySpan of the Ravenswood merchant generator in New York for $2.9 billion (£1.5 billion). The financial impact of the sale, which was required by the regulator, is already factored into the ratings In January, National Grid announced a more aggressive dividend policy from 2007/2008 that will reduce projected FFO to adjusted debt to about 13%. While this remains commensurate with existing ratings, National Grid has reduced flexibility at this rating level Management maintains its policy of maintaining 'A' category ratings for its operating subsidiaries in the U K

RWE AG(A/Stable/A-1)	Germany	Hugues de la Presle

RWE was recently downgraded to 'A' from 'A+' reflecting the expected weakening in its financial profile in coming years as a result of its large investment program A key objective of RWE under its strategic plan is to increase leverage The group aims to grow its debt factor (which corresponds under the group's definition to net debt adjusted for postretirement and asset retirement provisions to EBITDA) to between 2.8x and 3.4x by 2010, from 2 1x at the end of 2007 This increase in debt will stem from large capital expenditures of €33 billion between 2008 and 2012, some external growth; and higher shareholder returns, especially a €2 5 billion share buyback, which the group plans to complete this year. RWE's financial profile, which is currently robust, with FFO to adjusted net debt of 37% in 2007, is thus expected to weaken markedly. RWE's offer to the EU to close antitrust cases to sell its gas transmission grid in Germany should not significantly lower its share of regulated earnings, given this business's relatively limited contribution.

Suez S.A.(A-/Watch Pos/A-2)	France	Hugues De La Presle

Under the revised terms announced for the merger between Suez and GDF, 21 GDF shares will be exchanged for 22 Suez shares, while 65% of the share capital of Suez's environment arm (21% of Suez's 2007 EBIT) will be spun off to Suez shareholders at the time of the merger, with the enlarged group retaining a 35% stake With respect to the merger process, the recent filings of a negative opinion by GDF's European works and Central works councils are important steps forward Their views are not binding, but French rules demand that these bodies, made up of union and workers representatives, give an opinion--be it positive or negative--before the tie-up can proceed Suez's European and Central works councils have both already filed their views. The main remaining hurdle for the merger is the approval by both groups' shareholders Both groups are also making progress on the disposals requested by the EU to approve the merger, especially the sale of Belgian gas incumbent Distrigaz and that of GDF's stake in the second-largest Belgian power generator SPE, for which it has now entered into final negotiations To resolve the CreditWatch placement we will focus on the enlarged group's strategy and financial policy So far management has announced a large €10 billion per annum capital expenditure program between 2008 and 2010, as well as a planned growth in dividends of 10% to 15% per year between the dividend paid in 2007 (by GDF· €1 1 per share) and the dividend to be paid in 2010, with potential further returns to shareholders, while seeking to maintain a "strong 'A'" rating

Vattenfall AB(A-/Stable/A-2)	Sweden	Mark Schindele

Vattenfall reported stable earnings in 2007, despite a sharp drop in electricity spot prices compared with 2006, which was an exceptionally strong year. The negative impact of lower electricity prices was offset by the group's strategy of selling its output forward In addition, the Nordic businesses reported an increase in hydro output and nuclear generation; the latter based on improved availability at the group's Swedish plants The large German generation operations improved, mainly because of better availability of the coal-fired plants, but also because of hedging gains, which more than offset unplanned outages at two of the group's German nuclear units Pressure on tariffs--particularly in Germany--resulted in deteriorating profitability within Vattenfall's network operations, whereas gross margins in electricity retail sales remain under pressure due to fierce competition in the group's main markets. We expect Vattenfall to continue its growth strategy, which may entail acquisitions. The group has the flexibility to fund such growth, with FFO interest coverage at 6.8x in 2007 (compared with 8.1x in 2006) and FFO to debt at 32% (from 37% in 2006)

Veolia Environnement S.A.(BBB+/Stable/A-2)	France	Hugues de la Presle

Veolia's operational performance continued to be solid in 2007, with 14% sales growth and a 9.8% advance in EBITDA For 2008, the group is targeting at least 10% sales growth and a commensurate increase in EBITDA on the back of the maturing of contracts signed in recent years, the full impact of recently completed acquisitions, ongoing productivity improvements, and some strengthening in earnings in the transport business The group's financial profile remains moderate, however, given the group's substantial investments, which totaled a hefty €6 1 billion in 2007 FFO coverage of adjusted net debt was about 19% in

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2007. In light of the group's substantial €15 billion-€20 billion investment program between 2007 and 2009, including €4 billion in capital expenditures on maintenance and organic growth in 2008, as well as possible further acquisitions and a high dividend payout, VE's financial profile is unlikely to improve in coming years, despite projected increases in earnings and cash flow

Australia/New Zealand

AGL Energy(BBB/Negative/--)
AGL Energy's earnings outlook for the fiscal year ending June 30, 2008 remains on track, with the company forecasting EBITDA of A$830–A$875 million amid continued improvements in the company's cost-to-grow and cost-to-serve metrics The rating remains on negative outlook following a weakening in AGL Energy's financial metrics, with the company working on an active program to reduce debt by A$600–A$700 million in order to return its funds from operations (FFO)-to-interest ratio to at least 5x Debt will be reduced by a mix of using its underwritten dividend-reinvestment plan and disposal of non-core assets. As part of this process, AGL recently announced the sale of its Chilean GasValpro business for A$90 million. Other non-core assets being considered include the divestment of its assets in Papua New Guinea Any further deterioration in AGL's earnings outlook, or a delay in the credit metrics recovery over the medium term, will likely result in a rating downgrade of AGL Energy.

Australia — Andrew Palmer

Contact Energy Ltd.(BBB/Stable/A-2)
Contact's earnings to date are in line with budget expectations. The December 2007 decommissioning of the 300 MW New Plymouth thermal power plant continues to be offset by synthetic arrangements to replicate the plants capacity and will ultimately be replaced with the planned 200 MW gas-fired Stratford peaking plant expected to be commissioned in 2010. Contact's upcoming extensive expenditure in future generation will further diversify the company's generation portfolio, while reducing its reliance on gas. Of the company's possible next five-year capital expenditure of NZ$1.1 billion, 9% is earmarked for hydro generation, 31% for gas-fired generation, and 36% for geothermal generation. We expect Contact to manage its risk exposure commensurate with the current rating tolerance and time projects in order to preserve credit metrics close to current levels, with only minor weakening during times of peak expenditure.

New Zealand — Tammy Garay

Diversified Utility and Energy Trusts (DUET)(BBB-/Stable/--)
DUET has announced a capital restructure in which its listed 'POWERS' notes will be refinanced with bank debt. The re-finance will improve the groups ability to manage its capital structure and importantly debt refinancing given current credit market conditions. Overall. DUET continues to perform to expectations, with solid earnings growth driven by its three major assets United Energy, DBNGP, and Duquesne Light Holdings Inc . DUET's earnings growth is contributing to stronger debt coverage than historically achieved, nevertheless, underlying asset quality remains a key focus, with four of its five assets currently on negative outlook.

Australia — Andrew Wilkie

Origin Energy Ltd.(BBB+/Stable/A-2)
Origin has upgraded its 3P coal seam gas (CSG) reserves 121% to 10,122PJ Recent market sales of CSG suggests the value of the reserves has increased substantially. Accordingly Origin has rejected a proposal from BG Energy Holdings Ltd (BG; A/WatchNeg/A-1) to acquire Origin despite a share price offer premium in excess of 40%. While an increase in CSG reserves of this magnitude potentially provides Origin with significant commercial opportunities the challenge for the company is to monetize the reserves to obtain indicated value Origin has alos given market guidance that reported profit for the June 2008 fiscal year will be up 15%

Australia — Richard Creed

Latin America

AES Gener S.A.(BBB-/Stable/--)
AES Gener has developed an aggressive expansion strategy through the construction of new thermal capacity for around 1,200MW and is analyzing other important power projects for around 1,300MW in Chile. The strategy is to take advantage of the positive environment deriving from the attractive regulatory framework for power generation after the passage of the Short Law II in 2005. The already announced projects would represent a high level of investments of around $2.0 to 2.5 billion that are projected to be financed by a mix of equity and recourse and non recourse debt. To partly finance its capital contributions in those projects, AES Gener has and will raise long term debt and will raise capital for about $300 million (AES Corp already announced that it will exercise its right to buy 80,11% of that amount) The BBB- rating reflects the assumption that total debt to EBITDA will be below 4x and FFO interest coverage and FFO to average total debt will remain above 3x and 20%, respectively.

Chile — Sergio Fuentes

Comision Federal De Electricidad (CFE)(FC: BBB+/Stable/--, LC. A-/Stable/--)
The ratings on CFE and the United Mexican States (UMS) are linked reflecting CFE's importance to the UMS as its primary vertically integrated electric utility, which constitutes a strong economic incentive for the sovereign to support CFE during periods of financial distress. CFE enjoys a good liquidity and financial flexibility based on its fluid access to the financial markets and high cash position, that reached about $4,8 billion compared with a $1,5 billion short term debt as of March 31, 2008 We expect CFE to carry out capital expenditures for about $5 billion in 2008, mainly concentrated in generation and distribution.

Mexico — Fabiola Ortiz

Companhia Energetica de Sao Paulo(B/Positive/--)

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CESP continued improving its debt structure after a series of financial transactions that resulted in positive advances in the company's financial risk profile. CESP raised Br$2 billion in the national and international capital markets in 2007 to refinance debt maturities and also reduced its total debt to Br$ 6.3 billion as of March 2008 from Br$ 6 7 billion as of December 2007, which resulted in a much more adequate debt profile In addition, the company improved its cash flow protection measures FFO to total debt and FFO to interest reached 11 5% and 2.3x, respectively in the twelve months ended in March 31, 2008 compared with 5.7% and 1 5x in the same period of the previous year	Brazil	Juliana Gallo

Eletropaulo Metropolitana Eletricidade de Sao Paulo S.A.(BB-/Stable/--)

We expect that even after the 8.43% tariff reduction in July 2007, Eletropaulo's cash flow generation was slightly affected and the company was able to reduce overall debt by Br$500 million. We expect the company to continue working on its liability management to reduce costs and improve its debt amortization profile. FFO to total debt and FFO interest coverage reached 29 1% and 4.4x, respectively, in the 12 months ended March 31 2008, compared with 33% and 4x in the same period of 2007.	Brazil	Marcelo Costa

Interconexion Electrica S.A. E.S.P. (ISA)(FC: BB+/Stable/--; LC: BBB-/Stable/--)

The ratings reflect the company's dominant position as a transmission grid operator in Colombia, its strategic importance to the country, efficient operations, and the government's ownership. For the last twelve months as of March 31 2008, the company presented an FFO interest coverage of 3.1x which was slightly above our expectations. We expect FFO interest coverage to maintain its historical levels of 2.5x to 3.0x	Colombia	Monica Ponce

Enersis S.A.(BBB/Stable/--)

Enersis' credit quality mainly benefits from the good credit profile of its Chilean investments in power generation and distribution, and from its good financial risk profile, as evidenced by its adequate leverage (total debt to EBITDA below 3x), debt service coverage ratios, and very good liquidity and financial flexibility. We expect Enersis to continue to benefit from the still favorable economic environment in Latin America during 2008, and FFO interest coverage and FFO to total debt to reach about 3.5x to 4.5x and 25% to 35%, respectively.	Chile	Sergio Fuentes

*Ratings are as of June 23, 2008. ¶Debt rating guaranteed by the Province of Quebec. FC--Foreign currency LC--Local currency

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Table 2

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Table 2

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Industry Top Trends 2017

Utilities

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Overview

- **Ratings Outlook:** Rating trends across regulated utilities remain mostly stable supported by stable regulatory oversight, slow but steady demand for utility services, and tempered by aggressive capital spending that will keep credit metrics from improving. Emerging new political trends in historically stable regions like Europe and the U.S. may have far-reaching effect on utilities over time, but S&P Global Ratings sees little immediate influence from those factors in 2017. Sovereign rating developments can influence utility ratings in some countries and we expect them to vary in different parts of the globe.

- **Forecasts:** Credit ratios are likely to be stable in 2017 with some slight downside risk as revenue growth will be modest in most regions in keeping with the slow demand growth in regions where the utility industries are mature. In contrast, growth can be higher in countries and regions where utility services have not fully penetrated the market offset by large investment needs. We expect margins across the industries globally to be flat to improving slightly as operating conditions and favorable fuel cost trends are maintained.

- **Assumptions:** Sales growth at most utilities is closely tied to the general economic outlook in its service territory, which can vary considerably from utility to utility. We project solid regulatory support for utility earnings and cash flow, with the occasional exception due to specific political or policy issues at the local level. Capital spending will continue to be elevated in most areas, with substantial infrastructure needs.

- **Risks:** Transformative risks abound in utility industries. Corporate transformations (M&A) are an ever-present risk to ratings. Electric generation transformation is ongoing as carbon concerns and other environmental considerations lead utilities to change the mix of fuel sources. Grid transformation is becoming more prominent as utilities react to technological advances and the need for greater attention to cyber security.

- **Industry Trends:** The utility industry in most regions is stable, consistent with our general ratings outlook and the nature of the essential products and services utilities sell. The unsettled state of the world economy, buffeted by political volatility and uncertain capital flows as international trade and tax reform emerge as urgent issues, could spill over into the utility space. However, the industry as a whole is well positioned to withstand mild shocks, and we see steady growth and stable credit quality overall.

Ratings trends and outlook

Global Utilities

Chart 1 – Ratings distribution

■ Utilities
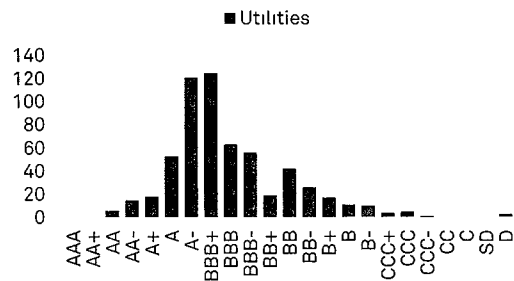
The industry remains largely investment-grade.

Chart 2 – Ratings distribution by region

■ North America ◫ W.Europe
■ Asia-Pacific ◪ Latin America
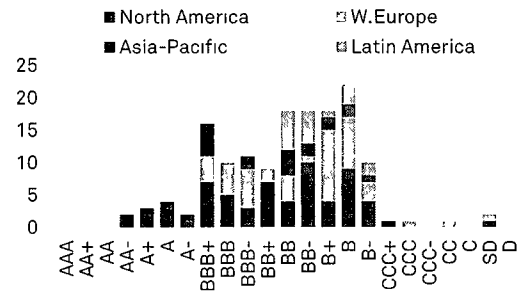
Ratings are distributed mostly the same, with a notable shift in EMEA toward the lower end of investment grade.

Chart 3 – Ratings outlooks

WatchPos 2%
Positive 5%
Negative 18%
WatchNeg 2%
Stable 73%
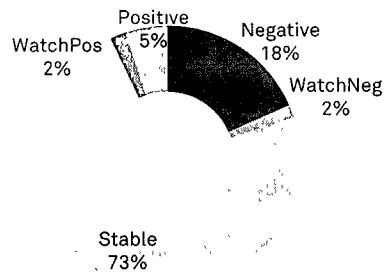
Mostly stable, but a little more tilt toward the negative than last year

Chart 4 – Ratings outlooks by region

■ Negative ◫ WatchNeg Stable ◻ WatchPos ◨ Positive

APAC LatAm N.America W.Eur
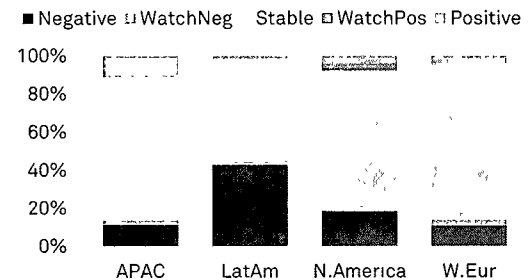
Very consistent, with slightly less negative bias in North America and EMEA, and more positive outlooks in EMEA and APAC

Chart 5 – Ratings outlook net bias

Net Outlook Bias (%) ■ Utilities

13 14 15 16
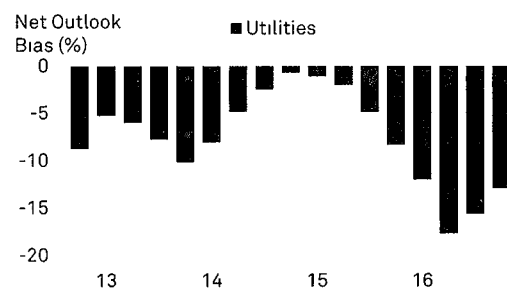
Chart 6 – Ratings net outlook bias by region

Net Outlook Bias (%) ━━ Asia-Pacific ━━ N.America
━-━- Latin America ━-━ W.Europe

13 14 15 16
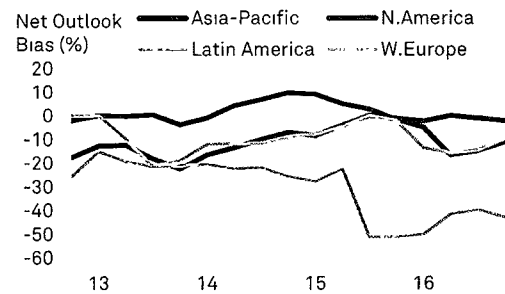
Source S&P Global Ratings Ratings data measured quarterly with last shown quarter ending December 31, 2016

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Industry forecasts

Global Utilities

Chart 7 – Revenue growth (local currency)

- N.America
- W.Europe
- Asia-Pacific
- Latin America
- Global
- Forecast
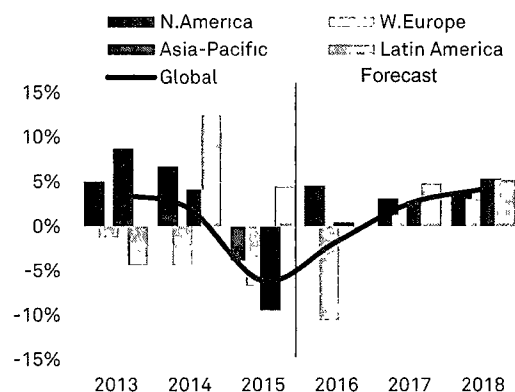
Chart 8 – EBITDA margin (adjusted)

- N.America
- W.Europe
- Asia-Pacific
- Latin America
- Global
- Forecast

Stable margins across all regions

Chart 9 – Debt / EBITDA (adjusted)

- N.America
- W.Europe
- Asia-Pacific
- Latin America
- Global
- Forecast

A little more stable than last year's projections

Chart 10 – FFO / Debt (adjusted)

- N.America
- W.Europe
- Asia-Pacific
- Latin America
- Global
- Forecast

This has been remarkably stable globally, and we project a rebound in regions where there's been some deterioration

Source: S&P Global Ratings Revenue growth shows local currency growth weighted by prior-year common-currency revenue-share All other figures are converted into U S Dollars using historic exchange rates. Forecasts are converted at the last financial year-end spot rate

Key assumptions

Global Utilities

1

Industry demand growth broadly linked to economic growth

Historically, demand for electricity, natural gas, and other utility services has correlated broadly with overall economic growth. In regions where market penetration is low the growth can outpace the economy. In mature markets where appliance and industrial efficiency has advanced through the years, load growth has slackened and lagged the performance of the broader economy. In **Europe**, we expect most economies to have low but improving economic growth and inflation slightly increasing from commodity prices. Moderate inflation in the U.K. and the Eurozone support earnings growth for regulated utilities whose remuneration is linked to the consumer price index or retail prices index. This is particularly true for the U K. utilities. In **North America**'s economies, the ability of utilities to maintain a growth profile alongside the economy has faltered in what has been a long-term trend, and we assume low growth for most utilities. In **Canada** the downturn in energy prices has had a knock-on effect on load in combination with continued conservation initiatives. **Latin American** revenues will remain constrained by the overall sluggish economic activity, especially in Brazil, although a pick-up in commodity prices could help. We expect a mixed trend in **APAC**, with few Asian countries such as **India** and **Indonesia** likely to see revenue growth outpace economic growth due to increasing capacities to bridge power needs and government policies to move towards 100% electrification. In other parts of Asia-Pacific, we expect modest to sedate growth.

Regulation supports earnings and cash flow

2

Regulatory behavior is notoriously difficult to predict, but the political and economic conditions in many regions have enabled utility regulators to sustain a long period of supportive cost recovery through rates and support for capital improvements to bolster service reliability and quality, which has translated into earnings and cash flow stability. In **APAC**, some markets are going through or experiencing some form of industry restructure, although the regulatory environment is largely stable and supportive Abrupt changes, if any, driven by political or socioeconomic reasons are not anticipated in our base assumptions but also difficult to predict. Stability has held in **North America**, where commodity and financing costs have steadied the regulatory environments as rate increases have been mild. In **Europe**, recent regulatory reviews (France and Italy notably) have led to generally lower remuneration of the asset base, reflecting the overall lower cost of capital, but it was manageable and generally did not hamper the affected credit quality. We view regulatory frameworks in **Latin America's** main economies as relatively stable, with utilities being able to recover its costs while presenting adequate returns.

Capital spending elevated to meet infrastructure needs

3

We assume that capital spending will remain a focus of most utility managements and strain credit metrics. It provides growth when sales are diminished by ongoing demanded efficiency from regulators and other trends, and it is welcomed by policymakers that appreciate the economic stimulus and the benefits of safer, more reliable service The speed with which the regulatory process turns the new spending into higher rates to begin to pay for it is an important factor in our assumptions and the forecast. Any extended lag between spending and recovery can exacerbate the negative effect on credit metrics and therefore ratings. As for last year, the main drive for high investments will remain integration of new renewables capacity and decentralized generation / micro grids, which require new connections and significant network upgrades to manage a less predictable demand –supply curve. Some distribution networks are also responsible for smart meter deployment, which can represent a significant share of the capital investments. Investments in **Latin America** should remain focused on the expansion of networks and quality of services and there are important projects in transmission that are currently in progress. Increasing generation capacity to meet the growing needs of the population should continue to drive the construction of new power generation facilities. **Asian** markets should see elevated investments leading to some weakness in metrics until the new projects are commissioned, while the mature markets of Australia and New Zealand should see investments in line with past few years.

Key risks and opportunities

Global Utilities

Corporate transformation

In order to respond to the sector challenges, we expect M&A activity to remain strong in 2017. On the one side, we see utilities spinning off some of their more mature networks given the attractive prices they can obtain, supported by the strong appetite of infrastructure funds eager to invest in defensive assets generating decent yields. In **Europe**, we see Italy, France, and the U.K. as recent examples, for which selling prices were well above the regulated asset base. The proceeds of such disposals would in turn be primarily used to remunerate shareholders and to finance the growing regulated network activities, where significant upgrades are needed and investments may be substantial. We also see execution of disposal programs for some integrated utilities as paramount for the maintenance of their credit quality this year. Targeted assets include the more volatile thermal and merchant generation assets, oil and gas upstream activities, and non-core, non-domestic assets. In **APAC**, offshore investments mainly by Chinese entities are likely to remain the theme although certain restrictions can see some softening of the trend. Japan, China, and some other Asian countries are seeing some industry reforms that can lead to tariff reforms or the dismantling of integrated entities, which could have a bearing on the credit quality over the next few years.

1

North American utilities have been focusing on cross-industry (gas utilities buying electric utilities) or cross-border (**Canadian** holding companies buying U.S. utilities) combinations and using historically low interest rates and strong stock prices and plentiful leverage to justify paying large multiples. Cost of capital has been rising but is still well below historical averages, so 2017 could bring more transactions before higher interest rates start to dissuade purchasers. Transactions outside the utility space, which are typically more credit-negative because of added risk, have been less prevalent but could accelerate if growth on the utility side slows. In **Latin America**, we view Brazil to remain attractive to investors despite the still weak economic activity, as some integrated entities resort to asset sales aiming to reduce leverage and improve liquidity, amid tight credit markets. Participants from Europe and the region were active in 2016, but expect the activity to slow down as rated participants integrate recent acquisitions in 2017.

In order to meet increasingly tough efficiency targets set by regulators and to face IT challenges associated with smart technologies and the integration of renewables in the network management, we see sector consolidation as a key theme for 2017 in certain areas. This could vary across markets driven by local policies. In **Italy** for example, we see the sector consolidation as a key theme given the high number of small-scale municipal networks. A similar trend is emerging in **Canada** in the province of Ontario with the merger of several municipal distribution companies. We also see investments in quasi-regulated/midstream assets as being a hot topic for the regulated utilities sector, as some of them try to search for new growth drivers outside of their core markets. These include notably investments in optic fiber, long-term contracted pipelines, liquefied natural gas (LNG) assets and storage businesses.

In such an environment, we will focus on effective execution of disposal programs, appetite for growth and change in financial policies towards potential high leverage--especially in a context of low interest rate environment.

Generation transformation

As in previous years, and notably following the COP 21 in late 2015 and the following adherence to the Paris Agreement at the national level during the course of 2016, the more stringent environmental targets globally will continue to reshape the generation mix towards an accelerated penetration of renewable energies, notably solar and wind. In some regions, we also see growth in gas assets (both gas-fired power plants and LNG facilities) as driving new infrastructure developments to distribute power in the respective areas. In **Canada** the Alberta government has mandated the complete replacement of coal generation with gas assets and renewables by 2030. We believe significant push for renewable power will increase share of renewables in the energy-mix for countries like **India**. However, coal is likely to remain the mainstay in the fuel-mix and power generation there and in **Indonesia** due to significant capacity additions.

The significant amount of new projects will require new connections and new transmission lines, which we believe will be a key driver for the asset base and revenue growth for the sector. This is notably because new connections may be complex and expensive (notably for offshore wind) and because the location of new generation sites may be quite remote from the end-users given potential land constraints as well as geographic or weather characteristics. Beyond the political push, we believe the development of renewable energies is also driven by significant progress in technologies and cost. Wind and solar have indeed seen their cost reducing significantly in recent years (by about 60% for solar between 2009 and 2016, according to the **International Renewable Energy Agency** (IRENA) and efficiencies have increased (as measured through load factors and wind turbine capacity notably). These significant manufacturing and technology progress make their value proposition economically more acceptable and therefore more financeable. Some studies show that technology parity versus efficient thermal assets can be reached between 2020 and 2025, while recent auctions (notably in **Latin America**) reflected the more competitive nature of renewable projects.

Similar themes are seen to varying degree in the **Asian** markets given the big gap between demand and supply. While a number of Asian countries, such as India, China, Thailand, and Australia are increasingly looking at renewable projects, coal and gas are likely to remain the mainstay for most Asian countries Associated with growing renewables is the need for investment to manage intermittency which can lead to a different approach to grid management and cost recovery. We believe this is an evolving space. Potential easing of environmental regulation in the U S. may allow East Asia-based electric and gas utility companies to further stabilize fuel costs due to improved U.S. shale gas supplies.

2

Grid Transformation

The inherent intermittency of the generation profile for renewable assets requires in many cases a significant upgrade of the networks to manage such complex and somewhat less predictable power inflow. We also believe that the growth of renewable energies goes together with the development of so-called micro grids, which aim at increasing consumption of locally produced energy. With increasing decentralized production and self-consumption, systems need to forecast and manage a much more dense and complex network, which requires significant big data management and sophisticated forecasting tools, which we believe represent significant IT investments.

This goes alongside with a push for the penetration of smart meters, to better measure and control the network. The digitalization of the network represents in our view a significant opportunity for network operators to optimize their cost structure (given the more centralized control of the network, avoiding physical intervention). Where the network operators are also in charge of the roll-out of such smart meters, we believe it will also boost the regulated asset base and allowed revenues

3

Yet both the need for optimized balancing of the flows and digitalization of the networks require evolving roles and responsibilities of the network operators, and a potential change in their remuneration scheme in the near future. In this context, we believe not all players are well prepared for such transition and we may see increasing differentiation in operating performance (and ultimately cash flows) between network operators. We further believe that while increasing responsibilities may push for higher allowed revenues, we see a potential risk that such additional remuneration may not fully compensate for the additional costs and risks associated with these new responsibilities. This is notably because of the lack of track record when transitioning to these unchartered territories driven by new technologies. What's more, in an increasingly digitalized environment, we see cyber security as an increasing threat to the sector. Beyond the obvious risk of blackout associated to cyber piracy, we see data security (given the big data management model associated to the generally large customer base) as another major threat. This ultimately may result in reputation risk for the networks; and unforeseen financial consequences.

Industry developments

Corporate strategy and diversification

With some notable exceptions, utilities are experiencing a secular slowdown in growth prospects. This is especially true in regions and countries where the provision of electricity and natural gas and water is well-established and has broadly penetrated the relevant market. The causes are many and center mainly around significant past investments based on economic growth rates (and power and gas consumption) that did not materialize, slowing population growth, and increasing efficiency in end-use products that use natural gas and power. A furnace that is twice as efficient as the one it replaces may encourage the customer to stay a little warmer by raising the thermostat, but it's still not going to make up for the fact that it uses half as much fuel as its predecessor. Industrial usage offers the same story.

Another factor that is intruding on the ability of utilities to grow, prevalent mostly in electric markets, is the popularity of customers providing their own commodity and depriving the utility of the margins for that service and cutting down topline growth. In electricity it's called self-generation or distributed generation Solar panels on individual customer roofs is the most recent and dramatic manifestation of this phenomenon, but it's been a long-standing trend for large commercial and industrial customers going back decades with "cogeneration" plants and outright leaving the grid (often called "behind-the-fence" projects) as industrial firms looked for ways to lower costs

Firms facing low growth potential may find it more difficult to attract equity investors, and the natural impulse of any corporation and its managers to desire to grow to satisfy stockholders adds to the imperative to look for alternatives to their core utilities to invest in This activity often goes in cycles,

seemingly as constant as the ocean tide, ebbing and flowing as utility managers hear the irresistible siren call of growth and greater profits– most of the time away from regulated activities. With that kind of growth comes risk, of course, and thus pressure on ratings

Many **APAC** utilities still have traditional investment and integrated operations. Australia could see more asset privatization and potentially some consolidation Market reforms in China and Japan are likely to occur over the next few years which may take few years to reflect in how the industry shapes up Companies' ability to adapt to such reforms and maintain their balance sheet profile will be key to their credit quality. In **Latin America**, corporate groups still have opportunities to grow by expanding their coverage and improving basic service, and acquisition opportunities remain, particularly in Brazil The energy reform in Mexico will also offer opportunities to build new generation capacity (mainly gas) and to provide services to the national utility to improve the country's transmission and distribution infrastructure.

We think we may be on the cusp of another cycle in some areas In **North America**, utilities have been practicing a "back-to-basics" approach for many years in the wake of a difficult period of diversification efforts that accompanied deregulation of first natural gas and then electricity. While corporate strategic moves for the past decade or so have been mainly inside the industry (utilities combining with other utilities) to assist growth, the attractiveness of that strategy could wane if interest rates and other costs begin to rise and harm M&A economics In **Europe,** international expansion (notably in Latin America) is privileged to build a new growth story. Also on the radar are midstream assets (pipelines, storage, and regasification plants, for example), which utilities see as having business similarities

Alternative financing, private equity, and infrastructure funds

Corporate transformation (see Key Risks and Opportunities) and the diversification discussion immediately above suggest that M&A transactions and other corporate-level reformations will continue to be a feature of utility credit quality considerations in 2017. Corporate finance techniques outside of the usual debt/equity playbook have risen in popularity, especially as transactions have become more expensive and more creative avenues are needed to make the numbers work. Increased regulatory costs of being a public company has also contributed in the past to some utilities, especially small ones, "going private" to escape the cost and other burdens of full securities regulation. Institutional investors' appetite for secured, above-average-yield assets remains significant for utilities, and as mentioned above prices paid for such assets often come with significant premiums over the regulated asset base.

APAC utilities are likely to see dominant group and government ownership, particularly in Asia Private equity firms have not been very active in the utilities space and we see limited prospects due to significant presence of industry super funds, dominant corporate groups and national wealth funds Strong growth and investment in renewables could attract private equity, but interest seems to be low We expect infrastructure funds to remain a dominant force in the market as also sovereign wealth funds (such as from Singapore, UAE) and private investors like SoftBank of Japan providing sufficient financial flexibility to fund large projects. Asset pooling to diversify risks across countries/ sites and resources like hydro /wind/ solar is also expected to gain momentum.

In **Europe**, such pricing environment has recently led some utilities to sell their lower-growth networks, and we see the trend continuing in 2017. Proceeds first aim at offering the excess returns to shareholders and then to partly fund the capital expenditures on the higher-growth part of the network. In the transactions we have seen so far, little, if any, has been allocated to debt reduction. Funding in **Latin America** should continue to be dominated by bank and capital markets financing However, some alternative financing structures are emerging in selected markets like Mexico, where entities similar to U S. master limited partnerships have been recently launched in the infrastructure space.

Hybrid securities, whether in the form of preferred stock or some sort of subordinated debt with interest deferral permitted, are commonly used in M&A deals (as in last year's acquisition of TECO Energy by Emera Inc), as well as other types of hybrids such as mandatory convertible debt that provides for equity support a few years after the merger.

Less associated with M&A is the use of unconventional corporate structures, which are invariably undertaken for tax reasons to reduce the issuer's cost of capital. While it's challenging to generalize about the myriad structures that exist, the details of which are limited only by the imaginations of tax attorneys and investment bankers, they do exhibit common attributes that can affect credit quality In **Europe**, the sophistication of corporate structures is also significant in order to maximize the debt and benefit from a still low interest rate environment. We notably see more transactions that favor a tranche of subordinated debt with a holding company level, above the regulatory perimeter and sometimes with some ring-fencing structures. To understand the robustness of such structures, we generally take in consideration not only the documentation and financial structure, but also the legal and regulatory frameworks in which the utility operates.

In **North America** we see master limited partnerships and "yieldcos" as archetypes of this kind of entity. As tax-driven vehicles, they are frequently pass-through entities (so the tax man can get his share somewhere), so the ability of these issuers to retain earnings and build equity to provide creditors with a cushion is limited The tax advantages mostly benefit shareholders, though some crumbs do accrue to creditors Because their allure for equity investors is mostly in a steady but growing dividend, the structures often compel issuers to emphasize growth through acquisitions that carry extra risk. Consequently, we believe non-standard corporate structures connote lesser credit quality, although we always evaluate each entity on its merits and do not let the structure govern our opinion. Their use may change over time if tax reform takes hold, as is possible in the **U.S.**, but history tells us they will never disappear.

Operating efficiency through digitalization and cost control

Although utilities are sometimes viewed as staid, bureaucratic organizations in a mature industry that contains no technological challenges, indifferent to all the changes occurring around them, the reality is quite different. Putting aside the advanced techniques and tools needed to operate, maintain, and monitor pipelines and power plants (the "pigs" that travel through a pipeline are high-tech marvels, not to mention nuclear plants and continent-wide electric grids), utilities spend considerable time and effort to leverage digital technology and the latest cost-control tools to push efficiency measures throughout their systems If indeed utilities begin to experience greater cost pressures outside their control—capital costs, commodity costs, etc –the need to implement more stringent cost-cutting efforts will become acute to improve operating efficiency and avoid putting undue pressure on the regulatory environment to sustain ratings performance. The digitalization of the network includes the significant deployment of sensors and remotely-controlled substations across the network The technology allows for more centralized problem diagnostics and maintenance – limiting the physical presence needed to resolve network issues. Further, we have seen drones widely used for active network surveillance and access to difficult areas Digitalization of the networks improves problem prevention, shortens response time, and reduces or optimizes utilization of human capital.

In the **Asia-Pacific** market, remote control apps, smart metering, consolidation of control room functions, and integrated outsourcing of operations and maintenance are avenues that will continue to lower the cost profile of utilities. With cost efficiency at the forefront of regulatory decisions, we expect increasing shift to incentive-based regulation. This could lead to optimal reliability and availability standards that could optimize investment in the networks. Cost profile of most Asian utilities remains relatively high and we don't expect an immediate change in the composition of their cost base. This is partly a reflection of their scale and integrated operations, high investment phase, and socio economic obligation under government ownership,

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Cash, debt and returns

Global Utilities

Chart 11 – Cash and equivalents / Total assets

■ Global Utilities - Cash & Equivalents/Total Assets (%)
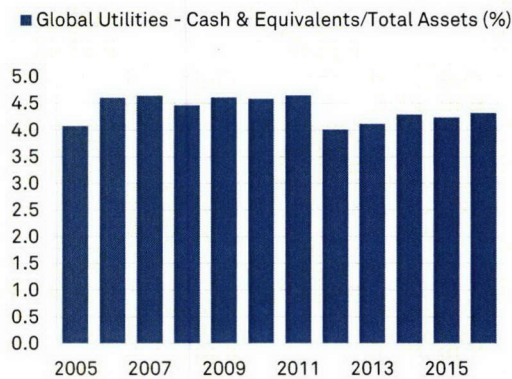
Chart 12 – Total debt / Total assets

■ Global Utilities - Total Debt / Total Assets (%)
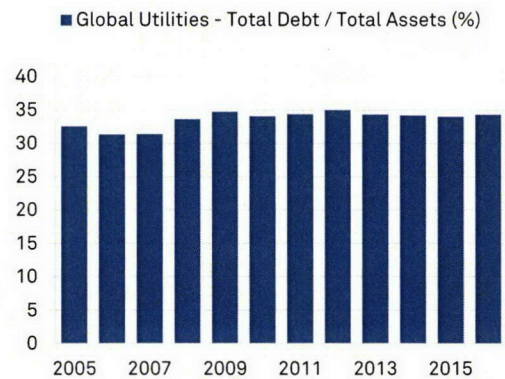
Chart 13 – Fixed versus variable rate exposure

■ Variable Rate Debt (% of Identifiable Total)

■ Fixed Rate Debt (% of Identifiable Total)
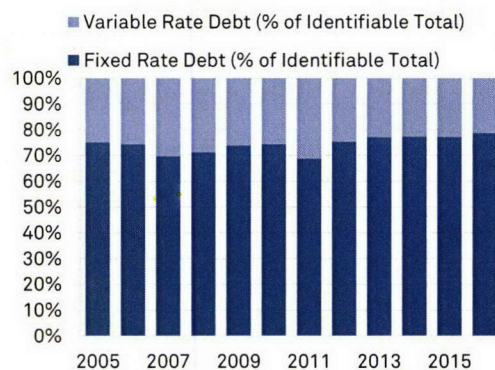
Chart 14 – Long term debt term structure

■ LT Debt Due 1 Yr ■ LT Debt Due 2 Yr
■ LT Debt Due 3 Yr ■ LT Debt Due 4 Yr
■ LT Debt Due 5 Yr ■ LT Debt Due 5+ Yr
— Nominal Due In 1 Yr
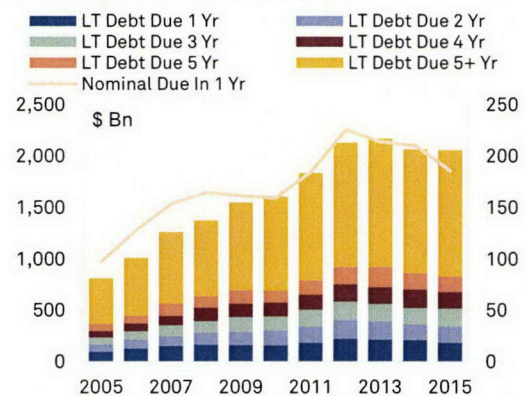
Chart 15 – Cash flow and primary uses

■ Capex ■ Dividends
■ Net Acquisitions ■ Share Buybacks
— Operating CF
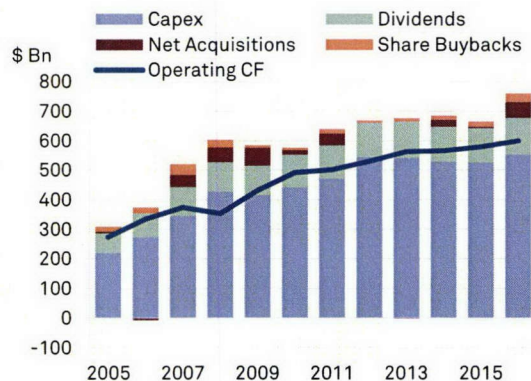
Chart 16 – Return on capital employed

■ Global Utilities - Return On Capital (%)
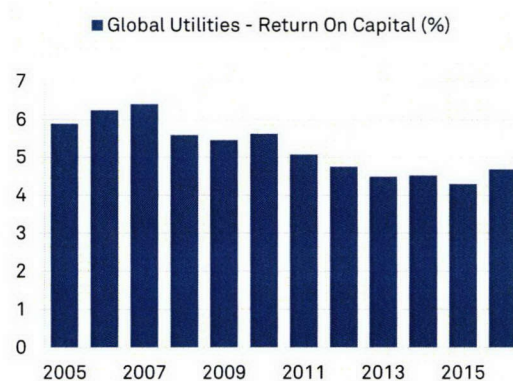
Source S&P Global Market Intelligence, S&P Global Ratings calculations

TNMP_LK 1-4_Attachment E.060

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Ratings

Research

Summary:

Texas-New Mexico Power Co.

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Summary:

Texas-New Mexico Power Co.

Business Risk: EXCELLENT

CORPORATE CREDIT RATING

Vulnerable — Excellent — a+ — a — bbb+

Financial Risk: INTERMEDIATE

Highly leveraged — Minimal

Anchor — Modifiers — Group/Gov't

BBB+/Negative/--
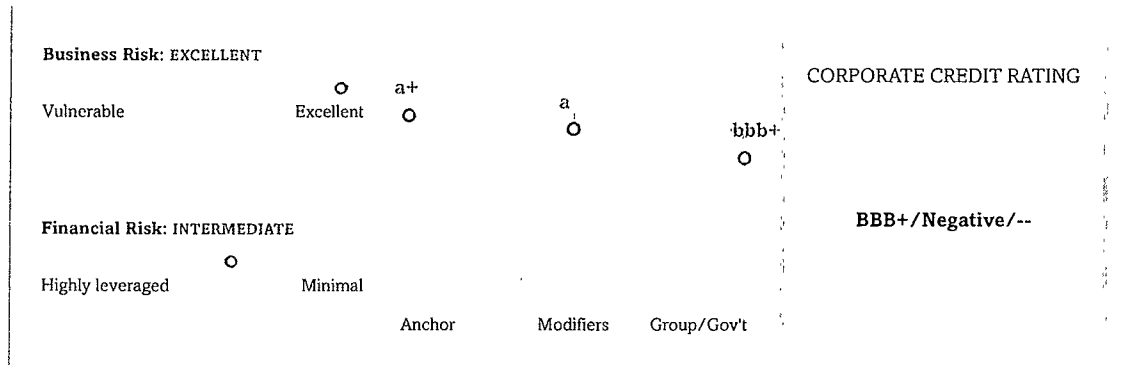
Rationale

Business Risk: Excellent

Financial Risk: Intermediate

- Texas-New Mexico Power Co. (TNMP) is a low-risk, rate-regulated, electric transmission and distribution utility.

- The company demonstrates effective management of regulatory risk in part by using multiple riders.

- The company's small size is mitigated by the stability of its customer base.

- TNMP has a strong track record of providing safe and reliable electric operations.

- We assess TNMP's financial measures using moderate financial benchmarks compared with the typical corporate issuer, reflecting the company's position as a lower-risk, rate-regulated electric utility and overall management of regulatory risk.

- We expect TNMP's financial measures, including funds from operations (FFO) to debt of about 23%, to remain consistent with the company's current stand-alone risk profile.

- We expect the company to have elevated capital spending that averages about $175 million annually through 2020.

- The company's sales growth averages about 1.5%.

- We expect a modest weakening of the company's financial measures beginning in 2019, taking into account the company's elevated capital spending.

Summary: Texas-New Mexico Power Co.

Outlook: Negative

The negative outlook reflects S&P Global Ratings' expectations that Texas-New Mexico Power Co.'s (TNMP) parent, PNM Resources Inc. (PNMR), will have weaker cash flows largely stemming from the effects of the revised U.S. corporate tax code. In addition, the negative outlook takes into account the unresolved prudence issue related to PSNM's continued investments in its coal-fired Four Corners power plant, potentially resulting in regulatory headwinds that could challenge the company's ability to consistently manage regulatory risk in New Mexico.

Downside scenario

We could lower the rating on TNMP if we lower the ratings on parent PNMR. We could lower the ratings on PNMR over the coming quarters if PNMR's financial measures continue to weaken, including FFO to debt that is consistently less than 16%. This could occur if the company is not successful in its efforts to obtain securitization financing for its remaining San Juan coal-fired generating assets.

Upside scenario

We could revise our outlook on TNMP to stable if parent PNMR materially improves its consolidated financial measures, including FFO to debt that consistently reflects about 17%.

Our Base-Case Scenario

Assumptions   ### Key Metrics

- Continued use of constructive regulatory riders;

- Capital spending averaging about $175 million annually through 2020;

- Annual dividends of about $25 million; and

- Sales growth averaging about 1.5%.

	2017	2018E	2019E
FFO/debt (%)	25.7	22-24	21-22
Debt/EBITDA (x)	3	3.1-3.2	3.3-3.4

A-Actual. E-Estimate. FFO-Funds from operations.

Company Description

TNMP is a low-risk, rate-regulated electric transmission and distribution utility that serves about 250,000 customers in Texas TNMP is a wholly owned subsidiary of PNMR and contributes about 25% of parent PNMR's consolidated EBITDA.

                                                                                    2032838

Summary: Texas-New Mexico Power Co.

Business Risk: Excellent

Our business risk assessment for TNMP reflects its lower-risk, rate-regulated electric transmission and distribution utility operations, based exclusively in the U.S. Our business risk assessment also reflects the company's management of regulatory risk, its customer base, and its strong operating track record. TNMP is regulated by the Public Utilities Commission of Texas (PUCT), and we view the company's management of regulatory risk as effective. This largely reflects the use of supportive regulatory mechanisms that aid in the recovery of costs related the company's investments. Partially offsetting this practice is the use of historical test periods for setting rates in Texas TNMP's stable customer base, consisting mostly of residential customers, mitigates its small size. In addition, TNMP has a strong track record of providing safe and reliable electric operations to its customers. These factors collectively result in a comparatively higher assessment for TNMP within the excellent business risk profile category relative to peers.

Financial Risk: Intermediate

We assess TNMP's financial measures using moderate financial benchmarks compared to the typical corporate issuer reflecting the company's lower-risk, regulated electric utility business, and effective management of regulatory risk Under our base-case scenario, reflecting elevated capital spending averaging about $175 million annually through 2020, dividends of about $25 million, and sales growth of about 1.5%, we expect FFO to debt of about 23%. In addition, we expect a modest weakening of the company's financial measures beginning in 2019, incorporating the company's elevated capital spending.

Liquidity: Adequate

TNMP has adequate liquidity, in our view, and can more than cover its needs for the next 12 months, even if EBITDA declines by 10%. We expect the company's liquidity sources over the next 12 months will exceed its uses by more than 1.1x. Under our stress scenario, we don't expect TNMP will require capital market access during that period to meet its liquidity needs. In addition, TNMP has sound relationships with its banks, satisfactory standing in the credit markets, and can absorb a high-impact, low-probability event with limited need for refinancing. TNMP also benefits from shared group treasury services from parent PNMR.

Principal liquidity sources	Principal liquidity uses
• Cash FFO of about $130 million;	• No significant long-term debt maturities in 2018;
• Credit facility of $75 million; and	• Maintenance capital spending of about $150 million; and
• Minimal cash assumed.	• Dividend payments of about $25 million.

Summary: Texas-New Mexico Power Co.

Other Credit Considerations

We assess TNMP's comparative ratings analysis (CRA) modifier as negative, reflecting our view of the company's financial measures that we expect will consistently reflect the lower end of the range for the company's financial risk profile category.

Group Influence

TNMP is a wholly owned subsidiary of PNMR. We consider TNMP as core to its parent, reflecting our view that TNMP is highly unlikely to be sold, operates in a line of business that is integral to the group's overall strategy, has a strong long-term commitment from PNMR's senior management, and is closely linked to PNMR's name and reputation. Therefore, we cap our issuer credit rating on TNMP at PNMR's 'bbb+' group credit profile.

Ratings Score Snapshot

Corporate Credit Rating

BBB+/Negative/--

Business risk: Excellent

- **Country risk:** Very low
- **Industry risk:** Very low
- **Competitive position:** Strong

Financial risk: Intermediate

- **Cash flow/Leverage:** Intermediate

Anchor: a+

Modifiers

- **Diversification/Portfolio effect:** Neutral (no impact)
- **Capital structure:** Neutral (no impact)
- **Financial policy:** Neutral (no impact)
- **Liquidity:** Adequate (no impact)
- **Management and governance:** Satisfactory (no impact)
- **Comparable rating analysis:** Negative (-1 notch)

Stand-alone credit profile : a

- **Group credit profile:** bbb+
- **Entity status within group:** Core (-2 notches from SACP)

Summary: Texas-New Mexico Power Co.

Issue Ratings--Recovery Analysis

- We assign recovery ratings to first-mortgage bonds (FMB) issued by U.S. utilities, which can result in issue ratings being notched above the issuer credit rating on a utility depending on the rating category and the extent of the collateral coverage. The FMBs issued by U.S. utilities are a form of "secured utility bond" (SUB) that qualify for a recovery rating as defined in our criteria (see "Collateral Coverage and Issue Notching Rules for '1+' and '1' Recovery Ratings on Senior Bonds Secured by Utility Real Property," published Feb. 14, 2013).

- The recovery rating is supported by the ample historical record of 100% recovery for secured bondholders in utility bankruptcies in the U.S. and our view that the factors that enhanced those recoveries (limited size of the creditor class and the durable value of utility rate-based assets during and after a reorganization given the essential service provided and the high replacement cost) will persist.

- Under our SUB criteria, we calculate a ratio of our estimate of the value of the collateral pledged to bondholders relative to the amount of FMBs outstanding. FMB ratings can exceed the issuer credit rating on a utility by up to one notch in the 'A' category, two notches in the 'BBB' category, and three notches in speculative-grade categories, depending on the calculated ratio.

- TNMP's FMBs benefit from a first-priority lien on substantially all of the utility's real property owned or subsequently acquired. Collateral coverage of more than 1.5x supports a recovery rating of '1+' and an issue rating two notches above the issuer credit rating.

Related Criteria

- Criteria - Corporates - General: Reflecting Subordination Risk In Corporate Issue Ratings, Sept. 21, 2017
- General Criteria: Methodology For Linking Long-Term And Short-Term Ratings, April 7, 2017
- Criteria - Corporates - General: Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Dec. 16, 2014
- Criteria - Corporates - General: Corporate Methodology: Ratios And Adjustments, Nov. 19, 2013
- Criteria - Corporates - General: Corporate Methodology, Nov. 19, 2013
- Criteria - Corporates - Utilities: Key Credit Factors For The Regulated Utilities Industry, Nov. 19, 2013
- General Criteria: Methodology: Industry Risk, Nov. 19, 2013
- General Criteria: Group Rating Methodology, Nov. 19, 2013
- General Criteria: Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013
- Criteria - Corporates - Utilities: Collateral Coverage And Issue Notching Rules For '1+' And '1' Recovery Ratings On Senior Bonds Secured By Utility Real Property, Feb. 14, 2013
- General Criteria: Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- General Criteria: Use Of CreditWatch And Outlooks, Sept. 14, 2009
- Criteria - Insurance - General: Hybrid Capital Handbook: September 2008 Edition, Sept. 15, 2008

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Summary: Texas-New Mexico Power Co.

Business And Financial Risk Matrix

Business Risk Profile	Financial Risk Profile					
	Minimal	Modest	Intermediate	Significant	Aggressive	Highly leveraged
Excellent	aaa/aa+	aa	**a+/a**	a-	bbb	bbb-/bb+
Strong	aa/aa-	a+/a	a-/bbb+	bbb	bb+	bb
Satisfactory	a/a-	bbb+	bbb/bbb-	bbb-/bb+	bb	b+
Fair	bbb/bbb-	bbb-	bb+	bb	bb-	b
Weak	bb+	bb+	bb	bb-	b+	b/b-
Vulnerable	bb-	bb-	bb-/b+	b+	b	b-

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Eugene F. Brigham / Michael C. Ehrhardt

Financial Management 12e

THEORY AND PRACTICE
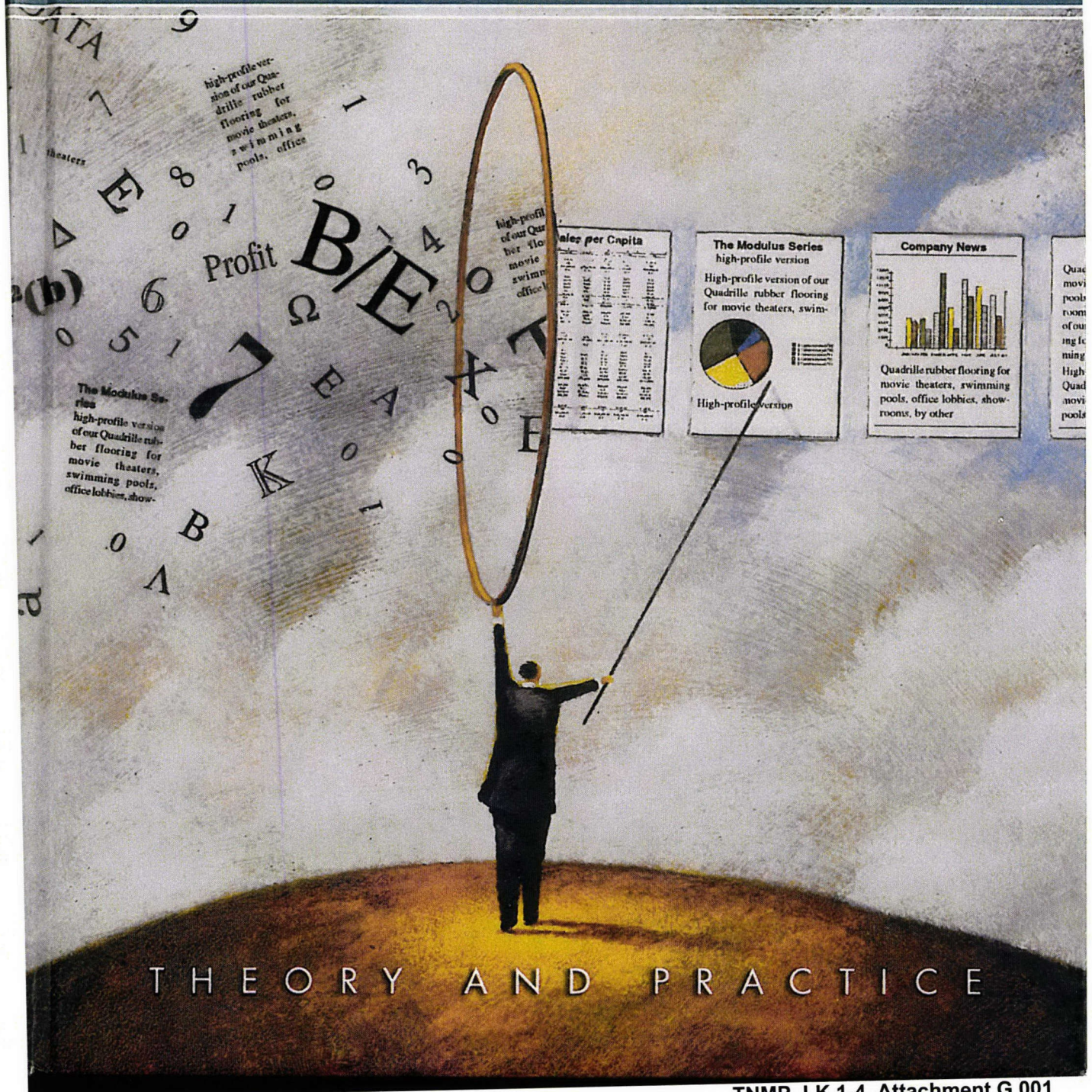
different ways, the need to take corrective actions. Thus, a thorough financial statement analysis will include ratio, percentage change, and common size analyses, as well as a Du Pont analysis, as described next.

SELF-TEST

How does one do a trend analysis?
What important information does a trend analysis provide?
What is common size analysis?
What is percent change analysis?

4.8 Tying the Ratios Together: The Du Pont Equation

In ratio analysis, it is sometimes easy to miss the forest for all the trees. Managers often need a framework that ties together a firm's profitability, its asset usage efficiency, and its use of debt. This section provides just such a model. The profit margin times the total assets turnover is called the **Du Pont equation**, and it gives the rate of return on assets (ROA):

$$\text{ROA} = \text{Profit margin} \times \text{Total assets turnover}$$
$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}. \tag{4-1}$$

For MicroDrive, the ROA is

$$\text{ROA} = 3.8\% \times 1.5 = 5.7\%.$$

MicroDrive made 3.8%, or 3.8 cents, on each dollar of sales, and its assets were turned over 1.5 times during the year. Therefore, the company earned a return of 5.7% on its assets.

To find the return on equity (ROE), multiply the rate of return on assets (ROA) by the *equity multiplier*, which is the ratio of assets to common equity:

$$\text{Equity multiplier} = \frac{\text{Total assets}}{\text{Common equity}}. \tag{4-2}$$

Firms that have a lot of leverage (i.e., a lot of liabilities or preferred stock) will necessarily have a high equity multiplier—the more leverage, the less the equity, hence the higher the equity multiplier. For example, if a firm has $1,000 of assets and is financed with $800 (or 80%) liabilities and preferred stock, then its equity will be $200, and its equity multiplier will be $1,000/$200 = 5. Had it used only $200 of liabilities and preferred stock, then its equity would have been $800, and its equity multiplier would have been only $1,000/$800 = 1.25.[10]

Therefore, the return on equity (ROE) depends on the ROA and the use of leverage:

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[10]Expressed algebraically,

$$\text{Debt ratio} = \frac{D}{A} = \frac{A - E}{A} = \frac{A}{A} - \frac{E}{A} = 1 - \frac{1}{\text{Equity multiplier}}.$$

Here we use D to denote all debt, other liabilities, and preferred stock, in other words, D is all financing other than common equity, E is common equity, A is total assets, and A/E is the equity multiplier.

$$ROE = ROA \times \text{Equity multiplier}$$

$$= \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}}. \qquad (4\text{-}3)$$

MicroDrive's ROE is

$$ROE = 5.7\% \times \frac{\$2,000}{\$896}$$

$$= 5.7\% \times 2.23$$

$$= 12.7\%$$

Now we can combine Equations 4-1 and 4-3 to form the *extended Du Pont equation,* which shows how the profit margin, the assets turnover ratio, and the equity multiplier combine to determine the ROE:

$$ROE = (\text{Profit margin})(\text{Total assets turnover})(\text{Equity multiplier})$$

$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}}. \qquad (4\text{-}4)$$

For MicroDrive, we have

$$ROE = (3.8\%)(1.5)(2.23)$$

$$= 12.7\%.$$

The 12.7% rate of return could, of course, be calculated directly: both Sales and Total assets cancel, leaving Net income/Common equity = $113.5/$896 = 12.7%. However, the Du Pont equation shows how the profit margin, the total assets turnover, and the use of debt interact to determine the return on equity.

The insights provided by the Du Pont model are valuable, and it can be used for "quick and dirty" estimates of the impact that operating changes have on returns. For example, holding all else equal, if MicroDrive can drive up its ratio of sales/total assets to 1.8, then its ROE will improve to (3.8%)(1.8)(2.23) = 15.25%. For a more complete "what if" analysis, most companies use a forecasting model such as the one described in Chapter 14.

SELF-TEST

Explain how the extended, or modified, Du Pont equation can be used to reveal the basic determinants of ROE.

What is the equity multiplier?

A company has a profit margin of 6%, a total asset turnover ratio of 2, and an equity multiplier of 1.5. What is its ROE? (18%)

4.9 Comparative Ratios and Benchmarking

Ratio analysis involves comparisons—a company's ratios are compared with those of other firms in the same industry, that is, with industry average figures. However, like most firms, MicroDrive's managers go one step further—they also compare their ratios with those of a smaller set of the leading computer companies. This technique is called **benchmarking,** and the companies used for the comparison are called **benchmark companies.** For example, MicroDrive benchmarks against five other firms that its management considers to be the best-managed companies with operations similar to its own.

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Journal of Asset Management; Mar 2002; 2, 4; ABI/INFORM Global
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SOAH Docket No 473-18-3981
PUC Docket No 48401
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The record on small companies: A review of the evidence

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Abstract It is now exactly 20 years since the publication of the two pioneering papers — Banz, R. (1981) 'The Relationship between Return and Market Value of Common Stock', *Journal of Financial Economics*, 9, 3–18, and Reinganum, M. (1981) 'Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings' Yields and Market Values', *Journal of Financial Economics*, 9, 19–46 — on the performance of small capitalisation companies. The discovery of the so-called 'small size effect' generated a lively debate on market efficiency and asset pricing and led to a considerable amount of further research that shed light on the nature and market behaviour of this important asset class. The purpose of this paper is to review the empirical evidence on small companies with particular emphasis on the implications relevant to practising fund managers. The weight of the evidence suggests that conventional risk measures (betas) fail to reflect the inherent risks of small firms. Such firms are, however, riskier in terms of higher mortality, lower liquidity, higher short-term borrowings and higher volatility of earnings. The evidence also suggests that the outperformance of small cap stocks, even at the pinnacle of its manifestation, was driven by a relatively limited number of such stocks. Such good performers possess a number of key characteristics. They have lower than average market-to-book and price-earnings ratings, and their market value is higher than the average capitalisation of the small cap sector; they have been listed in the market for longer than a year and have not raised additional equity capital in the last year. They have reasonably stable earnings growth profile, do not belong to sectors with excessive swings in analyst forecasts and current ratings do not depend on hugely over-optimistic analyst forecasts.

Keywords: *performance; size effect; small companies*

Introduction

Small cap stocks, in terms of market value, have a long-established tradition in the investment community as an important and distinct asset class. They have always attracted the following of expert analysts and have formed the basis of specialist funds. Interest in small firms exploded in the early 1980s, when a series of academic papers documented a significant long-run return differential between large and small capitalisation stocks. Small companies continue to attract wide investment interest in spite

of their dramatic performance reversal in recent years. Although they make up only a small proportion of the total market capitalisation, in terms of numbers they constitute a large and vital segment of the market.

From the academic viewpoint, the evidence on small cap outperformance provided a direct challenge to the broad concept of market efficiency and conventional asset pricing models. At the beginning, the bulk of the research endeavour was to document the 'anomaly' and test its robustness under various methodologies and independent datasets. This effort has provided considerable insights into some aspects of small firms' behaviour, and in the process discovered a number of other intriguing empirical irregularities.[1] Nevertheless, it is fair to say that, after almost 20 years of its discovery, the underlying logic and sometimes the practical significance[2] of the so-called 'size effect' still remains a matter of debate. We have, however, gained considerable insights into the pricing of financial assets, the operating characteristics of small companies and the special risk characteristics of such firms. It could be argued that the discovery of the small size effect represents a turning point in the direction of academic thinking on asset pricing.

The purpose of this paper is to review the empirical evidence on small companies. It aims to establish the key facts about the characteristics of this asset class rather than to rehearse old explanations for the small size effect.[3] More specifically, this paper's emphasis is on aspects of small companies' behaviour that appear well substantiated by empirical evidence and have practical implications to practising fund managers. Although the review is based on both the USA and the UK evidence, the emphasis is inevitably on the latter. Given the paucity of studies for the

London market, it relies heavily on the author's own published and previously unpublished research.

The performance of small caps

Since the initial discovery of the size effect in the USA by Banz (1981) and Reinganum (1981), a stream of other studies documented broadly similar results for a number of other countries as well. Hawawini and Keim (1999) provide a comprehensive review of the international evidence. Levis (1985) published the first detailed study on the performance of small companies for the London market. The study documents an average 6.5 per cent annual raw premium for the smaller decile of UK firms during the period January 1958 to December 1982; it is based on a sample ranging from around 1,500 in the late 1950s to 2,400 in the mid-1970s. In line with the US evidence, the size premium is consistent across the whole spectrum of market size deciles, suggesting that a significant, albeit lower, size premium could be achieved at levels of market capitalisation more amenable to fund managers' requirements.

This study attracted considerable media[4] attention which eventually led to the 1987 launch of the Hoare Govett Smaller Companies (HGSC), the Hoare Govett 1000 (HG1000) and the FTSE Small Companies indices. The HGSC index is value weighted and defines small companies as the bottom 10 per cent of the London market according to market capitalisation. The index is broadly equivalent to the weighted average of the first nine deciles classification in the Levis (1995) study. It covers an average of about 1,600 companies with a maximum market capitalisation of about £500m. At the same time, the largest company in the HG 1000 index is usually about £100m. The definition of

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a small firm has also shifted in recent years. A survey reveals that 63 per cent of investment managers now include businesses with a market capitalisation of more than £350m in their definition of a small company; the proportion of fund managers taking this view has doubled during the past year.[5]

The HGSC index shows a premium of 6.3 per cent over the FTSE All Share for the period 1955–88 but it records a dramatic reversal of small companies' performance in more recent years. Thus, the average return differential for the period 1955–2000 has declined to a mere 3.6 per cent per annum. The turning point for small companies' performance in the UK appears to be in the third quarter of 1988. Before then, small companies enjoyed six consecutive years of strong outperformance. With the exception of the 1957–64 period, this was indeed the longest spell of small company supremacy Sometimes it is argued that the small company premium disappeared, both in the USA and in the UK, as soon as it became widely publicised. This is a far-fetched interpretation of causality. It is important to note that, at the time of the size effect reversal, the UK economy was undergoing some significant changes. For the record, four key developments can be noted. First, the FTA index lost 5.24 per cent of its value during the single month of August 1988. Secondly, this same month was the first time for a long period that the market witnessed an inverted term structure in interest rates. Treasury bill rates increased from 6.9 per cent in May 1988 to 10.9 in August 1988. Thirdly, in the 12 months to August 1988, the sterling rate strengthened by 6.8 per cent against a basket of main currencies. Fourthly, the CBI business confidence

indicator dropped by 67 per cent in the 12 months to August 1988, starting a period of prolonged deterioration in business confidence across the UK manufacturing industry.

The international evidence

The size effect has also ceased to exist in the US markets since the mid-1980s. In fact, Siegel (1994) claims that the entire outperformance by small cap stocks from the end of 1926 to 1996 is due to the nine-year period from 1975 through 1983. More recently, Horowitz *et al.* (1998), in an extension of the pioneering Banz and Reinganum studies, find that during the period 1980–96, the average return for the smallest size decile — across NYSE, AMEX and NASDAQ — is 1.33 per cent per month compared with 1.34 per cent per month for the largest decile.[6] Ibbotson (1997) also reports a negative 1.7 per cent annual size premium during the 1980s and a positive premium of just 1.2 per cent in the period 1990–96.

Figure 1 shows the size effect for seven European countries over the period 1988–98.[7] With the exception of France, where small companies outperformed large ones, and Spain, where the performance of small and large companies is almost identical, the other five countries — Germany, Netherlands, Spain, Sweden and Switzerland — had exactly the same experience as the UK in the last decade: large firms performed better than small firms. Thus, it appears that in the 1990s small companies lagged considerably in market performance across almost all major capital markets.[8] This is again in sharp contrast to evidence relating to earlier periods, suggesting a positive size effect. For example, Hawawini and Keim (1999) report positive size premia of about 6–9 per cent per annum for France,
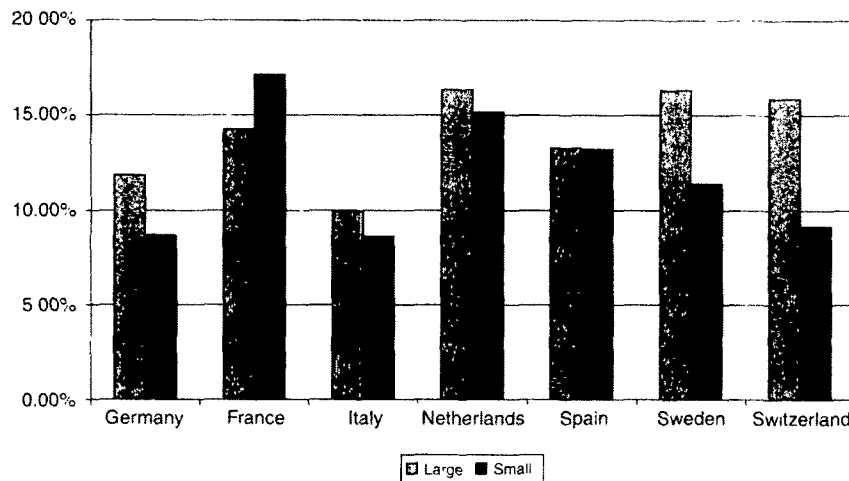
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Figure 1 Annual average returns 1988–98

Germany, Spain and Switzerland for long periods before 1989. It is important also to note that in 1998 small companies in Europe generally underperformed their larger counterparts only by a narrow margin. This is in sharp contrast to the disastrous performance recorded by UK small cap stocks.

At this stage two clarification points are in order. The first relates to the robustness of the size effect and its interrelation with other stock characteristics, while the second addresses the definition of firm size. The search for an explanation of the effect revealed a number of other irregularities in asset pricing which appeared not to be completely independent of size. A number of studies, for example, show that the small size effect is concentrated in certain months of the year, while others report that the size spread is related to other stock characteristics. Blume and Stambaugh (1983) and Stoll and Whaley (1983) report a high rank correlation between size and price, while Keim (1988) and Jaffe *et al.* (1989) find similar correlations between size and earnings yield and price-to-book ratios.

The main question surrounding these findings is whether these additional effects are independent of or are related to market size. The evidence on this issue is rather controversial. While, for example, Reinganum (1981) and Banz and Breen (1986) argue that the size effect subsumes the PE effect, Basu (1983) maintains quite the opposite, ie size-related anomalies disappear when one controls for the PE effect. Using more recent data covering the period 1962–94, Hawawini and Keim (1999) report pairwise significant correlations between size, E/P, CF/P, P/B and price for NYSE and AMEX stocks. Interestingly, however, the strongest correlation is observed between market size and price (0.78), suggesting that the size effect may be some manifestation of a low price effect.

The evidence for the UK raises even further questions about the robustness of the size effect. Using data for the London Stock Exchange for the period April 1961 to March 1985, Levis (1989a) shows significant differences in risk-adjusted returns for portfolios formed on size, PE, dividend yield and price. It

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appears, however, that small firms tend to be firms with low PE ratios and share prices. Hence, when controlling for the possible interactions between the four ranking criteria, it becomes difficult to distinguish among the four effects in general and between size and share price in particular. He concludes that 'the weight of the evidence raises questions about the strength of firm size as an independent determinant of the stock generating process. Its strong dependence with the other firm attributes suggest that it cannot be viewed as either an independent anomaly or a profitable investment strategy on its own' (p. 695).

The second issue relates to the definition of firm size. Although the finance literature almost invariably uses market value as the metric for company size, this is not common practice in other disciplines. The general business literature, for example, tends to define company size using other relevant metrics such as size of assets, volume of sales, book value of assets and number of employees. Berk (1995a) examines the market performance of small firms using various definitions of size. In a sample in which both market value and book-to-market (BM) have a strong cross-sectional relation to average return, he fails to find a similar significant relation between average return and other, non-market, measures of firm size. Thus, although quite often market size is inferred as equivalent to economic size, it is clear that small stocks are different from small firms. Nevertheless, following long-established practice, the terms are used interchangeably in this paper.

These basic observations tend to suggest that the performance of small companies is not isolated from macroeconomic fundamentals, and there is probably a certain cyclicality in the small size premium. These issues are discussed in the following two sections.

It is also worth noting that there are some marked differences in the pattern and underlying characteristics of small and large companies. They relate to the risk profiles, underlying fundamentals and market characteristics of small firms. These issues are reviewed in the fourth, fifth and sixth sections.

Time varying performance

The reversal in the fortunes of smaller companies during the period August 1998 to December 1992 and later on from 1995 to the end of 1998 was widespread and dramatic. This was not the first time, however, that smaller companies had gone through a bad spell. Levis (1985) shows noticeable variations in the performance of size decile portfolios during the 1960s and 1970s as well. Such cycles in the size effect are of course not unique to the London market. Reinganum (1992), for example, provides evidence for the period 1926–89 suggesting that the outperformance of smaller firms in the NYSE follow a five-year cycle. He examines the stock returns' behaviour of different size portfolios in period 1926–89 by estimating the autocorrelations of returns over different investment horizons. His results show that, over a one-year horizon, the autocorrelations are positive but not significantly different from zero. The autocorrelations become negative for investment horizons of three-years or longer, peaking in year five. This cyclical pattern of behaviour raises the possibility that the small-firm effect may be driven by economic fundamentals and may be even predictable.

Brown *et al.* (1983) also document considerable variability over time in the performance of small firms. More specifically, it appears that the size effect reverses itself over sustained periods. Fama and French (1988) provide broader and more detailed evidence consistent

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Table 1 Autocorrelation of returns

	Return horizon (years)					
	1	**2**	**3**	**4**	**5**	**6**
Small	0.217	−0.266	−0.505	−0.573	−0.465	−0.257
	(1.79)	(−1.89)	(−3.89)	(−4.24)	(−1.99)	(−0.68)
Q2	0.098	−0.345	−0.478	−0.510	−0.346	−0.158
	(0.83)	(−2.31)	(−3.65)	(−5.63)	(−2.56)	(−0.73)
Q3	0.085	−0.337	−0.455	−0.475	−0.333	−0.177
	(0.66)	(−2.52)	(−4.14)	(−4.38)	(−2.29)	(−0.95)
Q4	0.002	−0.279	−0.316	−0.344	−0.257	−0.208
	(0.02)	(−2.03)	(−3.32)	(−3.51)	(−1.68)	(−1.08)
Large	−0.067	−0.198	−0.135	−0.174	−0.162	−0.242
	(−0.39)	(−1.49)	(−1.39)	(−2.66)	(−1.11)	(−1.25)
FTA	−0.078	−0.224	−0.101	−0.120	−0.121	−0.261
	(−0.44)	(−1.70)	(−0.91)	(−1.39)	(−0.66)	(−1.06)

Source. Levis and Kalliontzi (1993)

Table 2 Duration of size effect cycles and annualised rates of return for five size portfolios during the cycle

			% Annualised rate of return			
	Months	**Cycle**	**Small**	**MV2**	**MV3**	**Large**
May 60–May 62	25	Down	10.5	13.8	12.8	11.5
Jun 62–Mar 64	22	Up	28.6	25.3	17.8	13.0
Apr 64–May 68	50	Down	13.7	14.9	15.1	18.2
Jun 68–Sep 73	64	Up	28.4	20.9	16.9	12.1
Oct 73–Sep 75	24	Down	2.3	−0.8	1.9	9.1
Oct 75–Feb 79	41	Up	54.2	49.6	39.8	28.4
Mar 79–Dec 81	34	Down	19.2	16.5	19.0	20.4
Jan 81–Nov 87	83	Up	40.4	31.0	28.5	26.4
Dec 87–Mar 91	40	Down	2.6	3.8	11.2	17.6

Source· Levis and Kalliontzi (1973)

with the proposition that stock returns are predictable over longer time periods. They test separately various industry returns and size decile portfolios. The estimates for industry portfolios suggest that predictable variation due to mean reversion is about 35 per cent of 3–5-year variances. Returns, however. are more predictable for portfolios of small firms. Predictable variation is estimated to be about 40 per cent of 3–5-year return variances for small-firm portfolios. The equivalent variation falls to around 25 per cent for portfolios of large firms. On the basis of this evidence, they argue that the negative autocorrelations of portfolio returns are largely due to a common

macroeconomic phenomenon, and stock returns are related to the business conditions." Poterba and Summers (1988), using an alternative approach that overcomes some of the methodological problems of Fama and French (1988), also find evidence of negative serial correlations over long-term horizons.

To test the mean reversion proposition in the UK context. Table 1 shows slopes in regressions of $r(t, t + 12)$ on $r(t - T, i)$ for return horizons from 1 to 6 years, using size quintiles data for the 1956–91 sample period.[10] The slopes are negative for investment horizons of 2–6 years. They peak in the third and fourth year and decline again in years five and six. As in the case of the US, this U-shaped

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pattern of regression slopes is particularly pronounced for smaller firms' portfolios.

Table 2 provides descriptive statistics of the size premia during the business cycle in the period 1960–91. The first full cycle covers the period May 1960 to March 1964; the second extends from April 1964 to September 1973, the third from October 1973 to February 1979, while the last full cycle, in the period under consideration in this study, covers the period March 1979 to November 1987. Since then, the downward part of a cycle has been witnessed, which ended in March 1991. The length of a full cycle ranges from 47 months (May 1960 through March 1964) to 117 months (March 1979 through November 1987). The upward half-part of a cycle is always longer than its declining counterpart. The average duration of the down cycle is 34 months, while the equivalent length of the up cycle is 52 months. The irregular length of the small-firm cycle does not lend itself to easy forecasts. This table also reports the annualised rates of return for each of the four size portfolios during each half cycle. The results clearly demonstrate that small companies tend to underperform in economic contractions and outperform during periods of economic expansion.

In spite of the persistent evidence of predictability of long horizon returns, the source of this predictability remains a subject of continuous controversy. Some argue that it is due to some form of irrationality (such as fads, speculative bubbles or noise trading) that forces stock prices to deviate temporarily from their fundamental values and generates negatively autocorrelated and, hence, predictable returns. The irrational type of arguments proposed by Shiller (1984), DeBondt and Thaler (1985 and 1987) and Lakonishok *et al.* (1994) can take a variety of different forms. Although a full discussion of this type of research is

outside the scope of this paper, it is worth mentioning that the 'noise trading' story may be of some direct relevance to the size effect. It is argued that small companies, being held predominantly by private investors at least in the US, are more prone to sentiment swings than their larger counterparts. Others maintain that it is a consequence of rational time variation in expected returns as business conditions, investment opportunities and risk aversion change through time. The fact that the variation in expected returns is largely common across assets and is related to business conditions in plausible ways, adds credence to the rational type of explanation.

Small companies and macroeconomic conditions

Modern finance theory suggests that prices of financial assets are determined by the expected changes in future cash flows and the discount rate applied to them. Thus, the observed differences in the returns of different size firms should be related to the different reactions of the cash flows and discount rates for such firms to changes in the economic environment. Such disparate reactions to economic conditions are likely to be due to the differences in the underlying fundamental characteristics of small, medium and large firms.

There is a plethora of anecdotal and *ad hoc* statistical evidence that small companies are more sensitive to hikes in interest rates, changes to monetary policy and recessions in general. Jensen *et al.* (1997, 1998), for example, argue that the relationships between stock returns and firm size varies across monetary periods. The premium for small firms is positive and significant in periods when monetary policy is in an expansive mode, but insignificant or negative in cases when policy is restrictive.[11] Anderson (1997)

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also reports that the size premium is positively related to inflation and the term structure of interest rates, while Speidell and Stone (1997) and Levis and Liodakis (1999) find that changes in industrial production lead to small stock returns in all major capital markets.

Chan et al. (1985) argue that returns are different because they have different sensitivities to the risk factors determining asset prices.[12] They show that small firms are more exposed to production risk and changes in the risk premium. The significant coefficient for the risk premium factor suggests that smaller firms are more exposed to economic downturns. Thus, firm size proxies for some unmeasured risks not captured by the conventional risk measures.

He and Ng (1994) examine whether size and BM are proxies for risks associated with the Chen et al. (1986) macroeconomic factors or are just measures of a stock's sensitivity to relative distress. They find that the macroeconomic risks related to the CRR factors are not able to explain the role of BM in the cross section of average returns on NYSE, AMEX and NASDAQ stocks. Instead, they find that size. BM and relative distress are related. Moreover, their results imply that BM and size do not capture similar risk characteristics important for pricing stocks.

The above studies assume stationarity both in the time series behaviour of the risk coefficients and the equivalent behaviour of risk premiums. Such tests are usually referred to as unconditional tests of asset pricing models because the moments are considered to be independent of any ex ante known information. They are generally more popular because they require rather short testing periods, during which betas and risk premia are considered to be time invariant. But unconditional tests of asset pricing models completely ignore the

dynamic behaviour of expected returns, which is somewhat inconsistent with the evidence documenting predictable time-variation in returns.

Conditional asset pricing

More recent research has concentrated on the time-series properties of risk premia rather than long-term averages. Conditional asset pricing models are in fact motivated by the empirical evidence reporting the existence of time-series return predictability and by the belief that investors update their expectations using the latest available information in the market. Using this approach, Ferson and Harvey (1991, 1993) and Ferson and Korajczyk (1994) demonstrate that the time variation in expected returns is mostly attributed to changes in risk premia rather than movements in the betas. By averaging the risk premia over time (as done in the unconditional tests), the properties of their dynamic behaviour are missed. Specifically, in some states of the economy, some factors may be rewarded, whereas they may not be priced in some others. Thus, if the risk premium associated with a certain factor is highly volatile, its average may turn out to be statistically insignificant when, in fact, it may be important to explain the cross section of returns in some states of the economy. For example, Ferson and Harvey (1991), using a version of the Fama and MacBeth (1973) methodology, report that the average market risk premium is not statistically significant in a multibeta model. Using a conditional asset pricing model, however, they find that the expected compensation for the stock market is larger at some times and smaller at other times, depending on the economic conditions. In particular, they show that it varies

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counter-cyclically. This type of conditional model is better suited for studying the performance of small companies over time.

In sharp contrast to the voluminous research in the USA relating the cross-sectional behaviour of stock returns to the macroeconomy and individual risk characteristics, there is very little work relating to the UK market.[13] In an attempt to account for the differences in risk characteristics between size and value strategies, Levis (1995a) tests a conditional APT model for the period 1970–91 using UK data. Using the standard Fama and McBeth (1973) methodology and 20 market size portfolios, he tests an APT model with the same five macroeconomic factors[14] — market, growth of industrial production, inflation, term structure and default premium — as Chen *et al.* (1985). His results show that the average market betas for small firms are lower than their larger counterparts.[15] The beta coefficients of the other four economic factors are less consistent. Small firms, for example, are more likely to be adversely affected by unexpected increases in inflation and deterioration in credit conditions.

Analysis of the time series pattern of the betas for each of the economic factors suggests large variation for the smallest and largest portfolios and relatively stable exposure coefficients for the intermediate portfolios. It is also worth noting that the market betas of smaller firms have increased consistently since the early 1970s and ended the period considerably higher than those of larger firms; on the contrary the betas of this latter portfolio declined from about 1.1 in the early 1970s to just below 0.9 in 1991. Thus, since the late 1980s betas of smaller firms on the London Exchange appear consistent with the pattern of betas documented in US studies.

Levis (1995a) also documents considerable variability over time in the

risk premia for each of the five economic factors. This is particularly pronounced for the market and the growth rate of industrial production premia; they take a wide range of values and can change signs over a relatively short time period. The market risk premium associated with the size procedure increases during economic downturns and peaks near business cycle troughs. This is consistent with the notion that the required rates of return for different types of risk are not constant over time; they vary with economic cycles and certain size companies are more susceptible than others to different types of economic environments.

Risk characteristics of small companies

Although the studies discussed in the previous section suggest that there are risk differences, in terms of exposure to macroeconomic conditions, between small and large companies, they do not suggest why.[16] Smallness by itself does not necessarily imply higher risk, and differences in market capitalisations do not explain why small and large companies have different responses to economic news. Moreover, the traditional beta measure of risk does not appear sufficiently robust to capture the risk exposure of small companies.

Of course the failure to capture the riskiness of the small companies by conventional risk measures could be attributed to some type of beta mis-estimation. Chan and Chen (1988) show that when more accurate estimates of betas are employed, no size-related differences in average returns are observed. In a related paper, Handa *et al.* (1989) argue that the size effect is sensitive to the return measurement intervals used for beta estimation and

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present results suggesting that it can be explained by betas estimated with annual returns. Of course it may sometimes be possible to devise some type of beta estimate to accommodate the problem in hand but, in general, Jegadeesh (1992) demonstrates that betas do not explain the cross-sectional differences in average returns.

Chan and Chen (1991), in one of the most important contributions to the literature, explore the fundamental risk characteristics of smaller companies. They argue that small firms are marginal firms in the sense that their prices tend to be more sensitive to changes in the economy and are more exposed to adverse economic conditions. More specifically, small firms are more likely to be inefficient producers, to have high financial leverage and limited access to capital markets, particularly at periods of tight credit conditions. As a result of such fundamental differences with larger (healthier) companies, marginal companies react differently to the same piece of macroeconomic news. The evidence in the previous section is consistent with this interpretation. They also provide a battery of tests that are consistent with the broad underlying rationale of their proposition. More specifically they show: First, a total of 66 per cent of the constituents of the bottom size quintile found themselves in this position as a result of dropping from higher size quintiles, suggesting that this grouping contains a large proportion of firms that have not been doing well. The proportion of companies moving up the quintile ladder is relatively small. Secondly, after controlling for differences in industrial classification, the average return to assets of the bottom quantile firms during 1966–84 is about 5 per cent lower than the equivalent return of the firms in the top quartile. (The operating income before depreciation over total

assets for quartile 1 is 12.1 per cent, while the equivalent ratio for quartile 5 is 17.8 per cent.) The differences in the average interest expenses over operating income before depreciation ratio are even more striking: the interest expenses of firms in the first quartile amount to 25 per cent of operating income before depreciation, while those of the top quartile firms are only 14.4 per cent. Thirdly, among the firms that have cut their dividends in half or more the year before, 50 per cent are in the bottom size quintile. Fourthly, the probability that a small company is highly leveraged[17] is almost four times higher than that of a large company.

There is only limited research currently available focusing on these types of risk. This is rather unfortunate, since firm mortality, dividend policy and leverage may have a significant impact on expected cash flows and discount rates. There is, however, some evidence that appears to corroborate the results of Chan and Chen (1991). Queen and Roll (1987), for example, show that there is a strong inverse relation between unfavourable mortality and size. About one-quarter of the smallest firms are halted, delisted or suspended from trading within a decade, and about 5 per cent actually meet this fate within a year. In contrast, less than 1 per cent of the largest firms expire from unfavourable causes even over the longest observation period.

A high mortality rate among small firms is also observed in the UK.[18] A firm, of course, may be delisted for different reasons, such as a straight takeover, suspension or liquidation. Figure 2 shows that the probability of such incidents occurring is significantly higher for small to medium-size companies. On the basis of the record during the period 1958–88, companies in deciles 3–6 are more likely to be the
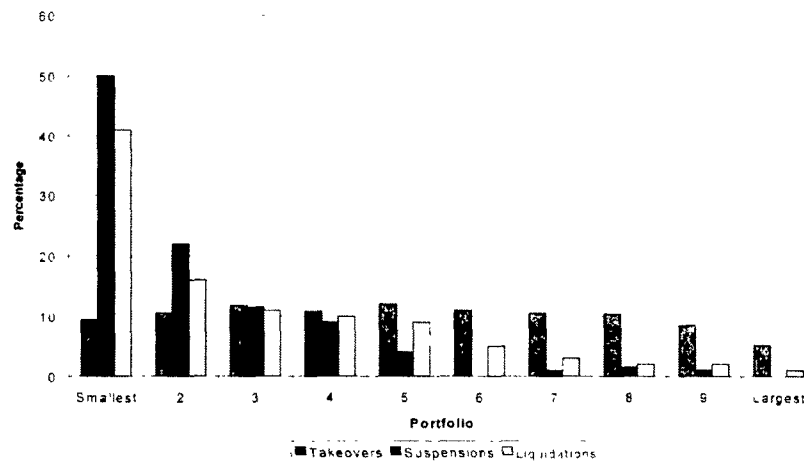
Levis

Figure 2 Drop-outs size distribution

targets of takeovers than companies in deciles 9 and 10. During the same period, 95 per cent of the suspended companies belonged to deciles 1–5, with a staggering 50 per cent coming exclusively from the first smallest decile. Liquidations were also heavily concentrated in deciles 1–6 with 45 per cent from the first decile alone. Thus, there is little doubt that smaller companies are more vulnerable than their larger counterparts to some type of event risk.

To access the life-cycle profile of the typical UK small company, Levis (1989b) examines the interquintile movement of quintile size portfolios over a five-year period. Although the analysis has been conducted over a full 10-year period in the 1980s, the basis year 1984 shown in the graph represents a good basis for assessing the life cycle of small companies. During the period 1984–88, the HGSC index outperformed the FTA index by an average of 7.2 per cent per annum. Thus, one would expect to find some substantial upward interquintile movement during this period. In this sense, the results are rather surprising. A

remarkable 57 per cent of the smaller companies that started in the smallest quintile in January 1984, excluding those that have dropped out of the sample for various reasons, are still in the same grouping at the end of 1988. Of the total population of companies that started in quintile 4 in January 1984, only 21 per cent moved to the top quintile, while 26 per cent moved down to smaller quintiles. In short, the evidence from the London market is consistent with the proposition that, even at the best of times, the outperformance of small companies is driven by a relatively small number of such companies with exceptional performance. Most of the small cap universe is static and is composed of companies that migrated to this group as a result of past bad performance or are almost permanently stuck in this position following years of indifferent performance.

Table 3 shows three measures of gearing for firms in five market size portfolios: short-term borrowings over assets, long-term borrowings over assets and total borrowing over assets. Short-term borrowings refer to loans

Table 3   Borrowing ratios for five market size portfolios 1971–90

Portfolio	Short loan/total assets	Long loans/total assets	Total loans/total assets
MV1	11.1	4.9	15.9
MV2	10.4	5.8	16.2
MV3	8.5	6.9	15.3
MV4	7.5	9.0	16.4
MV5	6.4	12.5	19.1

Source: Levis and Kalliontzi (1993)

shorter than a year. The data were collected from Datastream, and cover the period 1971–90. The number of firms included in the sample varies from year to year, ranging from 330 in 1971 to 1,232 in 1989. Market size portfolios were constructed in the same way as for rates of return, but they are based on the total number of firms for whom data were available in each of the 20 years. The results reveal significant differences between small and large firms. While all firms appear to use roughly the same amount of total loans as a percentage of their total assets, there are nevertheless significant differences in the composition of these borrowings. Smaller firms rely more on short loans; the average ratio of short loans to assets decreases monotonically with firm size. It starts from 11.1 per cent for MV1 and declines to 6.4 per cent for MV5. In contrast, the ratio of long loans to total assets follows a reverse pattern. The average ratio for MV1 is 4.9 per cent and increases to 12.5 per cent for firms in the largest market size portfolio.

Finally, it is worth mentioning again the liquidity issue that is widely recognised as one of the key impediments to successful small companies' strategies. Liquidity, or the lack of it, is also regarded by the managers of small companies themselves as the key disadvantage for their shares. In a recent survey of 165 companies, 36 per cent cited this as the most detrimental factor to the performance

of their shares.[19] Keim (1989) reports that small firms have, on average, 11 times the percentage spread of large firms. The differentials in bid-ask spreads between small and large can be significant, but they are not the only components of the total transaction costs. Bhagat (1993) estimates that the total round-trip trading costs can range from 200 to 300 basis points under normal implementation conditions and could be even higher in the face of unfavourable market impact and/or opportunity costs.[20] These costs detract from overall performance. With an annual turnover of 150 per cent, the performance barrier to simply break even with the passive alternative would be as high as 300 to 450 basis points.

In short, the evidence in both the USA and the UK clearly demonstrates that small companies differ from their larger counterparts in a number of key fundamental characteristics which make them more vulnerable to macroeconomic conditions. The increased riskiness may be reflected directly in their expected earnings or, equally importantly, may affect their valuation by the increased risk premia required for such companies by the investors. The next two sections discuss the earnings record of small companies.

Size and earnings fundamentals

Corporate earnings are normally regarded as a main measure of general

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Table 4 Earnings growth profile and PE ratios for size deciles, 1980–89

Market size	% EPS growth	PE ratio	% of total in sample	% in sample with high EPS growth	% in sample with low EPS growth
Small	19.5	13.7	6.3	7.5	5.1
2	14.5	14.4	7.7	7.7	7.6
3	16.0	13.4	8.1	8.7	7.5
4	16.0	13.8	8.9	9.9	8.0
5	14.0	13.9	9.8	10.2	9.4
6	9.4	12.8	10.5	10.3	10.6
7	7.7	12.7	11.8	10.4	13.3
8	7.0	13.4	11.9	11.0	12.8
9	9.4	12.5	12.8	12.8	12.8
Large	5.8	7.5	12.2	11.5	12.9
Market	10.9	12.7	100.0	100.0	100.0

Source: Levis (1991)

macroeconomic activity.[21] They are also essential for most contemporary stock valuation models. There is solid evidence suggesting that over sufficiently long periods, stock performance maps reasonably well on earnings. Easton and Harris (1991) for the USA and Strong (1993) for the UK, among others, show that stock returns are associated with both earnings levels and earnings changes.[22] Probably the most telling evidence is provided by Fama and French (1992, 1993, 1995). Their time-series regressions of annual returns on fundamentals (equity income/book equity, earnings before interest and sales) clearly demonstrate that the size factor in returns is related to the size factor in fundamentals. This is consistent with the hypothesis that the size factor in fundamentals is the source of the size factor in returns.

Ragsdale et al. (1993) show that in the period 1975–81 of small-stock market outperformance in the US, the aggregate net income of the small-capitalisation quintile of stocks grew at a compound annual rate of 18.5 per cent, while that of the largest capitalisation quintile grew at only 9.1 per cent. During the 1984–90 period of small-stock market underperformance, the smallest stocks

reported negative aggregate net income for the period, while the largest quintile reported positive aggregate net income and grew 4.3 per cent on a compound annual basis. Thus, the reversal of the market performance of small stocks is mapped to the pattern of earnings in the two periods Ragsdale et al. (1993) also show that earnings fundamentals play a significant role in explaining both the strong performance of small stocks during 1974–83 and their underperformance in the 1984–90 period. More specifically, they identified the increased leverage ratio of smaller firms as one of the factors that might have contributed to the shifts of relative earnings performance of small stocks.

The UK evidence on the link between earnings growth, market size and stock valuation remains tenuous. Levis (1991) examines the history of earnings growth for ten market size groups. The results in column 2 of Table 4 show that small companies have outpaced the EPS growth of their larger counterparts by as much as 13 per cent per annum in nominal terms during the period 1980–89. Moreover, the evidence points to a gradual decline in EPS growth as one moves towards the larger size deciles. The remarkable earnings
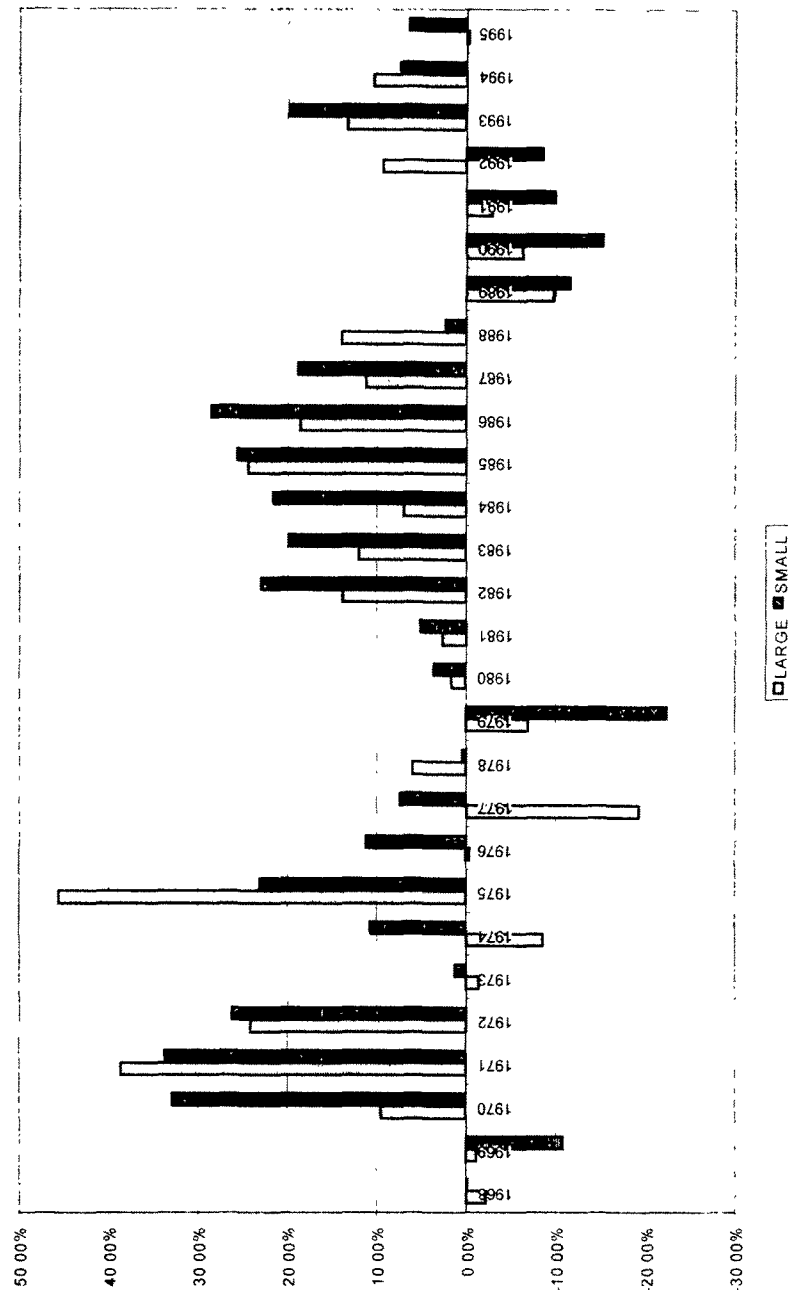
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Figure 3 Annual earnings growth by market size 1969–95

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outperformance of small firms during this period appears to be reflected in the stock returns. During the 1980s, small and medium-size companies were trading at multiples markedly higher than their very counterparts and still managed to outperform.

Using more recent data, Dimson and Marsh (1999b) show that during the period 1955–88 the average dividend growth of the HGSC index was 1.9 per cent higher than that of non-HGSC companies. The pattern reversed during 1989–97, where the annualised dividend growth for HGSC companies was 3.4 per cent lower than that of their larger counterparts. On the basis of this evidence, they conclude that the reversal of the size effect is linked to the fundamentals. A closer examination of the earnings record of UK firms during the 1990s, however, reveals that the relative earnings growth of small firms was not as disastrous as suggested by their stock returns. Figure 3 shows that small firms suffered negative earnings growth in four consecutive years from 1989 to 1992, at the height of the recession — 1990 and 1991 — large companies have also recorded negative changes in the earnings, albeit somewhat less dramatic than those observed for small firms. What is even more interesting, and to a certain extent puzzling, is the earnings behaviour of small companies in the following three years, 1993–95. With the exception of 1994, the earnings growth of small firms was better than that of large firms. The superiority in earnings growth ranges from about 9 per cent in 1993 to a solid 6 per cent in 1995. Thus it appears that in recent years the UK market experienced a remarkable decoupling between fundamentals and stock returns performance. A similar type of pattern has also emerged in the US. While earnings growth in the Russell 2000

index was almost twice as large as the equivalent growth for the S&P 500 in the first two quarters of 1998, the price performance gap continued to move against small caps.

Taking a long-term perspective, Fama and French (1995) show that, after controlling for BM differences, small firms tend to have lower earnings on book equity than large firms. The size effect in earnings is, however, largely due to the low profits of small stocks after 1980. In contrast to the UK evidence, profitability in the US shows little relation to size before 1981. It appears that the recession in the US in 1981 and 1982 turned to a prolonged depression for small stocks. They observe, however, that 'for some reason, which remains unexplained, small stocks do not participate in the boom of the middle and late 1980s' (p. 132).

In spite of the overall superior earnings growth by small firms in the 1980s, documented in Table 6, however, it is important to note that the proportion of smaller/larger companies with above/below median growth is not markedly different from their proportional representations in the sample. In other words, the high annual average EPS growth of small companies appears to be predominantly due to the very fast growth of some companies in these groups rather than to the universal faster growth record of such companies. Moreover, low growth does not appear to be a unique, across the board, characteristic of large companies. While, for example, the very large companies accounted for 12.2 per cent of the population in the sample, the high EPS growth group contained not less than 11.5 per cent of these companies.

Table 5 sheds some further light into this issue. The standard deviation of earnings growth within the first five size deciles is almost twice as large as the

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Table 5   Average EPS growth and within group standard deviation (SD) of EPS growth

	1980-82		1982-84		1984-86		1986-88		1987-89	
	Growth	SD	Growth	SD	Growth	SD	Growth	SD	Growth	SD
Small	2.7	1.17	29.8	1.53	15.7	0.83	24.5	1.24	21.0	1.39
2	6.7	1.19	10.4	1.04	20.6	1.46	26.6	1.46	21.7	1.35
3	3.0	1.00	15.6	1.13	19.1	1.19	25.4	1.12	20.3	1.07
4	-3.5	0.77	15.8	0.94	20.3	0.94	16.4	0.93	21.1	1.04
5	0.1	1.00	9.6	0.89	21.4	1.23	16.7	1.12	19.0	1.15
6	-0.7	0.82	12.7	0.98	9.5	0.70	18.5	1.08	20.5	1.18
7	-3.9	0.59	9.9	0.87	11.9	1.04	19.1	1.15	17.7	0.96
8	-4.4	0.58	6.8	0.86	12.1	0.83	7.4	0.79	7.5	0.77
9	-2.1	0.65	10.2	0.77	10.6	0.73	9.3	0.78	13.5	0.83
Large	-2.2	0.64	6.8	0.65	6.0	0.63	9.1	0.66	11.4	0.74

Source: Levis (1991)

volatility of large companies. It is this particular aspect of risk that is of more concern to investors than volatility in prices. It means the fundamental performance of smaller companies, as a group, is much more difficult to assess and predict than that of large companies. It appears that sometime in 1988 the market suddenly realised that smaller companies could not any more match their past earnings growth, thus it became apparent that their PE ratings were out of step with future prospects. The unavoidable correction was already well under way. Table 5, for example, shows a jump in the earnings volatility and a significant narrowing of the gap in earnings growth between small and large companies during the period 1987-89. Bank of England (1991) reports that large companies were the sole group to experience operating profits growing faster in 1989 than in 1988. This group also saw the most rapid growth in overseas sales. Income gearing rose rapidly for all three groups; for the smallest, this is most likely to have reflected their relative dependence on bank finance combined with some distress borrowing.

The volatile nature of small firms' earnings is another key ingredient in understanding the differences in market performance across different-size firms.

We know that there is a significant, albeit modest, association between earnings and stock returns during the same time period, but this says very little about the relation between current earnings and future returns. On the other hand, Ou and Penman (1989) show that financial statement information, applied mechanically across companies can be used to predict subsequent-year earnings changes and systematically earn abnormal investment returns. Thus, the relation between current earnings and future returns may differ across different-size firms depending on how predictable future earnings are.

Ettredge and Fuller (1991) show that a larger number of small firms report negative earnings over any single period; but firms with negative earnings in any one year appear to perform much better in the following year than firms with positive earnings. Firms with negative earnings have better risk-adjusted returns in the following year. They argue that the market appears excessively to discount stocks of firms reporting losses and subsequently corrects for this over-reaction. Alternatively, it might be that the market systematically underestimates subsequent earnings recoveries by firms reporting losses.

The differential performance of small firms is sometimes perceived as being

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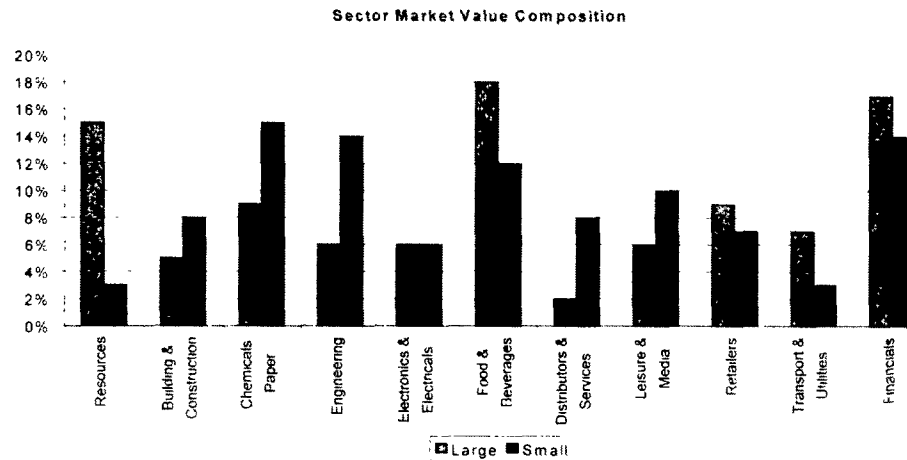
Sector Market Value Composition

Figure 4 Sector market value composition of large vs small companies (average 1968–97)

linked to the fortunes of certain industries at certain points in time. The argument is based on the fact that small and large firms are not evenly distributed across all industrial sectors. Figure 4 shows the sector market value composition of large and small firms and provides considerable support for this view. In five out of the 11 industrial sectors — building and construction, chemicals, paper and packaging, engineering. distributors and services, and leisure and media — small firms account for a higher proportion of the sector in terms of market capitalisation; in contrast, resources, food and beverages, transport and utilities and financials are dominated by large firms.

Although the uneven distribution of large and small companies may result in sector-related performance differences, the evidence provides very limited support towards this argument. Figure 5, panels A–D, show the performance of small and large companies for 11 industrial sectors for the 30-year period 1968–97 and three 10-year sub-periods. Although there are some differences in the performance of individual sectors in

the two 10-year periods of 1968–77 and 1978–87, the size effect is certainly not driven by a single industrial sector. Smaller firms appear to have outperformed their larger counterparts in almost every single sector. In a similar vein, the dramatic underperformance of smaller firms during 1988–97 is widespread across all industries. In some industrial sectors, such as resources, building and construction, chemicals and paper, and retailers, smaller firms suffered an absolute decline in market values. At the same time, it is worth noting that the strong market performance of the FTSE 100 index is to a certain extent driven by the strong performance of utilities and financials, both sectors heavily populated by larger companies. Thus, it is evident that size rather than industry is the key factor in determining market performance.[23] From the perspective of the practising fund manager, this evidence suggests that a small cap strategy based on sector plays is likely to be only of limited value. The size effect is somewhat linked to the industrial performance but it is not determined by it.
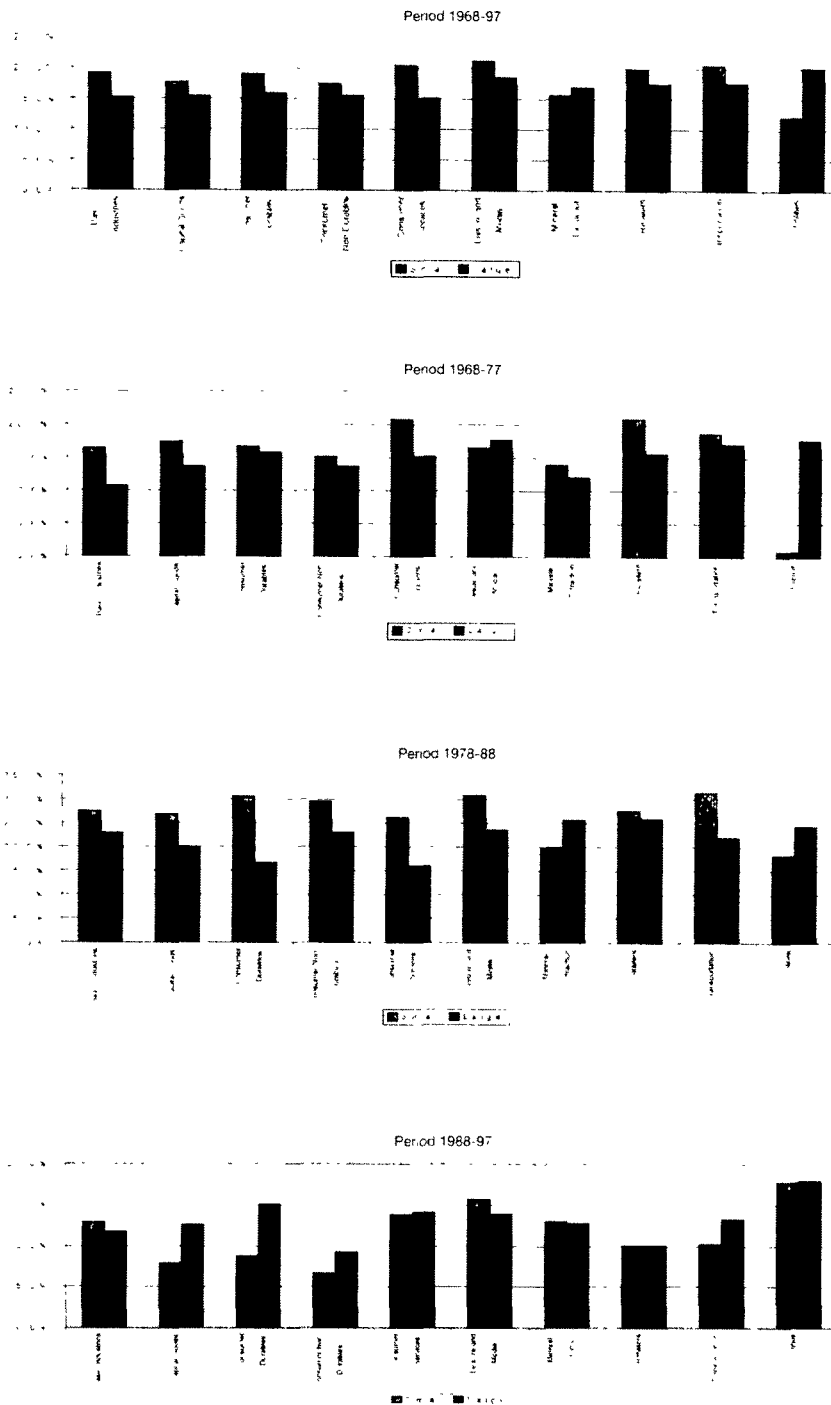
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Period 1968-97

Period 1968-77

Period 1978-88

Period 1988-97

Figure 5 Average returns by industrial sector

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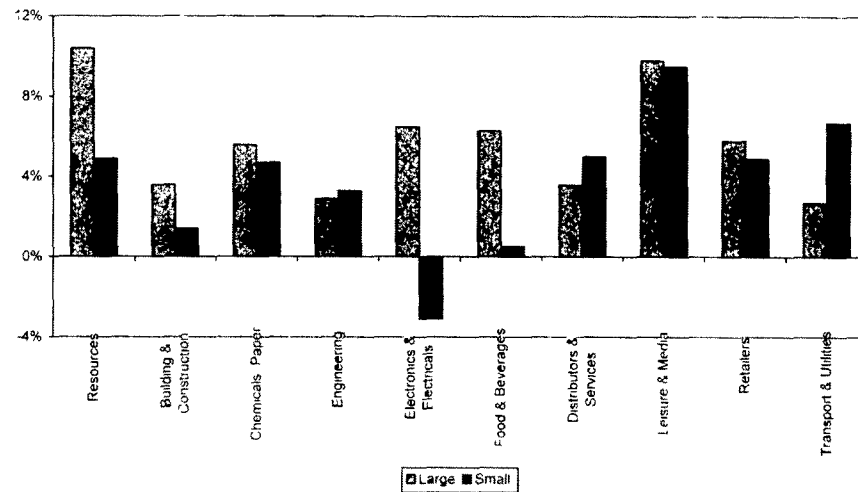
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Figure 6 EPS growth by industrial sector (annual average for the period 1968–97)

Figure 6 shows the average annual earnings growth for the 30-year period 1968–97 for the same industries, except for financials, as in Figure 8. Although it is difficult to draw any firm conclusions about the association between earnings and market performance from a visual inspection of the two figures, there appears to be a broad consistency between the two sets of data. It is reassuring, for example, to observe that large companies across almost all industries performed better than smaller ones both in terms of stock price and earnings growth. The notable exception is the case of distributors and services where small companies are superior on both counts. The leisure and media sector is also an interesting example, as it exhibits some of the strongest performances both in price and earnings terms. Of course identifying a broad historical consistency between earnings and prices across large and small firms does not answer the fundamental question concerning the disparity in market performance between the two size groups. Taking this evidence together with our clues on the risk characteristics

of small companies and their association with economic conditions, however, leads one to believe that the solution to our puzzle lies in the market's expectations about the path of future earnings.

Earnings forecasts

The mere existence of strong average earnings growth rates in the 1980s and the sluggish earnings performance of small companies in the 1990s is not, in itself, sufficient to explain their corresponding stock market performances in the two decades. First, we saw that, in spite of the lower average earnings growth by the small companies in the 1990s, their year-on-year growth after 1993 outpaced the equivalent growth of large firms. Secondly, earnings growth on its own does not convey the full picture about the true profitability of a company. Return on equity (ROE) is often an equally if not more important component of value.[24] Thirdly, the dramatic and persistent underperformance of small firms in the late 1980s and early 1990s indicates that the deterioration of

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earnings must have taken the market by surprise 'Earnings growth forecasts, for example, may be biased if analysts fail to incorporate all available information. Anomalous behaviour in earnings forecasts may be associated with anomalous behaviour by market participants in price formation. Even when the available forecasts are efficient, however, the market may be slow or completely fail to incorporate such information into their pricing process.

The evidence of inefficient upwardly biased earnings forecasts, across the whole spectrum of stocks, is now well established.[25] In fact, Dreman and Berry (1995) argue, on the basis of their study of analysts' forecasts for US stocks from 1972 through 1991, that only 'a minority of estimates fall within a range around reported earnings considered acceptable to many professional investors' (p. 30). There is, however, a controversy as to whether analysts under-react or over-react to available information. While, Abarbanell (1991), Abarbanell and Bernard (1992) and Ali et al. (1992) report that analysts systematically under-react to new information, DeBondt and Thaler (1990) maintain that analysts systematically over-react. Easterwood and Nutt (1999) provide evidence that appears consistent with both views. They report that analysts systematically react to information in an optimistic manner by under-reacting to negative information and over-reacting to positive news. A third view that is attracting considerable attention maintains that analysts and investors simply observe abnormal earnings and price performance over a relatively short time period and extrapolate these trends to the future.[26]

The apparent differences in the quality of forecasts across different types of firms may have an impact on their valuation. If forecasts for small companies, for example, are less efficient than those

associated with large companies, as the evidence tends to suggest, then at least some of the variability in the size effect may be linked to the pattern of these forecasts. In an early study, for example, Givoly and Lakonishok (1984) examine the actual and forecasted earnings of small firms for the 20-year period from 1963 to 1981. They demonstrate that growth of economic fundamentals is inversely related to size, and this relationship is almost monotonic. They document significant differences between large and small firms for a variety of growth measures such as gross margin, net operating income, sales etc. 'They conclude that the size effect in the USA before 1983 is due to the understatement of the economic growth of such firms.

Earnings of smaller firms may be under/over-estimated because information on small firms is scarce as a result of their shorter histories and/or of their limited analysts' following.[27] This of course is not surprising. Not only are there potentially greater financial gains for investors in the identification of mispriced securities for large firms, but there are also greater economic incentives for analysts' following of large firms. In any case, the end result is that analysts' earnings forecasts for small firms are generally inferior to those produced for large firms. Elgers and Murray (1992), using I/B/E/S consensus financial analyst forecasts and forecasts based upon the anticipatory behaviour of security prices, show that firm size is positively associated with earnings forecasting accuracy. Moreover, Brown et al. (1987) find that forecasts based on time series models may be more efficient for small companies than analysts' forecasts.[28] This may be regarded as an opportunity for some active and skilled managers[29] because of its possible implications for the pricing of such stocks. An analysis by Arbel and Strebel (1982) suggests that,

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over a 10-year period, the shares of those firms neglected by institutions outperform significantly the shares of firms widely held by institutions. This superior performance persists over and above any small-firm effect. This had led to the widespread belief that the size effect is more likely a 'neglect' effect.

We know that the release of interim and annual earnings is associated with both increased trading volume and increased stock return variability. Forthcoming earnings announcements stimulate private information acquisition by investors in the period prior to announcement. In addition, there is an increase in public available information prior to anticipated announcements. Both private and public information are expected to increase in the pre-announcement period. Freeman (1987) shows that the level of pre-disclosure information available for a firm increases with firm size. More recently, Byard (1998) finds that the average quality of both public and private information increases during the 30 days prior to annual earnings announcement. Firm size is found to have little or no impact upon the average quality of public information available to analysts. The average quality of the private information acquired by analysts is, however, found to be increasing with size, which is consistent with size-related incentives for analysts to engage in private information acquisition.

A variation of this 'neglect' effect is also reported in the early study of Foster *et al.* (1984). They show that small firms are likely to react more negatively (positively) to negative (positive) earnings forecasts[30] in the two days surrounding the announcement. The return differentials between small and large firms are quite marked: while the cumulative abnormal return in the two days around a negative forecast error is only −0.81

per cent for large firms, it rises to −1.83 per cent for the smallest size decile portfolio. The corresponding price reaction differential to positive forecast errors is even more pronounced — a positive 0.5 per cent for large firms against 2.58 per cent for the small firms. The equivalent stock returns around a longer window of 60 days around the announcement provide even further support to the apparent over-reaction of small firms to unexpected earnings announcements. Similar results are reported by Bernard and Thomas (1990) as well. They find that the failure of stock prices to reflect fully the implications of current earnings for future earnings is significantly more pronounced for small companies. Given that there are no significant differences in the predictability of future earnings from a series of historical earnings between large and small firms, the evidence suggests some pattern of excessive over-reaction to earnings announcements of small firms.

Mott and Coker (1993) provide further and more detailed evidence on the asymmetric response between small and large companies earnings' surprises. They show that small cap stocks over the period 1988–93 reported fewer positive surprises than negative ones in any given quarter. An average 19.8 per cent of the companies reported positive surprises over the period. whereas 25.6 per cent of the companies posted earnings disappointments. Furthermore, they show that, on average. a positive surprise results in an increase in stock prices of 2.1 per cent relative to Russell 2000 in the first month after reporting earnings; this figure rises to 12.9 per cent over the ensuing 12 months. In contrast, negative surprises underperform both the universe and the market across all periods. Overall, negative surprises fall 0.9 per cent relative to the Russell 2000 in the
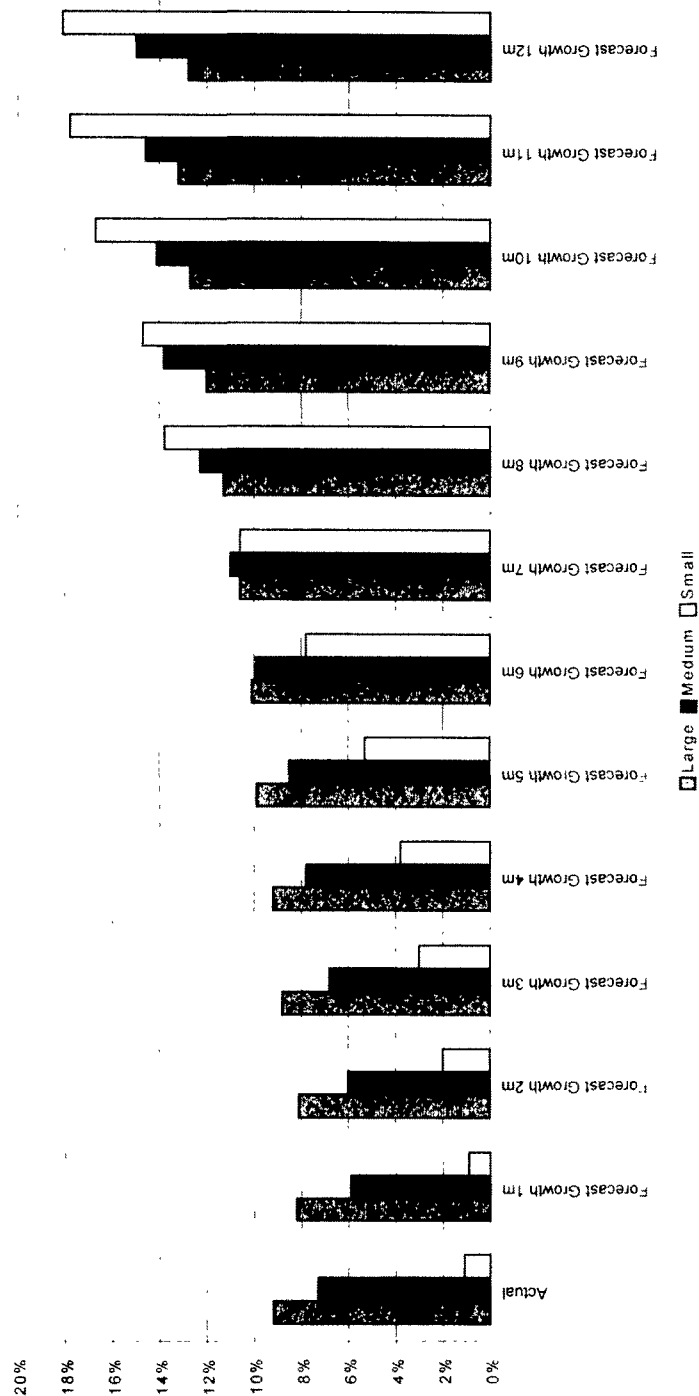
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Figure 7 Actual and forecast earnings growth by size 1988–97

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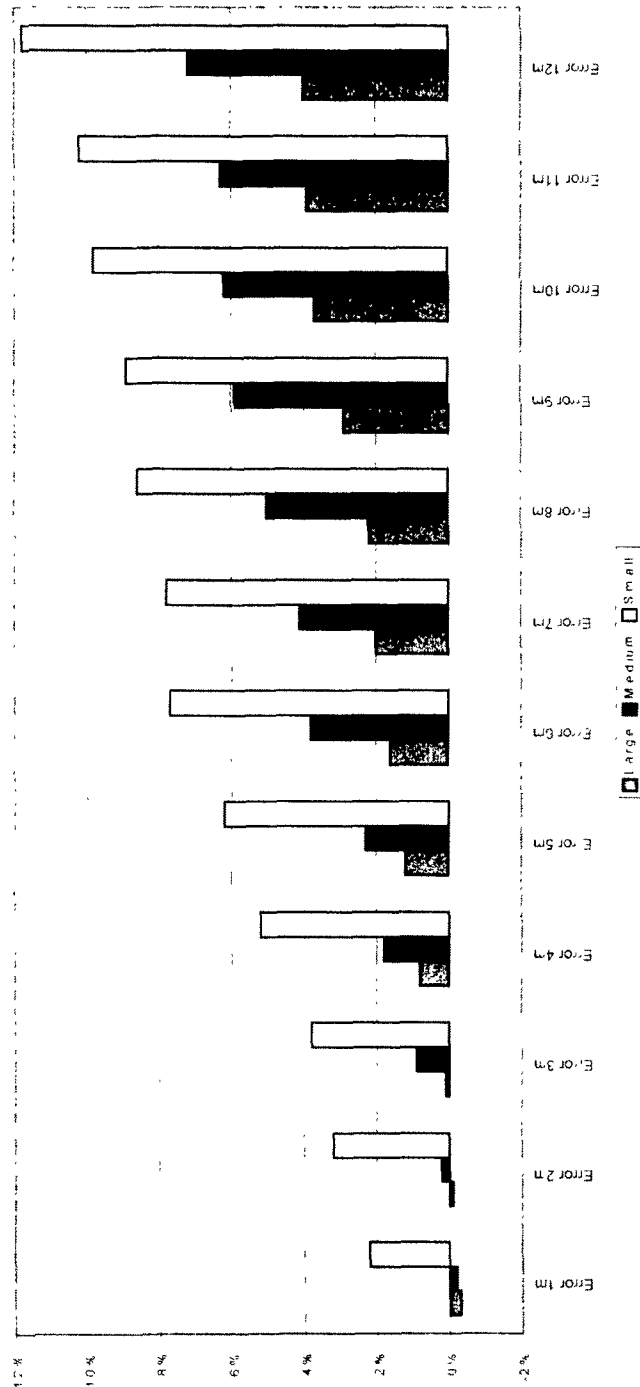
Figure 8 Forecast errors by size 1988–1997

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Table 6   One year buy and hold returns for size portfolios with positive and negative surprises (1987–97)

	Small		Large	
	Positive (%)	Negative (%)	Positive (%)	Negative (%)
1987	−1.41	−8.09	−8.47	−17.88
1988	23.33	3.48	23.67	10.89
1989	−3.38	−17.61	10.67	- 3.20
1990	12.41	−9.65	7.59	−2.39
1991	41.65	3.77	19.74	2.23
1992	43.26	22.56	22.89	16.27
1993	35.92	9.01	13.21	3.42
1994	13.19	−7.26	12.67	8.98
1995	39.79	15.61	29.18	6.77
1996	9.81	−14.36	14.33	-2.12
Average	21.46	−0.25	14.55	2.30

Source: Levis and Liodakis (1999)

first month after reporting earnings, with the relative decline falling to 3.5 per cent at the end of a 12-month period.

A number of UK studies, such as Patz (1989), Capstaff et al. (1995), Hussain (1998) and Levis and Liodakis (2001) also suggest that, at a given horizon, analysts' forecasts for large firms are superior to those of small firms. More specifically, Capstaff et al. (1995) find that UK analysts, like their US counterparts, generally over-react to earnings-related news across the whole market size spectrum. This tendency, however, is more pronounced for small companies. Analysts' forecasts of smaller firms appear to impound even less earnings related information and are generally more over-optimistic and overstated than equivalent forecasts for large firms. Unfortunately the extent of the differences in the forecast bias and efficiency for small firms is not known as this study does not provide detailed statistical evidence on this issue. It is not also clear whether the biases in small companies forecasts are consistent across different forecast horizons. Moreover, the Capstaff et al. (1995) study is based on the period February 1987 to December 1990. This is a period with relatively narrow coverage for UK small companies

in the I/B/E/S universe and it spans over August 1988, the month that has been identified as the turning point for the performance of small companies in UK.

The preliminary investigation on analyst forecasts is based on a longer time period — January 1987 to March 1998 — and covers the entire universe of I/B/E/S forecasts for UK companies, ie an average of about 1,300 companies per year. The evidence provides some relevant insights to the small companies performance record in recent years.

Figures 7 and 8 show that analysts' forecasts in general are optimistic and inefficient; this is particularly pronounced for longer (6–12 months) investment horizons. In fact, for shorter investment horizons, analysts' forecasts for large companies appear to be pessimistic.

The extent of the over-optimism varies across the 10-year period of the analysis. The bias in forecasts is particularly pronounced during the recession in the early 1990s, suggesting that analysts were rather slow to grasp the implications of the economic downturn for corporate profitability.

Analyst forecasts are particularly biased for small companies in general and during the recession period in particular. The

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