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SOAH DOCKET NO. 473-20-1674.WS
PUC DOCKET NO. 48819

APPLICATION OF NORTHTOWN	§	**BEFORE THE STATE OFFICE**
ACRES WATER SUPPLY FOR	§	**OF**
AUTHORITY TO CHANGE RATES	§	**ADMINISTRATIVE HEARINGS**

DIRECT TESTIMONY AND WORKPAPERS OF EMILY SEARS
RATE REGULATION DIVISION
PUBLIC UTILITY COMMISSION OF TEXAS
JULY 16, 2021

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ATTACHMENTS

1   I.   **INTRODUCTION OF WITNESS**

2   **Q.   Please state your name and business address.**

3   A.   Ms. Emily Sears, Public Utility Commission of Texas, 1701 N. Congress Avenue, Austin,

4   Texas 78711-3326.

5

6   **Q.   By whom are you currently employed and in what capacity?**

7   A.   I have been employed by the Public Utility Commission of Texas (Commission) since

8   January 1, 2015.   I am a Financial Analyst in the Rate Regulation Division.

9

10   **Q.   What are your principal responsibilities at the Commission?**

11   A.   My principal responsibilities at the Commission include reviewing tariff and rate change

12   applications and appeals.   I am also responsible for preparing testimony and exhibits for

13   contested case matters involving investor-owned, non-profit, and governmental water and

14   sewer retail public utilities and wholesale matters as well as participating in settlement

15   negotiations.

16

17   **Q.   Please state your educational background and professional experience.**

18   A.   I have provided a summary of my educational background and professional experience in

19   Attachment ES-1 to my direct testimony.

20

21   **Q.   Have you previously testified before this Commission or the State Office of**

22   **Administrative Hearings (SOAH)?**

23   A.   Yes.   I have also testified before the Pennsylvania Public Utility Commission.   Attachment

24   ES-2 provides a summary of the cases in which I have testified or submitted testimony.

1 **II. PURPOSE AND SCOPE OF TESTIMONY**

2 **Q. What is the purpose of your testimony in this proceeding?**

3 A. The purpose of my testimony is to present a recommendation on the overall rate of return

4 (ROR) for Northtown Acres Water Supply (Northtown Acres). More specifically, I address

5 the issues of Northtown Acres' capital structure, cost of debt, cost of equity, and overall rate

6 of return.

7

8 **Q. What is the scope of your review?**

9 A. I reviewed Northtown Acres' amended application including its direct testimony, and its

10 responses to requests for information (RFI).

11

12 **Q. What issues identified in the Commission's Preliminary Order for this docket, adopted**

13 **on January 21, 2020, will you address?**

14

15 A. 13. What is the appropriate debt-to-equity capital structure of the utility?

16

17 14. What is the appropriate weighted cost of capital (also called the overall rate of

18 return), including return on equity and cost of debt for the utility, consistent with 16

19 TAC § 24.41(c)(1)?

20

21 19. Does the utility have any debt? If so, what is the cost of that debt?

22

23 **Q. If you do not address an issue or position in your testimony, should that be interpreted**

24 **as you agreeing with or supporting Northtown Acres' position on that issue?**

25 A. No.

26

27 **Q. What standards did you apply in addressing the reasonableness of Northtown Acres'**

28 **requested return?**

29 A. I applied the following standards:

30 • 16 Texas Administrative Code (TAC) § 24.31(c)(1), which states:

1   The Commission shall allow each utility a reasonable opportunity to
2   earn a reasonable rate of return…and shall fix the rate of return in
3   accordance with the following principles. The return should be
4   reasonably sufficient to assure confidence in the financial soundness of
5   the utility and should be adequate, under efficient and economical
6   management, to maintain and support its credit and enable it to raise the
7   money necessary for the proper discharge of its public duties.

8   • Two decisions of the U.S. Supreme Court:

9   (1) *Bluefield Water Works & Improvement Co. v. Public Service*
10   *Commission of West Virginia* (*Bluefield*);[1] and

11   (2) *Federal Power Commission v. Hope Natural Gas Co.* (*Hope*).[2]

12

13   **III.   RATE OF RETURN**

14   **Q.   Please define the term "rate of return."**

15   A.   Rate of return generally is the amount of revenue an investment generates (in the form of

16   operating income) expressed as a percentage of the amount of capital invested, over a given

17   period of time. The overall rate of return is one of the components of the revenue

18   requirement formula.
19

20   **Q.   What is the revenue requirement formula?**

21   A.   The revenue requirement formula for the utility method of ratemaking, which is typically

22   used in base rate cases for investor-owned utilities, is as follows:

23   RR = E + D + T + (RB x ROR)

24   Where:

25   RR   =   Revenue Requirement

26   E   =   Operating Expense

---

[1] *Bluefield Water Works & Imp. Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679, 683 (1923).

[2] *Fed. Power Comm'n v. Hope Nat. Gas Co.*, 320 U.S. 591, 604 (1944).

1   D = Depreciation Expense

2   T = Taxes

3   RB = Rate Base

4   ROR = Overall Rate of Return

5   In the above formula the overall rate of return is expressed as a percentage.   The calculation

6   of the overall rate of return is independent of the determination of the appropriate rate base

7   value for ratemaking purposes.   As such, the appropriate total dollar return (RB x ROR) is

8   dependent upon the proper computation of the overall rate of return and the proper valuation

9   of the utility's rate base.

10

11 **Q. What constitutes a fair and reasonable overall rate of return?**

12 A.   A fair and reasonable overall rate of return is one that will allow the utility the opportunity

13   to recover those costs prudently incurred by all classes of capital used to finance the rate base

14   during the prospective period in which its rates will be in effect.

15   *Bluefield*[3] and *Hope*[4] set forth the principles that are generally accepted by regulators

16   throughout the country as the appropriate criteria for measuring a fair rate of return:

17   1) A utility is entitled to a return similar to that being earned by other
18   enterprises with corresponding risks and uncertainties, but not as high as
19   those earned by highly profitable or speculative ventures;
20   2) A utility is entitled to a return level reasonably sufficient to assure
21   financial soundness;
22   3) A utility is entitled to a return sufficient to maintain and support its credit
23   and raise necessary capital.

24   What is considered a fair return can change (increase or decrease) along with economic

25   conditions and capital markets.

26 _____

[3] *Bluefield Water Works*, 262 U.S. at 683.

[4] *Hope Nat. Gas Co.*, 320 U.S. at 604.

1   Q.   **In establishing a utility's rates, how is the overall rate of return calculated?**

2   A.   The overall rate of return in this rate proceeding is calculated using the weighted average

3   cost of capital method.   To calculate the weighted average cost of capital, the utility's capital

4   structure must first be determined by calculating, as a percentage of total capital, each

5   capitalization component that has financed the rate base.   The capital components consist of

6   long-term debt and common equity.   Next, the effective cost rate of each capital structure

7   component must be determined.   The cost rate of debt is typically fixed and can be computed

8   accurately.   The cost rate of common equity is not fixed and is more difficult to measure.

9   Next, each capital structure component percentage is multiplied by its corresponding

10   effective cost rate to determine the weighted capital component cost rate.   Lastly, the sum

11   of the weighted cost rates produces the overall rate of return.   This overall rate of return is

12   multiplied by the rate base to determine the dollar amount that is the return portion of the

13   utility's revenue requirement.

14

15   **IV.   COMPANY POSITION**

16   Q.   **Please summarize Northtown Acres' requested overall rate of return in this case.**

17   A.   Based on the amended rate application, Northtown Acres requested the following overall

18   rate of return:[5]

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	40.00 %	5.04 %	2.016 %
Common Equity	60.00 %	11.71 %	7.026 %
Total	100.00 %		9.04%

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[5]   Amendment to Application at Schedule III-1 (Dec. 16, 2020).

1 **V.   STAFF RECOMMENDATION**

2 **Q.   Please summarize your recommendation in this case.**

3 A.   I recommend the following overall rate of return for Northtown Acres:[6]

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.70 %	4.19 %	2.12 %
Common Equity	49.30 %	8.90 %	4.39 %
Total	100.00 %		6.51 %

4 **VI.   BAROMETER (PROXY) GROUP**

5 **Q.   What is a barometer group, as used in base rate cases?**

6 A.   A barometer group, also called a proxy group, is a group of companies that serves as a

7 benchmark for determining the subject utility's rate of return in a base rate case.

8

9 **Q.   What are the reasons for using a barometer group?**

10 A.   Many public utility companies are not publicly traded, and therefore, lack specific market

11 data.   A barometer group provides that industry-specific market data and allows for a more

12 accurate estimation of the true cost of equity.   Furthermore, the water utilities in a barometer

13 group share common characteristics with regulated water utilities and are well suited for

14 comparison to utility companies.   This comparative method is a standard approach in utility

15 rate cases.

16

17 **Q.   Are there additional reasons for using a barometer group?**

18 A.   Yes.   A barometer group is typically utilized because the use of data exclusively from one

19 company may be less reliable than the use of data from a group of companies.   The lower

---

[6]   Attachment ES-3.

1   reliability occurs because the data for one company may be subject to events that can cause

2   short-term anomalies in the marketplace's perception of that company.   The rate of return

3   on common equity for a single company could become distorted in these particular

4   circumstances and would therefore not be representative of similarly situated companies.

5   The use of a barometer group has the effect of smoothing out potential anomalies associated

6   with a single company.

7   Using a barometer group cost of equity as a benchmark also satisfies the long-

8   established guideline of utility regulation that seeks to provide the subject utility with the

9   opportunity to earn a return equal to that of similar risk enterprises.

10

11   **Q.   What criteria did you use in selecting your barometer group companies?**

12   A.   As I have done in this proceeding, I generally use the following criteria when selecting a

13   barometer group: 1) 50% or more of the company's revenues must be generated from the

14   water utility industry; 2) the company's stock must be publicly traded; 3) investment

15   information for the company must be available from more than one source; and 4) the

16   company must not be currently involved or targeted in an announced merger or acquisition.

17

18   **Q.   Did Northtown Acres use a barometer group in its analysis?**

19   A.   No.

20

21   **Q.   What barometer group did you use in your analysis?**

22   A.   My barometer group includes American States Water Company, American Water Works,

23   California Water Service Group, Essential Utilities, Middlesex Water, SJW Group, and York

24   Water.

1   VII.   CAPITAL STRUCTURE

2   Q.   **What does a utility's capital structure represent in a rate case?**

3   A.   Capital structure represents the financing of long-term assets (rate base).   The primary forms

4   of financing employed by public utilities include debt and common equity.

5

6   Q.   **What is Northtown Acres' requested capital structure?**

7   A.   Northtown Acres is requesting a hypothetical capital structure of 40% debt and 60% equity,

8   as its actual capital structure is 100% equity.[7]

9

10   Q.   **What is the basis for Northtown Acres' requested hypothetical capital structure of 40%**

11   **debt and 60% equity?**

12   A.   Ms. Richardson states, "The requested regulatory capital structure of 40% debt is requested

13   solely to comply with the rate filing package requirement that seems to state that debt may

14   not be less than 40% of the capital structure."[8]

15

16   Q.   **What is your recommendation regarding Northtown Acres' capital structure?**

17   A.   I recommend using a hypothetical capital structure based on the barometer group of 50.70%

18   debt and 49.30% equity.[9]

19

20   Q.   **What is the basis for your recommendation?**

21   A.   I recommend using a hypothetical capital structure because Northtown Acres' capital

22   structure of 100% equity is out of line with the capital structures of the companies in the

23   barometer group.   While regulatory agencies often use a company's actual capital structure,

24   it is common industry practice that if the actual capital structure is far out of line with the

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[7] Direct Testimony of Sheroll Richardson at 13-14 (May 17, 2021) (Richardson Direct).

[8] *Id.* at 14.

[9] Attachment ES-4.

1   industry average, regulators will consider a typical – i.e., average – industry capital structure.

2   In this case, Northtown Acres' capital structure is clearly atypical of current capital structures

3   among water utility distribution systems, which have a capital structures of approximately

4   50% debt and 50% equity.   The capital structure Northtown Acres proposed would not result

5   in a reasonable ROR in comparison to other water utility distribution systems, which is

6   neither fair nor reasonable for ratemaking.   Therefore, I have used the capital structure as

7   measured and supported by the barometer group.

8

9   **VIII. COST RATE OF LONG-TERM DEBT**

10   **Q.   What is Northtown Acres' claimed cost rate of long-term debt?**

11   A.   Northtown Acres claimed a hypothetical cost of debt of 5.04% based on the industry cost of

12   debt recommended by Staff and approved by the Commission in recent water utility cases.[10]

13

14   **Q.   What is your recommendation regarding Northtown Acres' cost rate of long-term**

15   **debt?**

16   A.   I recommend using a hypothetical cost of debt of 4.19%.

17

18   **Q.   What is the basis for your recommendation?**

19   A.   My recommendation is based on the Mergent Bond Record's data for public utility bond debt

20   costs issued for the year ending December 2019.[11]   This data reflects the interest rates for

21   public utilities that issued bonds during Northtown Acres' test year, which ended December

22   31, 2019.   While this might not be exactly what Northtown Acres could obtain debt for, it

23   is the most reasonable approximation of the cost of debt for a public utility during the test

24   year.   While other utilities may have had higher debt costs approved by the Commission,

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[10] Richardson Direct at 14.

[11] Attachment ES-11.

1   those utilities would have included debt costs for years in which debt costs would have been

2   higher than current debt cost rates.   My recommendation is based solely on what debt could

3   have been issued at during Northtown Acre's test year, as they did not incur debt in prior

4   years.

5

6 IX.   EQUITY ANALYSIS

7 Q.   **What is your recommendation for the appropriate cost of common equity in this**

8   **proceeding?**

9 A.   Based upon my analysis, I recommend a cost of common equity of 8.90%.

10

11 Q.   **What is the basis for your recommendation?**

12 A.   I arrived at this return on equity (ROE) primarily on the basis of the results of my single-

13   stage Discounted Cash Flow (DCF) method.   I also used a multistage DCF and a Risk

14   Premium method as comparisons to my DCF results.   I further discuss each of these methods

15   below.

16

17   **A. DISCOUNTED CASH FLOW**

18 Q.   **What is the theoretical basis for the DCF method?**

19 A.   The theoretical basis for the DCF method is the "dividend discount model" of financial

20   theory, which maintains that the value (price) of any security or commodity is the discounted

21   present value of all future cash flows.   The DCF model assumes that investors evaluate

22   stocks in the classical economic framework, which maintains that the value of a financial

23   asset is determined by its earning power, or its ability to generate future cash flows.   The

24   constant-growth DCF model recognizes that the return to the stockholder consists of two

25   parts: dividend yield and growth.   Therefore, equity investors expect to receive a portion

1   of their total required return in the form of current dividends and the remainder through price

2   appreciation.

3

4   **Q.   Please explain your single-stage DCF analysis.**

5   A.   My analysis employs the standard discrete DCF model as expressed in the following formula:

6          $k = D_1/P_0 + g$

7   Where:

8   k = Cost of equity

9   D_1 = Dividend expected during the year

10   P_0 = Current price of the stock

11   g = Expected growth rate of dividends

12 When a forecast of D_1 is not available, it is appropriate to make an adjustment to D_0 (the

13 current dividend) to account for changes in the dividend paid in period 1. In this case, I

14 have used a forecast of D_1 by adjusting D_0 by the growth rate in the quarter the dividend has

15 been historically increased.[12]

16

17 **Q.   Are there variations of the DCF model?**

18 A.   Yes. For conditions in which significantly different growth rates are expected over different

19   periods of time, analysts often employ a multistage version of the DCF model instead of the

20   single-stage, constant growth version. For example, the expected near-term growth of a

21   given company may be significantly higher or lower than the expected sustainable growth

22   rate. In these situations, it is appropriate to apply a multistage DCF model that incorporates

23   the various growth rates expected over time.

24   Under the multistage DCF, in order to incorporate two or more growth-rate periods,

---

[12] Attachment ES-6.

1   the equation for the single-stage DCF is simply expanded, with the assumption that a

2   permanent constant growth rate can be estimated for some point in the future:

3
$$P_o = \frac{D_0(1+g_1)}{(1+k)^1} + \frac{D_1(1+g_2)}{(1+k)^2} + \ldots + \frac{D_{(n-1)}(1+g_n)}{(1+k)^n}$$

4   where the variables are the same as in the equation in the previous question-and-answer, but

5   there are more subscripts to indicate the different time periods to which the variables apply—

6   e.g., g_1 represents the growth rate for the first period, D_2 represents the dividend rate for the

7   second period, g_2 represents the growth rate for the second period, and so on.   The "n"

8   subscript represents the number of periods to be included (up to infinity).

9

10   **Q.   What versions of the DCF model did you use in your analysis?**

11   A.   I used both a single-stage version and a multistage version of the DCF model.   In the single-

12   stage version, the stock's dividend growth is based on analysts' estimates of the utility's

13   earnings growth over the next five years.   In the multistage version of the DCF model, I

14   used a three-stage growth approach.   The first stage spans the next five years and uses the

15   same growth estimates employed in the single-stage version.   The second stage, which

16   covers years six through ten, is based on an average of the growth rate used in years one

17   through five and the projected long-term growth in Gross Domestic Product (GDP) of 5.14%,

18   discussed in more detail below.   The third, and final, stage covers years 11 through 150, and

19   is based upon the GDP growth rate of 5.14%.

20

21   **Q.   Why did you use two versions of the DCF model?**

22   A.   I used two versions of the DCF model because each model is reasonable in its own right and,

23   therefore, is likely to be used by investors.   I included the multistage growth model because

24   the utility cannot outgrow the economy over the long-term.   My intent, by considering both

1   approaches and blending the two, was to more closely approximate the long-term

2   expectations of investors on average.

3

4 **Q.**   **What prices did you use for your DCF analyses?**

5 A.   As shown on Attachment ES-5, I used stock prices that are an average of weekly prices over

6   a recent 12-week period, specifically March 29, 2021 through June 14, 2021.   I consider the

7   12-week period long enough to smooth out stock market fluctuations and accurately reflect

8   long-term expectations, but short enough to reflect the most current information on the

9   market's perceptions of risk, earnings growth, and dividend growth.

10

11 **Q.**   **What estimates for the growth expectations of investors did you use in your DCF**

12   **analyses?**

13 A.   I used data from Value Line, Zacks, and Yahoo! Finance for the earnings growth rates in the

14   single-stage DCF model and the first stage and second stage of the multistage DCF model.

15   For the second stage, in part, and the entire third stage of the multistage DCF model, I used

16   an expected long-run nominal growth rate of 5.14%, consisting of the 3.14% per year average

17   real growth-rate of GDP for the period 1951 through 2020 as calculated from data reported

18   by the U.S. Bureau of Economic Analysis,[13] and the 2.00% rate of inflation forecast by the

19   Board of Governors of the Federal Reserve System in its most recent estimate.[14]   This is

20   widely disseminated information that is generally considered credible by investors.

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[13]   U.S. Bureau of Economic Analysis, Real Gross Domestic Product [A191RL1Q225SBEA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/A191RL1Q225SBEA, July 7, 2021.

[14]   *Monetary Policy Report* submitted to Congress on February 19, 2021, pursuant to section 2B of the Federal Reserve Act.

1   Q.   **What are the results of your DCF analyses?**

2   A.   Attachments ES-7 and ES-8 to my testimony include the results and supporting calculation

3   detail from the single-stage and multistage DCF models, respectively.   The average of the

4   barometer group's estimated cost of equity using the single-stage DCF yields a cost of equity

5   of 8.90%.   An average of the barometer group's results when employing the multistage DCF

6   yields a cost-of-equity estimate of 6.83%.

7

8   **B. CONVENTIONAL RISK-PREMIUM ESTIMATE**

9   Q.   **What is the theoretical basis for the Risk-Premium Method?**

10   A.   The Risk-Premium method is based on the concept that common stocks are riskier than debt

11   and, as a result, investors require a higher expected return on stocks than bonds.

12

13   Q.   **Please describe the "conventional" risk-premium approach that you used in your**

14   **estimate of cost of equity in this case.**

15   A.   I refer to the risk-premium approach I use as the "conventional" risk premium to distinguish

16   it from the concept of risk premiums in general.   The conventional risk premium is a risk

17   premium that estimates the cost of equity for Northtown Acres by comparing the costs of

18   equity authorized for water utilities across the United States to the yields of public utility

19   bonds rated Baa by Moody's Investors Service.   The timeframe I have used for this purpose

20   is 2007 through 2020.

21

22   Q.   **How did you use the relationship between the authorized costs of equity and the bond**

23   **yields to quantify the cost of equity for Northtown Acres?**

24   A.   I quantified the relationship by subtracting the bond yields from the authorized costs of

25   equity.   The difference represents the premium required by an investor to make the riskier

26   investment in equity.

1   Q.   **Did you test the data for correlation?**

2   A.   Yes.   I performed a regression analysis to analyze the relationship between the risk premium

3   and the bond yields in the corresponding period.   The regression analysis showed, with high

4   confidence, that there is a trend in the relationship.   It is an inverse trend, in which the risk

5   premiums increase as bond yields decrease.   On average, during the 2007 through 2020 time

6   period, risk premiums increased 0.7152% for every 1.00% that bond yields decreased.

7

8   Q.   **What are the results of your risk-premium analysis?**

9   A.   As shown on page 2 of Attachment ES-9, the conventional risk-premium analysis implied a

10   cost of equity of 9.29%.

11

12 Q.   **Do you directly rely on your risk premium results?**

13 A.   No, my risk premium result is not directly included in my results.   This is due to several

14   factors.   Primarily, the authorized ROEs in the regulated community do not fall as quickly

15   as interest rates do.   Due to this lag, the authorized ROEs do not reflect current market

16   conditions.   Also, the publication of water utility authorized ROEs is not always available.

17   As such I do not have the 2021 authorized ROE's, and therefore, my analysis is not current.

18   I do use it as a comparison for my DCF results.

1   X.   **SIZE ADJUSTMENT**

2   **Q.   What comments does Sheroll Richardson make with respect to risk of Northtown**

3   **Acres?**

4   A.   Ms. Richardson believes there is risk for Northtown Acres as a small utility with regards to

5   its business. and that there is regulatory risk in providing service to its customers, and more

6   specifically, regulatory lag.[15]

7

8   **Q.   What comments do you have regarding Northtown Acres risk?**

9   A.   First, a size adjustment would go against recent Commission precedent. In Docket No.

10   46245, the Commission rejected the utility's requested ROE, which included a small size

11   risk premium.[16]

12   Second, although the scale of operations for water utilities can vary, the basic nature

13   of a water utility's business does not change with respect to scale. A water utility's core

14   business is to provide water to its customers, regardless of size.   Therefore, it must construct

15   and maintain its distribution system, provide administrative functions, treat the water, etc.

16   This business model remains essentially the same for water utility companies of any size,

17   along with the fact that water utilities operate as monopolies with a captive customer base in

18   the areas they serve.

19   Third, water utilities are regulated, and a utility's earnings are set by the ratemaking

20   process.   This is true regardless of the utility's size.   The utilities are also subject to other,

21   general regulatory oversight.

22   Fourth, Northtown Acres is not unique with respect to the regulatory lag that it faces,

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[15] Richardson Direct at 13-14.

[16] *Application of Double Diamond Utility Co., Inc, for a Rate/Tariff Change*, Docket No. 46245, Order on
Rehearing at Finding of Fact No. 114 (Dec. 12, 2019).

1   nor the fact that utilities need to incur debt prior to including it in their rates for recovery.

2   These risks are already reflected in the market RORs for the barometer group.

3   Finally, there are articles examining the size premium in the utility industry

4   specifically. Wallace Davidson states:

5   [O]ur results suggest that neither large nor small utilities merit a premium
6   because of their size. The implications of our findings for regulatory
7   officials for regulatory accounting standard-setters are straightforward: we
8   find no evidence among the electric utility industry…to suggest that a
9   utility's cost of capital or its allowable ARR should be adjusted to reflect
10   firm size.[17]

11   In research also specific to public utilities, Professor Annie Wong states:

12   [G]iven firm size, utility stocks are consistently less risky than industrial
13   stocks. Second, industrial betas tend to decrease with firm size, but utility
14   betas do not. These findings may be attributed to the fact that all public
15   utilities operate in an environment with regional monopolistic power and
16   regulated financial structure. As a result, the business and financial risks
17   are very similar among the utilities regardless of their size. Therefore,
18   utility betas would not necessarily be related to firm size.

19   She then concludes:

20   The object of this study is to examine if the size effect exists in the utility
21   industry. After controlling for equity values, there is some weak evidence
22   that firm size is a missing factor from the CAPM for industrial but not utility
23   stocks. This implies that although the size phenomenon has been strongly
24   documented for industrials, findings suggest that there is no need to adjust
25   for the firm size in utility regulation.[18]

26   For all of these reasons, I recommend that my recommended ROR be adopted as it reflects

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[17] Wallace Davidson III, Kenneth Ferris, and William Reichenstein, A Note on the Relationship Between Firm Size and Return in the Electric Utility Industry, *Journal of Accounting, Auditing, and Finance* Vol. 8, Issue 3 (Summer 1993).

[18] Annie Wong, Utility Stocks and the Size Effect: An Empirical Analysis, *Journal of the Midwest Finance Association* 98 (1993).

1   the risks put forth by Ms. Richardson.

2

3   **XI.**   **SUMMARY**

4   **Q.**   **What is your recommended ROE?**

5   A.   I recommend an ROE of 8.90%. As previously stated in my testimony, I arrived at this ROE

6   primarily on the basis of the results of my single-stage DCF method. I used the results from

7   my multi-stage DCF and risk premium analyses as points of comparison to my single-stage

8   DCF results. If I had given equal weight to the average result of all three analyses, the result

9   would have been an average ROE of 8.34%.[19] If I had given equal wight to the combined

10   DCF results and the result of the Risk Premium method, my recommended ROE would have

11   been 8.58%.[20] These results show that my recommended ROE of 8.90% ROE is reasonable.

12

13   **Q.**   **What is your recommended overall rate of return?**

14   A.   I recommend an overall rate of return, to be applied to rate base, of 6.51%.

15

16   **Q.**   **Does this conclude your direct testimony?**

17   A.   Yes. I reserve the right to supplement this testimony during the course of the proceeding if

18   new evidence becomes available.

---

[19] ((8.90% (single-stage DCF) + 6.83% (multi-stage DCF) + 9.29% (risk premium method))/3 = 8.34%.

[20] (((8.90% (single-stage DCF) + 6.83% (multi-stage DCF))/2) + 9.38% (risk premium method))/2 = 8.58%.

Emily Sears

Professional Experience

- **Public Utility Commission of Texas**
  Utility Rates Analyst
  Water Utilities Division
  January 2015 - Present

- **Commonwealth of Pennsylvania, Public Utility Commission**
  Fixed Utility Financial Analyst
  Bureau of Investigation and Enforcement
  May 2009 – December 2014

- **Commonwealth of Pennsylvania, Public Utility Commission**
  Fixed Utility Financial Analyst
  Bureau of Fixed Utility Services
  April 2008 – May 2009

- **Nationwide Insurance Company**
  Personal Lines Underwriting Screener
  October 2004 – May 2007

Education

- **University of Pittsburgh, College of Business Administration**
  Bachelors of Science in Business Administration
  Major – Finance
  August 2004

- **Annual Regulatory Studies Program: Camp NARUC**
  Week 1-Introduction to Regulation
  August 2008

- **Pennsylvania Public Utility Commission Rate Case Training**
  December 2008

- **Society of Utility and Regulatory Financial Analysts**
  Certified Rate of Return Analyst
  June 2010

- **Utility Finance and Accounting for Financial Professionals**
  Seminar June 20-21, 2019

- **Institute of Public Utilities – Advanced Course on Cost Allocation and Rate Design**
  November 2-5, 2020

Presentations

- **Pennsylvania Public Utility Commission Rate Case Training**
  Presented on Rate of Return/Return on Equity
  October 2012, September 2014

- **Public Utility Commission of Texas – Rate of Return Training**
  Presented on Rate of Return/Return on Equity
  August 2017 - Present

TESTIMONY SUBMITTED:

I have testified and/or submitted testimony in the following proceedings before the Pennsylvania Public Utility Commission:

- Duquesne Light Company, Docket No. M-2009-2093217
- West Penn Power Company d/b/a Allegheny Power, Docket No. M-2009-2093218
- Duquesne Light Company, Docket No. M-2009-2123948
- West Penn Power Company d/b/a Allegheny Power, Docket No. M-2009-2123951
- Utilities, Inc. – Westgate, Docket No. R-2009-2117389
- Utilities, Inc. of Pennsylvania, Docket No. R-2009-2117402
- PECO Energy Company - Electric Division, Docket No. P-2009-2143607
- PECO Energy Company – Gas Division, Docket No. P-2009-2143588
- Philadelphia Gas Works, Docket No. R-2009-2139884
- York Water Company, Docket No. R-2010-2157140
- City of Lancaster, Docket No. R-2010-2179103
- Columbia Gas of Pennsylvania, Inc., Docket No. R-2010-2215623
- CMV Sewage, Inc., Docket No. R-2011-2218562
- Pennsylvania American Water Company, Docket No. R-2011-2232243
- UGI Penn Natural Gas, Docket No. R-2011-2238943
- Aqua Pennsylvania, Inc., Docket No. R-2011-2267958
- Equitable Gas Company, LLC, Docket No. R-2012-2287044
- Peoples Natural Gas Company, LLC, Docket No. R-2012-2285985
- PPL Electric Utilities Corporation, Docket No. R-2012-2290597
- Columbia Gas of Pennsylvania, Inc., Docket No. R- 2012-2321748
- The City of Lancaster – Sewer Fund, Docket No. R-2012-2310366
- Columbia Gas of Pennsylvania, Inc., Docket No. R-2012-2321748 and M-2012-2323645
- UGI Penn Natural Gas, Docket No. R-2013-2361763
- City of DuBois – Bureau of Water, Docket No. R-2013-2350509
- Pennsylvania-American Water Company, Docket No. R-2013-2355276
- Duquesne Light Company, Docket No. R-2013-2372129
- Pike County Light and Power Company, Gas Division, Docket No. R-2013-2397353
- Pike County Light and Power Company, Electric Division, Docket No. R-2013-2397237
- UGI Penn Natural Gas, Docket No. R-2014-2420273
- Emporium Water Company, Docket No. R-2014-2402324
- City of Lancaster – Water Fund, Docket No. R-2014-2418872
- Peoples TWP, LLC, R-2014-2429613
- Peoples Natural Gas Company, LLC, R-2014-2429606

I have testified and/or submitted testimony in the following proceedings before the Public Utility Commission of Texas and the Texas State Office of Administrative Hearings:

- Custom Water Company, LLC., Docket No. 44236
- City of Austin water rate appeal, Docket No. 42857
- City of Austin wastewater rate appeal, Docket No. 42867 (consolidated with Dkt No. 42857)
- Consumers Water, Inc., Docket No. 43076
- Laguna Vista, LTD. and Laguna Tres, Inc., Docket No. 44046
- Quadvest, L.P., Docket No. 44809
- Monarch Utilities I, L.P., Docket No. 45570
- Corix Utilities (Texas), Inc., Docket No. 45418
- Double Diamond Properties Construction Co. dba Rock Creek, Docket No. 46247
- Liberty Utilities Corp., Docket No. 46256
- Double Diamond Utility Company, Inc., Docket No. 46245
- Wolfe Air Park Civic Club, Inc., Docket No. 46923
- Liberty Utilities, LLC, Docket No. 47976
- W. E. Vlasek, Docket No. 48640
- City of Austin, Docket No. 49189
- Corix Utilities (Texas), Inc, Docket No. 49923
- Ratepayers' Appeal of Bear Creek Special Utility District's Rates, Docket No. 49351
- Monarch Utilities I, L.P., Docket No. 50944
- Corix Utilities (Texas), Inc., Docket 50557

WEIGHTED AVERAGE COST OF CAPITAL

	% of Total	*Component Cost*	*Weighted Avg. Cost*
Long-term Debt	50.70%	4.19%	2.12%
Common Equity	49.30%	8.90%	4.39%
	100.00%		6.51%

BAROMETER GROUP AND EARNINGS GROWTH

Ticker Symbol	Company	Market Cap.[1] (Millions)	LTD/Capital[1,2]	S&P Rating[3]	Earnings Growth		
					VL[1]	Zacks[4]	Yahoo!Finance[5]
AWR	American States Water Company	$2,800	47.2%	A+	6.50%	N/A	5.20%
AWK	American Water Works Company	$26,800	59.1%	A	8.50%	8.10%	8.60%
CWT	California Water Service Group	$2,800	45.9%	A+	6.50%	N/A	11.70%
WTRG	Essential Utilities	$11,000	54.0%	A	10.00%	6.20%	6.40%
MSEX	Middlesex Water	$1,400	44.0%	A	4.50%	N/A	2.70%
SJW	SJW Group	$1,800	58.4%	A-	13.00%	N/A	7.00%
YORW	York Water	$625	46.3%	A-	6.50%	N/A	4.90%
	Averages	$6,746	50.7%	A	7.93%	7.15%	6.64%

Sources: [1] *Value Line Investment Report:* Water Utility (April 9, 2021).

[2] Most recent capital structure from *Value Line Investment Report:* Water Utility (April 9, 2021).

[3] Issuer Credit Rating from *S&P Global Ratings,* retrieved on June 17, 2021, from *S&P Global Market Intelligence* (www.snl.com).

[4] *Zacks Investment Research,* retrieved on June 17, 2021, from *www.zacks.com/stock/quote/*

[5] Yahoo!Finance, retrieved on June 17, 2021 from finance.yahoo.com/quote

Average
5.85%
8.40%
9.10%
7.53%
3.60%
10.00%
5.70%
7.24%

AVERAGE STOCK PRICE

Ticker Symbol	Company	12-week Average	12 14-Jun-21	11 7-Jun-21	10 31-May-21	9 24-May-21	8 17-May-21	7 10-May-21	6 3-May-21	5 26-Apr-21	4 19-Apr-21	3 12-Apr-21	2 5-Apr-21	1 29-Mar-21
AWR	American States Water Company	$79.39	$82.43	$82.45	$78.91	$79.37	$78.64	$78.14	$79.16	$78.85	$82.03	$80.37	$76.77	$75.57
AWK	American Water Works Company	$155.37	$158.47	$160.36	$156.43	$155.02	$155.12	$152.23	$152.17	$155.37	$158.73	$159.49	$151.08	$150.00
CWT	California Water Service Group	$57.84	$58.25	$58.83	$56.66	$56.84	$56.45	$56.64	$57.60	$58.52	$60.94	$60.07	$57.27	$55.99
WTRG	Essential Utilities	$46.90	$48.07	$48.86	$47.35	$47.80	$47.03	$46.12	$46.38	$46.87	$47.70	$46.98	$45.20	$44.47
MSEX	Middlesex Water	$82.67	$86.31	$86.90	$85.79	$85.96	$80.52	$79.45	$80.39	$81.73	$84.07	$82.64	$79.44	$78.86
SJW	SJW Group	$64.71	$65.90	$65.60	$63.51	$64.45	$64.18	$62.93	$63.37	$65.20	$67.98	$67.46	$63.63	$62.27
YORW	York Water	$50.37	$51.41	$52.47	$50.75	$50.33	$49.19	$48.59	$49.01	$51.64	$51.58	$51.97	$48.57	$48.91

[1] Stock Prices are adjusted by Yahoo Finance to reflect the effects of the date when the next dividend is expected to be paid.

FORECASTED DIVIDENDS

Ticker Symbol	Company	Growth Rate[1] (Attach. ES-4)	Next Four Quarters				Total Proj. D$_1$	Stock Price (Attach. ES-5)	Dividend Yield
			Next	3rd	4th	1st			
AWR	American States Water Company	5.85%	$0.3350	$0.3546	$0.3546	$0.3546	*$1.40*	$79.39	1.76%
AWK	American Water Works Company	8.40%	$0.5962	$0.5962	$0.5962	$0.5962	*$2.38*	$155.37	1.53%
CWT	California Water Service Group	9.10%	$0.2300	$0.2300	$0.2300	$0.2300	*$0.92*	$57.84	1.59%
WTGR	Essential Utilities	7.53%	$0.2507	$0.2696	$0.2696	$0.2696	*$1.06*	$46.90	2.26%
MSEX	Middlesex Water	3.60%	$0.2725	$0.2725	$0.2823	$0.2925	*$1.12*	$82.67	1.35%
SJW	SJW Group	10.00%	$0.3400	$0.3400	$0.3400	$0.3400	*$1.36*	$64.71	2.10%
YORW	York Water	5.70%	$0.1874	$0.1874	$0.1981	$0.1981	*$0.77*	$50.37	1.53%

[1]The growth rate is applied to the quarterly dividend during the period when dividends have historically increased.

DISCOUNTED CASH FLOW
Single-Stage

Ticker Symbol	Company	Stock Price (Attch. ES-5)	Div1 (Attch. ES-6)	Dividend Yield (Attch. ES-6)	Div. Growth (Attch. ES-4)	DCF ROE
AWR	American States Water Company	$79.39	$1.40	1.76%	5.85%	7.61%
AWK	American Water Works Company	$155.37	$2.38	1.53%	8.40%	9.93%
CWT	California Water Service Group	$57.84	$0.92	1.59%	9.10%	10.69%
WTRG	Essential Utilities	$46.90	$1.06	2.26%	7.53%	9.79%
MSEX	Middlesex Water	$82.67	$1.12	1.35%	3.60%	4.95%
SJW	SJW Group	$64.71	$1.36	2.10%	10.00%	12.10%
YORW	York Water	$50.37	$0.77	1.53%	5.70%	7.23%

Minimum	*4.95%*
1st Quartile	*7.42%*
Average	*8.90%*
3rd Quartile	*10.31%*
Maximum	*12.10%*

Minimum ROE	*6.08%*
1st Quartile	*6.56%*
Average ROE	***6.83%***
3rd Quartile	*7.15%*
Maximum ROE	*7.55%*

MULTI-STAGE DISCOUNTED CASH FLOW

	AWR	AWK	CWT	WTRG	MSEX	SJW	YORW
Stock Price	$79.39	$155.37	$57.84	$46.90	$82.67	$64.71	$50.37
Div1	$1.40	$2.38	$0.92	$1.06	$1.12	$1.36	$0.77
5-Yr Growth	5.85%	8.40%	9.10%	7.53%	3.60%	10.00%	5.70%
L-t Growth	5.14%	5.14%	5.14%	5.14%	5.14%	5.14%	5.14%
Cost of Equity	***6.77%***	***6.67%***	***6.80%***	***7.51%***	***6.08%***	***7.55%***	***6.46%***

Cash Flows

	AWR	AWK	CWT	WTRG	MSEX	SJW	YORW
2021	-$79.39	-$155.37	-$57.84	-$46.90	-$82.67	-$64.71	-$50.37
2022	$1.40	$2.38	$0.92	$1.06	$1.12	$1.36	$0.77
2023	$1.48	$2.59	$1.00	$1.14	$1.16	$1.50	$0.81
2024	$1.57	$2.80	$1.10	$1.23	$1.20	$1.65	$0.86
2025	$1.66	$3.04	$1.19	$1.32	$1.25	$1.81	$0.91
2026	$1.76	$3.29	$1.30	$1.42	$1.29	$1.99	$0.96
2027	$1.85	$3.46	$1.37	$1.49	$1.36	$2.09	$1.01
2028	$1.94	$3.64	$1.44	$1.57	$1.43	$2.20	$1.06
2029	$2.04	$3.83	$1.51	$1.65	$1.50	$2.31	$1.12
2030	$2.15	$4.02	$1.59	$1.73	$1.58	$2.43	$1.18
2031	$2.26	$4.23	$1.67	$1.82	$1.66	$2.56	$1.24
2032	$2.37	$4.45	$1.76	$1.91	$1.74	$2.69	$1.30
2033	$2.49	$4.68	$1.85	$2.01	$1.83	$2.83	$1.37
2034	$2.62	$4.92	$1.95	$2.12	$1.93	$2.97	$1.44
2035	$2.76	$5.17	$2.05	$2.22	$2.02	$3.13	$1.51
2036	$2.90	$5.43	$2.15	$2.34	$2.13	$3.29	$1.59
2037	$3.05	$5.71	$2.26	$2.46	$2.24	$3.46	$1.67
2038	$3.20	$6.01	$2.38	$2.58	$2.35	$3.63	$1.76
2039	$3.37	$6.32	$2.50	$2.72	$2.47	$3.82	$1.85
2040	$3.54	$6.64	$2.63	$2.86	$2.60	$4.02	$1.94
2041	$3.72	$6.98	$2.76	$3.00	$2.74	$4.22	$2.04
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
				[Hidden Rows]			
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
2167	$2,054.56	$3,852.76	$1,525.07	$1,657.52	$1,509.30	$2,329.77	$1,125.99
2168	$2,160.13	$4,050.72	$1,603.43	$1,742.69	$1,586.85	$2,449.47	$1,183.85
2169	$2,271.12	$4,258.85	$1,685.82	$1,832.23	$1,668.38	$2,575.33	$1,244.68
2170	$2,387.81	$4,477.67	$1,772.43	$1,926.37	$1,754.11	$2,707.65	$1,308.63
2171	$2,510.50	$4,707.74	$1,863.50	$2,025.35	$1,844.24	$2,846.78	$1,375.87

CONVENTIONAL RISK PREMIUM ANALYSIS
OF WATER UTILITIES' AUTHORIZED RATES OF RETURN ON EQUITY
### AND CONCURRENT BOND YIELDS

Year	Allowed ROE[1]	Avg Baa Bond Yield[2]	Risk Premium
2020	9.04%	3.39%	5.65%
2019	9.63%	4.19%	5.44%
2018	9.43%	4.67%	4.76%
2017	9.56%	4.68%	4.88%
2016	9.71%	4.68%	5.03%
2015	9.76%	5.03%	4.73%
2014	9.59%	4.80%	4.79%
2013	9.73%	4.98%	4.75%
2012	9.90%	4.86%	5.04%
2011	10.04%	5.57%	4.47%
2010	10.18%	5.96%	4.22%
2009	10.18%	7.06%	3.12%
2008	10.24%	7.23%	3.01%
2007	10.07%	6.33%	3.74%
Averages	9.79%	5.25%	4.55%

[1]SNL Financial LC (https://platform.mi.spglobal.com/web/client?auth=inherit#industry/statisticsAndGraphs), available at www.snl.com.

[2]Mergent Bond Record, June 2021, p. 16, and earlier editions.

CONVENTIONAL RISK PREMIUM ANALYSIS
OF WATER UTILITIES' AUTHORIZED RATES OF RETURN ON EQUITY
AND CONCURRENT BOND YIELDS

Risk Premium Analysis

$y = -0.7152x + 0.083$

$R^2 = 0.9669$

Risk Premium (y-axis): 0% to 6%

Baa Bond Yield (x-axis): 0% to 8%
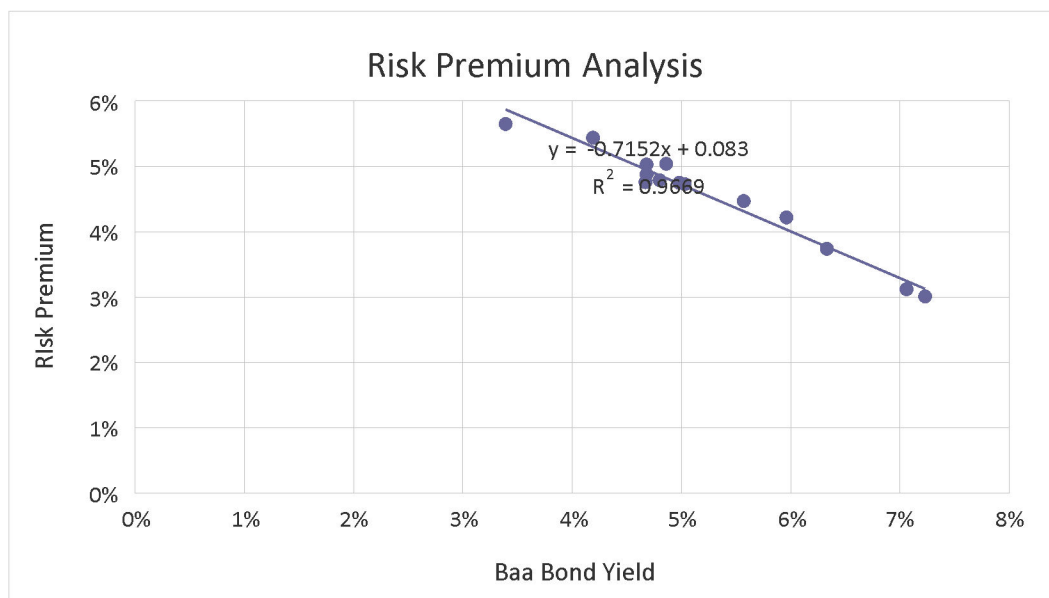
Computation of ROE

Average seasoned Baa bond yield, Jan 2021 – May 2021		3.48%
Average bond yield over study period	-	5.25%
Change in bond yield		-1.77%
Risk premium/interest rate relationship	**x**	-0.7152
Adjustment to average risk premium		1.26%
Average risk premium over study period	+	4.55%
Adjusted risk premium		5.81%
Avg seasoned Baa bond yield	+	3.48%
Implied cost of equity:		***9.29%***

RETURN ON EQUITY

Summary

Single-stage DCF	
Range	Average
4.95%–12.1%	8.90%
Multi-stage DCF	
Range	Average
6.08%–7.55%	6.83%
Combined DCF	
Range	Average
4.95%-12.1%	7.87%

Risk Premium	
Range	Point Estimate
N/A	9.29%

Final Estimate

Range	4.95%-12.1%
Point	8.90%

Baa Public Utility Bond Yield Averages

	2017			
4.62%		5.06%	
4.58%		5.02%	
4.62%		5.13%	
4.51%		5.11%	
4.50%		4.97%	
4.32%		4.91%	
4.36%		4.85%	
4.23%		4.88%	
4.24%		4.81%	
4.26%		4.54%	
4.16%		4.42%	
4.14%	4.38%	4.56%	4.86%

	2018			
4.18%		4.66%	
4.42%		4.74%	
4.52%		4.72%	
4.58%		4.49%	
4.71%		4.65%	
4.71%		5.08%	
4.67%		5.21%	
4.64%		5.28%	
4.74%		5.31%	
4.91%		5.17%	
5.03%		5.24%	
4.92%	4.67%	5.25%	4.98%

	2019			
4.91%		5.09%	
4.76%		5.01%	
4.65%		5.00%	
4.55%		4.85%	
4.47%		4.69%	
4.31%		4.73%	
4.13%		4.66%	
3.63%		4.65%	
3.71%		4.79%	
3.72%		4.67%	
3.76%		4.75%	
3.73%	4.19%	4.70%	4.80%

	2020			
3.60%		4.39%	
3.42%		4.44%	
3.96%		4.51%	
3.82%		4.51%	
3.63%		4.91%	
3.44%		5.13%	
3.09%		5.22%	
3.06%		5.23%	
3.17%		5.42%	
3.27%		5.47%	
3.17%		5.57%	
3.05%	3.39%	5.55%	5.03%

	2021			
3.18%		5.49%	
3.37%		5.28%	
3.72%		5.12%	
3.57%		4.75%	
3.58%		4.60%	
		4.47%	
		4.16%	
		4.20%	
		4.27%	
		4.34%	
		4.64%	
	3.48%	4.79%	4.68%

Source: Mergent Bond Record

Inflation Expectations
Federal Reserve Monetary Policy Report
February 19, 2021
Link: https://www.federalreserve.gov/monetarypolicy/files/20200612_mprfullreport.pdf
Part 3, Summary of Economic Projections
Table 1.

A191RL1Q225SBEA | Percent Change from Preceding Period, Annual, Seasonally Adjusted Annual Rate

PCE (Personal Consumption Expenditures) Infla   2.0%

Frequency: Annual

observation_date	GDP Growth Rate (%)
1951-01-01	5.50%
1952-01-01	5.48%
1953-01-01	0.65%
1954-01-01	2.80%
1955-01-01	6.63%
1956-01-01	2.03%
1957-01-01	0.40%
1958-01-01	3.00%
1959-01-01	4.65%
1960-01-01	1.05%
1961-01-01	6.43%
1962-01-01	4.33%
1963-01-01	5.18%
1964-01-01	5.18%
1965-01-01	8.45%
1966-01-01	4.55%
1967-01-01	2.65%
1968-01-01	5.00%
1969-01-01	2.10%
1970-01-01	-0.13%
1971-01-01	4.43%
1972-01-01	6.93%
1973-01-01	4.10%
1974-01-01	-1.90%
1975-01-01	2.65%
1976-01-01	4.35%
1977-01-01	5.05%
1978-01-01	6.83%
1979-01-01	1.28%
1980-01-01	0.13%
1981-01-01	1.45%
1982-01-01	-1.40%
1983-01-01	7.90%
1984-01-01	5.60%
1985-01-01	4.18%
1986-01-01	2.93%
1987-01-01	4.48%
1988-01-01	3.83%
1989-01-01	2.75%
1990-01-01	0.65%
1991-01-01	1.18%
1992-01-01	4.38%
1993-01-01	2.63%
1994-01-01	4.13%
1995-01-01	2.20%
1996-01-01	4.40%
1997-01-01	4.50%
1998-01-01	4.90%
1999-01-01	4.80%
2000-01-01	3.00%
2001-01-01	0.18%
2002-01-01	2.08%
2003-01-01	4.35%
2004-01-01	3.30%
2005-01-01	3.15%
2006-01-01	2.60%

2007-01-01	1.98%
2008-01-01	-2.68%
2009-01-01	0.25%
2010-01-01	2.55%
2011-01-01	1.63%
2012-01-01	1.48%
2013-01-01	2.63%
2014-01-01	2.93%
2015-01-01	5.15%
2016-01-01	2.08%
2017-01-01	2.70%
2018-01-01	2.48%
2019-01-01	2.35%
2020-01-01	0.33%
Average	**3.14%**

SOAH DOCKET NO. 473-20-1674.WS
PUC DOCKET NO. 48819

APPLICATION OF NORTHTOWN	§	BEFORE THE STATE OFFICE
ACRES WATER SUPPLY FOR	§	OF
AUTHORITY TO CHANGE RATES	§	ADMINISTRATIVE HEARINGS
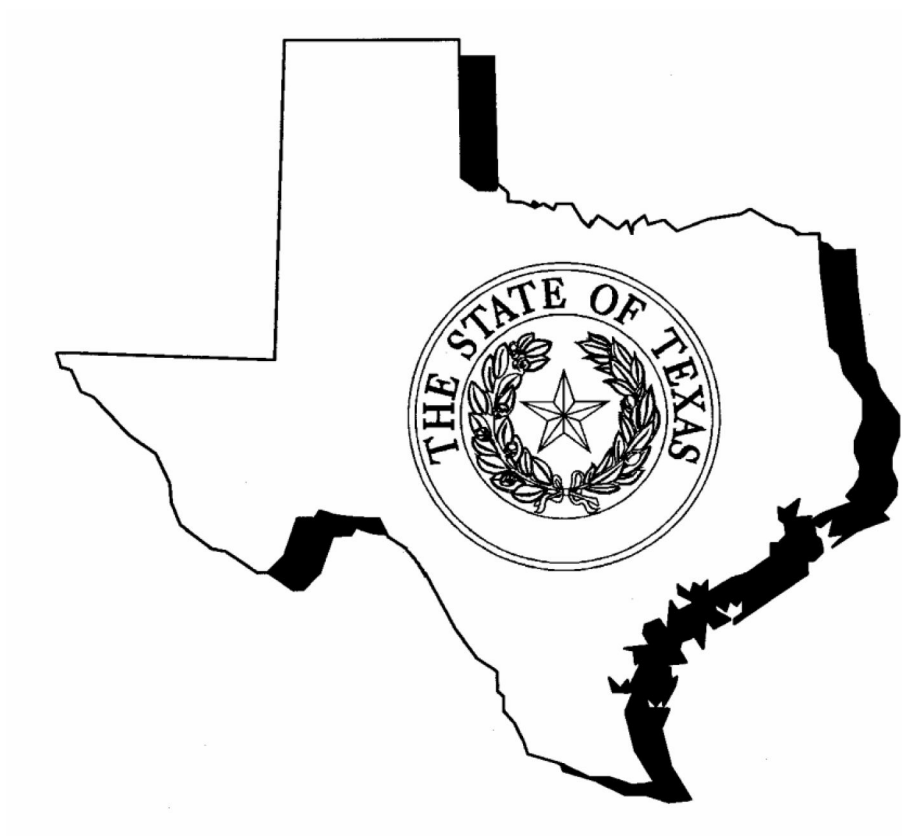
WORKPAPERS OF EMILY SEARS

JULY 16, 2021

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ATTACHMENTS

1   I.   **INTRODUCTION OF WITNESS**

2   **Q.   Please state your name and business address.**

3   A.   Ms. Emily Sears, Public Utility Commission of Texas, 1701 N. Congress Avenue, Austin,

4   Texas 78711-3326.

5

6   **Q.   By whom are you currently employed and in what capacity?**

7   A.   I have been employed by the Public Utility Commission of Texas (Commission) since

8   January 1, 2015.   I am a Financial Analyst in the Rate Regulation Division.

9

10   **Q.   What are your principal responsibilities at the Commission?**

11   A.   My principal responsibilities at the Commission include reviewing tariff and rate change

12   applications and appeals.   I am also responsible for preparing testimony and exhibits for

13   contested case matters involving investor-owned, non-profit, and governmental water and

14   sewer retail public utilities and wholesale matters as well as participating in settlement

15   negotiations.

16

17   **Q.   Please state your educational background and professional experience.**

18   A.   I have provided a summary of my educational background and professional experience in

19   Attachment ES-1 to my direct testimony.

20

21   **Q.   Have you previously testified before this Commission or the State Office of**

22   **Administrative Hearings (SOAH)?**

23   A.   Yes.   I have also testified before the Pennsylvania Public Utility Commission.   Attachment

24   ES-2 provides a summary of the cases in which I have testified or submitted testimony.

1   II.   PURPOSE AND SCOPE OF TESTIMONY

2   Q.   **What is the purpose of your testimony in this proceeding?**

3   A.   The purpose of my testimony is to present a recommendation on the overall rate of return

4   (ROR) for Northtown Acres Water Supply (Northtown Acres).   More specifically, I address

5   the issues of Northtown Acres' capital structure, cost of debt, cost of equity, and overall rate

6   of return.
7

8   Q.   **What is the scope of your review?**

9   A.   I reviewed Northtown Acres' amended application including its direct testimony, and its

10   responses to requests for information (RFI).
11

12 Q.   **What issues identified in the Commission's Preliminary Order for this docket, adopted**

13   **on January 21, 2020, will you address?**
14
15 A.   13. What is the appropriate debt-to-equity capital structure of the utility?
16
17   14. What is the appropriate weighted cost of capital (also called the overall rate of
18   return), including return on equity and cost of debt for the utility, consistent with 16
19   TAC § 24.41(c)(1)?
20
21   19. Does the utility have any debt? If so, what is the cost of that debt?
22

23 Q.   **If you do not address an issue or position in your testimony, should that be interpreted**

24   **as you agreeing with or supporting Northtown Acres' position on that issue?**

25 A.   No.
26

27 Q.   **What standards did you apply in addressing the reasonableness of Northtown Acres'**

28   **requested return?**

29 A.   I applied the following standards:

30   • 16 Texas Administrative Code (TAC) § 24.31(c)(1), which states:

1   The Commission shall allow each utility a reasonable opportunity to
2   earn a reasonable rate of return…and shall fix the rate of return in
3   accordance with the following principles. The return should be
4   reasonably sufficient to assure confidence in the financial soundness of
5   the utility and should be adequate, under efficient and economical
6   management, to maintain and support its credit and enable it to raise the
7   money necessary for the proper discharge of its public duties.

8   • Two decisions of the U.S. Supreme Court:

9   (1) *Bluefield Water Works & Improvement Co. v. Public Service*
10   *Commission of West Virginia (Bluefield)*;[1] and

11   (2) *Federal Power Commission v. Hope Natural Gas Co. (Hope)*.[2]

12

13 **III. RATE OF RETURN**

14 **Q. Please define the term "rate of return."**

15 A. Rate of return generally is the amount of revenue an investment generates (in the form of

16   operating income) expressed as a percentage of the amount of capital invested, over a given

17   period of time. The overall rate of return is one of the components of the revenue

18   requirement formula.
19

20 **Q. What is the revenue requirement formula?**

21 A. The revenue requirement formula for the utility method of ratemaking, which is typically

22   used in base rate cases for investor-owned utilities, is as follows:

23   RR = E + D + T + (RB x ROR)

24   Where:

25   RR = Revenue Requirement

26   E = Operating Expense

---

[1] *Bluefield Water Works & Imp. Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679, 683 (1923).

[2] *Fed. Power Comm'n v. Hope Nat. Gas Co.*, 320 U.S. 591, 604 (1944).

1   D = Depreciation Expense

2   T = Taxes

3   RB = Rate Base

4   ROR = Overall Rate of Return

5   In the above formula the overall rate of return is expressed as a percentage. The calculation

6   of the overall rate of return is independent of the determination of the appropriate rate base

7   value for ratemaking purposes. As such, the appropriate total dollar return (RB x ROR) is

8   dependent upon the proper computation of the overall rate of return and the proper valuation

9   of the utility's rate base.

10

11 **Q.   What constitutes a fair and reasonable overall rate of return?**

12 A.   A fair and reasonable overall rate of return is one that will allow the utility the opportunity

13   to recover those costs prudently incurred by all classes of capital used to finance the rate base

14   during the prospective period in which its rates will be in effect.

15   *Bluefield*[3] and *Hope*[4] set forth the principles that are generally accepted by regulators

16   throughout the country as the appropriate criteria for measuring a fair rate of return:

17   1) A utility is entitled to a return similar to that being earned by other
18   enterprises with corresponding risks and uncertainties, but not as high as
19   those earned by highly profitable or speculative ventures;
20   2) A utility is entitled to a return level reasonably sufficient to assure
21   financial soundness;
22   3) A utility is entitled to a return sufficient to maintain and support its credit
23   and raise necessary capital.

24   What is considered a fair return can change (increase or decrease) along with economic

25   conditions and capital markets.

26   _____

[3] *Bluefield Water Works*, 262 U.S. at 683.

[4] *Hope Nat. Gas Co.*, 320 U.S. at 604.

1   **Q.**   **In establishing a utility's rates, how is the overall rate of return calculated?**

2   **A.**   The overall rate of return in this rate proceeding is calculated using the weighted average

3   cost of capital method.   To calculate the weighted average cost of capital, the utility's capital

4   structure must first be determined by calculating, as a percentage of total capital, each

5   capitalization component that has financed the rate base.   The capital components consist of

6   long-term debt and common equity.   Next, the effective cost rate of each capital structure

7   component must be determined.   The cost rate of debt is typically fixed and can be computed

8   accurately.   The cost rate of common equity is not fixed and is more difficult to measure.

9   Next, each capital structure component percentage is multiplied by its corresponding

10   effective cost rate to determine the weighted capital component cost rate.   Lastly, the sum

11   of the weighted cost rates produces the overall rate of return.   This overall rate of return is

12   multiplied by the rate base to determine the dollar amount that is the return portion of the

13   utility's revenue requirement.

14

15   **IV.**   **COMPANY POSITION**

16   **Q.**   **Please summarize Northtown Acres' requested overall rate of return in this case.**

17   **A.**   Based on the amended rate application, Northtown Acres requested the following overall

18   rate of return:[5]

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	40.00 %	5.04 %	2.016 %
Common Equity	60.00 %	11.71 %	7.026 %
Total	100.00 %		9.04%

---

[5]   Amendment to Application at Schedule III-1 (Dec. 16, 2020).

1 **V. STAFF RECOMMENDATION**

2 **Q. Please summarize your recommendation in this case.**

3 A. I recommend the following overall rate of return for Northtown Acres:[6]

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.70 %	4.19 %	2.12 %
Common Equity	49.30 %	8.90 %	4.39 %
Total	100.00 %		6.51 %

4 **VI. BAROMETER (PROXY) GROUP**

5 **Q. What is a barometer group, as used in base rate cases?**

6 A. A barometer group, also called a proxy group, is a group of companies that serves as a

7 benchmark for determining the subject utility's rate of return in a base rate case.

8

9 **Q. What are the reasons for using a barometer group?**

10 A. Many public utility companies are not publicly traded, and therefore, lack specific market

11 data. A barometer group provides that industry-specific market data and allows for a more

12 accurate estimation of the true cost of equity. Furthermore, the water utilities in a barometer

13 group share common characteristics with regulated water utilities and are well suited for

14 comparison to utility companies. This comparative method is a standard approach in utility

15 rate cases.

16

17 **Q. Are there additional reasons for using a barometer group?**

18 A. Yes. A barometer group is typically utilized because the use of data exclusively from one

19 company may be less reliable than the use of data from a group of companies. The lower

---

[6] Attachment ES-3.

1   reliability occurs because the data for one company may be subject to events that can cause

2   short-term anomalies in the marketplace's perception of that company. The rate of return

3   on common equity for a single company could become distorted in these particular

4   circumstances and would therefore not be representative of similarly situated companies.

5   The use of a barometer group has the effect of smoothing out potential anomalies associated

6   with a single company.

7   Using a barometer group cost of equity as a benchmark also satisfies the long-

8   established guideline of utility regulation that seeks to provide the subject utility with the

9   opportunity to earn a return equal to that of similar risk enterprises.

10

11   **Q.**   **What criteria did you use in selecting your barometer group companies?**

12   A.   As I have done in this proceeding, I generally use the following criteria when selecting a

13   barometer group: 1) 50% or more of the company's revenues must be generated from the

14   water utility industry; 2) the company's stock must be publicly traded; 3) investment

15   information for the company must be available from more than one source; and 4) the

16   company must not be currently involved or targeted in an announced merger or acquisition.

17

18   **Q.**   **Did Northtown Acres use a barometer group in its analysis?**

19   A.   No.

20

21   **Q.**   **What barometer group did you use in your analysis?**

22   A.   My barometer group includes American States Water Company, American Water Works,

23   California Water Service Group, Essential Utilities, Middlesex Water, SJW Group, and York

24   Water.

1   VII.   CAPITAL STRUCTURE

2   Q.   **What does a utility's capital structure represent in a rate case?**

3   A.   Capital structure represents the financing of long-term assets (rate base).   The primary forms

4   of financing employed by public utilities include debt and common equity.
5

6   Q.   **What is Northtown Acres' requested capital structure?**

7   A.   Northtown Acres is requesting a hypothetical capital structure of 40% debt and 60% equity,

8   as its actual capital structure is 100% equity.[7]
9

10   Q.   **What is the basis for Northtown Acres' requested hypothetical capital structure of 40%**

11   **debt and 60% equity?**

12   A.   Ms. Richardson states, "The requested regulatory capital structure of 40% debt is requested

13   solely to comply with the rate filing package requirement that seems to state that debt may

14   not be less than 40% of the capital structure."[8]
15

16   Q.   **What is your recommendation regarding Northtown Acres' capital structure?**

17   A.   I recommend using a hypothetical capital structure based on the barometer group of 50.70%

18   debt and 49.30% equity.[9]
19

20   Q.   **What is the basis for your recommendation?**

21   A.   I recommend using a hypothetical capital structure because Northtown Acres' capital

22   structure of 100% equity is out of line with the capital structures of the companies in the

23   barometer group.   While regulatory agencies often use a company's actual capital structure,

24   it is common industry practice that if the actual capital structure is far out of line with the

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[7]   Direct Testimony of Sheroll Richardson at 13-14 (May 17, 2021) (Richardson Direct).

[8]   *Id.* at 14.

[9]   Attachment ES-4.

1   industry average, regulators will consider a typical – i.e., average – industry capital structure.

2   In this case, Northtown Acres' capital structure is clearly atypical of current capital structures

3   among water utility distribution systems, which have a capital structures of approximately

4   50% debt and 50% equity.   The capital structure Northtown Acres proposed would not result

5   in a reasonable ROR in comparison to other water utility distribution systems, which is

6   neither fair nor reasonable for ratemaking.   Therefore, I have used the capital structure as

7   measured and supported by the barometer group.

8

9   **VIII.   COST RATE OF LONG-TERM DEBT**

10   **Q.**   **What is Northtown Acres' claimed cost rate of long-term debt?**

11   A.   Northtown Acres claimed a hypothetical cost of debt of 5.04% based on the industry cost of

12   debt recommended by Staff and approved by the Commission in recent water utility cases.[10]
13

14   **Q.**   **What is your recommendation regarding Northtown Acres' cost rate of long-term**

15   **debt?**

16   A.   I recommend using a hypothetical cost of debt of 4.19%.
17

18   **Q.**   **What is the basis for your recommendation?**

19   A.   My recommendation is based on the Mergent Bond Record's data for public utility bond debt

20   costs issued for the year ending December 2019.[11]   This data reflects the interest rates for

21   public utilities that issued bonds during Northtown Acres' test year, which ended December

22   31, 2019.   While this might not be exactly what Northtown Acres could obtain debt for, it

23   is the most reasonable approximation of the cost of debt for a public utility during the test

24   year.   While other utilities may have had higher debt costs approved by the Commission,

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[10] Richardson Direct at 14.

[11] Attachment ES-11.

1   those utilities would have included debt costs for years in which debt costs would have been

2   higher than current debt cost rates.   My recommendation is based solely on what debt could

3   have been issued at during Northtown Acre's test year, as they did not incur debt in prior

4   years.

5

6   **IX.   EQUITY ANALYSIS**

7   **Q.   What is your recommendation for the appropriate cost of common equity in this**

8   **proceeding?**

9   A.   Based upon my analysis, I recommend a cost of common equity of 8.90%.

10

11   **Q.   What is the basis for your recommendation?**

12   A.   I arrived at this return on equity (ROE) primarily on the basis of the results of my single-

13   stage Discounted Cash Flow (DCF) method.   I also used a multistage DCF and a Risk

14   Premium method as comparisons to my DCF results.   I further discuss each of these methods

15   below.

16

17   **A.   DISCOUNTED CASH FLOW**

18   **Q.   What is the theoretical basis for the DCF method?**

19   A.   The theoretical basis for the DCF method is the "dividend discount model" of financial

20   theory, which maintains that the value (price) of any security or commodity is the discounted

21   present value of all future cash flows.   The DCF model assumes that investors evaluate

22   stocks in the classical economic framework, which maintains that the value of a financial

23   asset is determined by its earning power, or its ability to generate future cash flows.   The

24   constant-growth DCF model recognizes that the return to the stockholder consists of two

25   parts: dividend yield and growth.   Therefore, equity investors expect to receive a portion

1   of their total required return in the form of current dividends and the remainder through price

2   appreciation.

3

4   **Q.   Please explain your single-stage DCF analysis.**

5   A.   My analysis employs the standard discrete DCF model as expressed in the following formula:

6            $k = D_1/P_0 + g$

7   Where:

8   k =   Cost of equity

9   D_1 =   Dividend expected during the year

10   P_0 =   Current price of the stock

11   g =   Expected growth rate of dividends

12   When a forecast of D_1 is not available, it is appropriate to make an adjustment to D_0 (the

13   current dividend) to account for changes in the dividend paid in period 1.   In this case, I

14   have used a forecast of D_1 by adjusting D_0 by the growth rate in the quarter the dividend has

15   been historically increased.[12]

16

17   **Q.   Are there variations of the DCF model?**

18   A.   Yes.   For conditions in which significantly different growth rates are expected over different

19   periods of time, analysts often employ a multistage version of the DCF model instead of the

20   single-stage, constant growth version.   For example, the expected near-term growth of a

21   given company may be significantly higher or lower than the expected sustainable growth

22   rate.   In these situations, it is appropriate to apply a multistage DCF model that incorporates

23   the various growth rates expected over time.

24   Under the multistage DCF, in order to incorporate two or more growth-rate periods,

---

[12]   Attachment ES-6.

1 the equation for the single-stage DCF is simply expanded, with the assumption that a

2 permanent constant growth rate can be estimated for some point in the future:

3
$$P_o = \frac{D_0(1+g_1)}{(1+k)^1} + \frac{D_1(1+g_2)}{(1+k)^2} + \ldots + \frac{D_{(n-1)}(1+g_n)}{(1+k)^n}$$

4 where the variables are the same as in the equation in the previous question-and-answer, but

5 there are more subscripts to indicate the different time periods to which the variables apply—

6 e.g., g_1 represents the growth rate for the first period, D_2 represents the dividend rate for the

7 second period, g_2 represents the growth rate for the second period, and so on. The "n"

8 subscript represents the number of periods to be included (up to infinity).

9

10 **Q. What versions of the DCF model did you use in your analysis?**

11 A. I used both a single-stage version and a multistage version of the DCF model. In the single-

12 stage version, the stock's dividend growth is based on analysts' estimates of the utility's

13 earnings growth over the next five years. In the multistage version of the DCF model, I

14 used a three-stage growth approach. The first stage spans the next five years and uses the

15 same growth estimates employed in the single-stage version. The second stage, which

16 covers years six through ten, is based on an average of the growth rate used in years one

17 through five and the projected long-term growth in Gross Domestic Product (GDP) of 5.14%,

18 discussed in more detail below. The third, and final, stage covers years 11 through 150, and

19 is based upon the GDP growth rate of 5.14%.

20

21 **Q. Why did you use two versions of the DCF model?**

22 A. I used two versions of the DCF model because each model is reasonable in its own right and,

23 therefore, is likely to be used by investors. I included the multistage growth model because

24 the utility cannot outgrow the economy over the long-term. My intent, by considering both

1   approaches and blending the two, was to more closely approximate the long-term

2   expectations of investors on average.

3

4 **Q.** **What prices did you use for your DCF analyses?**

5 A.   As shown on Attachment ES-5, I used stock prices that are an average of weekly prices over

6   a recent 12-week period, specifically March 29, 2021 through June 14, 2021.   I consider the

7   12-week period long enough to smooth out stock market fluctuations and accurately reflect

8   long-term expectations, but short enough to reflect the most current information on the

9   market's perceptions of risk, earnings growth, and dividend growth.

10

11 **Q.** **What estimates for the growth expectations of investors did you use in your DCF**

12   **analyses?**

13 A.   I used data from Value Line, Zacks, and Yahoo! Finance for the earnings growth rates in the

14   single-stage DCF model and the first stage and second stage of the multistage DCF model.

15   For the second stage, in part, and the entire third stage of the multistage DCF model, I used

16   an expected long-run nominal growth rate of 5.14%, consisting of the 3.14% per year average

17   real growth-rate of GDP for the period 1951 through 2020 as calculated from data reported

18   by the U.S. Bureau of Economic Analysis,[13] and the 2.00% rate of inflation forecast by the

19   Board of Governors of the Federal Reserve System in its most recent estimate.[14]   This is

20   widely disseminated information that is generally considered credible by investors.

---

[13] U.S. Bureau of Economic Analysis, Real Gross Domestic Product [A191RL1Q225SBEA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/A191RL1Q225SBEA, July 7, 2021.

[14] *Monetary Policy Report* submitted to Congress on February 19, 2021, pursuant to section 2B of the Federal Reserve Act.

1 **Q.   What are the results of your DCF analyses?**

2 A.   Attachments ES-7 and ES-8 to my testimony include the results and supporting calculation

3   detail from the single-stage and multistage DCF models, respectively.   The average of the

4   barometer group's estimated cost of equity using the single-stage DCF yields a cost of equity

5   of 8.90%.   An average of the barometer group's results when employing the multistage DCF

6   yields a cost-of-equity estimate of 6.83%.

7

8   **B.   CONVENTIONAL RISK-PREMIUM ESTIMATE**

9 **Q.   What is the theoretical basis for the Risk-Premium Method?**

10 A.   The Risk-Premium method is based on the concept that common stocks are riskier than debt

11   and, as a result, investors require a higher expected return on stocks than bonds.

12

13 **Q.   Please describe the "conventional" risk-premium approach that you used in your**

14   **estimate of cost of equity in this case.**

15 A.   I refer to the risk-premium approach I use as the "conventional" risk premium to distinguish

16   it from the concept of risk premiums in general.   The conventional risk premium is a risk

17   premium that estimates the cost of equity for Northtown Acres by comparing the costs of

18   equity authorized for water utilities across the United States to the yields of public utility

19   bonds rated Baa by Moody's Investors Service.   The timeframe I have used for this purpose

20   is 2007 through 2020.

21

22 **Q.   How did you use the relationship between the authorized costs of equity and the bond**

23   **yields to quantify the cost of equity for Northtown Acres?**

24 A.   I quantified the relationship by subtracting the bond yields from the authorized costs of

25   equity.   The difference represents the premium required by an investor to make the riskier

26   investment in equity.

1   **Q.**   **Did you test the data for correlation?**

2   A.   Yes.   I performed a regression analysis to analyze the relationship between the risk premium

3   and the bond yields in the corresponding period.   The regression analysis showed, with high

4   confidence, that there is a trend in the relationship.   It is an inverse trend, in which the risk

5   premiums increase as bond yields decrease.   On average, during the 2007 through 2020 time

6   period, risk premiums increased 0.7152% for every 1.00% that bond yields decreased.

7

8   **Q.**   **What are the results of your risk-premium analysis?**

9   A.   As shown on page 2 of Attachment ES-9, the conventional risk-premium analysis implied a

10   cost of equity of 9.29%.

11

12   **Q.**   **Do you directly rely on your risk premium results?**

13   A.   No, my risk premium result is not directly included in my results.   This is due to several

14   factors.   Primarily, the authorized ROEs in the regulated community do not fall as quickly

15   as interest rates do.   Due to this lag, the authorized ROEs do not reflect current market

16   conditions.   Also, the publication of water utility authorized ROEs is not always available.

17   As such I do not have the 2021 authorized ROE's, and therefore, my analysis is not current.

18   I do use it as a comparison for my DCF results.

1   X.   SIZE ADJUSTMENT

2   Q.   **What comments does Sheroll Richardson make with respect to risk of Northtown**

3   **Acres?**

4   A.   Ms. Richardson believes there is risk for Northtown Acres as a small utility with regards to

5   its business. and that there is regulatory risk in providing service to its customers, and more

6   specifically, regulatory lag.[15]

7

8   Q.   **What comments do you have regarding Northtown Acres risk?**

9   A.   First, a size adjustment would go against recent Commission precedent.   In Docket No.

10   46245, the Commission rejected the utility's requested ROE, which included a small size

11   risk premium.[16]

12   Second, although the scale of operations for water utilities can vary, the basic nature

13   of a water utility's business does not change with respect to scale.   A water utility's core

14   business is to provide water to its customers, regardless of size.   Therefore, it must construct

15   and maintain its distribution system, provide administrative functions, treat the water, etc.

16   This business model remains essentially the same for water utility companies of any size,

17   along with the fact that water utilities operate as monopolies with a captive customer base in

18   the areas they serve.

19   Third, water utilities are regulated, and a utility's earnings are set by the ratemaking

20   process.   This is true regardless of the utility's size.   The utilities are also subject to other,

21   general regulatory oversight.

22   Fourth, Northtown Acres is not unique with respect to the regulatory lag that it faces,

---

[15] Richardson Direct at 13-14.

[16] *Application of Double Diamond Utility Co., Inc, for a Rate/Tariff Change*, Docket No. 46245, Order on
Rehearing at Finding of Fact No. 114 (Dec. 12, 2019).

1   nor the fact that utilities need to incur debt prior to including it in their rates for recovery.

2   These risks are already reflected in the market RORs for the barometer group.

3   Finally, there are articles examining the size premium in the utility industry

4   specifically.   Wallace Davidson states:

5   [O]ur results suggest that neither large nor small utilities merit a premium
6   because of their size.   The implications of our findings for regulatory
7   officials for regulatory accounting standard-setters are straightforward: we
8   find no evidence among the electric utility industry…to suggest that a
9   utility's cost of capital or its allowable ARR should be adjusted to reflect
10   firm size.[17]

11   In research also specific to public utilities, Professor Annie Wong states:

12   [G]iven firm size, utility stocks are consistently less risky than industrial
13   stocks.   Second, industrial betas tend to decrease with firm size, but utility
14   betas do not.   These findings may be attributed to the fact that all public
15   utilities operate in an environment with regional monopolistic power and
16   regulated financial structure.   As a result, the business and financial risks
17   are very similar among the utilities regardless of their size.   Therefore,
18   utility betas would not necessarily be related to firm size.

19   She then concludes:

20   The object of this study is to examine if the size effect exists in the utility
21   industry.   After controlling for equity values, there is some weak evidence
22   that firm size is a missing factor from the CAPM for industrial but not utility
23   stocks.   This implies that although the size phenomenon has been strongly
24   documented for industrials, findings suggest that there is no need to adjust
25   for the firm size in utility regulation.[18]

26   For all of these reasons, I recommend that my recommended ROR be adopted as it reflects

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[17]   Wallace Davidson III, Kenneth Ferris, and William Reichenstein, A Note on the Relationship Between Firm Size and Return in the Electric Utility Industry, *Journal of Accounting, Auditing, and Finance* Vol. 8, Issue 3 (Summer 1993).

[18]   Annie Wong, Utility Stocks and the Size Effect: An Empirical Analysis, *Journal of the Midwest Finance Association* 98 (1993).

1   the risks put forth by Ms. Richardson.

2

3   **XI.   SUMMARY**

4   **Q.   What is your recommended ROE?**

5   A.   I recommend an ROE of 8.90%.   As previously stated in my testimony, I arrived at this ROE

6   primarily on the basis of the results of my single-stage DCF method.   I used the results from

7   my multi-stage DCF and risk premium analyses as points of comparison to my single-stage

8   DCF results.   If I had given equal weight to the average result of all three analyses, the result

9   would have been an average ROE of 8.34%.[19]   If I had given equal wight to the combined

10   DCF results and the result of the Risk Premium method, my recommended ROE would have

11   been 8.58%.[20]   These results show that my recommended ROE of 8.90% ROE is reasonable.

12

13   **Q.   What is your recommended overall rate of return?**

14   A.   I recommend an overall rate of return, to be applied to rate base, of 6.51%.

15

16   **Q.   Does this conclude your direct testimony?**

17   A.   Yes.   I reserve the right to supplement this testimony during the course of the proceeding if

18   new evidence becomes available.

---

[19]   ((8.90% (single-stage DCF) + 6.83% (multi-stage DCF) + 9.29% (risk premium method))/3 = 8.34%.

[20]   (((8.90% (single-stage DCF) + 6.83% (multi-stage DCF))/2) + 9.38% (risk premium method))/2 = 8.58%.

AMER. STATES WATER NYSE-AWR

| RECENT PRICE | 75.91 | P/E RATIO | 31.5 | (Trailing: 32.6 Median: 24.0) | RELATIVE P/E RATIO | 1.44 | DIV'D YLD | 1.9% | VALUE LINE |

TIMELINESS	3	Raised 3/5/21
SAFETY	2	Raised 7/20/12
TECHNICAL	4	Lowered 4/9/21
BETA .65	(1.00 = Market)	

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$62-$108	$85 (10%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	85	(+10%)	5%
Low	60	(-20%)	-3%

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	135	121	121
to Sell	129	135	142
Hld'g(000)	25635	25731	25483

Percent shares traded: 24 / 16 / 8

LEGENDS
- 1.35 x Dividends p sh divided by Interest Rate
- .... Relative Price Strength
- 2-for-1 split 9/13
- Options: Yes
- Shaded area indicates recession

Target Price Range 2024 | 2025 | 2026

High: 19.8 18.2 24.1 33.1 38.7 44.1 47.2 58.4 69.6 96.0 96.6 83.1
Low: 15.6 15.3 17.0 24.0 27.0 35.8 37.3 41.1 50.1 63.3 65.1 70.1

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-3.0	50.1
3 yr.	43.9	45.4
5 yr.	88.1	108.8

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26
7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.86	13.24	13.55	13.75	Revenues per sh	17.20
1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.26	3.34	3.50	3.65	"Cash Flow" per sh	4.80
.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.28	2.33	2.40	2.55	Earnings per sh A	3.05
.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.28	1.40	1.52	Div'd Decl'd per sh B■	2.00
2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	4.12	3.54	4.05	4.00	Cap'l Spending per sh	4.25
7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.33	17.39	18.95	20.00	Book Value per sh D	23.20
33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.85	36.89	37.25	37.50	Common Shs Outst'g C	37.50
21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	34.4	34.3	Bold figures are		Avg Ann'l P/E Ratio	24.0
1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.84	1.83	1.78	Value Line estimates		Relative P/E Ratio	1.35
3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	1.5%	1.6%			Avg Ann'l Div'd Yield	2.6%

CAPITAL STRUCTURE as of 12/31/20
Total Debt $575.0 mill. Due In 5 Yrs $136.0 mill.
LT Debt $574.6 mill. LT Interest $22.5 mill.
(47% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.6 mill.
Pension Assets-12/19 $213.1 mill.
Oblig. $272.8 mill.

Pfd Stock None

Common Stock 36,898,213 shs.
as of 2/19/20

MARKET CAP: $2.8 billion (Mid Cap)

	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	488.2	505	515	Revenues ($mill)	645
	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	86.4	90.0	95.0	Net Profit ($mill)	115
	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	24.6%	23.0%	24.0%	Income Tax Rate	23.0%
	2.0%	2.5%	--	--	--	--	--	--	2.5%	--	1.0%	1.0%	AFUDC % to Net Profit	1.0%
	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	47.2%	45.0%	45.5%	Long-Term Debt Ratio	53.5%
	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	52.8%	55.0%	54.5%	Common Equity Ratio	46.5%
	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1216.2	1280	1380	Total Capital ($mill)	1620
	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	1512.0	1600	1700	Net Plant ($mill)	1925
	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.0%	8.0%	Return on Total Cap'l	8.5%
	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.0%	12.5%	Return on Shr. Equity	13.0%
	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.0%	12.5%	Return on Com Equity	13.0%
	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.1%	6.0%	5.0%	Retained to Com Eq	4.5%
	49%	45%	47%	53%	54%	56%	52%	61%	51%	55%	58%	60%	All Div'ds to Net Prof	66%

CURRENT POSITION

(SMILL.)	2018	2019	12/31/20
Cash Assets	7.1	1.3	36.7
Accts Receivable	23.4	20.9	29.2
Other	101.0	100.3	91.2
Current Assets	131.5	122.5	157.1
Accts Payable	59.5	55.6	63.8
Debt Due	40.3	5.3	.4
Other	46.8	55.1	54.4
Current Liab.	146.6	116.0	118.6

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	2.5%	.5%	5.0%
"Cash Flow"	5.5%	3.0%	7.0%
Earnings	9.0%	5.5%	6.5%
Dividends	8.5%	7.5%	9.5%
Book Value	5.5%	5.0%	5.5%

QUARTERLY REVENUES ($ mill.)

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2018	94.7	106.9	124.2	111.0	436.8
2019	101.7	124.7	134.5	113.0	473.9
2020	109.1	121.3	133.6	124.2	488.2
2021	115	125	145	120	505
2022	118	127	148	122	515

EARNINGS PER SHARE A

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2018	.29	.44	.62	.37	1.72
2019	.35	.72	.76	.45	2.28
2020	.38	.69	.72	.54	2.33
2021	.45	.67	.75	.53	2.40
2022	.48	.72	.78	.57	2.55

QUARTERLY DIVIDENDS PAID B■

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.242	.242	.255	.255	.99
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020	.305	.305	.335	.335	1.28
2021	.335				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 261,976 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,545 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS subsidiary. Sold Chaparral City Wtr. of AZ. (6/11). Employs 841. BlackRock, Inc. owns 15.9% of out. shares; Vanguard, 11.9%; off. & dir. 1.0%. (4/20 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc: CA. Address: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

Shares of American States Water have not performed well lately. Over the past three-month period, the price of the stock has declined about 2%. By comparison, the S&P 500 Index has increased 7%, a difference of nearly 900 basis points. **Meanwhile, a major rate case is pending.** California is a state where water utilities file a petition to raise prices once every three years. Last summer, the Golden States Water Company (GSWC) submitted the papers for rate hikes that would cover the years 2022 to 2024. The final decision on the case is not expected until late this year, at the earliest. Our earnings assumptions are based upon a reasonable ruling, as relations with the regulators has been mostly positive. An unexpectedly harsh decision would have a negative impact on the bottom line. **Earnings should advance at a decent clip both this year and next.** The company's year-over-year share net will likely only increase 3% in 2021. (Utilities often see earnings growth slow in the year before new rates are determined.) In 2022, with the assistance of higher rates, we are estimating that earnings per share will climb 6%.

Dividend growth prospects seem to be somewhat brighter. At the company's August board meeting, we think the distribution per share will be raised $0.03, a 9% increase. This is near the very high end of the range for water utilities. **The company's nonregulated operations offer some potential upside.** Through its ASUS business, the company operates water systems at U.S. Army installations. ASUS has been reasonably successful in winning its share of the many contracts the military has put out for bid. With more privatizations of these facilities planned, this segment could provide higher-margined revenues. That's because returns here are not capped, so there isn't a limit on profitability. **These neutrally ranked shares do not have appeal, at this time.** Despite lagging the market, AWR is only ranked to perform in line with the major indexes in the year ahead. Moreover, over the pull to 2024-2026, total return potential is well-below the *Value Line* median, as the equity is already in its Target Price Range.
James A. Flood   *April 9, 2021*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '05, 13¢; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due mid-May.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.
(D) Includes intangibles. As of 12/31/20; $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	100
Price Growth Persistence	95
Earnings Predictability	85

AMERICAN WATER NYSE-AWK

| RECENT PRICE | 147.91 | P/E RATIO | 35.4 | (Trailing: 37.8 / Median: 24.0) | RELATIVE P/E RATIO | 1.62 | DIV'D YLD | 1.6% | VALUE LINE |

TIMELINESS	2	Lowered 11/13/20	
SAFETY	3	New 7/25/08	
TECHNICAL	3	Lowered 4/9/21	
BETA	.85	(1.00 = Market)	

High/Low:

| High: | 25.8 | 32.8 | 39.4 | 45.1 | 56.2 | 61.2 | 85.2 | 92.4 | 98.2 | 129.9 | 172.6 | 166.1 |
| Low: | 19.4 | 25.2 | 31.3 | 37.0 | 41.1 | 48.4 | 58.9 | 70.0 | 76.0 | 88.0 | 92.0 | 131.0 |

LEGENDS
- 1.10 x Dividends p sh divided by Interest Rate
- · · · · Relative Price Strength
- Options: Yes
- Shaded area indicates recession

18-Month Target Price Range

Low-High Midpoint (% to Mid)
$114-$247 $181 (20%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	155	(+5%)	3%
Low	105	(-30%)	-6%

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	363	401	449
to Sell	371	337	344
Hld'g(000)	151102	150689	148917

Percent shares traded: 21 / 14 / 7

Target Price Range 2024 | 2025 | 2026

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	16.5	50.1
3 yr.	87.7	45.4
5 yr.	139.3	108.8
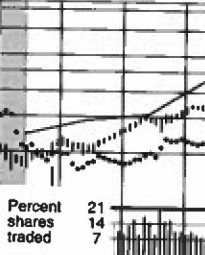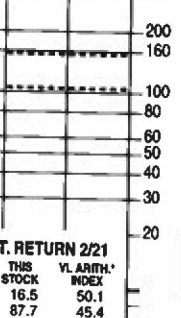
2005	2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26
--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	19.97	20.83	22.10	23.30	Revenues per sh	25.80
--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.65	7.24	7.70	8.25	"Cash Flow" per sh	9.70
--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.43	3.91	4.25	4.60	Earnings per sh A	5.50
--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	2.15	2.35	2.55	Div'd Decl'd per sh B■	3.10
--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	9.15	10.05	12.80	12.60	Cap'l Spending per sh	11.75
--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	33.83	35.58	37.45	39.40	Book Value per sh D	50.00
--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.26	178.10	178.44	180.68	180.81	181.30	181.50	182.00	Common Shs Outst'g C	190.00
--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	32.9	35.3	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	23.5
--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	1.75	1.83			Relative P/E Ratio	1.30
--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	1.7%	1.6%			Avg Ann'l Div'd Yield	2.4%

CAPITAL STRUCTURE as of 12/31/20
Total Debt $10691 mil. Due In 5 Yrs $2500 mil.
LT Debt $9329 mil. LT Interest $354 mil.
(59% of Cap'l)

Leases, Uncapitalized: Annual rentals $14.0 mill.
Pension Assets12/19 $1747.0 mill.
Oblig. $2161.0 mill.
Pfd Stock $4.0 mill. Pfd Div'd $.3 mill

Common Stock 181,439,255 shares
as of 2/19/21

MARKET CAP: $26.8 billion (Large Cap)

CURRENT POSITION ($MILL.)	2018	2019	12/31/20
Cash Assets	158	91	576
Accts Receivable	301	294	321
Other	322	900	1009
Current Assets	781	1285	1906
Accts Payable	175	203	189
Debt Due	1035	814	1611
Other	884	1028	1081
Current Liab.	2094	2045	2881

	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	3777.0	4010	4240	Revenues ($mill)	4900
	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	709.0	770	835	Net Profit ($mill)	1045
	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	23.3%	23.5%	23.5%	Income Tax Rate	24.0%
	--	6.2%	5.1%	--	--	--	--	--	5.1%	4.0%	5.0%	5.0%	AFUDC % to Net Profit	5.0%
	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	59.1%	59.5%	61.5%	Long-Term Debt Ratio	61.0%
	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	40.9%	40.5%	39.5%	Common Equity Ratio	39.0%
	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	14760	15787	16800	19000	Total Capital ($mill)	20000
	11021	11739	12391	12900	13933	14992	16246	17409	18232	19710	21150	22650	Net Plant ($mill)	24500
	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	5.7%	6.0%	5.5%	Return on Total Cap'l	6.0%
	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	11.5%	11.5%	Return on Shr. Equity	11.0%
	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	11.5%	11.5%	Return on Com Equity	11.0%
	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	5.0%	5.0%	5.0%	Retained to Com Eq	4.5%
	52%	57%	40%	50%	50%	56%	68%	56%	57%	55%	55%	55%	All Div'ds to Net Prof	56%

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 15 million people in 46 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2020 revenues. New Jersey is its largest market accounting for 24.5% of regulated revenues; Pennsylvania, 22.5%; Missouri, 10.6%. Has 6,800 employees. The Vanguard Grp. owns 11.7% of outstanding shares; BlackRock, Inc., 8.1%; officers & directors, less than 1.0%. (3/21 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	3.0%	3.5%	4.5%
"Cash Flow"	8.0%	7.0%	6.5%
Earnings	10.5%	8.0%	8.5%
Dividends	11.0%	11.5%	8.5%
Book Value	3.5%	4.5%	5.0%

Cal- endar	QUARTERLY REVENUES ($ mill.)				Full Year
	Mar.31	Jun. 30	Sep. 30	Dec. 31	
2018	761	853	976	850	3440
2019	813	882	1013	902	3610
2020	844	931	1079	923	3777
2021	880	995	1140	995	4010
2022	935	1055	1200	1050	4240

Cal- endar	EARNINGS PER SHARE A				Full Year
	Mar.31	Jun. 30	Sep. 30	Dec. 31	
2018	.59	.91	1.03	.62	3.15
2019	.62	.94	1.33	.54	3.43
2020	.68	.97	1.46	.80	3.91
2021	.73	1.05	1.60	.87	4.25
2022	.80	1.15	1.70	.95	4.60

Cal- endar	QUARTERLY DIVIDENDS PAID B■				Full Year
	Mar.31	Jun.30	Sep.30	Dec.31	
2017	.375	.415	.415	.415	1.62
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020	.50	.55	.55	.55	2.15
2021	.55				

American Water Works completed another very successful year in 2020. Due in part to a strong fourth quarter, the water utility managed to post an impressive 14% share-earnings increase over 2019. One of the most attractive qualities about this industry is that the demand for water is relatively inelastic. Hence, the pandemic has had no real impact on the company.

The earnings picture remains bright. American Water has an aggressive acquisition policy (more below). This, plus solid cost controls, an expanding rate base, and the stable need for water, should ensure solid yearly earnings per share increases for the foreseeable future. We think the company's share net will rise 8% both this year and in 2022. Through 2024 to 2026, we estimate growth here should be in the 7%-10% range, a much higher rate than the typical utility.

The company ought to continue to following what has been a successful strategy. Management has been acquiring small, independent water districts for many years. Indeed, in 2020, 23 such purchases were made. Domestically, there are literally thousands of these undersized water entities that are run by local municipalities. Often they are inefficient and undercapitalized. American Water can merge these operations into its existing business and attain significant economies of scale. As a result, the utility's margins should continue to widen annually as long as this policy is in place.

Capital expenditures are large, but manageable. Like others in the group, the company is spending heavily to upgrade its pipelines and other assets. Also, most of the acquisitions require investment to ensure that they are in compliance with federal mandates. Over the past 10 years, capital outlays have totaled $28 billion. Out to mid-decade, annual outlays may average $2.2 billion to $2.5 billion. The balance sheet will likely handle this without deteriorating much.

These shares are timely. Since our January report, the equity has underperformed the market indexes by about 750 basis points. Thus, the premium investors usually have to pay for this industry standout has declined to some degree.
James A. Flood *April 9, 2021*

(A) Diluted earnings. Excludes nonrecur. losses: '08, $4.62; '09, $2.63; '11, $0.07. Disc. oper.: '06, ($0.04); '11, $0.03; '12, ($0.10); '13,($0.01). GAAP used as of 2014. Next earn- ings report due mid-May. (B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available. (C) In millions. (D) Includes intangibles. On 12/31/20: $1.559 billion, $8.59/share. (E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	80
Earnings Predictability	85

CALIFORNIA WATER NYSE-CWT

| RECENT PRICE | 56.17 | P/E RATIO | 31.4 (Trailing: 29.0 / Median: 24.0) | RELATIVE P/E RATIO | 1.43 | DIV'D YLD | 1.6% | VALUE LINE |

TIMELINESS	1	Raised 3/19/21
SAFETY	3	Lowered 7/27/07
TECHNICAL	2	Lowered 4/9/21
BETA .65	(1.00 = Market)	

High/Low:
| High: | 19.8 | 19.4 | 19.3 | 23.4 | 26.4 | 26.0 | 36.8 | 46.2 | 49.1 | 57.5 | 57.4 | 60.5 |
| Low: | 16.9 | 16.7 | 16.8 | 18.4 | 20.3 | 19.5 | 22.5 | 32.4 | 35.3 | 44.6 | 39.7 | 51.8 |

LEGENDS
- 1.33 x Dividends p sh divided by Interest Rate
- .... Relative Price Strength
- 2-for-1 split 6/11
- Options: Yes
- Shaded area indicates recession

18-Month Target Price Range
Low-High	Midpoint (% to Mid)
$43-$81	$62 (10%)

Target Price Range 2024 | 2025 | 2026

2024-26 PROJECTIONS
	Price	Gain	Ann'l Total Return
High	65	(+15%)	6%
Low	45	(-20%)	-3%

Institutional Decisions
	2Q2020	3Q2020	4Q2020
to Buy	109	101	122
to Sell	107	106	91
Hld's(000)	35580	36492	37534

Percent shares traded: 18 / 12 / 6

% TOT. RETURN 2/21
	THIS STOCK	VL ARITH.* INDEX
1 yr.	16.6	50.1
3 yr.	51.7	45.4
5 yr.	142.7	108.8

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26
8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	14.72	15.78	16.00	15.95	Revenues per sh	16.30
1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	3.14	3.88	3.45	3.55	"Cash Flow" per sh	3.75
.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	1.97	1.90	2.00	Earnings per sh A	2.25
.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.85	.92	.98	Div'd Decl'd per sh B ■	1.15
2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	5.64	5.93	5.25	5.50	Cap'l Spending per sh	5.85
7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	16.07	18.30	18.35	18.25	Book Value per sh C	19.80
36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	48.53	50.33	51.00	52.00	Common Shs Outst'g D	53.00
24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	39.3	24.9	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	24.0
1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64	2.09	1.29			Relative P/E Ratio	1.30
3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	1.5%	1.7%			Avg Ann'l Div'd Yield	2.1%

CAPITAL STRUCTURE as of 12/31/20
Total Debt $1156.2 mill. Due in 5 Yrs $357.0 mill.
LT Debt $781.1 mill. LT Interest $40.0 mill.
(Total interest coverage: 5.2x) (46% of Cap'l)

Pension Assets-12/20 $716.8 mill.
Oblig. $833.9 mill.

Pfd Stock None

Common Stock 50,330,000 shs.

MARKET CAP: $2.8 billion (Mid Cap)

	501.8	560.0	584.1	597.5	588.4	609.4	666.9	698.2	714.6	794.3	815	830	Revenues ($mill) E	865
	36.1	42.6	47.3	56.7	45.0	48.7	67.2	65.6	63.1	96.8	97.0	105	Net Profit ($mill)	120
	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	11.1%	21.0%	21.0%	Income Tax Rate	21.0%
	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	3.3%	5.0%	5.0%	AFUDC % to Net Profit	5.0%
	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	45.9%	44.5%	43.5%	Long-Term Debt Ratio	38.0%
	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	54.1%	55.5%	56.5%	Common Equity Ratio	62.0%
	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	1702.4	1685	1675	Total Capital ($mill)	1700
	1381.1	1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	2650.6	2675	2700	Net Plant ($mill)	2850
	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	7.0%	6.5%	7.0%	Return on Total Cap'l	8.0%
	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	10.5%	11.0%	Return on Shr. Equity	11.5%
	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	10.5%	11.0%	Return on Com Equity	11.5%
	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	6.0%	5.5%	5.5%	Retained to Com Eq	5.5%
	71%	62%	56%	55%	71%	68%	51%	55%	60%	43%	48%	49%	All Div'ds to Net Prof	51%

CURRENT POSITION
($MILL.)	2018	2019	12/31/20
Cash Assets	47.2	42.7	44.6
Other	141.5	142.0	221.4
Current Assets	188.7	184.7	266.0
Accts Payable	95.6	108.5	131.7
Debt Due	170.0	197.0	375.1
Other	55.6	53.2	81.9
Current Liab.	321.2	358.7	588.7

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 492,600 customers in 100 communities in the state of California. Accounts for about 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '20: residential, 70%; business, 18%; industrial, 4%; public authorities, 5%; other 3%. Off. and dir. own 1% of common stock (4/20 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

ANNUAL RATES Past
of change (per sh)	Past 10 Yrs.	5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	3.5%	4.0%	1.5%
"Cash Flow"	6.0%	8.0%	2.0%
Earnings	5.0%	8.0%	6.5%
Dividends	3.0%	4.0%	6.5%
Book Value	5.0%	5.0%	4.0%

QUARTERLY REVENUES ($ mill.) E
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	134.6	174.9	221.3	167.4	698.2
2019	126.1	179.0	232.6	176.9	714.6
2020	125.6	175.5	304.1	189.1	794.3
2021	155	205	255	200	815
2022	160	205	260	205	830

EARNINGS PER SHARE A
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	d.02	.31	.75	.32	1.36
2019	d.16	.35	.88	.24	1.31
2020	d.42	.11	1.94	.31	1.97
2021	.08	.45	.95	.42	1.90
2022	.10	.45	1.00	.45	2.00

QUARTERLY DIVIDENDS PAID B ■
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.18	.18	.18	.18	.72
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020	.2125	.2125	.2125	.2125	.85
2021	.230				

California Water Service Group reported solid financial results to wrap up 2020. The West Coast water service provider generated revenues of $189 million in the December period, or a 7% annual increase, thanks largely to rate hikes associated with the recently approved general rate case. Meanwhile, fourth-quarter share profits of $0.31, which were also buoyed by benefits from the general rate case decision, specifically higher operating income and lower taxes, logged a healthy 29% advance compared to the year-earlier tally.

California Water is on a buying spree. The company's subsidiary, Hawaii Water Service, announced that it has received approval to acquire the assets of Kapalua Water and Kapalua Waste Treatment Company, which will add roughly 1,000 service connections in the area. In addition, a deal has been inked to purchase the water system assets of Skylanda Mutual Water Company. Pending regulatory approval, the transaction, which would add almost 19,000 service connection in California, is expected to be finalized early next year. Overall, tuck-in acquisitions will probably be a staple in the company's long-term growth strategy.

The company is in the early innings of a massive infrastructure improvement program. Indeed, management is taking an aggressive approach to upgrading and revamping its aging water delivery, transportation, and treatment facilities. For this year, its capital spending budget for infrastructure-related projects is approximately $285 million. Over the pull to 2025, the company is likely to invest upwards of $700 million. Lastly, California Water has already been given the green light by the California Public Utilities Commission to tap the debt and equity markets.

We continue to like this issue for subscribers with a short-term investment horizon. The stock has been raised one notch on our Timeliness Ranking Scale, to 1 (Highest) and, thus is slated to outpace the broader market averages over the coming six to 12 months. On the other hand, buy-and-hold accounts should turn the page, as total return potential out to 2024-2026 is unenticing at recent levels.

Nicholas P. Patrikis   April 9, 2021

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early May.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '20 : $27.6 mill., $0.55/sh.
(D) In millions, adjusted for split.
(E) Excludes non-regulated revenues

Company's Financial Strength	B++
Stock's Price Stability	95
Price Growth Persistence	70
Earnings Predictability	65

ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE	44.64	
P/E RATIO	27.4	(Trailing: 39.9 / Median: 23.0)
RELATIVE P/E RATIO	1.25	
DIV'D YLD	2.4%	

VALUE LINE

TIMELINESS	2	Raised 2/5/21
SAFETY	3	Lowered 1/8/21
TECHNICAL	3	Lowered 4/9/21
BETA	.95	(1.00 = Market)

High: 18.4 19.0 21.5 28.1 28.2 31.1 35.8 39.6 39.4 47.3 54.5 48.9
Low: 13.2 15.4 16.8 20.6 22.4 24.4 28.0 29.4 32.1 32.7 30.4 41.1

LEGENDS
— 1.60 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
5-for-4 split 9/13
Options: Yes
Shaded area indicates recession

Target Price Range 2024 | 2025 | 2026

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$32-$77	$55 (20%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	60	(+35%)	10%
Low	40	(-10%)	Nil

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	250	237	264
to Sell	235	227	221
Hld's(000)	161504	167838	169334

Percent shares traded: 15 / 10 / 5

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-0.0	50.1
3 yr.	31.1	45.4
5 yr.	53.8	108.8

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	©VALUE LINE PUB, LLC 24-26
Revenues per sh	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	4.03	5.96	8.00	8.50	8.60
"Cash Flow" per sh	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	1.73	2.21	2.40	2.65	2.85
Earnings per sh A	.57	.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	1.12	1.65	1.80	1.90
Div'd Decl'd per sh B=	.32	.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	.97	1.03	1.10	1.40
Cap'l Spending per sh	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	2.49	3.41	4.00	4.00	3.75
Book Value per sh	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	17.58	19.09	19.70	20.30	23.35
Common Shs Outst'g C	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	220.76	245.39	250.00	252.50	270.00
Avg Ann'l P/E Ratio	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	39.1	39.6			27.0
Relative P/E Ratio	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76	2.08	2.06			1.50
Avg Ann'l Div'd Yield	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%	2.2%	2.2%			2.8%

Bold figures are Value Line estimates

CAPITAL STRUCTURE as of 12/31/20
Total Debt $5670.3 mill. Due in 5 Yrs $1032 mill.
LT Debt $5507.7 mill. LT Interest $185.0 mill.
(54% of Cap'l)

Pension Assets-12/20 $426.8 mill.
Oblig. $486.2 mill.

Pfd Stock None
Common Stock 245,393,761 shares
as of 2/15/21

MARKET CAP: $11.0 billion (Large Cap)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	24-26
Revenues ($mill)	712.0	757.8	768.6	779.9	814.2	819.9	809.5	838.1	889.7	1462.7	2000	2150	2320
Net Profit ($mill)	144.8	153.1	205.0	213.9	201.8	234.2	239.7	192.0	224.5	284.8	310	365	515
Income Tax Rate	32.9%	39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	--	6.6%	6.6%	5.0%	6.0%	8.0%
AFUDC % to Net Profit	--	--	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	4.5%	7.0%	7.5%	7.0%
Long-Term Debt Ratio	52.7%	52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	54.0%	55.0%	56.0%	56.0%
Common Equity Ratio	47.3%	47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	46.0%	45.0%	44.0%	44.0%
Total Capital ($mill)	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	10192	11000	11775	14300
Net Plant ($mill)	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	9512.9	10175	10800	12100
Return on Total Cap'l	6.9%	6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	3.7%	3.5%	4.5%	5.5%
Return on Shr. Equity	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	6.0%	7.0%	9.5%
Return on Com Equity	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	6.0%	7.0%	9.5%
Retained to Com Eq	4.6%	4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	1.1%	1.5%	1.5%	2.0%
All Div'ds to Net Prof	60%	61%	50%	52%	60%	56%	59%	79%	84%	82%	76%	76%	74%

CURRENT POSITION ($MILL.)

	2018	2019	12/31/20
Cash Assets	3.6	1868.9	4.8
Receivables	101.2	67.1	154.8
Inventory (AvgCst)	15.8	18.4	58.4
Other	26.6	58.3	162.2
Current Assets	147.2	2012.7	380.2
Accts Payable	77.3	74.9	177.5
Debt Due	160.0	130.8	162.6
Other	161.7	113.1	263.8
Current Liab.	399.0	318.8	603.9

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	2.0%	2.0%	10.0%
"Cash Flow"	4.5%	1.0%	6.5%
Earnings	5.5%	-1.5%	10.0%
Dividends	7.5%	7.5%	7.5%
Book Value	9.5%	11.5%	4.5%

QUARTERLY REVENUES ($ mill.)

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	194.3	211.9	226.2	205.7	838.1
2019	201.1	218.9	243.6	226.1	889.7
2020	255.6	384.5	348.6	474.0	1462.7
2021	650	385	430	535	2000
2022	690	415	460	585	2150

EARNINGS PER SHARE A

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.29	.37	.44	d.02	1.08
2019	.09	.25	.38	.28	1.04
2020	.21	.29	.22	.40	1.12
2021	.63	.30	.30	.42	1.65
2022	.67	.33	.35	.45	1.80

QUARTERLY DIVIDENDS PAID B=

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.1913	.1913	.2047	.2047	.79
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020	.2343	.2343	.2507	.2507	.97
2021	.2507				

BUSINESS: Essential Utilities, Inc. became the new name for Aqua America on Feb. 3, 2020, to reflect the acquisition of Peoples, a natural gas utility, which occurred in 3/20. In 2020, Aqua Amer. provided water and wastewater services to about 5 million people in PA, OH, TX, IL, NC, NJ, IN, VA NS WS. Employed 3,180 Acquired AquaSource, 7/13; North Maine Utilities, 7/15; and others. Water respn. for 65% of revenues in 2020; residential, 39%; commercial, 10%; industrial, wastewater & other, 26%. Gas 35%. Off. & dir. own less than 1% of the common stock; BlackRock, 10.5%; Vanguard, 10.4%; (4/20 proxy). Canadian Pension Plan about 8.8%. Pres. & CEO: Christopher Franklin. Inc.: PA Addr.: 762 W Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Int.: www.essential.co.

Starting in the June quarter, Essential Utilities' figures ought to be comparable to 2020's. In mid-March of last year, Essential became a much different company (including taking on a new name), when it made the large acquisition of Peoples Gas for total consideration of about $5.3 billion. The purchase turned the new entity into one that is not totally water based. Despite not generating revenues for almost 85% of the first quarter, which is usually an important period for a gas entity, Peoples still accounted for 35% of Essential's revenues last year.

The outlook for earnings is positive. The company was able to increase its share net last year even though it had to absorb many merger-related charges. The process is mostly completed now. So, aided by cost-containment efforts, we expect WTRG to have a very strong share-net showing in 2021 and 2022.

The balance sheet is more leveraged. As a result of the merger, Essential's debt load increased significantly. As can be seen in the numbers array, long-term debt-to-equity rose from 43% to 54% during 2020. Capital expenditures are es-

timated to be $1 billion this year, which means that more borrowing will be required. Following 2022, we think the situation will likely stabilize, and Essential's finances should remain average for a water utility.

Essential's regulatory treatment will probably not be on par with other members of the group. Gas and electric utilities have historically not had great relations with the authorities that determine the rates they can charge customers. On the other hand, water utilities and the authorities have worked well together. Part of this is due to water regulators' understanding that there has been under investment in the domestic infrastructure and large amounts of capital spending are required to make upgrades.

These share have moved up a notch in rank, to 2 (Above Average), since our January report. The equity is pegged to outperform the market averages in the year ahead. Long-term total return potential is still unattractive even though WTRG has trailed the S&P 500 Index significantly over the past three months.
James A. Flood *April 9, 2021*

(A) Diluted egs. Excl. nonrec. gains: '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. Quarterly EPS do not add in '19 due to a large change in the number of shares outstanding in the Dec. period. Next earnings report May 5th. (B) Dividends historically paid in early March, June, Sept., & Dec. ■ Div'd. reinvestment plan available (5% discount). (C) In millions, adjusted for stock splits. (D) Includes intangibles: 12/31/20, $2.325 bill./$9.47 a share.

Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	70
Earnings Predictability	60

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MIDDLESEX WATER NDQ-MSEX

RECENT PRICE	80.66	
P/E RATIO	36.7	(Trailing: 37.0 / Median: 23.0)
RELATIVE P/E RATIO	1.68	
DIV'D YLD	1.4%	

VALUE LINE

TIMELINESS	1	Raised 11/13/20
SAFETY	2	New 10/21/11
TECHNICAL	4	Lowered 4/9/21
BETA	.70	(1.00 = Market)

High/Low:

| High: | 19.3 | 19.4 | 19.6 | 22.5 | 23.7 | 28.0 | 44.5 | 46.7 | 60.3 | 67.7 | 76.1 | 85.9 | | |
| Low: | 14.7 | 16.5 | 17.5 | 18.6 | 19.1 | 21.2 | 25.0 | 32.2 | 34.0 | 51.0 | 48.8 | 67.1 | | |

LEGENDS
- 1.20 x Dividends p sh divided by Interest Rate
- Relative Price Strength
- Options: Yes
- Shaded area indicates recession

18-Month Target Price Range

Low-High Midpoint (% to Mid)
$58-$106 $82 (0%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(-5%)	Nil
Low	55	(-30%)	-7%

Target Price Range 2024 | 2025 | 2026

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	68	52	67
to Sell	55	69	49
Hld's(000)	10359	10357	10675

Percent shares traded: 12 / 8 / 4

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	17.2	50.1
3 yr.	103.1	45.4
5 yr.	168.7	108.8

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26
6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.72	8.10	8.45	8.70	Revenues per sh	9.15
1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.90	3.25	3.15	3.25	"Cash Flow" per sh	3.70
.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	2.18	2.25	2.35	Earnings per sh A	2.70
.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.10	1.15	Div'd Decl'd per sh B■	1.35
2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	5.11	6.04	5.50	5.50	Cap'l Spending per sh	6.25
8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	18.57	19.81	19.45	19.60	Book Value per sh	20.85
11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.43	17.47	17.75	17.85	Common Shs Outst'g C	18.00
27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	29.7	30.1	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	24.0
1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.58	1.56			Relative P/E Ratio	1.30
3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	1.6%	1.6%			Avg Ann'l Div'd Yield	2.1%

CAPITAL STRUCTURE as of 12/31/20

Total Debt $282.5 mill. Due in 5 Yrs $43.7 mill.
LT Debt $273.2 mill. LT Interest $7.5 mill.
(Total interest coverage: 7.3x)
(44% of Cap'l)

Pension Assets-12/20 $88.9 mill.
Obllg. $115.9 mill.
Pfd Stock $2.4 mill. Pfd Div'd: $.1 mill.

Common Stock 17,473,000 shs.

MARKET CAP: $1.4 billion (Mid-Cap)

	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	141.6	150	155	Revenues ($mill)	165
	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	38.4	40.0	42.0	Net Profit ($mill)	49.0
	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	2.8%	2.8%	21.0%	21.0%	Income Tax Rate	21.0%
	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	3.9%	2.5%	2.5%	AFUDC % to Net Profit	2.5%
	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	44.0%	42.5%	41.5%	Long-Term Debt Ratio	40.0%
	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	55.7%	57.0%	58.0%	Common Equity Ratio	60.0%
	312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	621.5	610	600	Total Capital ($mill)	630
	422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	796.6	800	815	Net Plant ($mill)	835
	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	6.8%	7.0%	7.5%	Return on Total Cap'l	8.0%
	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	11.0%	11.5%	12.0%	Return on Shr. Equity	13.0%
	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	11.1%	11.5%	12.0%	Return on Com Equity	13.0%
	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	5.8%	6.0%	6.0%	Retained to Com Eq	6.5%
	87%	83%	73%	67%	63%	58%	62%	46%	48%	48%	49%	49%	All Div'ds to Net Prof	50%

CURRENT POSITION

(SMILL.)	2018	2019	12/31/20
Cash Assets	3.7	2.2	4.5
Other	27.1	26.9	29.6
Current Assets	30.8	29.1	34.1
Accts Payable	19.3	23.3	30.4
Debt Due	55.8	27.2	9.3
Other	19.3	14.5	17.1
Current Liab.	94.4	65.0	56.8

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	2.0%	2.0%	2.0%
"Cash Flow"	7.5%	10.5%	3.5%
Earnings	9.0%	12.5%	4.5%
Dividends	3.0%	5.0%	5.5%
Book Value	5.5%	8.0%	2.5%

QUARTERLY REVENUES ($ mill.)

Cal-endar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2018	31.2	34.9	38.7	33.3	138.1
2019	30.7	33.4	37.8	32.7	134.6
2020	31.8	35.3	39.9	34.6	141.6
2021	33.0	37.0	44.0	36.0	150
2022	34.0	38.0	45.0	38.0	155

EARNINGS PER SHARE A

Cal-endar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2018	.27	.52	.74	.43	1.96
2019	.39	.49	.66	.46	2.01
2020	.44	.55	.72	.47	2.18
2021	.45	.55	.73	.52	2.25
2022	.47	.57	.76	.55	2.35

QUARTERLY DIVIDENDS PAID B■

Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.21125	.21125	.21125	.22375	.86
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020	.2562	.2562	.2562	.2725	1.04
2021	.2725				

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 61,000 retail customers, primarily in Middlesex County, New Jersey. In 2020, the Middlesex System accounted for 59% of operating revenues. At 12/31/20, the company had 348 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.1% of the com. stock; BlackRock Inst. Trust Co., 7.7% (4/20 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Shares of Middlesex Water continue to march higher. The equity established yet another all-time high in early February, but has since retracted modestly to slightly above $80 per share. Still, the stock is up about 10% in price since our early-January review, keeping intact its enviable multiyear price ascent. Based on our Timeliness ranking scale, MSEX shares are slated to outperform (1: Highest) the broader market over the coming six to 12 months. Thus, they may pique the interest of near-term accounts.

The stage is set for respectable top- and bottom-line growth this year. Favorable operating trends, which were evident in the fourth quarter, are likely to persist over the near- to intermediate-terms. These include increased residential and wholesale water consumption owing to more people staying at home and greater handwashing frequency, as well as an expanding customer base in its Delaware water system. A recently inked contract with Highland Park in its New Jersey system is a positive, too. Adding it all up, revenues are poised to expand 6%, to $150 million, and will likely be accompanied by a 3% earnings advance, to $2.25 per share.

From a financial perspective, the company ought to be a stable performer over the pull to mid-decade. Modest revenue and earnings growth is likely on tap for 2022. Meanwhile, significant infrastructure spending may well overflow into the 3- to 5-year time frame. Management has laid out a budget of nearly $300 million through its Water For Tomorrow program, which aims to upgrade watermains, piping, and wastewater treatment facilities. Most recently, the company announced a $10 million investment to improve its drinking water infrastructure in New Jersey. Overall, aggressive spending ought to eventually curb unnecessary operating costs, and may well facilitate additional rate hikes going forward.

Shares of Middlesex Water are currently trading beyond the upper end of our 3- to 5-year Target Price parameters. This is so even after modestly lifting our P/E multiple to 24x. All in all, subscribers with an investment horizon of 18 months or longer can find more-attractive options elsewhere, at this juncture.

Nicholas P. Patrikis *April 9, 2021*

(A) Diluted earnings. Next earnings report due early May.
(B) Dividends historically paid in mid-Feb., May, Aug., and November.■ Div'd reinvestment plan available.
(C) In millions.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	65
Earnings Predictability	85

SJW GROUP NYSE-SJW

| RECENT PRICE | 63.42 | P/E RATIO | 26.9 (Trailing: 29.6 / Median: 21.0) | RELATIVE P/E RATIO | 1.23 | DIV'D YLD | 2.1% | VALUE LINE |

TIMELINESS — E	
SAFETY 3 New 4/22/11	
TECHNICAL — E	
BETA .85 (1.00 = Market)	

High: 28.2 26.8 26.9 30.1 33.7 35.7 56.9 69.3 68.4 74.5 75.0 71.7
Low: 21.6 20.9 22.6 24.5 25.5 27.5 28.6 45.4 51.3 53.9 45.6 58.0

LEGENDS
— 1.50 x Dividends p sh divided by Interest Rate
· · · · Relative Price Strength
Options: Yes
Shaded area indicates recession

Target Price Range 2024 | 2025 | 2026

18-Month Target Price Range
Low-High Midpoint (% to Mid)
$53-$123 $88 (40%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	100	(+60%)	14%
Low	65	(Nil)	3%

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	78	62	80
to Sell	75	77	68
Hld'g(000)	19939	19827	19850

Percent shares traded 15 / 10 / 5

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	4.5	50.1
3 yr.	24.8	45.4
5 yr.	89.0	108.8

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC 24-26	
9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	18.97	14.00	14.78	19.77	20.00	20.65	Revenues per sh	22.15
2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	5.24	3.29	3.67	5.28	4.25	4.40	"Cash Flow" per sh	5.30
1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	1.35	2.14	2.55	2.70	Earnings per sh A	3.65
.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	1.28	1.36	1.44	Div'd Decl'd per sh B■	1.72
2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	7.26	5.08	6.25	7.44	6.75	7.00	Cap'l Spending per sh	7.50
10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	22.57	31.31	31.27	32.12	35.60	36.95	Book Value per sh	40.85
18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	20.52	28.40	28.46	28.56	29.50	29.75	Common Shs Outst'g C	30.00
19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	28.45	28.56	Bold figures are		Avg Ann'l P/E Ratio	23.0
1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	2.55	1.56	Value Line estimates		Relative P/E Ratio	1.30
2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	1.9%	1.9%	1.9%	2.0%			Avg Ann'l Div'd Yield	2.1%

CAPITAL STRUCTURE as of 12/31/20
Total Debt $1363.8 mill. Due in 5 Yrs $22.4 mill.
LT Debt $1287.6 mill.   LT Interest $50.0 mill.
(LT Interest Coverage: 3.8x)

(58% of Cap'l)

Pension Assets-12/20 $278.1 mill.
Oblig. $386.1 mill.
Pfd Stock None.
Common Stock 28,560,000 shs.

MARKET CAP: $1.8 billion (Mid Cap)

CURRENT POSITION	2018	2019	12/31/20
(SMILL.)			
Cash Assets	420.7	17.9	9.3
Accts Receivable	19.2	36.3	58.1
Other	62.8	67.8	59.9
Current Assets	502.7	122.0	127.3
Accts Payable	24.9	34.9	34.2
Debt Due	--	22.3	76.2
Other	139.1	177.4	240.4
Current Liab.	164.0	234.6	350.8

	239.0	261.5	276.9	319.7	305.1	339.7	389.2	397.7	420.5	564.5	590	615	Revenues ($mill)	665
	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	38.7	61.5	75.0	80.0	Net Profit ($mill)	110
	41.1%	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	25.3%	12.0%	21.0%	21.5%	Income Tax Rate	21.0%
	--	--	--	--	--	--	--	--	2.0%	1.5%	1.5%	1.5%	AFUDC % to Net Profit	1.5%
	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.1%	58.4%	53.5%	51.0%	Long-Term Debt Ratio	38.0%
	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	40.9%	41.6%	46.5%	49.0%	Common Equity Ratio	62.0%
	607.9	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	2173.6	2204.7	2250	2250	Total Capital ($mill)	1975
	756.2	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	2334.9	2450	2565	Net Plant ($mill)	2775
	4.9%	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	2.5%	4.0%	4.0%	4.0%	Return on Total Cap'l	6.0%
	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	6.7%	7.0%	7.5%	Return on Shr. Equity	9.0%
	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	6.7%	7.0%	7.5%	Return on Com Equity	9.0%
	3.1%	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	.5%	2.7%	3.5%	3.5%	Retained to Com Eq	4.5%
	61%	59%	62%	29%	42%	31%	36%	60%	88%	59%	53%	53%	All Div'ds to Net Prof	47%

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with a total population of 450,000 people. Has 361 employees. Officers and directors own 8.3% of outstanding shares (3/21 proxy). Chairman & CEO: Eric Thornburg. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '24-'26
Revenues	3.0%	2.0%	5.5%
"Cash Flow"	5.5%	2.0%	4.5%
Earnings	7.0%	-.5%	13.0%
Dividends	6.0%	10.0%	6.0%
Book Value	8.5%	12.5%	4.5%

Cal- endar	QUARTERLY REVENUES ($ mill.)				Full Year
	Mar.31	Jun. 30	Sep. 30	Dec. 31	
2018	75.0	99.1	124.9	98.7	397.7
2019	77.7	103.0	114.0	126.0	420.5
2020	115.8	147.2	165.9	135.6	564.5
2021	120	150	175	145	590
2022	125	155	185	150	615

Cal- endar	EARNINGS PER SHARE A				Full Year
	Mar.31	Jun. 30	Sep. 30	Dec. 31	
2018	.06	.62	.76	.38	1.82
2019	.21	.47	.33	.34	1.35
2020	.08	.69	.91	.46	2.14
2021	.20	.75	.95	.65	2.55
2022	.23	.77	1.00	.70	2.70

Cal- endar	QUARTERLY DIVIDENDS PAID BD■				Full Year
	Mar.31	Jun.30	Sep.30	Dec.31	
2017	.2175	.2175	.2175	.3875	1.04
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020	.32	.32	.32	.32	1.28
2021	.34				

SJW Group posted better-than-expected top- and bottom-line results to close 2020. December-period revenues of $136 million came in about $5 million above our call, while earnings of $0.46 a share exceeded our $0.42 expectation. The overall outperformance was driven primarily by greater customer usage, cumulative water rate increases, slimmer operating expenses due to lower merger-related costs, and a decline in general & administrative expenses.

Noteworthy share-profit expansion is likely in the cards this year and next. Water production costs are apt to rise in conjunction with increased water consumption and a widening customer base, but operating expenses may well trend lower. Not to mention, we think significant merger synergies are likely to develop. All told, we think SJW will earn $2.55 a share this year, and $2.70 a share in 2022.

The coast-to-coast regulated water utility has tapped the equity markets. Specifically, the company recently closed a public offering of over one million shares, netting proceeds of almost $61 million. Management's plan for the raised funds include paying down outstanding obligations, various capital expenditures, and general corporate purposes.

The long-term growth narrative remains largely unaltered. Increased residential and wholesale water consumption, alongside periodic rate hikes, ought to keep revenues moving in the right direction. SJW Group's diverse geographical footprint is advantageous, and should expand further down the road. From an operational standpoint, robust capital spending on infrastructure upgrades ought to boost efficiency, as much of these costs can eventually be passed along to the consumer.

Unranked SJW shares are a bit more appealing for patient accounts following their recent step back in price. At recent levels, capital appreciation potential out to mid-decade is slightly above average, thus presenting a decent entry point for interested subscribers to start building a position. What's more, the dividend yield is now comfortably above the Value Line median, and ranks among the top payers in the Water Utilities Industry.

Nicholas P. Patrikis   April 9, 2021

(A) Diluted earnings. Excludes nonrecurring losses: '05, $1.09; '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due early May. Quarterly egs. may not add due to rounding. (B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available. (C) In millions. (D) Paid special dividend of $0.17 per share on 11/17. (E) Suspended due to recent CTWS merger.

Company's Financial Strength	B+
Stock's Price Stability	75
Price Growth Persistence	70
Earnings Predictability	45

YORK WATER NDQ-YORW

RECENT PRICE	48.74	P/E RATIO	38.1 (Trailing: 38.4 / Median: 26.0)	RELATIVE P/E RATIO	1.74	DIV'D YLD	1.5%	VALUE LINE

TIMELINESS	3	Lowered 1/15/21
SAFETY	3	Lowered 7/17/15
TECHNICAL	3	Lowered 4/2/21
BETA	.80	(1.00 = Market)

High/Low:

| High: | 18.0 | 18.1 | 18.5 | 22.0 | 24.3 | 26.7 | 39.8 | 39.9 | 36.1 | 47.3 | 51.3 | 51.9 |
| Low: | 12.8 | 15.8 | 16.8 | 17.6 | 18.8 | 19.7 | 23.8 | 31.7 | 27.5 | 30.3 | 34.6 | 40.7 |

LEGENDS
— 1.10 x Dividends p sh divided by Interest Rate
···· Relative Price Strength
Options: Yes
Shaded area indicates recession

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$36-$76	$56 (15%)

2024-26 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	50	(+5%)	2%
Low	35	(-30%)	-6%

Institutional Decisions

	2Q2020	3Q2020	4Q2020
to Buy	59	46	56
to Sell	48	53	46
Hld's(000)	5479	5302	5341

Percent shares traded: 12 / 8 / 4

Target Price Range 2024 | 2025 | 2026

% TOT. RETURN 2/21

	THIS STOCK	VL ARITH.* INDEX
1 yr.	0.0	50.1
3 yr.	56.3	45.4
5 yr.	64.3	108.8
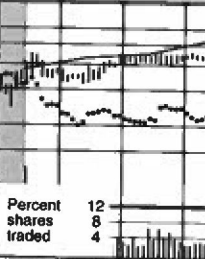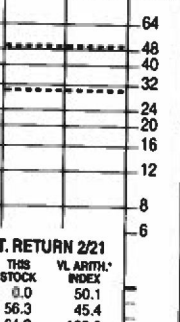
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC 24-26	
2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	3.96	4.13	4.20	4.35	Revenues per sh	5.10
.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	1.70	1.88	1.95	2.10	"Cash Flow" per sh	2.45
.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	1.11	1.27	1.35	1.40	Earnings per sh A	1.65
.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	.73	.78	.83	Div'd Decl'd per sh B	1.00
1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	--	.16	.85	1.35	1.45	Cap'l Spending per sh	1.85
4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	10.31	10.97	11.55	12.00	Book Value per sh	12.90
10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	13.02	13.06	13.00	12.90	Common Shs Outst'g C	12.80
26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	33.8	35.7	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	25.0
1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.64	1.80	1.85			Relative P/E Ratio	1.40
2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%	1.9%	1.6%			Avg Ann'l Div'd Yield	2.4%

CAPITAL STRUCTURE as of 12/31/20
Total Debt $123.6 mill. Due in 5 Yrs $42.5 mill.
LT Debt $123.6 mill. LT Interest $5.5 mill.

(46% of Cap'l)

Pension Assets 12/20 $56.3 mill.
Oblig. $54.1 mill.

Pfd Stock None

Common Stock 13,060,817 shs.

MARKET CAP: $625 million (Small Cap)

	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	51.6	53.9	54.5	56.0	Revenues ($mill)	65.0
	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	14.4	16.6	17.5	18.0	Net Profit ($mill)	21.0
	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	13.5%	18.5%	21.0%	21.0%	Income Tax Rate	21.0%
	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	2.5%	1.5%	1.5%	1.5%	AFUDC % to Net Profit	1.5%
	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	41.3%	46.3%	44.5%	42.5%	Long-Term Debt Ratio	37.5%
	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	58.7%	53.7%	55.5%	57.5%	Common Equity Ratio	62.5%
	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	228.7	266.9	270	270	Total Capital ($mill)	265
	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	313.2	343.6	355	370	Net Plant ($mill)	405
	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	7.4%	7.1%	7.5%	7.5%	Return on Total Cap'l	9.0%
	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.7%	11.5%	11.5%	11.5%	Return on Shr. Equity	13.0%
	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.7%	11.5%	11.5%	11.5%	Return on Com Equity	13.0%
	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	4.0%	4.9%	5.0%	4.5%	Retained to Com Eq	5.0%
	73%	74%	74%	64%	62%	67%	63%	64%	62%	58%	58%	59%	All Div'ds to Net Prof	61%

CURRENT POSITION ($MILL.)

	2018	2019	12/31/20
Cash Assets	--	--	5.0
Accounts Receivable	4.8	4.4	5.2
Inventory (Avg. Cost)	.9	1.0	1.0
Other	3.3	4.0	5.1
Current Assets	9.0	9.4	16.3
Accts Payable	3.0	3.4	6.5
Debt Due	1.0	6.5	--
Other	6.8	5.3	5.5
Current Liab.	10.8	15.2	12.0

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2020, the company's average daily availability was 35.6 million gallons and its service territory had an estimated population of 202,000. Has more than 72,600 customers. Residential customers accounted for 66% of 2020 revenues; commercial and industrial (26%); other (8%). It also provides sewer billing services. Incorporated: PA. York had 108 full-time employees at 12/31/20. President/Chief Executive Officer: J.T. Hand. Officers/directors own 1.3% of the common stock (3/21 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '24-'26
Revenues	3.0%	2.5%	4.0%
"Cash Flow"	6.0%	5.5%	6.5%
Earnings	6.0%	6.0%	6.5%
Dividends	3.0%	4.0%	6.0%
Book Value	4.5%	4.0%	4.0%

QUARTERLY REVENUES ($ mill.)

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	11.6	12.0	12.7	12.1	48.4
2019	11.8	13.0	13.7	13.1	51.6
2020	12.9	13.3	14.3	13.4	53.9
2021	13.0	13.5	14.5	13.5	54.5
2022	13.5	13.7	15.0	13.8	56.0

EARNINGS PER SHARE A

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.20	.26	.29	.29	1.04
2019	.22	.28	.35	.26	1.11
2020	.31	.32	.36	.28	1.27
2021	.28	.35	.37	.35	1.35
2022	.30	.36	.38	.36	1.40

QUARTERLY DIVIDENDS PAID B

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.1602	.1602	.1602	.1666	.647
2018	.1666	.1666	.1666	.1733	.673
2019	.1733	.1733	.1733	.1802	.70
2020	.1802	.1802	.1802	.1874	.73
2021	.1874				

York Water delivered decent top- and bottom-line results to conclude 2020. In the December period, revenues of $13.4 million rose 2%, year over year, while earnings of $0.28 advanced 8%. For the full year, the regulated water utility benefited from rate increases, higher residential water consumption due to more people staying at home, and strong customer base expansion. Capital investment was robust in 2020, as the company spent more than $30 million on infrastructure upgrades such as standpipe replacements and raw water pumping station and wastewater treatment improvements.

Our preliminary 2022 financial projections suggest modest expansion is likely to persist. For the current year, we are maintaining our revenue call of $54.5 million, but are adding a nickel to our earnings forecast, to $1.35 per share. For next year, we anticipate low single-digit top- and bottom-line growth of 3% and 4%, respectively.

The long-term outlook is bright, as well. Water consumption ought to remain stable, and possibly trend higher, as York's customer base expands further. In addition, the company is likely to keep its foot on the gas in terms of capital investments, as its aging infrastructure demands increased attention. This ought to precipitate periodic rate hikes, which help to alleviate some of these expenses.

The stock is trading around recently minted all-time high territory. Underpinning the investment community's notable enthusiasm of late, in our view, is a combination of strong quarterly operating performances and a broad-based flight-to-safety approach amidst an uncertain, albeit improving economic backdrop. York Water is indeed a noncyclical, conservative security, as its water utility operations stand at the core of everyday life, and are largely immune to economic shocks.

We do not recommend starting a position at the recent quotation. On the contrary, committed investors may want to consider locking in some profits following the multiyear price ascent. Moreover, the equity is pegged as a year-ahead market performer, and offers limited price upside over the pull to 2024-2026. The dividend yield leaves much to be desired, too.

Nicholas P. Patrikis *April 9, 2021*

(A) Diluted earnings. Next earnings report due early May.
(B) Dividends historically paid in late February, June, September, and December.
(C) In millions, adjusted for split.

Company's Financial Strength	B+
Stock's Price Stability	75
Price Growth Persistence	65
Earnings Predictability	100

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American States Water Company (AWR)
(Real Time Quote from BATS)

$82.68 USD

+0.25 (0.30%)

Updated Jun 17, 2021 11:03 AM ET

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Zacks Rank:
3-Hold [ ] [ ] [3] [ ] [ ]

Style Scores:
C Value | C Growth | F Momentum | D VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

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American States Water Company (AWR) Quote Overview » Estimates » American States Water Company (AWR) Detailed Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date   8/2/21   Earnings ESP   0.00%

Last EPS Surprise	8.33%	EPS (TTM)	2.47
ABR	1.00	P/E (F1)	33.44

Growth Estimates	AWR	IND	S&P
Current Qtr (06/2021)	1.45	67,733.33	146.15
Next Qtr (09/2021)	4.17	7.39	157.99
Current Year (12/2021)	6.01	11.10	59.35
Next Year (12/2022)	3.64	24.00	5.13
Past 5 Years	7.80	1.50	2.80
Next 5 Years	NA	10.50	NA
PE	33.44	49.50	21.66
PEG Ratio	NA	4.71	NA

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Premium Research for AWR

| Zacks Rank	Hold [3]
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	C Value	C Growth	F Momentum	[D] VGM
Earnings ESP	0.00%
Research Reports for AWR	Analyst	Snapshot

(▲ ▼ = Change in last 30 days)

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Research for AWR

Chart for AWR
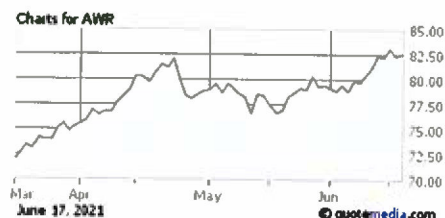
Charts for AWR

Mar Apr May Jun
June 17, 2021   © quotemedia.com

Interactive Chart | Fundamental Charts

Sales Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	124.00M	140.00M	508.00M	525.50M
# of Estimates	1	1	2	2
High Estimate	124.00M	140.00M	509.00M	528.00M
Low Estimate	124.00M	140.00M	507.00M	523.00M
Year ago Sales	121.28M	133.69M	488.24M	508.00M
Year over Year Growth Est.	2.24%	4.72%	4.05%	3.44%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.70	0.75	2.47	2.56
# of Estimates	1	1	2	2
Most Recent Consensus	NA	NA	2.47	2.54
High Estimate	0.70	0.75	2.47	2.58
Low Estimate	0.70	0.75	2.46	2.54
Year ago EPS	0.69	0.72	2.33	2.47
Year over Year Growth Est.	1.45%	4.17%	6.01%	3.85%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	2	1
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	0	0	0

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.70	0.75	2.47	2.56
7 Days Ago	0.70	0.75	2.47	2.56
30 Days Ago	0.70	0.75	2.47	2.56
60 Days Ago	0.70	0.75	2.41	2.55
90 Days Ago	0.70	0.75	2.41	2.55

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.70	0.75	2.47	2.56
Zacks Consensus Estimate	0.70	0.75	2.47	2.56
Earnings ESP	0.00%	0.00%	0.00%	0.00%

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Reported	0.52	0.54	0.72	0.69	NA
Estimate	0.48	0.49	0.75	0.69	NA
Difference	0.04	0.05	-0.03	0.00	0.02
Surprise	8.33%	10.20%	-4.00%	0.00%	3.63%

Quarterly Estimates By Analyst

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American Water Works Company, Inc. (AWK)
(Real Time Quote from BATS)

$160.07 USD

+1.60 (1.01%)

Updated Jun 17, 2021 11:03 AM ET

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Zacks Rank:

3-Hold   ☐ ☐ 3 ☐ ☐

Style Scores:

D Value | D Growth | C Momentum | D VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

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American Water Works Company, Inc. (AWK) Quote Overview » Estimates » American Water Works Company, Inc. (AWK) Detailed Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date   8/4/21   Earnings ESP   0.00%

Last EPS Surprise	0.00%	EPS (TTM)	3.96
ABR	2.10	P/E (F1)	37.35

Growth Estimates	AWK	IND	S&P
Current Qtr (06/2021)	11.34	67,733.33	146.15
Next Qtr (09/2021)	6.16	7.39	157.99
Current Year (12/2021)	8.72	11.10	59.35
Next Year (12/2022)	7.55	24.00	5.13
Past 5 Years	8.10	1.50	2.80
Next 5 Years	8.10	10.50	NA
PE	37.35	49.50	21.66
PEG Ratio	4.62	4.71	NA

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See Earnings Report Transcript

Premium Research for AWK

Zacks Rank	Hold [3]
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	D Value | D Growth | C Momentum | D VGM
Earnings ESP	0.00%
Research Reports for AWK	Analyst | Snapshot

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Research for AWK

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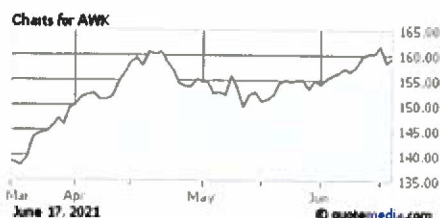
Charts for AWK

June 17, 2021   © quotemedia.com

Interactive Chart | Fundamental Charts

Sales Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	973.60M	1.10B	3.94B	4.11B
# of Estimates	2	2	3	3
High Estimate	974.00M	1.11B	3.99B	4.18B
Low Estimate	973.20M	1.09B	3.91B	4.06B
Year ago Sales	931.00M	1.08B	3.78B	3.94B

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	1.08	1.55	4.24	4.56
# of Estimates	4	3	7	6
Most Recent Consensus	1.04	1.57	4.28	4.56
High Estimate	1.11	1.57	4.28	4.59
Low Estimate	1.04	1.53	4.21	4.50
Year ago EPS	0.97	1.46	3.90	4.24
Year over Year Growth Est.	11.34%	6.16%	8.72%	7.52%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	1	2	2	3
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	1	0	0	0

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	1.08	1.55	4.24	4.56
7 Days Ago	1.08	1.55	4.24	4.56
30 Days Ago	1.08	1.55	4.24	4.56
60 Days Ago	1.06	1.50	4.19	4.53
90 Days Ago	1.02	1.50	4.19	4.53

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	1.08	1.55	4.24	4.56
Zacks Consensus Estimate	1.08	1.55	4.24	4.56
Earnings ESP	0.00%	0.00%	0.00%	0.00%

Surprise - Reported Earnings History

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Reported	0.73	0.80	1.46	0.97	NA
Estimate	0.73	0.80	1.38	0.96	NA
Difference	0.00	0.00	0.08	0.01	0.02
Surprise	0.00%	0.00%	5.80%	1.04%	1.71%

Quarterly Estimates By Analyst

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California Water Service Group (CWT)
(Real Time Quote from BATS)

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$58.44 USD

+0.19 (0.33%)

Updated Jun 17, 2021 11:03 AM
ET

Zacks Rank:
3-Hold ☐ ☐ 3 ☐ ☐

Style Scores:
C Value | C Growth | F Momentum | D VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

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Estimates

Detailed Estimates

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Estimates

Next Report Date   7/29/21   Earnings ESP   0.00%

Last EPS Surprise	-100.00%	EPS (TTM)	2.30
ABR	3.40	P/E (F1)	33.05

Growth Estimates	CWT	IND	S&P
Current Qtr (06/2021)	209.09	67,733.33	146.15
Next Qtr (09/2021)	-46.39	7.39	157.99
Current Year (12/2021)	-10.66	11.10	59.35
Next Year (12/2022)	6.82	24.00	5.13
Past 5 Years	13.70	1.50	2.80
Next 5 Years	NA	10.50	NA
PE	33.05	49.50	21.66
PEG Ratio	NA	4.71	NA

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Premium Research for CWT

Zacks Rank	Hold 3
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	C Value | C Growth | F Momentum | D VGM
Earnings ESP	0.00%
Research Reports for CWT	Analyst | Snapshot

(▲ ▼ = Change in last 30 days)

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Research for CWT

Chart for CWT
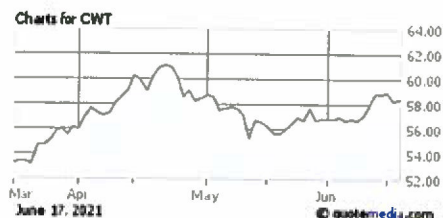
Charts for CWT

Mar   Apr   May   Jun
June 17, 2021   © quotemedia.com

Interactive Chart | Fundamental Charts

Sales Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	187.00M	252.00M	783.00M	802.00M
# of Estimates	1	1	1	1
High Estimate	187.00M	252.00M	783.00M	802.00M
Low Estimate	187.00M	252.00M	783.00M	802.00M
Year ago Sales	175.48M	304.11M	794.31M	783.00M
Year over Year Growth Est.	6.56%	-17.14%	-1.42%	2.43%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.34	1.04	1.76	1.88
# of Estimates	1	1	4	3
Most Recent Consensus	0.34	1.04	1.71	1.81
High Estimate	0.34	1.04	1.84	2.01
Low Estimate	0.34	1.04	1.70	1.81
Year ago EPS	0.11	1.94	1.97	1.76
Year over Year Growth Est.	209.09%	-46.39%	-10.66%	6.86%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	1	1	1
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	1	0	0	0

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.34	1.04	1.76	1.88
7 Days Ago	0.34	1.04	1.76	1.88
30 Days Ago	0.34	1.04	1.76	1.88
60 Days Ago	0.44	0.90	1.76	1.88
90 Days Ago	0.44	0.90	1.76	1.88

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.34	1.04	1.76	1.88
Zacks Consensus Estimate	0.34	1.04	1.76	1.88
Earnings ESP	0.00%	0.00%	0.00%	0.00%

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Reported	-0.06	0.31	1.94	0.11	NA
Estimate	-0.03	0.35	1.14	0.56	NA
Difference	-0.03	-0.04	0.80	-0.45	0.07
Surprise	-100.00%	-11.43%	70.18%	-80.36%	-30.40%

Quarterly Estimates By Analyst

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As of 6/17/2021
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Essential Utilities Inc. (WTRG)
(Real Time Quote from BATS)

$48.38 USD

+0.31 (0.65%)

Updated Jun 17, 2021 11:03 AM ET

Add to portfo | ▲ Trades from $1

Zacks Rank:
2-Buy [ ] [2] [ ] [ ]

Style Scores:
F Value | C Growth | D Momentum | D VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

▲ View All Zacks #1 Ranked Stocks

Essential Utilities Inc. (WTRG) Quote Overview » Estimates » Essential Utilities Inc. (WTRG) Detailed Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date	8/4/21	Earnings ESP	0.00%
Current Quarter	0.28	Current Year	1.67
EPS Last Quarter	0.72	Next Year	1.79
Last EPS Surprise	9.09%	EPS (TTM)	1.70
ABR	2.00	P/E (F1)	28.81

Growth Estimates

	WTRG	IND	S&P
Current Qtr (06/2021)	-3.45	67,733.33	146.15
Next Qtr (09/2021)	13.04	7.39	157.99
Current Year (12/2021)	5.70	11.10	59.35
Next Year (12/2022)	7.19	24.00	5.13
Past 5 Years	4.60	1.50	2.80
Next 5 Years	6.20	10.50	NA
PE	28.81	49.50	21.66
PEG Ratio	4.63	4.71	NA

Learn More About Estimate Research

See Brokerage Recommendations

Premium Research for WTRG

Zacks Rank	▲ Buy [2]
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	

Research Reports for WTRG

(▲ ▼ = Change in last 30 days)

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Research for WTRG

Chart for WTRG
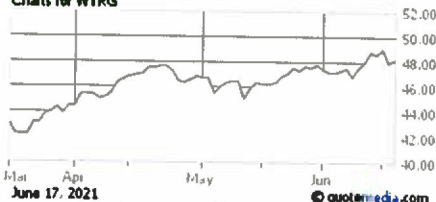
Interactive Chart | Fundamental Charts

Sales Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	388.00M	367.00M	1.84B	1.92B
# of Estimates	1	1	1	1
High Estimate	388.00M	367.00M	1.84B	1.92B
Low Estimate	388.00M	367.00M	1.84B	1.92B
Year ago Sales	384.47M	348.65M	1.46B	1.84B
Year over Year Growth Est.	0.92%	5.26%	25.52%	4.58%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.28	0.26	1.67	1.79
# of Estimates	3	3	7	6
Most Recent Consensus	0.23	0.21	1.64	1.80
High Estimate	0.32	0.29	1.69	1.85
Low Estimate	0.23	0.21	1.64	1.75
Year ago EPS	0.29	0.23	1.58	1.67
Year over Year Growth Est.	-3.45%	13.04%	5.70%	7.47%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	1	1	1	1
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	1	0	0

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.28	0.26	1.67	1.79
7 Days Ago	0.28	0.26	1.67	1.79
30 Days Ago	0.28	0.26	1.67	1.79
60 Days Ago	0.28	0.26	1.67	1.79
90 Days Ago	0.28	0.26	1.66	1.79

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.28	0.26	1.67	1.79
Zacks Consensus Estimate	0.28	0.26	1.67	1.79
Earnings ESP	0.00%	0.00%	0.00%	0.00%

Surprise - Reported Earnings History

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Reported	0.72	0.46	0.23	0.29	NA
Estimate	0.66	0.46	0.26	0.24	NA
Difference	0.06	0.00	-0.03	0.05	0.02
Surprise	9.09%	0.00%	-11.54%	20.83%	4.60%

Quarterly Estimates By Analyst

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Middlesex Water Company (MSEX)
(Real Time Quote from BATS)

$86.81 USD

+0.50 (0.58%)

Updated Jun 17, 2021 11:03 AM
ET

Add to portfo   Trades from ($1)

Zacks Rank:

4-Sell   ☐ ☐ ☐ [4] ☐

Style Scores:

C Value | B Growth | A Momentum | B VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

View All Zacks #1 Ranked Stocks

Middlesex Water Company (MSEX) Quote Overview » Estimates » Middlesex Water Company (MSEX) Detailed
Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date   7/30/21   Earnings ESP   0.00%

Last EPS Surprise	**-15.22%**	EPS (TTM)	2.13
ABR	2.33	P/E (F1)	38.44

Growth Estimates	MSEX	IND	S&P
Current Qtr (06/2021)	7.27	67,733.33	146.15
Next Qtr (09/2021)	0.00	7.39	157.99
Current Year (12/2021)	3.21	11.10	59.35
Next Year (12/2022)	6.67	24.00	5.13
Past 5 Years	11.80	1.50	2.80
Next 5 Years	NA	10.50	NA
PE	38.44	49.50	21.66
PEG Ratio	NA	4.71	NA

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See Brokerage Recommendations

Premium Research for MSEX

Zacks Rank	Sell 4
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	C Value | B Growth | A Momentum | B VGM
Earnings ESP	0.00%
Research Report for MSEX	Snapshot

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Research for MSEX

Chart for MSEX

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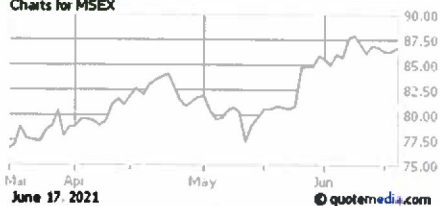
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Interactive Chart | Fundamental Charts

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	36.00M	40.00M	145.00M	149.00M
# of Estimates	1	1	1	1
High Estimate	36.00M	40.00M	145.00M	149.00M
Low Estimate	36.00M	40.00M	145.00M	149.00M
Year ago Sales	35.28M	39.92M	141.59M	145.00M
Year over Year Growth Est.	2.04%	0.20%	2.41%	2.76%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.59	0.72	2.25	2.40
# of Estimates	1	1	2	2
Most Recent Consensus	NA	NA	2.19	2.29
High Estimate	0.59	0.72	2.30	2.50
Low Estimate	0.59	0.72	2.19	2.29
Year ago EPS	0.55	0.72	2.18	2.25
Year over Year Growth Est.	7.27%	0.00%	3.21%	6.67%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	0	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	0	1	1

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.59	0.72	2.25	2.40
7 Days Ago	0.59	0.72	2.25	2.40
30 Days Ago	0.59	0.72	2.25	2.40
60 Days Ago	0.59	0.72	2.28	2.42
90 Days Ago	0.59	0.72	2.28	2.42

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.59	0.72	2.25	2.40
Zacks Consensus Estimate	0.59	0.72	2.25	2.40
Earnings ESP	0.00%	0.00%	0.00%	0.00%

Surprise - Reported Earnings History

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Estimate	0.46	0.43	0.70	0.51	NA
Difference	-0.07	0.04	0.02	0.04	0.01
Surprise	-15.22%	9.30%	2.86%	7.84%	1.20%

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SJW Group (SJW)
(Real Time Quote from BATS)

$66.00 USD

+0.10 (0.15%)

Updated Jun 17, 2021 11:03 AM ET

Add to portfo   🔊 Trades from ($1)

Zacks Rank:
4-Sell   ☐☐☐④☐   4

Style Scores:
B Value | C Growth | D Momentum | B VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

View All Zacks #1 Ranked Stocks
SJW Group (SJW) Quote Overview » Estimates » SJW Group (SJW) Detailed Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date	8/5/21	Earnings ESP	0.00%
Current Quarter	0.66	Current Year	1.97
EPS Last Quarter	0.12	Next Year	2.47
Last EPS Surprise	0.00%	EPS (TTM)	2.19
ABR	3.00	P/E (F1)	33.45

Growth Estimates

	SJW	IND	S&P
Current Qtr (06/2021)	-4.35	67,733.33	146.15
Next Qtr (09/2021)	-15.22	7.39	157.99
Current Year (12/2021)	-7.94	11.10	59.35
Next Year (12/2022)	25.38	24.00	5.13
Past 5 Years	-0.40	1.50	2.80
Next 5 Years	NA	10.50	NA
PE	33.45	49.50	21.66
PEG Ratio	NA	4.71	NA

Learn More About Estimate Research

See Brokerage Recommendations

See Earnings Report Transcript

Premium Research for SJW

Zacks Rank	Sell ④
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)

Research Report for SJW

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Research for SJW

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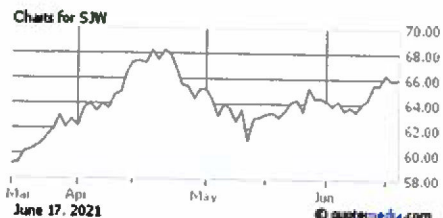
Charts for SJW

June 17, 2021

Interactive Chart | Fundamental Charts

Sales Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	150.58M	168.91M	572.20M	596.79M
# of Estimates	2	2	2	2
High Estimate	151.00M	170.00M	574.00M	600.58M
Low Estimate	150.16M	167.81M	570.40M	593.00M
Year ago Sales	147.21M	165.86M	564.53M	572.20M
Year over Year Growth Est.	2.29%	1.84%	1.36%	4.30%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.66	0.78	1.97	2.47
# of Estimates	2	2	2	3
Most Recent Consensus	0.61	0.74	2.00	2.44
High Estimate	0.70	0.82	2.00	2.50
Low Estimate	0.61	0.74	1.94	2.44
Year ago EPS	0.69	0.92	2.14	1.97
Year over Year Growth Est.	-4.35%	-15.22%	-7.94%	25.38%

Agreement - Estimate Revisions

I accept   X

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	0	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	1	2	2	2

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.66	0.78	1.97	2.47
7 Days Ago	0.66	0.78	1.97	2.47
30 Days Ago	0.66	0.78	1.97	2.47
60 Days Ago	0.72	0.95	2.36	2.52
90 Days Ago	0.74	0.92	2.38	2.51

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.66	0.78	1.97	2.47
Zacks Consensus Estimate	0.66	0.78	1.97	2.47
Earnings ESP	0.00%	0.00%	0.00%	0.00%

Surprise - Reported Earnings History

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Reported	0.12	0.46	0.92	0.69	NA
Estimate	0.12	0.34	0.93	0.71	NA
Difference	0.00	0.12	-0.01	-0.02	0.02
Surprise	0.00%	35.29%	-1.08%	-2.82%	7.85%

Quarterly Estimates By Analyst

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NYSE and AMEX data is at least 20 minutes delayed. NASDAQ data is at least 15 minutes delayed.

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The York Water Company (YORW)
(Real Time Quote from BATS)

$50.98 USD

-0.43 (-0.84%)

Updated Jun 17, 2021 11:03 AM ET

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Zacks Rank:
4-Sell ☐ ☐ ☐ 4 ☐

Style Scores:
C Value | B Growth | A Momentum | B VGM

Industry Rank:
Bottom 6% (236 out of 252)

Industry: Utility - Water Supply

View All Zacks #1 Ranked Stocks

The York Water Company (YORW) Quote Overview » Estimates » The York Water Company (YORW) Detailed Estimates

Detailed Estimates

Enter Symbol

Estimates

Next Report Date　　8/5/21　Earnings ESP　　0.00%

Last EPS Surprise	-6.67%	EPS (TTM)	1.24
ABR	1.00	P/E (F1)	39.70

Growth Estimates	YORW	IND	S&P
Current Qtr (06/2021)	3.13	67,733.33	146.15
Next Qtr (09/2021)	8.33	7.39	157.99
Current Year (12/2021)	2.36	11.10	59.35
Next Year (12/2022)	4.62	24.00	5.13
Past 5 Years	6.50	1.50	2.80
Next 5 Years	NA	10.50	NA
PE	39.70	49.50	21.66
PEG Ratio	NA	4.71	NA

Learn More About Estimate Research

See Brokerage Recommendations

Premium Research for YORW

Zacks Rank	▼ Sell [4]
Zacks Industry Rank	Bottom 6% (236 out of 252)
Zacks Sector Rank	Bottom 6% (15 out of 16)
Style Scores	C Value | B Growth | A Momentum | B VGM
Earnings ESP	0.00%
Research Report for YORW	Snapshot

(▲ ▼ = Change in last 30 days)

View All Zacks Rank #1 Strong Buys

More Premium Research » »

Research for YORW

Chart for YORW

Charts for YORW
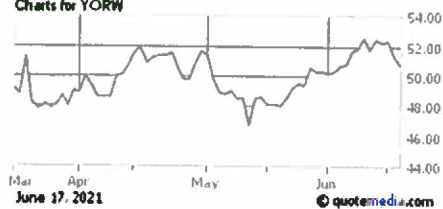
June 17, 2021   © quotemedia.com

Interactive Chart | Fundamental Charts

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	14.00M	15.00M	56.00M	57.00M
# of Estimates	1	1	1	1
High Estimate	14.00M	15.00M	56.00M	57.00M
Low Estimate	14.00M	15.00M	56.00M	57.00M
Year ago Sales	13.32M	14.26M	53.85M	56.00M
Year over Year Growth Est.	5.11%	5.19%	3.99%	1.79%

Earnings Estimates

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.33	0.39	1.30	1.36
# of Estimates	1	1	2	1
Most Recent Consensus	NA	NA	1.29	1.36
High Estimate	0.33	0.39	1.30	1.36
Low Estimate	0.33	0.39	1.29	1.36
Year ago EPS	0.32	0.36	1.27	1.30
Year over Year Growth Est.	3.13%	8.33%	2.36%	5.00%

Agreement - Estimate Revisions

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	0	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	0	1	1

Magnitude - Consensus Estimate Trend

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.33	0.39	1.30	1.36
7 Days Ago	0.33	0.39	1.30	1.36
30 Days Ago	0.33	0.39	1.30	1.36
60 Days Ago	0.33	0.39	1.30	1.37
90 Days Ago	0.33	0.39	1.30	1.37

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (6/2021)	Next Qtr (9/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0.33	0.39	1.30	1.36
Zacks Consensus Estimate	0.33	0.39	1.30	1.36
Earnings ESP	0.00%	0.00%	0.00%	0.00%

Surprise - Reported Earnings History

	Quarter Ending (3/2021)	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Average Surprise
Estimate	0.30	0.26	0.34	0.28	NA
Difference	-0.02	0.02	0.02	0.04	0.02
Surprise	-6.67%	7.69%	5.88%	14.29%	5.30%

Quarterly Estimates By Analyst

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American States Water Company (AWR)
NYSE - Nasdaq Real Time Price. Currency in USD

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82.69 +0.25 (+0.31%)
As of 10:44AM EDT. Market open.

Quote Lookup

Summary   Company Outlook 🔵   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   •••

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Currency in USD Next Year (2022)
No. of Analysts	2	2	3	4
Avg. Estimate	0.69	0.75	2.44	2.57
Low Estimate	0.68	0.75	2.4	2.54
High Estimate	0.7	0.75	2.47	2.58
Year Ago EPS	0.69	0.72	2.33	2.44

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	2	2	2	3
Avg. Estimate	121.54M	132.02M	506.5M	519.88M
Low Estimate	119.09M	124.05M	504M	512.64M
High Estimate	124M	140M	509M	528M
Year Ago Sales	N/A	133.69M	488.24M	506.5M
Sales Growth (year/est)	N/A	-1.20%	3.70%	2.60%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.69	0.75	0.47	0.45
EPS Actual	0.69	0.72	0.54	0.52
Difference	0	-0.03	0.07	0.07
Surprise %	0.00%	-4.00%	14.90%	15.60%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.69	0.75	2.44	2.57
7 Days Ago	0.69	0.75	2.44	2.57
30 Days Ago	0.69	0.75	2.44	2.57
60 Days Ago	0.67	0.76	2.4	2.54
90 Days Ago	0.67	0.76	2.4	2.54

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
CWT California Water Service Group	58.45	+0.20	+0.34%
SJW SJW Group	65.98	+0.08	+0.12%
MSEX Middlesex Water Company	86.78	+0.47	+0.54%
NWN Northwest Natural Holding Company	54.91	-0.10	-0.18%
YORW The York Water Company	50.65	-0.76	-1.48%

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	2021)				
Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Growth Estimates	AWR	Industry	Sector(s)	S&P 500
Current Qtr.	N/A	N/A	N/A	N/A
Next Qtr.	4.20%	N/A	N/A	N/A
Current Year	4.70%	N/A	N/A	N/A
Next Year	5.30%	N/A	N/A	N/A
Next 5 Years (per annum)	5.20%	N/A	N/A	N/A
Past 5 Years (per annum)	5.48%	N/A	N/A	N/A

Strong Buy
Buy
Hold
Underperform
Sell

Recommendation Rating >

2.2

1	2	3	4	5
Strong Buy	Buy	Hold	Under-perform	Sell

Analyst Price Targets (5) >

Average 79.20

Low 60.00   High 94.00
Current 82.67
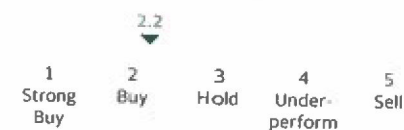
Upgrades & Downgrades >

Upgrade	Wells Fargo: Equal-Weight to Overweight	9/21/2020
Maintains	UBS: to Sell	6/22/2020
Initiated	Seaport Global: to Buy	5/20/2020
Maintains	UBS: to Sell	3/31/2020
Upgrade	Wells Fargo: Underweight to Equal-Weight	3/11/2020
Upgrade	Janney Capital: Neutral to Buy	3/4/2020

More Upgrades & Downgrades

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American Water Works Company, Inc. (AWK)
NYSE - Nasdaq Real Time Price. Currency in USD

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159.31 +0.84 (+0.53%)
As of 10:45AM EDT. Market open.

Quote Lookup

Summary   Company Outlook ⬡   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   ···

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Currency in USD Next Year (2022)
No. of Analysts	9	9	17	17
Avg. Estimate	1.09	1.55	4.24	4.61
Low Estimate	1.03	1.47	4.2	4.5
High Estimate	1.12	1.61	4.32	4.72
Year Ago EPS	0.97	1.46	3.91	4.24
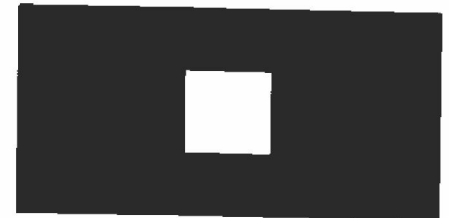
Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	7	7	12	12
Avg. Estimate	1.01B	1.19B	4.02B	4.24B
Low Estimate	957.92M	1.09B	3.91B	4.06B
High Estimate	1.07B	1.4B	4.16B	4.41B
Year Ago Sales	N/A	1.11B	3.78B	4.02B
Sales Growth (year/est)	N/A	7.60%	6.50%	5.50%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.96	1.38	0.8	0.73
EPS Actual	0.97	1.46	0.8	0.73
Difference	0.01	0.08	0	0
Surprise %	1.00%	5.80%	0.00%	0.00%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	1.09	1.55	4.24	4.61
7 Days Ago	1.09	1.55	4.24	4.61
30 Days Ago	1.09	1.55	4.24	4.61
60 Days Ago	1.08	1.55	4.24	4.6
90 Days Ago	1.08	1.56	4.23	4.59

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
AWR American States Water Company	82.61	+0.18	+0.22%
CWT California Water Service Group	58.45	+0.20	+0.34%
NEE NextEra Energy, Inc.	74.13	+0.83	+1.13%
XYL Xylem Inc.	114.57	-0.92	-0.80%
AEP American Electric Power Company, ...	84.64	+0.24	+0.28%

Recommendation Trends ›

Strong Buy
Buy
Hold
Underperform
Sell

Mar Apr May Jun

Recommendation Rating ›

2.4

	2021)			
Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Growth Estimates	AWK	Industry	Sector(s)	S&P 500
Current Qtr.	12.40%	N/A	N/A	N/A
Next Qtr.	6.20%	N/A	N/A	N/A
Current Year	8.40%	N/A	N/A	N/A
Next Year	8.70%	N/A	N/A	N/A
Next 5 Years (per annum)	8.60%	N/A	N/A	N/A
Past 5 Years (per annum)	8.74%	N/A	N/A	N/A

Strong Buy   Buy   Hold   Underperform   Sell

Analyst Price Targets (14) >

Average 165.36

Low 146.00   Current 159.31   High 185.00

Upgrades & Downgrades >

Maintains	Barclays: to Equal-Weight	5/25/2021
Downgrade	Argus Research: Buy to Hold	5/12/2021
Maintains	Barclays: to Equal-Weight	1/22/2021
Initiated	Atlantic Equities: to Overweight	1/7/2021
Downgrade	Janney Capital: Buy to Neutral	10/13/2020
Downgrade	HSBC: Buy to Hold	8/28/2020

More Upgrades & Downgrades

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California Water Service Group (CWT)
NYSE - Nasdaq Real Time Price. Currency in USD

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58.50 +0.25 (+0.43%)
As of 10:50AM EDT. Market open.

Quote Lookup

Summary　　Company Outlook ✪　　Chart　　Conversations　　Statistics　　Historical Data　　Profile　　Financials　　**Analysis**　　Options　　···

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022) Currency in USD
No. of Analysts	4	4	6	6
Avg. Estimate	0.43	0.96	1.77	1.86
Low Estimate	0.34	0.77	1.7	1.78
High Estimate	0.48	1.07	1.85	2.01
Year Ago EPS	0.11	1.94	1.97	1.77

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	2	2	3	3
Avg. Estimate	202.09M	307.68M	799.04M	833.89M
Low Estimate	187M	252M	766M	779M
High Estimate	217.18M	363.37M	835.32M	873.17M
Year Ago Sales	175.48M	286.6M	794.31M	799.04M
Sales Growth (year/est)	15.20%	7.40%	0.60%	4.40%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.59	1.11	0.5	-0.02
EPS Actual	0.11	1.94	0.31	-0.06
Difference	-0.48	0.83	-0.19	-0.04
Surprise %	-81.40%	74.80%	-38.00%	-200.00%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.43	0.96	1.77	1.86
7 Days Ago	0.43	0.96	1.77	1.86
30 Days Ago	0.43	0.96	1.77	1.86
60 Days Ago	0.46	0.91	1.75	1.86
90 Days Ago	0.46	0.98	1.75	1.86

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
AWR American States Water Company	82.69	+0.26	+0.32%
SJW SJW Group	65.93	+0.03	+0.05%
MSEX Middlesex Water Company	86.73	+0.42	+0.49%
YORW The York Water Company	50.65	-0.76	-1.48%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%

Recommendation Trends ›

Strong Buy
Buy
Hold
Underperform
Sell

Mar　Apr　May　Jun

Recommendation Rating ›

3.2

Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Analyst Price Targets (6) >

Average 52.00

○

Low 40.00   High 60.00

Current 58.50

Growth Estimates	CWT	Industry	Sector(s)	S&P 500
Current Qtr.	290.90%	N/A	N/A	N/A
Next Qtr.	-50.50%	N/A	N/A	N/A
Current Year	-10.20%	N/A	N/A	N/A
Next Year	5.10%	N/A	N/A	N/A
Next 5 Years (per annum)	11.70%	N/A	N/A	N/A
Past 5 Years (per annum)	21.05%	N/A	N/A	N/A

Upgrades & Downgrades >

Downgrade	Seaport Global: Neutral to Sell	4/16/2021
Downgrade	Wells Fargo: Equal-Weight to Underweight	3/4/2021
Initiated	Seaport Global: to Neutral	5/20/2020
Maintains	Wells Fargo: to Equal-Weight	5/1/2020
Upgrade	Janney Capital: Neutral to Buy	5/1/2020
Downgrade	Wells Fargo: Market Perform to Underperform	3/27/2019

More Upgrades & Downgrades

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Essential Utilities, Inc. (WTRG)

NYSE - Nasdaq Real Time Price. Currency in USD

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48.40   +0.33 (+0.69%)

As of 10:59AM EDT. Market open.

Quote Lookup

Summary   Company Outlook ⊕   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   ...

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Currency in USD Next Year (2022)
No. of Analysts	8	8	14	13
Avg. Estimate	0.26	0.25	1.67	1.79
Low Estimate	0.22	0.23	1.64	1.76
High Estimate	0.32	0.29	1.69	1.8
Year Ago EPS	0.29	0.23	1.58	1.67

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	2	2	8	7
Avg. Estimate	373.36M	364.14M	1.96B	2.09B
Low Estimate	342M	360M	1.8B	1.88B
High Estimate	404.71M	368.29M	2.08B	2.44B
Year Ago Sales	N/A	348.65M	1.46B	1.96B
Sales Growth (year/est)	N/A	4.40%	34.10%	6.80%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.22	0.23	0.45	0.66
EPS Actual	0.29	0.23	0.46	0.72
Difference	0.07	0	0.01	0.06
Surprise %	31.80%	0.00%	2.20%	9.10%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.26	0.25	1.67	1.79
7 Days Ago	0.26	0.25	1.67	1.79
30 Days Ago	0.26	0.25	1.67	1.79
60 Days Ago	0.27	0.25	1.67	1.79
90 Days Ago	0.28	0.25	1.67	1.79

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
MSEX Middlesex Water Company	86.79	+0.49	+0.56%
EVRG Evergy, Inc.	64.75	+0.53	+0.83%
YORW The York Water Company	50.95	-0.46	-0.89%
CWT California Water Service Group	58.53	+0.28	+0.47%
SJW SJW Group	65.93	+0.03	+0.05%

Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Growth Estimates	WTRG	Industry	Sector(s)	S&P 500
Current Qtr.	-10.30%	N/A	N/A	N/A
Next Qtr.	8.70%	N/A	N/A	N/A
Current Year	5.70%	N/A	N/A	N/A
Next Year	7.20%	N/A	N/A	N/A
Next 5 Years (per annum)	6.40%	N/A	N/A	N/A
Past 5 Years (per annum)	3.91%	N/A	N/A	N/A

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Middlesex Water Company (MSEX)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

(☆ Add to watchlist)   👥 Visitors trend 2W ↓ 10W ↑ 9M ↑

86.80 +0.49 (+0.56%)
As of 10:57AM EDT. Market open.

Quote Lookup

Summary   Company Outlook 🔷   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   ...

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Currency in USD Next Year (2022)
No. of Analysts	2	2	3	3
Avg. Estimate	0.58	0.8	2.28	2.49
Low Estimate	0.58	0.78	2.23	2.48
High Estimate	0.59	0.82	2.32	2.5
Year Ago EPS	0.55	0.72	2.18	2.28

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	1	1	3	3
Avg. Estimate	36M	40M	149.5M	157.87M
Low Estimate	36M	40M	145M	149M
High Estimate	36M	40M	157.7M	170M
Year Ago Sales	35.28M	39.92M	141.59M	149.5M
Sales Growth (year/est)	2.00%	0.20%	5.60%	5.60%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.51	0.7	0.42	0.46
EPS Actual	0.55	0.72	0.47	0.39
Difference	0.04	0.02	0.05	-0.07
Surprise %	7.80%	2.90%	11.90%	-15.20%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.58	0.8	2.28	2.49
7 Days Ago	0.58	0.8	2.26	2.49
30 Days Ago	0.58	0.77	2.24	2.39
60 Days Ago	0.59	0.72	2.28	2.42
90 Days Ago	0.59	0.72	2.28	2.42

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

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People Also Watch

Symbol	Last Price	Change	% Change
SJW SJW Group	65.93	+0.03	+0.05%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%
YORW The York Water Company	50.95	-0.46	-0.89%
CWT California Water Service Group	58.53	+0.28	+0.47%
AWR American States Water Company	82.75	+0.32	+0.39%

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Up Last 7 Days		N/A		1	N/A		N/A		
Up Last 30 Days		N/A		1	1		1		
Down Last 7 Days		N/A		N/A	N/A		N/A		
Down Last 30 Days		N/A		N/A	N/A		N/A		

Growth Estimates	MSEX	Industry	Sector(s)	S&P 500
Current Qtr.	5.50%	N/A	N/A	N/A
Next Qtr.	11.10%	N/A	N/A	N/A
Current Year	4.60%	N/A	N/A	N/A
Next Year	9.20%	N/A	N/A	N/A
Next 5 Years (per annum)	2.70%	N/A	N/A	N/A
Past 5 Years (per annum)	13.51%	N/A	N/A	N/A

SJW Group (SJW)
NYSE - Nasdaq Real Time Price. Currency in USD

(☆ Add to watchlist)   😎 Visitors trend   2W ↓   10W ↑   9M ↑

65.93   +0.03 (+0.05%)
As of 10:51AM EDT. Market open.

Quote Lookup

Summary   Company Outlook 🔴   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   ⋯

Currency in USD

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	4	4	6	6
Avg. Estimate	0.65	0.83	2.04	2.5
Low Estimate	0.61	0.74	1.94	2.44
High Estimate	0.7	0.97	2.36	2.55
Year Ago EPS	0.69	0.91	2.14	2.04

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	3	3	4	4
Avg. Estimate	154.53M	194.96M	583.82M	606.35M
Low Estimate	150M	168M	569M	584M
High Estimate	162.58M	246.89M	602.17M	626.41M
Year Ago Sales	N/A	157.2M	564.53M	583.82M
Sales Growth (year/est)	N/A	24.00%	3.40%	3.90%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.68	0.89	0.35	0.16
EPS Actual	0.69	0.91	0.46	0.09
Difference	0.01	0.02	0.11	-0.07
Surprise %	1.50%	2.20%	31.40%	-43.80%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.65	0.83	2.04	2.5
7 Days Ago	0.65	0.83	2.04	2.5
30 Days Ago	0.65	0.83	2.04	2.5
60 Days Ago	0.71	0.97	2.35	2.54
90 Days Ago	0.75	0.97	2.35	2.55

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
CWT California Water Service Group	58.47	+0.22	+0.38%
MSEX Middlesex Water Company	86.79	+0.49	+0.56%
AWR American States Water Company	82.75	+0.32	+0.39%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%
YORW The York Water Company	50.95	-0.46	-0.89%

Recommendation Trends ›

Strong Buy / Buy / Hold / Underperform / Sell

Mar   Apr   May   Jun

Recommendation Rating ›

2.7 ▼

Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Growth Estimates	SJW	Industry	Sector(s)	S&P 500
Current Qtr.	-5.80%	N/A	N/A	N/A
Next Qtr.	-8.80%	N/A	N/A	N/A
Current Year	-4.70%	N/A	N/A	N/A
Next Year	22.50%	N/A	N/A	N/A
Next 5 Years (per annum)	7.00%	N/A	N/A	N/A
Past 5 Years (per annum)	-5.79%	N/A	N/A	N/A

Analyst Price Targets (5) ›

Average 70.20

○

Low 60.00   High 88.00
Current 65.93

Upgrades & Downgrades ›

Downgrade	Wells Fargo: Equal-Weight to Underweight	1/6/2021
Downgrade	Wells Fargo: Overweight to Equal-Weight	8/11/2020
Initiated	Seaport Global: to Neutral	5/20/2020
Maintains	Wells Fargo: to Overweight	5/5/2020
Initiated	RBC Capital: to Outperform	4/24/2020
Maintains	Wells Fargo: to Overweight	3/11/2020

More Upgrades & Downgrades

The York Water Company (YORW)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

(☆ Add to watchlist)   👥 Visitors trend 2W ↑ 10W ↑ 9M ↑

50.95 -0.46 (-0.89%)   Quote Lookup
As of 10:56AM EDT. Market open.

Summary   Company Outlook 🔷   Chart   Conversations   Statistics   Historical Data   Profile   Financials   **Analysis**   Options   ...

Currency in USD

Earnings Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	1	1	2	2
Avg. Estimate	0.33	0.39	1.29	1.34
Low Estimate	0.33	0.39	1.29	1.32
High Estimate	0.33	0.39	1.3	1.36
Year Ago EPS	0.32	0.36	1.27	1.29

Revenue Estimate	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
No. of Analysts	1	1	1	1
Avg. Estimate	14M	15M	54.9M	56.1M
Low Estimate	14M	15M	54.9M	56.1M
High Estimate	14M	15M	54.9M	56.1M
Year Ago Sales	13.32M	14.26M	53.85M	54.9M
Sales Growth (year/est)	5.10%	5.20%	1.90%	2.20%

Earnings History	6/29/2020	9/29/2020	12/30/2020	3/30/2021
EPS Est.	0.28	0.34	0.26	0.3
EPS Actual	0.32	0.36	0.28	0.28
Difference	0.04	0.02	0.02	-0.02
Surprise %	14.30%	5.90%	7.70%	-6.70%

EPS Trend	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)
Current Estimate	0.33	0.39	1.29	1.34
7 Days Ago	0.33	0.39	1.29	1.34
30 Days Ago	0.33	0.39	1.29	1.36
60 Days Ago	0.33	0.39	1.31	1.37
90 Days Ago	0.33	0.39	1.31	1.37

EPS Revisions	Current Qtr. (Jun 2021)	Next Qtr. (Sep 2021)	Current Year (2021)	Next Year (2022)

People Also Watch

Symbol	Last Price	Change	% Change
MSEX Middlesex Water Company	86.79	+0.49	+0.56%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%
SJW SJW Group	65.93	+0.03	+0.05%
CWT California Water Service Group	58.47	+0.22	+0.38%
AWR American States Water Company	82.75	+0.32	+0.39%

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Up Last 7 Days	N/A	N/A	N/A	N/A
Up Last 30 Days	N/A	N/A	N/A	N/A
Down Last 7 Days	N/A	N/A	N/A	N/A
Down Last 30 Days	N/A	N/A	N/A	N/A

Growth Estimates	YORW	Industry	Sector(s)	S&P 500
Current Qtr.	3.10%	N/A	N/A	N/A
Next Qtr.	8.30%	N/A	N/A	N/A
Current Year	1.60%	N/A	N/A	N/A
Next Year	3.90%	N/A	N/A	N/A
Next 5 Years (per annum)	4.90%	N/A	N/A	N/A
Past 5 Years (per annum)	4.20%	N/A	N/A	N/A

American States Water Company (AWR)
NYSE - Nasdaq Real Time Price. Currency in USD

☆ Add to watchlist

👥 Visitors trend 2W ↓   10W ↑   9M ↑

82.61 +0.18 (+0.22%)
As of 10:46AM EDT. Market open.

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Time Period: Mar 16, 2021 - Jun 16, 2021 ∨   Show: Historical Prices ∨

Frequency: Weekly ∨

Currency in USD

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	82.50	83.75	81.40	82.43	82.43	466,500
Jun 07, 2021	79.00	82.48	79.00	82.45	82.45	582,900
May 31, 2021	79.53	79.93	78.46	78.91	78.91	690,700
May 24, 2021	78.78	80.75	78.43	79.37	79.37	946,400
May 17, 2021	78.36	79.06	76.11	78.64	78.64	1,200,200
May 14, 2021				0.335 Dividend		
May 10, 2021	79.50	80.04	76.79	78.47	78.14	953,700
May 03, 2021	79.19	80.85	77.75	79.50	79.16	996,400
Apr 26, 2021	82.38	82.38	78.13	79.19	78.85	1,337,000
Apr 19, 2021	80.52	83.31	79.20	82.38	82.03	834,300
Apr 12, 2021	77.26	81.67	77.20	80.71	80.37	782,900
Apr 05, 2021	75.94	77.77	75.73	77.10	76.77	859,300
Mar 29, 2021	75.37	76.62	74.86	75.89	75.57	709,800
Mar 22, 2021	73.69	75.60	72.22	75.43	75.11	1,168,600
Mar 15, 2021	72.44	73.69	72.06	73.69	73.38	1,384,400

*Close price adjusted for splits.   **Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
CWT California Water Service Group	58.45	+0.20	+0.34%
SJW SJW Group	65.98	+0.08	+0.12%
MSEX Middlesex Water Company	86.78	+0.47	+0.54%
NWN Northwest Natural Holding Company	54.91	-0.10	-0.18%
YORW The York Water Company	50.65	-0.76	-1.48%

Earnings ›

○ Consensus EPS

0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45

Financials >

Annual Quarterly   Revenue   Earnings

500 00M

450 00M

400 00M

350 00M

300 00M

250 00M

200 00M

150 00M

100 00M

$ 2017   2018   2019   2020

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American Water Works Company, Inc. (AWK)
NYSE - Nasdaq Real Time Price. Currency in USD

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160.12 +1.65 (+1.04%)
As of 10:59AM EDT. Market open.

Quote Lookup

Summary   Company Outlook ⬡   Chart   Conversations   Statistics   **Historical Data**   Profile   Financials   Analysis   Options   ...

Time Period: Mar 16, 2021 - Jun 16, 2021 ⌄   Show: Historical Prices ⌄

Frequency: Weekly ⌄

Apply

Currency in USD

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	160.53	163.00	158.36	158.47	158.47	2,171,600
Jun 07, 2021	156.55	160.44	156.03	160.36	160.36	2,898,900
May 31, 2021	155.88	157.20	153.77	156.43	156.43	2,247,400
May 24, 2021	155.60	156.49	153.10	155.02	155.02	3,108,400
May 17, 2021	152.65	156.35	149.85	155.12	155.12	3,970,200
May 10, 2021				0.603 Dividend		
May 10, 2021	152.31	156.55	149.15	152.83	152.23	4,904,500
May 03, 2021	156.16	156.81	151.28	152.77	152.17	3,642,600
Apr 26, 2021	159.47	159.68	153.53	155.99	155.37	4,775,600
Apr 19, 2021	160.24	162.50	157.98	159.36	158.73	4,007,000
Apr 12, 2021	151.65	160.32	151.28	160.12	159.49	4,820,800
Apr 05, 2021	150.27	153.86	150.25	151.68	151.08	3,304,200
Mar 29, 2021	146.32	151.83	145.66	150.59	150.00	3,785,600
Mar 22, 2021	138.86	147.27	138.26	146.32	145.74	5,692,200
Mar 15, 2021	140.52	142.67	136.90	138.36	137.81	5,762,700

*Close price adjusted for splits.   **Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
AWR American States Water Company	82.69	+0.26	+0.32%
CWT California Water Service Group	58.53	+0.28	+0.47%
NEE NextEra Energy, Inc.	74.39	+1.09	+1.49%
XYL Xylem Inc.	114.02	-1.47	-1.27%
AEP American Electric Power Company, ...	84.87	+0.47	+0.56%

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California Water Service Group (CWT)

NYSE - Nasdaq Real Time Price. Currency in USD

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58.54 +0.29 (+0.50%)

As of 10:52AM EDT. Market open.

Quote Lookup

Summary   Company Outlook 🔵   Chart   Conversations   Statistics   **Historical Data**   Profile   Financials   Analysis   Options   ...

Time Period: Mar 16, 2021 - Jun 16, 2021 ⌄   Show: Historical Prices ⌄

Frequency: Weekly ⌄

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Currency in USD

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	59.06	59.34	58.12	58.25	58.25	546,900
Jun 07, 2021	56.90	58.87	56.18	58.83	58.83	644,100
May 31, 2021	57.19	57.29	56.32	56.66	56.66	508,100
May 24, 2021	56.51	58.00	56.44	56.84	56.84	918,800
May 17, 2021	56.53	56.82	51.02	56.45	56.45	1,594,900
May 10, 2021	57.98	58.40	55.11	56.64	56.64	1,000,900
May 07, 2021				0.23 Dividend		
May 03, 2021	58.86	59.67	56.82	57.83	57.60	940,500
Apr 26, 2021	61.58	61.86	57.50	58.75	58.52	1,540,200
Apr 19, 2021	60.17	61.98	58.90	61.18	60.94	883,900
Apr 12, 2021	57.71	60.93	57.71	60.31	60.07	836,000
Apr 05, 2021	56.31	58.42	56.25	57.50	57.27	839,700
Mar 29, 2021	56.00	56.98	55.49	56.21	55.99	851,100
Mar 22, 2021	53.59	56.18	51.81	56.06	55.84	1,019,400
Mar 15, 2021	53.94	54.25	52.94	53.60	53.39	1,457,900

*Close price adjusted for splits.   **Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
AWR American States Water Company	82.75	+0.32	+0.39%
SJW SJW Group	65.93	+0.03	+0.05%
MSEX Middlesex Water Company	86.73	+0.42	+0.49%
YORW The York Water Company	50.65	-0.76	-1.48%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%

Earnings >

○ Consensus EPS

	2.00
	1.80
	1.60
	1.40
	1.20
	1.00
	0.80
	0.60
	0.40
	0.20
	-0.00

Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Missed By $0.48	Beat By $0.83	Missed By $0.19	Missed By $0.04	— Jul 28

Annual Quarterly Revenue Earnings

800 00M
700 00M
600 00M
500 00M
400 00M
300 00M
200 00M
100 00M
5
2017
2018
2019
2020

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Essential Utilities, Inc. (WTRG)
NYSE - Nasdaq Real Time Price. Currency in USD

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48.40 +0.33 (+0.69%)
As of 10:59AM EDT. Market open.

Quote Lookup

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Time Period: Mar 16, 2021 - Jun 16, 2021 ⌄   Show: Historical Prices ⌄

Frequency: Weekly ⌄

Currency in USD   ⬇ Download

Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	48.97	49.36	47.90	48.07	48.07	2,209,700
Jun 07, 2021	47.35	48.93	47.17	48.86	48.86	3,056,900
May 31, 2021	48.01	48.15	46.88	47.35	47.35	3,030,800
May 24, 2021	47.08	48.37	46.85	47.80	47.80	3,822,900
May 17, 2021	46.41	47.30	45.63	47.03	47.03	3,394,200
May 13, 2021				0.251 Dividend		
May 10, 2021	46.88	47.08	44.92	46.38	46.12	3,494,100
May 03, 2021	47.10	47.56	45.33	46.64	46.38	3,432,600
Apr 26, 2021	48.17	48.17	46.54	47.13	46.87	4,450,500
Apr 19, 2021	47.21	48.49	46.96	47.97	47.70	4,153,400
Apr 12, 2021	45.39	47.46	45.38	47.24	46.98	6,233,700
Apr 05, 2021	44.98	45.95	44.90	45.45	45.20	3,900,100
Mar 29, 2021	44.13	45.19	43.86	44.72	44.47	3,842,800
Mar 22, 2021	42.19	44.23	41.92	44.20	43.96	6,293,000
Mar 15, 2021	44.03	44.15	41.79	42.45	42.22	6,613,000

*Close price adjusted for splits.   **Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
MSEX Middlesex Water Company	86.79	+0.49	+0.56%
EVRG Evergy, Inc.	64.75	+0.53	+0.83%
YORW The York Water Company	50.95	-0.46	-0.89%
CWT California Water Service Group	58.53	+0.28	+0.47%
SJW SJW Group	65.93	+0.03	+0.05%

Total ESG Risk score ›

38.7 High 83rd percentile

Earnings ›

○ Consensus EPS

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	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
	Beat	Met	Beat	Beat	—
	By $0.07	$0.23	By $0.01	By $0.06	Aug 03

Financials ›

Annual Quarterly   Revenue Earnings

	2017	2018	2019	2020

Recommendation Trends ›

Strong Buy
Buy
Hold
Underperform
Sell

Mar Apr May Jun

Recommendation Rating ›

2.1

1 Strong Buy	2 Buy	3 Hold	4 Underperform	5 Sell

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Low 45.00
Current 48.40
High 70.00

Upgrades & Downgrades >

Maintains	Barclays: to Equal-Weight	1/22/2021
Upgrade	Wells Fargo: Equal-Weight to Overweight	9/14/2020
Maintains	UBS: to Neutral	6/5/2020
Initiated	RBC Capital: to Outperform	4/24/2020
Maintains	Wells Fargo: to Equal-Weight	3/11/2020
Maintains	Baird: to Outperform	2/28/2020

Company Profile >

762 West Lancaster
Avenue
Bryn Mawr, PA 19010-
3489
United States
610 527 8000
http://www.essential.co
Sector(s): **Utilities**
Industry: **Utilities—Regulated Water**
Full Time Employees: **3,180**

Essential Utilities, Inc., through its subsidiaries,
operates regulated utilities that provide water,
wastewater, or natural gas services in the United
States. It offers water services through operating
and maintenance contracts with municipal
authorities and other parties. The company also
provides non-utility raw water supply services for
firms in the natural gas drilling industry; and water
and sewer line protection solutions, and repair
services to households through a third-party. It
serves approximately 5 million residential water,
commercial water, fire protection, industrial water,
wastewater, and other water and utility customers
in Pennsylvania, Ohio, Texas, Illinois, North
Carolina, New Jersey, Indiana, Virginia, West
Virginia, and Kentucky under the Aqua and
Peoples brands. The company was formerly known
as Aqua America, Inc. and changed its name to
Essential Utilities, Inc. in February 2020. Essential
Utilities, Inc. was founded in 1886 and is
headquartered in Bryn Mawr, Pennsylvania.

More about Essential Utilities, Inc.

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Middlesex Water Company (MSEX)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

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86.80 +0.49 (+0.56%)
As of 10:57AM EDT. Market open.

Quote Lookup

Summary　Company Outlook ✪　Chart　Conversations　Statistics　**Historical Data**　Profile　Financials　Analysis　Options　...

7,283　　　　Add to Cart

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Frequency: Weekly ⌄

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	86.90	87.74	85.78	86.31	86.31	323,500
Jun 07, 2021	85.79	88.61	85.45	86.90	86.90	457,900
May 31, 2021	86.22	86.75	84.48	85.79	85.79	366,400
May 24, 2021	81.01	87.11	80.11	85.96	85.96	1,741,800
May 17, 2021	79.73	81.49	78.96	80.52	80.52	297,300
May 13, 2021				0.273 Dividend		
May 10, 2021	80.72	81.77	77.31	79.73	79.45	306,700
May 03, 2021	82.52	83.20	78.43	80.67	80.39	276,200
Apr 26, 2021	84.86	84.86	80.49	82.02	81.73	210,200
Apr 19, 2021	83.02	85.37	81.32	84.37	84.07	177,100
Apr 12, 2021	79.94	83.67	79.94	82.93	82.64	269,400
Apr 05, 2021	79.56	80.38	78.01	79.72	79.44	213,800
Mar 29, 2021	79.30	81.16	77.33	79.14	78.86	281,600
Mar 22, 2021	79.04	79.97	76.15	79.20	78.92	399,600
Mar 15, 2021	78.05	79.47	76.03	79.09	78.81	602,000

*Close price adjusted for splits.　**Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
SJW SJW Group	65.93	+0.03	+0.05%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%
YORW The York Water Company	50.95	-0.46	-0.89%
CWT California Water Service Group	58.47	+0.22	+0.38%
AWR American States Water Company	82.75	+0.32	+0.39%

Earnings >

◯ Consensus EPS

Financials >

Annual Quarterly   Revenue   Earnings

150.00M
140.00M
130.00M
120.00M
110.00M
100.00M
90.00M
80.00M
70.00M
60.00M
50.00M
40.00M
30.00M

$ 2017   2018   2019   2020

SJW Group (SJW)
NYSE - Nasdaq Real Time Price. Currency in USD

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65.93 +0.03 (+0.05%)
As of 10:51AM EDT. Market open.

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Time Period: Mar 16, 2021 - Jun 16, 2021 ⌄　　Show: Historical Prices ⌄

Frequency: Weekly ⌄

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Currency in USD

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	65.85	66.90	64.66	65.90	65.90	178,500
Jun 07, 2021	63.56	65.69	63.15	65.60	65.60	284,000
May 31, 2021	64.78	64.91	63.37	63.51	63.51	248,600
May 24, 2021	64.18	66.04	63.15	64.45	64.45	342,900
May 17, 2021	62.62	64.31	62.30	64.18	64.18	290,300
May 10, 2021	63.75	63.91	61.04	62.93	62.93	367,900
May 07, 2021			0.34 Dividend			
May 03, 2021	65.71	66.29	62.74	63.71	63.37	305,500
Apr 26, 2021	68.47	68.57	63.93	65.55	65.20	497,900
Apr 19, 2021	67.74	69.22	66.94	68.34	67.98	380,100
Apr 12, 2021	64.00	68.35	63.97	67.82	67.46	387,700
Apr 05, 2021	62.73	64.56	62.58	63.97	63.63	418,600
Mar 29, 2021	62.22	63.55	61.79	62.60	62.27	654,100
Mar 22, 2021	59.98	62.47	59.03	62.35	62.02	538,400
Mar 15, 2021	58.73	60.48	58.43	60.39	60.07	915,900

*Close price adjusted for splits.　**Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
CWT	58.47	+0.22	+0.38%
California Water Service Group			
MSEX	86.79	+0.49	+0.56%
Middlesex Water Company			
AWR	82.75	+0.32	+0.39%
American States Water Company			
ARTNA	40.29	-0.12	-0.28%
Artesian Resources Corporation			
YORW	50.95	-0.46	-0.89%
The York Water Company			

Earnings ›

○ Consensus EPS
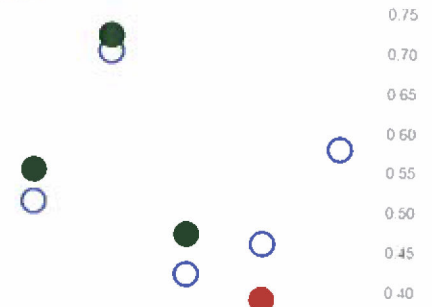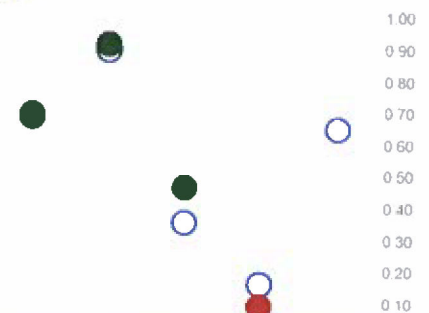
1.00
0 90
0 80
0 70
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0 40
0 30
0 20
0 10

by $0.01　by $0.02　by $0.11　by $0.07　Aug 04

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Annual Quarterly   Revenue   Earnings
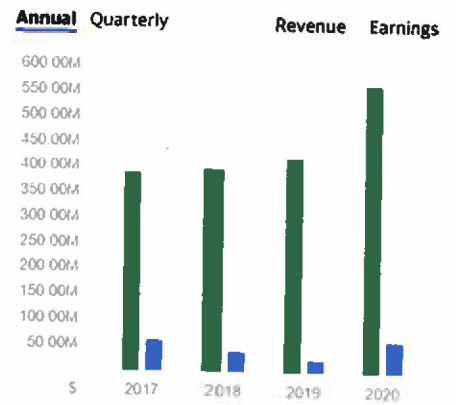
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The York Water Company (YORW)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

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50.95 -0.46 (-0.89%)
As of 10:56AM EDT. Market open.

Quote Lookup

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Time Period: Mar 16, 2021 - Jun 16, 2021 ⌄   Show: Historical Prices ⌄

Frequency: Weekly ⌄

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Currency in USD

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Date	Open	High	Low	Close*	Adj Close**	Volume
Jun 14, 2021	52.33	52.74	51.37	51.41	51.41	75,400
Jun 07, 2021	50.90	52.97	50.90	52.47	52.47	136,500
May 31, 2021	50.57	50.84	49.59	50.75	50.75	100,600
May 24, 2021	49.24	50.79	48.73	50.33	50.33	141,100
May 17, 2021	48.59	49.23	47.44	49.19	49.19	107,400
May 10, 2021	49.01	49.47	46.74	48.59	48.59	128,500
May 03, 2021	51.51	51.79	48.31	49.01	49.01	111,800
Apr 26, 2021	51.58	51.83	49.35	51.64	51.64	135,600
Apr 19, 2021	51.89	52.50	50.35	51.58	51.58	135,500
Apr 12, 2021	48.77	52.14	48.77	51.97	51.97	174,300
Apr 05, 2021	49.12	50.07	48.00	48.57	48.57	150,400
Mar 29, 2021	48.18	49.28	47.78	48.91	48.91	117,800
Mar 22, 2021	50.71	51.90	47.63	48.16	48.16	194,900
Mar 15, 2021	49.05	51.35	47.80	51.28	51.28	569,300

*Close price adjusted for splits.   **Adjusted close price adjusted for both dividends and splits.

People Also Watch

Symbol	Last Price	Change	% Change
MSEX Middlesex Water Company	86.79	+0.49	+0.56%
ARTNA Artesian Resources Corporation	40.29	-0.12	-0.28%
SJW SJW Group	65.93	+0.03	+0.05%
CWT California Water Service Group	58.47	+0.22	+0.38%

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Earnings >

○ Consensus EPS

					0.36
					0.35
					0.34
					0.33
					0.32
					0.31
					0.30
					0.29
					0.28
					0.27

Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Beat	**Beat**	**Beat**	**Missed**	—
By $0.04	By $0.02	By $0.02	By $0.02	Aug 04

Financials >

Annual Quarterly   Revenue   Earnings

	2017	2018	2019	2020
55.00M				
50.00M				
45.00M				
40.00M				
35.00M				
30.00M				
25.00M				
20.00M				
15.00M				
$				

Recommendation Trends >

	Mar	Apr	May	Jun
4				
3				
2		2	2	
1	1			1

Strong Buy
Buy
Hold
Underperform
Sell

Recommendation Rating >

2 ▼

1 Strong Buy	2 Buy	3 Hold	4 Under- perform	5 Sell

Upgrades & Downgrades >

Downgrade	Janney Capital: Buy to Neutral	3/13/2019
Initiated	Janney Capital: to Buy	1/18/2019
Downgrade	Hilliard Lyons: Neutral to Underperform	4/22/2016
Maintains	Baird: to Neutral	3/9/2016

Upgrade	Hilliard Lyons: Underperform to Neutral	3/12/2015

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York, PA 17401
United States
717 845 3601
http://www.yorkwater.com
Sector(s): **Utilities**
Industry: **Utilities—Regulated Water**
Full Time Employees: **108**

The York Water Company impounds, purifies, and distributes drinking water. It owns and operates two wastewater collection systems; five wastewater collection and treatment systems; and two reservoirs, including Lake Williams and Lake Redman, which hold approximately 2.2 billion gallons of water. The company also operates a 15-mile pipeline from the Susquehanna River to Lake Redman; and owns nine groundwater wells that supply water to customers in the Adams County. It serves customers in the fixtures and furniture, electrical machinery, food products, paper, ordnance units, textile products, air conditioning systems, laundry detergents, barbells, and motorcycle industries in 51 municipalities within three counties in south-central Pennsylvania. The York Water Company was incorporated in 1816 and is based in York, Pennsylvania.

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MONETARY POLICY REPORT

February 19, 2021

Board of Governors of the Federal Reserve System

LETTER OF TRANSMITTAL

BOARD OF GOVERNORS OF THE
FEDERAL RESERVE SYSTEM

Washington, D.C., February 19, 2021

THE PRESIDENT OF THE SENATE
THE SPEAKER OF THE HOUSE OF REPRESENTATIVES

The Board of Governors is pleased to submit its *Monetary Policy Report* pursuant to section 2B of the Federal Reserve Act.

Sincerely,

Jerome H. Powell, Chair

STATEMENT ON LONGER-RUN GOALS AND MONETARY POLICY STRATEGY

Adopted effective January 24, 2012; as amended effective January 26, 2021

The Federal Open Market Committee (FOMC) is firmly committed to fulfilling its statutory mandate from the Congress of promoting maximum employment, stable prices, and moderate long-term interest rates. The Committee seeks to explain its monetary policy decisions to the public as clearly as possible. Such clarity facilitates well-informed decisionmaking by households and businesses, reduces economic and financial uncertainty, increases the effectiveness of monetary policy, and enhances transparency and accountability, which are essential in a democratic society.

Employment, inflation, and long-term interest rates fluctuate over time in response to economic and financial disturbances. Monetary policy plays an important role in stabilizing the economy in response to these disturbances. The Committee's primary means of adjusting the stance of monetary policy is through changes in the target range for the federal funds rate. The Committee judges that the level of the federal funds rate consistent with maximum employment and price stability over the longer run has declined relative to its historical average. Therefore, the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past. Owing in part to the proximity of interest rates to the effective lower bound, the Committee judges that downward risks to employment and inflation have increased. The Committee is prepared to use its full range of tools to achieve its maximum employment and price stability goals.

The maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely to nonmonetary factors that affect the structure and dynamics of the labor market. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the shortfalls of employment from its maximum level, recognizing that such assessments are necessarily uncertain and subject to revision. The Committee considers a wide range of indicators in making these assessments.

The inflation rate over the longer run is primarily determined by monetary policy, and hence the Committee has the ability to specify a longer-run goal for inflation. The Committee reaffirms its judgment that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate. The Committee judges that longer-term inflation expectations that are well anchored at 2 percent foster price stability and moderate long-term interest rates and enhance the Committee's ability to promote maximum employment in the face of significant economic disturbances. In order to anchor longer-term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time.

Monetary policy actions tend to influence economic activity, employment, and prices with a lag. In setting monetary policy, the Committee seeks over time to mitigate shortfalls of employment from the Committee's assessment of its maximum level and deviations of inflation from its longer-run goal. Moreover, sustainably achieving maximum employment and price stability depends on a stable financial system. Therefore, the Committee's policy decisions reflect its longer-run goals, its medium-term outlook, and its assessments of the balance of risks, including risks to the financial system that could impede the attainment of the Committee's goals.

The Committee's employment and inflation objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it takes into account the employment shortfalls and inflation deviations and the potentially different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate.

The Committee intends to review these principles and to make adjustments as appropriate at its annual organizational meeting each January, and to undertake roughly every 5 years a thorough public review of its monetary policy strategy, tools, and communication practices.

CONTENTS

NOTE: **This report reflects information that was publicly available as of noon EST on February 17, 2021.** Unless otherwise stated, the time series in the figures extend through, for daily data, February 16, 2021; for monthly data, January 2021; and, for quarterly data, 2020:Q4. In bar charts, except as noted, the change for a given period is measured to its final quarter from the final quarter of the preceding period.

Summary

The COVID-19 pandemic continues to weigh heavily on economic activity and labor markets in the United States and around the world, even as the ongoing vaccination campaigns offer hope for a return to more normal conditions later this year. While unprecedented fiscal and monetary stimulus and a relaxation of rigorous social-distancing restrictions supported a rapid rebound in the U.S. labor market last summer, the pace of gains has slowed and employment remains well below pre-pandemic levels. In addition, weak aggregate demand and low oil prices have held down consumer price inflation. In this challenging environment, the Federal Open Market Committee (FOMC) has held its policy rate near zero and has continued to purchase Treasury securities and agency mortgage-backed securities to support the economic recovery. These measures, along with the Committee's strong guidance on interest rates and the balance sheet, will ensure that monetary policy will continue to deliver powerful support to the economy until the recovery is complete.

Economic and Financial Developments

Economic activity and the labor market. The initial wave of COVID-19 infections led to a historic contraction in economic activity as a result of both mandatory restrictions and voluntary changes in behavior by households and businesses. The level of gross domestic product (GDP) fell a cumulative 10 percent over the first half of 2020, and the measured unemployment rate spiked to a post–World War II high of 14.8 percent in April. As mandatory restrictions were subsequently relaxed and households and firms adapted to pandemic conditions, many sectors of the economy recovered rapidly and unemployment fell back. Momentum slowed substantially in the late fall and early winter, however, as spending on many services contracted again

amid a worsening of the pandemic. All told, GDP is currently estimated to have declined 2.5 percent over the four quarters of last year and payroll employment in January was almost 10 million jobs below pre-pandemic levels, while the unemployment rate remained elevated at 6.3 percent and the labor force participation rate was severely depressed. Job losses have been most severe and unemployment remains particularly elevated among Hispanics, African Americans, and other minority groups as well as those who hold lower-wage jobs.

Inflation. After declining sharply as the pandemic struck, consumer price inflation rebounded along with economic activity, but inflation remains below pre-COVID levels and the FOMC's longer-run objective of 2 percent. The 12-month measure of PCE (personal consumption expenditures) inflation was 1.3 percent in December, while the measure that excludes food and energy items—so-called core inflation, which is typically less volatile than total inflation—was 1.5 percent. Both total and core inflation were held down in part by prices for services adversely affected by the pandemic, and indicators of longer-run inflation expectations are now at similar levels to those seen in recent years.

Financial conditions. Financial conditions have improved notably since the spring of last year and remain generally accommodative. Low interest rates, the Federal Reserve's asset purchases, the establishment of emergency lending facilities, and other extraordinary actions, together with fiscal policy, continued to support the flow of credit in the economy and smooth market functioning. The nominal Treasury yield curve steepened and equity prices continued to increase steadily in the second half of last year as concerns over the resurgence in COVID-19 cases appeared to have been outweighed by positive news about vaccine prospects and expectations of further

fiscal support. Spreads of yields on corporate bonds over those on comparable-maturity Treasury securities narrowed significantly, partly because the credit quality of firms improved and market functioning remained stable. Mortgage rates for households remain near historical lows. However, financing conditions remain relatively tight for households with low credit scores and for small businesses.

Financial stability. While some financial vulnerabilities have increased since the start of the pandemic, the institutions at the core of the financial system remain resilient. Asset valuation pressures have returned to or exceeded pre-pandemic levels in most markets, including in equity, corporate bond, and residential real estate markets. Although government programs have supported business and household incomes, some businesses and households have become more vulnerable to shocks, as earnings have fallen and borrowing has risen. Strong capital positions before the pandemic helped banks absorb large losses related to the pandemic. Financial institutions, however, may experience additional losses as a result of rising defaults in the coming years, and long-standing vulnerabilities at money market mutual funds and open-end investment funds remain unaddressed. Although some facilities established by the Federal Reserve in the wake of the pandemic have expired, those remaining continue to serve as important backstops against further stress. (See the box "Developments Related to Financial Stability" in Part 1.)

International developments. Mirroring the United States, economic activity abroad bounced back last summer after the spread of the virus moderated and restrictions eased. Subsequent infections and renewed restrictions have again depressed economic activity, however. Relative to the spring, the current slowdown in economic activity has been less dramatic. Fiscal and monetary policies continue to be supportive, and people have adapted to containment measures that have often been less stringent than earlier.

Despite the resurgence of the pandemic in many economies, financial markets abroad have recovered since the spring, buoyed by continued strong fiscal and monetary policy support and the start of vaccination campaigns in many countries. With the abatement of financial stress, the broad dollar has depreciated, more than reversing its appreciation at the onset of the pandemic. On balance, global equity prices have recovered and sovereign credit spreads in emerging market economies and in the European periphery have narrowed. In major advanced economies, sovereign yields remained near historical low levels amid continued monetary policy accommodation.

Monetary Policy

Review of the strategic framework for monetary policy. The Federal Reserve concluded the review of its strategic framework for monetary policy in the second half of 2020. The review was motivated by changes in the U.S. economy that affect monetary policy, including the global decline in the general level of interest rates and the reduced sensitivity of inflation to labor market tightness. In August, the FOMC issued a revised Statement on Longer-Run Goals and Monetary Policy Strategy.[1] The revised statement acknowledges the changes in the economy over recent decades and articulates how policymakers are taking these changes into account in conducting monetary policy. In the revised statement, the Committee indicates that it aims to attain its statutory goals by seeking to eliminate shortfalls from maximum employment—a broad-based and inclusive goal—and achieve inflation that averages 2 percent over time. Achieving inflation that averages 2 percent

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1. The statement, revised in August 2020, was unanimously reaffirmed at the FOMC's January 2021 meeting.

over time helps ensure that longer-term inflation expectations remain well anchored at the FOMC's longer-run 2 percent objective. Hence, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time. (See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy" in Part 2.)

In addition, in December the FOMC introduced two changes to the Summary of Economic Projections (SEP) intended to enhance the information provided to the public. First, the release of the full set of SEP exhibits was accelerated by three weeks, from the publication of the minutes three weeks after the end of an FOMC meeting to the day of the policy decision, the second day of an FOMC meeting. Second, new charts were included that display how FOMC participants' assessments of uncertainties and risks have evolved over time.

Interest rate policy. In light of the effects of the continuing public health crisis on the economy and the associated risks to the outlook, the FOMC has maintained the target range for the federal funds rate at 0 to ¼ percent since last March. In pursuing the strategy outlined in its revised statement, the Committee noted that it expects it will be appropriate to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time.

Balance sheet policy. With the federal funds rate near zero, the Federal Reserve has also continued to undertake asset purchases to increase its holdings of Treasury securities by $80 billion per month and its holdings of agency mortgage-backed securities by $40 billion per month. These purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses. The Committee expects these purchases to continue at least at this pace until substantial further progress has been made toward its maximum-employment and price-stability goals.

In assessing the appropriate stance of monetary policy, the Committee will continue to monitor the implications of incoming information for the economic outlook. The Committee is prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals.

Special Topics

Disparities in job loss. The COVID-19 crisis has exacerbated pre-existing disparities in labor market outcomes across job types and demographic groups. Job losses last spring were disproportionately severe among lower-wage workers, less-educated workers, and racial and ethnic minorities, as in previous recessions, but also among women, in contrast to previous recessions. While all groups have experienced at least a partial recovery in employment rates since April 2020, the shortfall in employment remains especially large for lower-wage workers and for Hispanics, African Americans, and other minority groups, and the additional childcare burdens resulting from school closures have weighed more heavily on women's labor force participation than on men's labor force participation. (See the box "Disparities in Job Loss during the Pandemic" in Part 1.)

High-frequency indicators. The unprecedented magnitude, speed, and nature of the COVID-19 shock to the economy rendered traditional statistics insufficient for monitoring economic activity in a timely manner. As a result, policymakers turned to nontraditional high-frequency indicators of activity, especially for the labor market and consumer

spending. These indicators presented a more timely and granular picture of the drop and subsequent rebound in economic activity last spring. The most recent readings obtained from those indicators suggest that economic activity began to edge up again in January, likely reflecting in part the disbursement of additional stimulus payments to households. (See the box "Monitoring Economic Activity with Nontraditional High-Frequency Indicators" in Part 1.)

Monetary policy rules. Simple monetary policy rules, which relate a policy interest rate to a small number of other economic variables, can provide useful guidance to policymakers. This discussion presents the policy rate prescriptions from a number of rules that have received attention in the research literature, many of which mechanically prescribe raising the federal funds rate as employment rises above estimates of its longer-run level. A rule that instead responds only to shortfalls of employment from assessments of its maximum level is featured to illustrate one aspect of the FOMC's revised approach to policy, as described in the revised Statement on Longer-Run Goals and Monetary Policy Strategy. (See the box "Monetary Policy Rules and Shortfalls from Maximum Employment" in Part 2.)

PART 1
RECENT ECONOMIC AND FINANCIAL DEVELOPMENTS

Domestic Developments

The labor market has partially recovered from the pandemic-induced collapse, but the pace of improvement slowed substantially toward the end of last year …

The public health crisis spurred by the spread of COVID-19 weighed on economic activity throughout 2020, and patterns in the labor market reflected the ebb and flow of the virus and the actions taken by households, businesses, and governments to combat its spread. During the initial stage of the pandemic in March and April, payroll employment plunged by 22 million jobs, while the measured unemployment rate jumped to 14.8 percent—its highest level since the Great Depression (figures 1 and 2).[2] As cases subsided and early lockdowns were relaxed, payroll employment rebounded rapidly—particularly outside of the service sectors—and the unemployment rate fell back. Beginning late last year, however, the pace of improvement in the labor market slowed markedly amid another large wave of COVID-19 cases. The unemployment rate declined only 0.4 percentage point from November through January, while payroll gains averaged just 29,000 per month, weighed down by a contraction in the leisure and hospitality sector, which is particularly affected by social distancing and government-mandated restrictions.

1. Nonfarm payroll employment
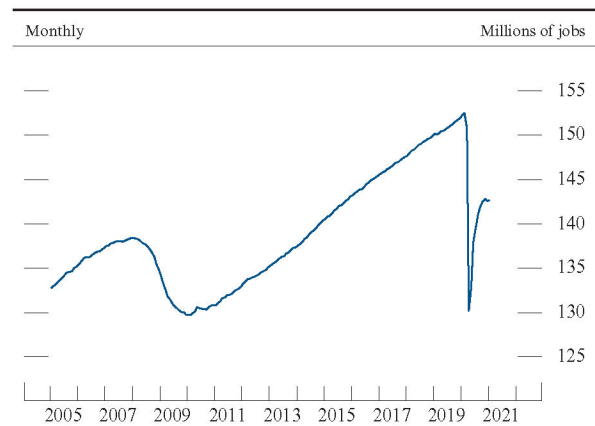
SOURCE: Bureau of Labor Statistics via Haver Analytics.

2. Civilian unemployment rate
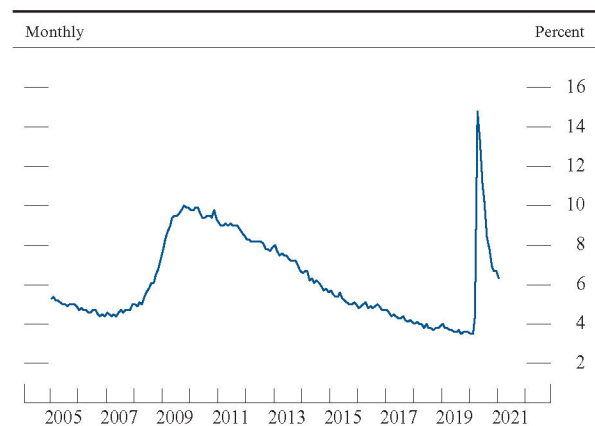
SOURCE: Bureau of Labor Statistics.

2. Since the beginning of the pandemic, a substantial number of people on temporary layoff, who should be counted as unemployed, have instead been recorded as "employed but on unpaid absence." The Bureau of Labor Statistics reports that, if these workers had been correctly classified, the unemployment rate would have been 5 percentage points higher in April. The misclassification problem has abated since then, and the unemployment rate in January was at most about ½ percentage point lower than it would have been in the absence of misclassification.

All told, the incomplete recovery left the level of employment in January almost 10 million lower than it was a year earlier, while the unemployment rate stood at 6.3 percent—nearly 3 percentage points higher than before the onset of the pandemic. Most recently, high-frequency data—including initial claims for unemployment insurance and weekly employment data from the payroll processor ADP—suggest modest further improvement in the labor market in recent weeks. (For more discussion of what high-frequency indicators are suggesting about the current trajectory of the economy, see the box "Monitoring Economic Activity with Nontraditional High-Frequency Indicators.")

. . . and the harm has been substantial

The damage to the labor market has been even more substantial than is indicated by the extent of unemployment alone. The labor force participation rate (LFPR)—the share of the population that is either working or actively looking for work—plunged in March and April, as many of those who lost their jobs were not seeking work and so were not counted among the unemployed. Despite recovering some over the summer, the LFPR remains nearly 2 percentage points below its pre-pandemic level (figure 3). A number of factors appear to have contributed to the continued weakness in the LFPR, including a lack of job opportunities, the effects of school closings and virtual learning on parents' ability to work, the health concerns of potential workers, and a spate of early retirements triggered by the crisis. All told, the employment-to-population ratio—the share of the population with jobs, regardless of the number seeking work—in January was 3.6 percentage points below the level at the beginning of 2020. Job losses last year fell most heavily on lower-wage workers and on Hispanics, African Americans, and other minority groups. As a result, the rise in unemployment and the decline

3. Labor force participation rate and employment-to-population ratio
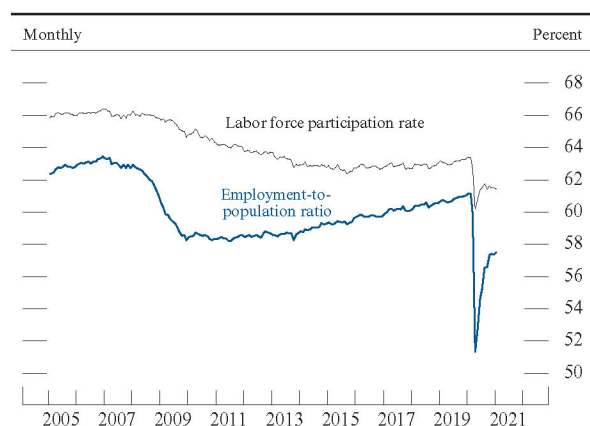
NOTE: The labor force participation rate and the employment-to-population ratio are percentages of the population aged 16 and over.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

Monitoring Economic Activity with Nontraditional High-Frequency Indicators

The unprecedented magnitude, speed, and nature of the COVID-19 shock to the economy rendered traditional statistics insufficient for monitoring economic activity in a timely manner. As a result, policymakers around the world turned to nontraditional indicators of activity, both those based on private-sector "big data" and those newly developed by official statistical agencies. Because some of the most salient characteristics of these indicators are their timeliness and the time span they cover (such as daily or weekly), they are often called "high-frequency indicators."

An important example of the usefulness of high-frequency indicators is the case of payroll employment. The Bureau of Labor Statistics' (BLS) monthly measure of payroll employment is one of the most reliable, timely, and closely watched business cycle indicators. However, during the onset of the pandemic in the United States, even the BLS Current Employment Statistics (CES) data were published with too long of a lag to track the dramatic dislocations in the labor market in a timely manner. Specifically, from the second half of March through early April, the economy was shedding jobs at an unprecedented rate, but those employment losses were captured only in the employment situation release issued on May 8, 2020. Because of this lag, economists looked to various private data sources to gain insights about the current state of the labor market.[1] An important example is data from the payroll processor ADP that cover roughly 20 percent of private U.S. employment, a sample size similar to the one used by the BLS to construct the CES. Estimates of changes in employment constructed from ADP data have tracked the official CES data remarkably well since the start of the pandemic recession, and the ADP data possess the important benefits of being available earlier and at a weekly frequency (figure A, left panel).[2]

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1. See, for example, Raj Chetty, John N. Friedman, Nathaniel Hendren, Michael Stepner, and the Opportunity Insights Team (2020), "The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data," NBER Working Paper Series 27431 (Cambridge, Mass.: National Bureau of Economic Research, November), https://www.nber.org/papers/w27431; and Alexander W. Bartik, Marianne Bertrand, Feng Lin, Jesse Rothstein, and Matt Unrath (forthcoming), "Measuring the Labor Market at the Onset of the COVID-19 Crisis," *Brookings Papers on Economic Activity.*

2. For further analysis of the ADP employment series, see Tomaz Cajner, Leland D. Crane, Ryan A. Decker, John Grigsby, Adrian Hamins-Puertolas, Erik Hurst, Christopher Kurz, and Ahu Yildirmaz (forthcoming), "The U.S. Labor Market during the Beginning of the Pandemic Recession," *Brookings Papers on Economic Activity.* Note that the ADP employment series referenced in this discussion differ from the ADP National Employment Report, which is published monthly by the ADP Research Institute in close collaboration with Moody's Analytics.

A.   Estimates of private payroll employment growth
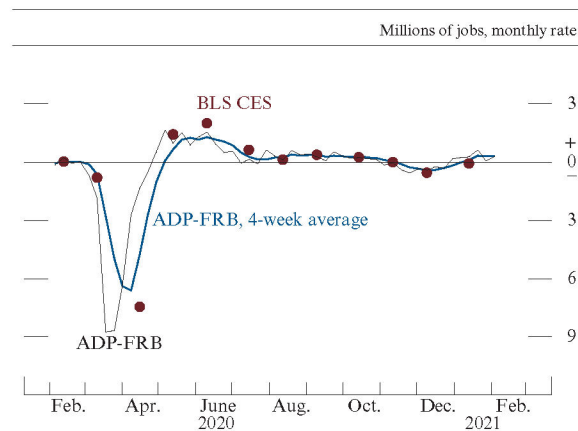
NOTE: ADP data are weekly and extend through February 6, 2021. BLS data are monthly.
SOURCE: Federal Reserve Board staff calculations using ADP, Inc., Payroll Processing Data; Bureau of Labor Statistics (BLS), Current Employment Statistics (CES).

Monitoring Economic Activity *(continued)*

Weekly employment estimates based on ADP data were particularly valuable not only last spring when employment plummeted and then quickly rebounded, but also during the renewed COVID-19 wave that started this past fall. In particular, high-frequency ADP employment data indicate that the fall and winter virus wave had a smaller effect on the labor market than was seen last spring, likely because there were fewer mandated shutdowns of businesses than in the spring, because many businesses implemented adaptations that made it easier for them to continue to operate (for example, curbside pickup), and because many individuals changed their behavior (for example, by wearing masks such that more economic activities are deemed safer now than in the spring). Most recently, the BLS data show that private payroll employment remained little changed through its survey week in mid-January, and the ADP data indicate that employment improved modestly through early February. Additionally, the latest ADP data indicate that the leisure and hospitality sector—which includes hotels, restaurants, and entertainment venues and is particularly affected by government-mandated restrictions and social distancing—started adding jobs again in recent weeks after experiencing a temporary downturn at the end of last year (figure A, right panel).

Outside of the labor market, several new high-frequency indicators have been useful in monitoring the massive effects of the COVID-19 pandemic on consumer spending. Weekly data from NPD (a market

analytics firm) on nonfood retail sales captured in real time the dramatic and sudden drop in consumption in mid-March; the monthly Census Bureau data recorded that decline only with a lag (figure B, left panel).[3] The NPD data also reflected how the income support payments to families, provided by the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, rapidly affected consumer spending in mid-April. More recently, the NPD data showed some decline in consumption late last year, followed by a pickup in January after the passage of the most recent fiscal stimulus package. Several nontraditional data sources illustrate that services spending remains depressed as social distancing continues to restrain in-person activity (figure B, right panel).[4]

With rapid changes in the economic environment, many statistical agencies also developed high-frequency

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4. Services spending accounts for roughly one-half of aggregate spending, but it is measured with some lag. In particular, the services spending information folded into gross domestic product comes from the revenue information sourced from the Census Bureau's Quarterly Services Survey (QSS). The advance QSS (early data for a subset of industries found in the full QSS) and full QSS are released two and three months, respectively, after a given quarter ends.

B. Indicators of consumption growth

Retail goods spending
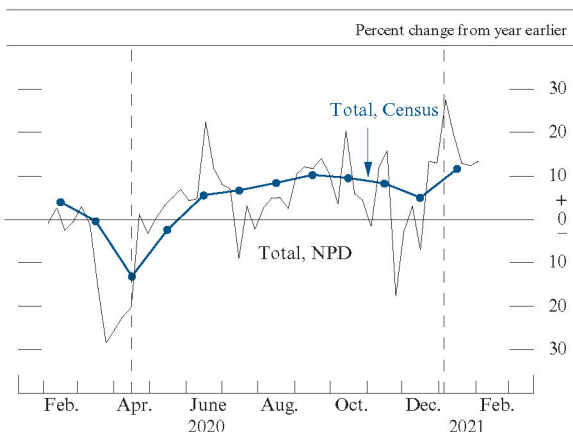
NOTE: NPD data are weekly and extend through February 6, 2021, and Census data are monthly. All series show nominal spending on nonfood retail goods. Dashed lines represent the first and second waves of stimulus tranche.

SOURCE: NPD Group; Census Bureau.

Services spending
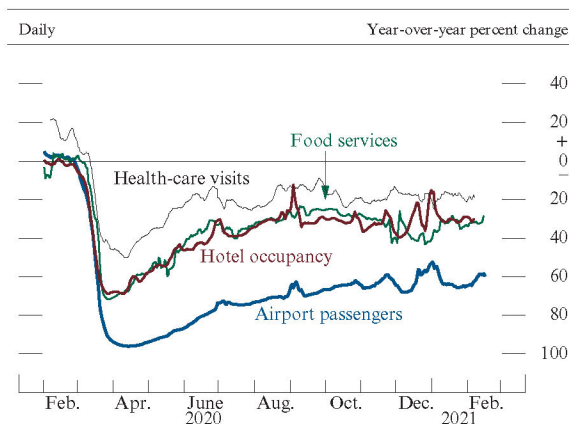
NOTE: Year-over-year percent change in 7-day moving average. Health-care visits data extend through February 7, 2021; food services data extend through February 15, 2021; and hotel occupancy data extend through February 6, 2021.

SOURCE: SafeGraph, Inc.; Fiserv, Inc.; STR, Inc.; Transportation Security Administration.

indicators. For example, the Census Bureau released data on weekly new business applications (figure C, left panel). During the initial stage of the pandemic recession, new business applications fell compared with previous years, a typical pattern during economic downturns. However, new business applications started to rebound notably during the summer, and for the year as a whole, they were higher than the average over the previous three years, a pattern that differs dramatically from previous business cycles.[5] The increase in applications appears to be concentrated in industries that rapidly adapted to the landscape of the pandemic, such as online retail, personal services, information technology, and delivery. It remains unclear, however, whether these business applications will lead to actual job creation at the same rate as in the past.[6] As another example, the Census Bureau developed high-frequency survey statistics that contain information about the

financial struggles of households (figure C, right panel). These data indicate that the financial stress of households increased late last year as households were becoming less confident about being able to make their next mortgage or rent payment as well as more likely to expect income loss over the next four weeks, but households' financial expectations improved somewhat in January.

Overall, nontraditional high-frequency indicators have served several purposes over the past year. First, they provide timely alternative estimates that complement official statistics and can also be used to verify movements in official statistics. Second, they are often helpful for assessing economic developments more quickly and with greater granularity than what can be found in official statistics. Third, high-frequency indicators without a direct counterpart in official statistics give a different perspective and help enhance our understanding of economic developments. These nontraditional indicators are also subject to several potential limitations, such as systematic biases due to nonrepresentativeness of data or small (and possibly nonrandom) samples. Importantly, only time will tell if such indicators will continue to provide a signal above and beyond traditional indicators as the high-frequency shocks associated with the pandemic dissipate. Overall, however, the use of nontraditional high-frequency indicators over the past year has amply shown that they can yield large benefits, especially when economic conditions are changing rapidly.

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5. For further discussion, see Emin Dinlersoz, Timothy Dunne, John Haltiwanger, and Veronika Penciakova (forthcoming), "Business Formation: A Tale of Two Recessions," *American Economic Review Papers and Proceedings*.

6. The link between applications and job creation in the pre-pandemic period is studied in Kimberly Bayard, Emin Dinlersoz, Timothy Dunne, John Haltiwanger, Javier Miranda, and John Stevens (2018), "Early-Stage Business Formation: An Analysis of Applications for Employer Identification Numbers," Finance and Economics Discussion Series 2018-015 (Washington: Board of Governors of the Federal Reserve System, March), https://dx.doi.org/10.17016/FEDS.2018.015.

C.   High-frequency indicators by official statistical agencies

New business applications
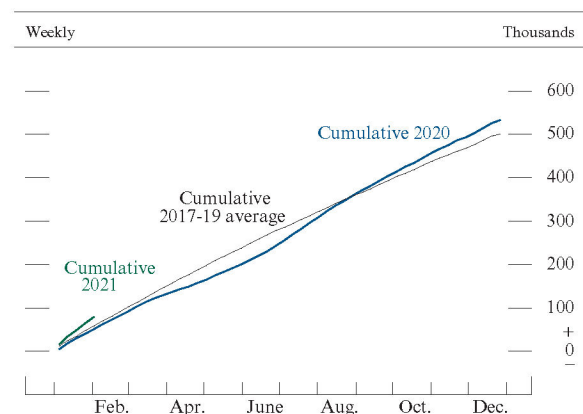
NOTE: The cumulative 2021 data extend through February 6, 2021. The data are derived from Employer Identification Number applications with planned wages.
SOURCE: Business Formation Statistics, Census Bureau via Haver Analytics.

Houshold expectations
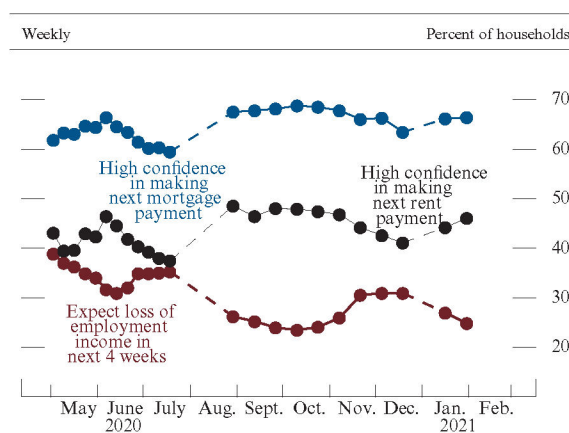
NOTE: Data extend through February 1, 2021. Dashed lines represent pauses in Household Pulse Survey data collection.
SOURCE: Household Pulse Survey, Census Bureau via Haver Analytics.

4.   Unemployment rate, by race and ethnicity

Monthly   Percent
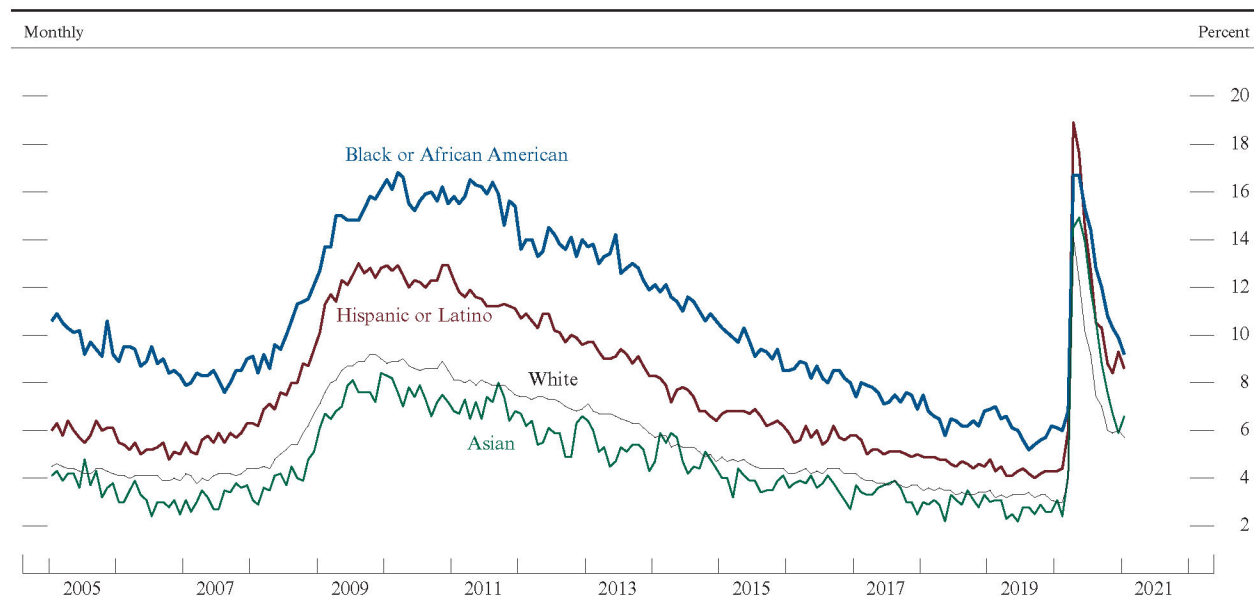
NOTE: Unemployment rate measures total unemployed as a percentage of the labor force. Persons whose ethnicity is identified as Hispanic or Latino may be of any race. Small sample sizes preclude reliable estimates for Native Americans and other groups for which monthly data are not reported by the Bureau of Labor Statistics.
SOURCE: Bureau of Labor Statistics via Haver Analytics.

5.   Measures of change in hourly compensation

Percent change from year earlier
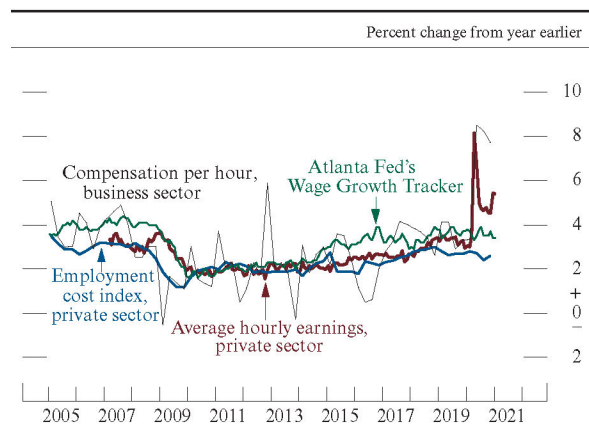
NOTE: Business-sector compensation is on a 4-quarter percent change basis. For the private-sector employment cost index, change is over the 12 months ending in the last month of each quarter; for private-sector average hourly earnings, the data are 12-month percent changes and begin in March 2007; for the Atlanta Fed's Wage Growth Tracker, the data are shown as a 3-month moving average of the 12-month percent change.
SOURCE: Bureau of Labor Statistics; Federal Reserve Bank of Atlanta, Wage Growth Tracker; all via Haver Analytics.

in the employment-to-population ratio were particularly evident among those groups (figure 4). (For more discussion of the pandemic's effects on the labor market outcomes of various groups, see the box "Disparities in Job Loss during the Pandemic.")

Aggregate wage growth appears to be little changed despite the weakness in the labor market

Although weakness in the labor market generally puts downward pressure on overall wages, the best available measures suggest that wage growth in 2020 was little changed from 2019. Total hourly compensation as measured by the employment cost index, which includes both wages and benefits, rose 2.6 percent during the 12 months ending in December, only slightly below pre-pandemic rates (figure 5). Wage growth as computed by the Federal Reserve Bank of Atlanta, which tracks the median 12-month wage growth of individuals responding to the Current Population Survey, was about 3½ percent

during 2020, similar to the growth rate
in 2019.[3] The continued gains in aggregate
wages mask important heterogeneity,
however; according to the Atlanta Fed data,
workers with lower earnings and nonwhites
experienced larger decelerations in wages than
other groups last year.

Price inflation remains low despite rebounding since last spring

As measured by the 12-month change in
the price index for personal consumption
expenditures (PCE), inflation fell from
1.6 percent in December 2019 to a low of
0.5 percent in April, as economic activity
dropped sharply (figure 6). Since then,
inflation has partially recovered along with the
pickup in demand, but it was only 1.3 percent
in December—still well below the Federal
Open Market Committee's (FOMC) objective
of 2 percent. After excluding consumer food
and energy prices, which are often quite
volatile, the 12-month measure of core PCE
inflation was 1.5 percent in December. An
alternative way to abstract from transitory
influences on measured inflation is provided
by the trimmed mean measure of PCE price
inflation constructed by the Federal Reserve
Bank of Dallas.[4] The 12-month change in this
measure declined to 1.7 percent in December

6. Change in the price index for personal consumption
    expenditures
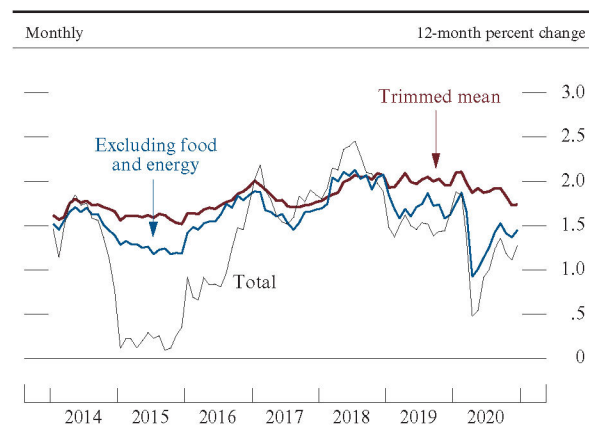
NOTE: The data extend through December 2020.
SOURCE: For trimmed mean, Federal Reserve Bank of Dallas; for all
else, Bureau of Economic Analysis; all via Haver Analytics.

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3. Some other common wage measures are providing
misleading signals at present because they are dominated
by compositional effects: Pandemic-related job losses fell
most heavily on lower-wage workers, which mechanically
increased measures of average wages. For example,
average hourly earnings from the payroll survey rose
more than 5 percent over the 12 months ending in
January. Similarly, the fourth-quarter reading on
compensation per hour, which includes both wages and
benefits, was 7.7 percent above its year-ago level. Output
per hour, or productivity, has also been affected by the
same composition effects, rising 2.5 percent over the four
quarters of 2020, the fastest pace in a decade.

4. The trimmed mean price index excludes whichever
prices showed the largest increases or decreases in a given
month. Over the past 20 years, changes in the trimmed
mean index have averaged ¼ percentage point above core
PCE inflation and 0.1 percentage point above total PCE
inflation.

Disparities in Job Loss during the Pandemic

Although employment has improved substantially since its trough in April 2020, the labor market recovery remains far from complete: As of January 2021, the employment-to-population (EPOP) ratio, a broad measure that encompasses both increased unemployment and decreased labor force participation, was still 3.6 percentage points below its February 2020 level. All industries, occupations, and demographic groups experienced significant employment declines at the start of the pandemic, and, over the ensuing months, all groups have experienced at least some partial recovery. That said, employment declines last spring were steeper for workers with lower earnings and for Hispanics, African Americans, and other minority groups, and the hardest-hit groups still have the most ground left to regain.

Although disparities in labor market outcomes generally widen during recessions, certain factors unique to this episode—in particular, the social-distancing measures taken by households, businesses, and governments to limit in-person interactions—have profoundly shaped the incidence of recent job losses in different segments of the labor market. Because jobs differ in the degree to which they involve personal contact and physical proximity, in whether they can be performed remotely, and in whether they are deemed to serve "essential" functions, social-distancing measures have had disparate effects across industries and occupations. To illustrate this point, figure A reports net changes in employment in 11 broad industry categories, both during the period of acute job losses last spring (column 1) and over the longer interval since the start of the pandemic (column 2). Net job losses through January have been especially severe in the leisure and hospitality industry—in which employment is still 22.9 percent below pre-pandemic levels (line 11)—and in other services, a category that includes barber shops and beauty salons (line 12).[1] By contrast, employment in most other broad industries is now 5 percent or less below pre-pandemic levels. Job losses have thus been disproportionately concentrated in lower-wage consumer service industries, in which business operations are strongly affected by social-

A.   Changes in private-sector employment, by industry

Industry	Percent change since Feb. 2020	
	(1) As of Apr. 2020	(2) As of Jan. 2021
1. Total private	−16.5	−6.6
2. Mining and logging	−9.9	−11.7
3. Manufacturing	−10.8	−4.5
4. Construction	−14.6	−3.3
5. Wholesale trade	−6.9	−4.5
6. Retail trade	−15.2	−2.5
7. Transp., warehousing, and utilities	−9.1	−2.7
8. Information and financial activities	−4.8	−2.8
9. Professional and business services	−11.1	−3.8
10. Education and health services	−11.6	−5.4
11. Leisure and hospitality	−48.6	−22.9
12. Other services	−23.7	−7.8

NOTE: The data are seasonally adjusted.
SOURCE: Bureau of Labor Statistics.

distancing measures and relatively few workers are able to work from home.[2]

In keeping with the sectoral composition of recent job losses, workers in lower-wage jobs have been hit especially hard. Figure B uses data from the payroll processor ADP to plot employment indexes for four job tiers defined by hourly wages. Between February and April of last year, employment fell most sharply for jobs in the bottom quartile of the pre-pandemic wage distribution. Between April and June, employment rose most quickly for these lowest-paying jobs. In subsequent months, job gains moderated substantially for all groups, and as of mid-January, employment in the lowest-paying jobs was about 20 percent below its

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1. Net job losses have also been pronounced in mining and logging (line 2), which is unique among these industries in having experienced further contraction in employment between April 2020 and January 2021.

2. For instance, in the January 2021 round of the Current Population Survey, 41 percent of those employed in the professional and business services industry reported working from home during the previous four weeks as a result of the pandemic, compared with about 7 percent of those employed in leisure and hospitality. See Bureau of Labor Statistics (2021), "Supplemental Data Measuring the Effects of the Coronavirus (COVID-19) Pandemic on the Labor Market," Current Population Survey, January, https://www.bls.gov/cps/effects-of-the-coronavirus-covid-19-pandemic.htm.

B. Employment declines for low-, middle-, and high-wage workers
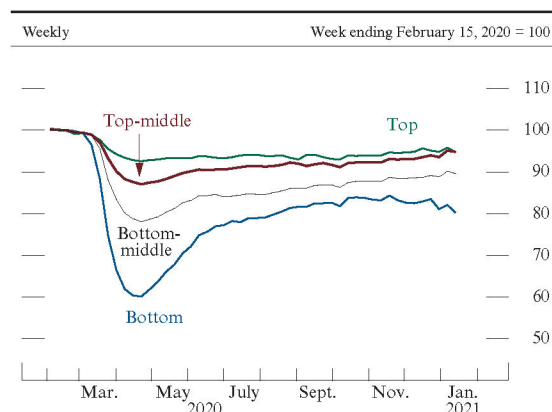
NOTE: The data are seasonally adjusted by the Federal Reserve Board and extend through January 16, 2021. Wage quartiles are defined using the February 2020 wage distribution.

SOURCE: Federal Reserve Board staff calculations using ADP, Inc., payroll processing data.

C. Change in employment-to-population ratio, by demographic group

NOTE: The data are seasonally adjusted. Small sample sizes preclude reliable estimates for Native Americans and other groups for which monthly data are not reported by the Bureau of Labor Statistics.

SOURCE: Bureau of Labor Statistics via Haver Analytics.

pre-pandemic level. In comparison, employment in the higher-paying job tiers is now about 10 percent or less below pre-pandemic levels.

Similar disparities are apparent across demographic groups. Figure C shows the change in each group's EPOP ratio. Between February 2020 and January 2021, the EPOP ratio fell by a similar amount for both men and women; in contrast, during many previous recessions the EPOP ratio declined substantially more for men. (In fact, given that men's employment rate was substantially higher than women's before the pandemic, the decline in employment for women as a percentage of pre-recession employment has been larger, which contrasts even more starkly with previous recessions.) Since February 2020, the EPOP ratio has fallen more for people without a bachelor's degree than for those with at least a bachelor's degree, more for prime-age individuals than for those under age 25 or over age 55, and more for Hispanics, African Americans, and Asians than for whites.[3] In general, the groups experiencing the largest declines in employment since last February are more commonly employed in the industries that have

experienced the greatest net employment declines to date, such as leisure and hospitality; these demographic groups are also less likely to report being able to work from home.[4]

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3. The decline in employment also appears to have been relatively large for Native Americans, based on annual average data for 2020. (Monthly data are not available for this group because of small sample sizes and are not shown in figure C for that reason.)

4. For more information on the groups with the largest employment declines since February 2020, see Kenneth A. Couch, Robert W. Fairlie, and Huanan Xu (2020), "Early Evidence of the Impacts of COVID-19 on Minority Unemployment," *Journal of Public Economics*, vol. 192 (December), pp. 1–11; Guido Matias Cortes and Eliza C. Forsythe (2020), "The Heterogeneous Labor Market Impacts of the Covid-19 Pandemic," Upjohn Institute Working Paper Series 20-327 (Kalamazoo, Mich.: W.E. Upjohn Institute for Employment Research, May), https://research.upjohn.org/cgi/viewcontent.cgi?article=1346&context=up_workingpapers; and Titan Alon, Matthias Doepke, Jane Olmstead-Rumsey, and Michèle Tertilt (2020), "This Time It's Different: The Role of Women's Employment in a Pandemic Recession," NBER Working Paper 27660 (Cambridge, Mass.: National Bureau of Economic Research, August), https://www.nber.org/papers/w27660.

Additional details on differences across demographic groups in the ability to work from home can be found in the Current Population Survey. For example, in January, around 23 percent of white workers reported working from home in the previous four weeks because of the pandemic, compared with 19 percent of African Americans and 14 percent of Hispanics; 43 percent of those with a bachelor's degree or higher reported working from home, compared with 16 percent or less for those with lower levels of education. See Bureau of Labor Statistics, "Supplemental Data," in box note 2.

Disparities in Job Loss *(continued)*

Since the start of the pandemic, another important impediment to individuals' ability to work or look for work has been the absence of in-person education for many K–12 students.[5] Because many working parents are unable to work from home while monitoring their children's virtual education (depending on the nature of their jobs and the availability of other caregivers), the widespread lack of K–12 in-person education may also explain some of the differences across groups. For example, among mothers aged 25 to 54 with children aged 6 to 17, the fraction who said they are not working or looking for work for caregiving reasons was 2½ percentage points higher in the three months ending January 2021 than over the year-earlier period, compared with a ½ percentage point increase for fathers. Relative to white mothers, the increase was about twice as large for Hispanic mothers and more than twice as large for African American mothers, and it was also more than twice as large for mothers without any college education as for mothers with more education.[6]

As the spread of COVID-19 is contained and a growing share of the population is immunized, some of the unique factors that have exacerbated disparities since the start of the pandemic will likely ease. For example, as COVID becomes less prevalent, businesses offering in-person services (for example, in the leisure and hospitality industry) will move closer to pre-pandemic levels of employment. In addition, as more schools return to offering in-person education, childcare constraints will become less acute.

Even as labor market impediments specific to the pandemic subside, however, the speed at which the labor market moves toward full employment will

be important for narrowing the disparities that have widened since the start of the pandemic, as research has consistently shown that strong labor markets especially benefit lower-wage and disadvantaged workers.[7] The pace of labor market gains will also depend on how many unemployed workers have the opportunity to return to their original jobs. In January 2021, 2.2 percent of labor force participants (representing 34.6 percent of unemployed workers) reported being unemployed because of a permanent job loss, up from 1.3 percent of the labor force (8.8 percent of unemployed workers) in April 2020.[8] Research has shown that workers who return to their previous employers after a temporary layoff tend to earn wages similar to what they were making previously, whereas laid-off workers who do not return to their previous employer experience a longer-lasting decline in earnings.[9]

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5. According to the Census Bureau's Household Pulse Survey, 85 percent of parents surveyed in early January reported that their children's classes for the 2020–21 school year were moved to virtual learning.

6. The findings are Federal Reserve Board staff estimates based on publicly available Current Population Survey microdata.

7. For example, see Stephanie R. Aaronson, Mary C. Daly, William L. Wascher, and David W. Wilcox (2019), "Okun Revisited: Who Benefits Most from a Strong Economy?" *Brookings Papers on Economic Activity*, Spring, pp. 333–75, https://www.brookings.edu/wp-content/uploads/2019/03/aaronson_web.pdf; and Tomaz Cajner, Tyler Radler, David Ratner, and Ivan Vidangos (2017), "Racial Gaps in Labor Market Outcomes in the Last Four Decades and over the Business Cycle," Finance and Economics Discussion Series 2017-071 (Washington: Board of Governors of the Federal Reserve System, June), https://dx.doi.org/10.17016/FEDS.2017.071.

8. The data are Federal Reserve Board staff calculations from published Bureau of Labor Statistics estimates. By comparison, the number of permanent job losers peaked at 4.4 percent of labor force participants (representing 44.8 percent of unemployed workers) during the Great Recession.

9. See Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan (1993), "Earnings Losses of Displaced Workers," *American Economic Review*, vol. 83 (September), pp. 685–709; Shigeru Fujita and Giuseppe Moscarini (2017), "Recall and Unemployment," *American Economic Review*, vol. 107 (December), pp. 3875–916; and Marta Lachowska, Alexandre Mas, and Stephen A. Woodbury (2020), "Sources of Displaced Workers' Long-Term Earnings Losses," *American Economic Review*, vol. 110 (October), pp. 3231–66.

from 2 percent a year earlier, a similar decrease to those in total and core PCE inflation.

The low level of consumer price inflation in 2020 partly reflected the deterioration in economic activity. For example, inflation in tenants' rent and owners' equivalent rent, which tend to be sensitive to overall economic conditions, softened in 2020 from the rates observed during the preceding few years. Low inflation also reflected the net effect of a number of pandemic-driven shifts in specific sectors of the economy, such as a decline in gasoline prices that resulted from a collapse in oil prices in the early part of the year, which only partially reversed in the second half. Similarly, airfares and hotel prices fell markedly, driven by huge reductions in demand due to the pandemic. In contrast, food prices increased at an unusually fast pace last year, given stronger demand at retail grocery stores and, at times, some pandemic-related supply chain disruptions. In addition, prices for some durable goods, such as motor vehicles and home appliances, rose sharply during the summer and remained somewhat elevated at the end of the year, in part because of a pandemic-induced shift in demand away from services and toward these goods.

Prices of imports and oil have also rebounded

The partial rebound in inflation later in 2020 also stemmed from a firming of import prices. After declining in the first half of last year, nonfuel import prices increased in the second half, as the dollar depreciated and the recovery in global demand put upward pressure on non-oil commodity prices—a substantial component of nonfuel import prices (figure 7). Prices of both agricultural commodities and industrial metals increased considerably, and nonfuel import prices are now higher than they were a year ago.

Early in the pandemic, benchmark oil prices fell below $20 per barrel, a level not breached since 2002. While prices have now nearly

7. Nonfuel import prices and industrial metals indexes
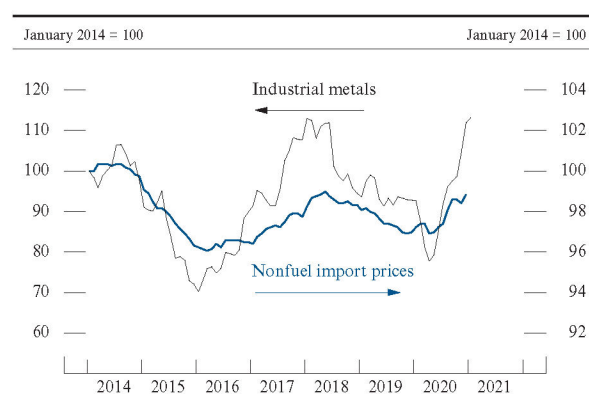
NOTE: The data for nonfuel import prices are monthly and extend through December 2020. The data for industrial metals are monthly averages of daily data and extend through January 29, 2021.
SOURCE: For nonfuel import prices, Bureau of Labor Statistics; for industrial metals, S&P GSCI Industrial Metals Spot Index via Haver Analytics.

8.   Spot and futures prices for crude oil

NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: ICE Brent Futures via Bloomberg.

9.   Surveys of inflation expectations
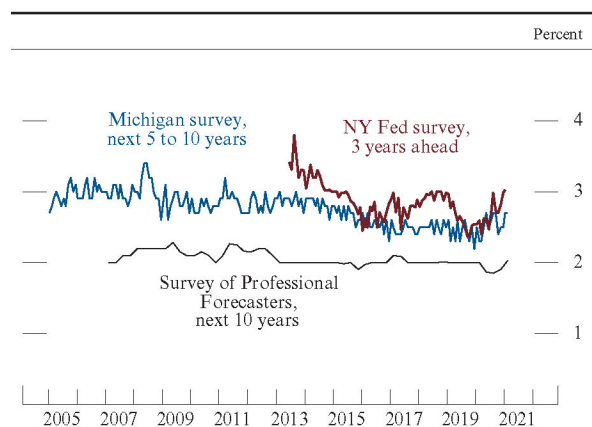
NOTE: The series are medians of the survey responses. The Michigan survey data are monthly and extend through February 2021; the February data are preliminary. The Survey of Professional Forecasters data for inflation expectations for personal consumption expenditures are quarterly, begin in 2007:Q1, and extend through 2021:Q1. The NY Fed survey data are monthly and begin in June 2013.
SOURCE: University of Michigan Surveys of Consumers; Federal Reserve Bank of New York, Survey of Consumer Expectations; Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters.

recovered, oil consumption and production are still well below pre-pandemic levels (figure 8). Although global economic activity has picked up since last spring, oil demand has not fully recovered, held back by the slow recovery in travel and commuting. Weak demand has been met by reductions in supply: U.S. production has fallen dramatically relative to a year ago, while OPEC (Organization of the Petroleum Exporting Countries) and Russia have only slightly increased production after making sharp cuts last spring.

Survey-based measures of long-run inflation expectations have been broadly stable . . .

Despite the volatility in actual inflation last year, survey-based measures of inflation expectations at medium- and longer-term horizons, which likely influence actual inflation by affecting wage- and price-setting decisions, have been little changed on net (figure 9). In the University of Michigan Surveys of Consumers, the median value for inflation expectations over the next 5 to 10 years was 2.7 percent in January and early February. In the Survey of Consumer Expectations, conducted by the Federal Reserve Bank of New York, the median of respondents' expected inflation rate three years ahead was 3.0 percent in January, somewhat above its year-earlier level. Finally, in the first-quarter Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, the median expectation for the annual rate of increase in the PCE price index over the next 10 years was 2.0 percent, close to the level around which it had typically hovered in previous years.

. . . and market-based measures of inflation compensation have retraced earlier declines

Inflation expectations can also be inferred from market-based measures of inflation compensation, although the inference is not straightforward because these measures are affected by changes in premiums that provide compensation for bearing inflation

and liquidity risks. Measures of longer-term inflation compensation—derived either from differences between yields on nominal Treasury securities and those on comparable-maturity Treasury Inflation-Protected Securities (TIPS), or from inflation swaps—dropped sharply last March, partly reflecting a reduction in the relative liquidity of TIPS compared with nominal Treasury securities (figure 10). Both measures rebounded in the next couple of months as liquidity improved, before drifting up further through the remainder of 2020 and early 2021. The TIPS-based measure of 5-to-10-year-forward inflation compensation and the analogous measure from inflation swaps are now about 2¼ percent and 2½ percent, respectively, a bit above the average levels seen in 2019.[5]

The plunge and rebound in gross domestic product reflected unusual patterns of spending during the pandemic

After contracting with unprecedented speed and severity in the first half of 2020, gross domestic product (GDP) rose rapidly in the third quarter and continued to pick up, albeit at a much slower pace, in the fourth quarter (figure 11). The rebound in activity reflected a relaxation of voluntary and mandatory social distancing, as well as unprecedented fiscal and monetary support. Nevertheless, the recovery remains incomplete: At the end of 2020, GDP was 2.5 percent below its level four quarters earlier. This incomplete recovery reflected weakness in services consumption and overall exports that resulted largely from ongoing social-distancing measures to contain the virus, both at home and abroad. The concentration of the recession in services is unprecedented in the United States. Indeed, the sectors that are typically responsible for the cyclical dynamics of GDP have shown remarkable resilience: Activity in the housing market and consumer spending on goods were both above their

---

5. As these measures are based on consumer price index (CPI) inflation, one should probably subtract about ¼ percentage point—the average differential between CPI and PCE inflation over the past two decades—to infer inflation compensation on a PCE basis.

10. 5-to-10-year-forward inflation compensation
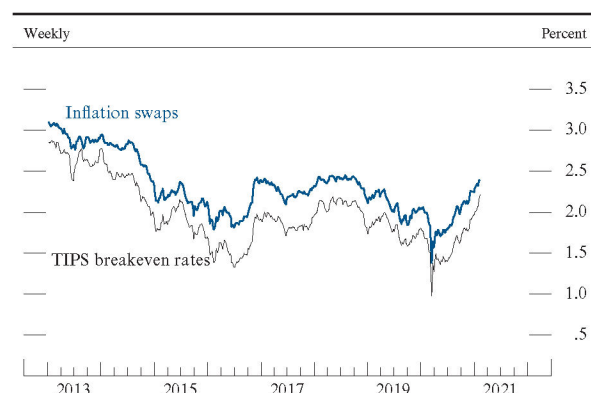
NOTE: The data are weekly averages of daily data and extend through February 12, 2021. TIPS is Treasury Inflation-Protected Securities.
SOURCE: Federal Reserve Bank of New York; Barclays; Federal Reserve Board staff estimates.

11. Real gross domestic product and gross domestic income
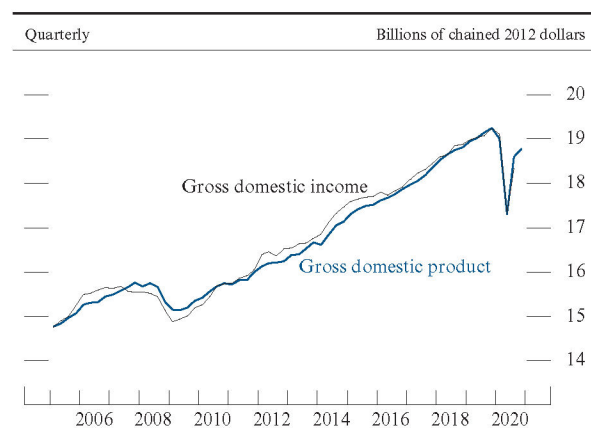
NOTE: Gross domestic income extends through 2020:Q3.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

12.   Real personal consumption expenditures
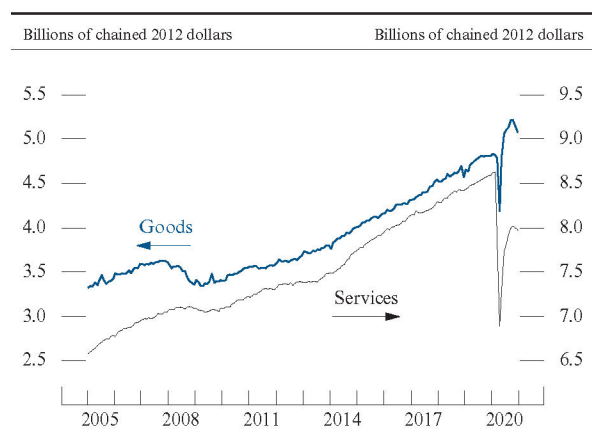
Billions of chained 2012 dollars   Billions of chained 2012 dollars

NOTE: The data are monthly and extend through December 2020.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

13.   Indexes of consumer sentiment

1985 = 100   1966 = 100
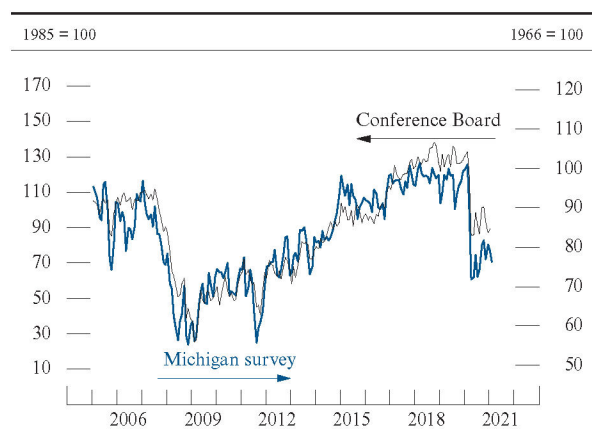
NOTE: The data are monthly. Michigan survey data extend through
February 2021; the February data are preliminary.
SOURCE: University of Michigan Surveys of Consumers; Conference
Board.

pre-pandemic levels in the fourth quarter, and
business fixed investment and manufacturing
output also recovered rapidly from their
initial plunges.

Consumer spending, particularly on goods, bounced back in the second half of 2020 . . .

Household consumption rebounded rapidly
during the late spring and summer from its
COVID-induced plunge, and it continued to
make gains through the fourth quarter, ending
the year 2.6 percent below its year-earlier
level. Notably, purchases of both durable
and nondurable goods rose above their pre-
COVID levels in the second half of 2020, as
spending shifted away from services curtailed
by voluntary and mandatory social distancing
(figure 12). Within durable goods, sales of light
motor vehicles moved up quickly in the second
half and are now close to their pre-pandemic
level; any residual weakness in sales may be
attributable to low supply, as production
has failed to keep pace with demand.
Services spending also rebounded from the
extraordinarily low level seen in April, but
it remained well below its pre-pandemic
pace through the fourth quarter, as concerns
about the virus continued to limit in-person
interactions. Notably, consumer sentiment has
also remained well below pre-pandemic levels
(figure 13).

. . . assisted by government income support . . .

Consumer spending has been bolstered by
government income support in the form
of unemployment insurance and stimulus
measures targeted at households. These
payments were largest in the spring and
summer of last year, but even in the fourth
quarter aggregate real disposable personal
income (DPI) was 3.7 percent above the level
prevailing in late 2019, despite the low level of
employment.[6] The still-elevated level of DPI,

6. The Consolidated Appropriations Act, 2021,
which was enacted in late December, should provide a

combined with the low level of consumption, resulted in an aggregate saving rate of more than 13 percent in the fourth quarter, nearly double its level from a year earlier (figure 14).[7] That said, these aggregate figures mask important variation across households, and many low-income households, especially those whose earnings declined as a result of the pandemic and recession, have seen their finances stretched.[8]

. . . but spending fell back late in the year

As COVID cases began rising again in November, some states retightened restrictions, and many households likely cut back voluntarily on their activities, leading to a retrenchment in spending on services such as restaurants and travel. Spending on durable goods also stepped down late in the fourth quarter, possibly in part because many households had already purchased durable items such as furniture and electronics earlier in the year. Further, while higher-income households accrued substantial savings over the course of 2020, some lower-income consumers likely began to reduce their spending toward the end of the year, as support provided by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) waned. More recently, however, retail sales data and high-frequency indicators suggest that consumer spending

14.   Personal saving rate
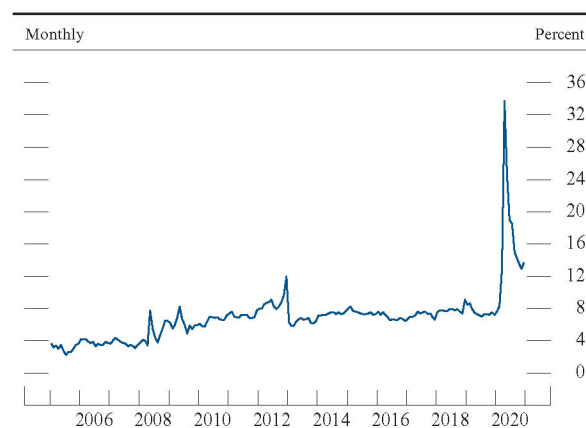
NOTE: The data extend through December 2020.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

substantial further boost to DPI in the first quarter of this year.

7. The saving rate reached 26 percent in the second quarter of 2020—by far the highest level since World War II—before falling back as consumption rebounded and government transfers declined over the course of the year. Even so, the saving rate in the fourth quarter remained higher than in any other period since the 1970s.

8. Food pantries saw a significant increase in demand in 2020, and there was a sharp increase in the number of families reporting that they did not have sufficient money to buy food. See, for example, Marianne Bitler, Hilary W. Hoynes, and Diane Whitmore Schanzenbach (2020), "The Social Safety Net in the Wake of COVID-19," NBER Working Paper Series 27796 (Cambridge, Mass.: National Bureau of Economic Research, September), https://www.nber.org/system/files/working_papers/w27796/w27796.pdf.

15.   Real prices of existing single-family houses

Quarterly   2005 = 100
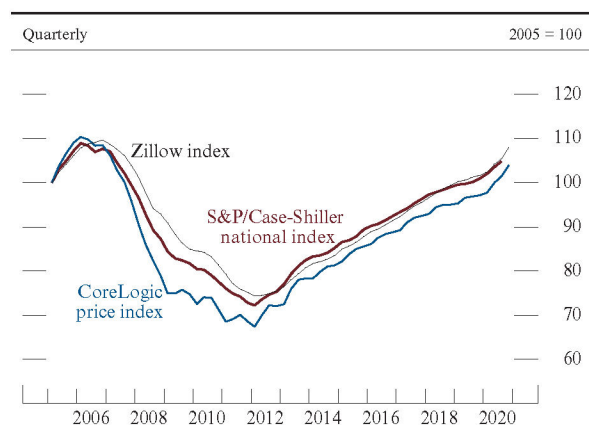
NOTE: The data for the S&P/Case-Shiller index extend through 2020:Q3. Series are deflated by the personal consumption expenditure price index.

SOURCE: CoreLogic Home Price Index; Zillow; S&P/Case-Shiller U.S. National Home Price Index. The S&P/Case-Shiller index is a product of S&P Dow Jones Indices LLC and/or its affiliates. (For Dow Jones Indices licensing information, see the note on the Contents page.)

16.   Wealth-to-income ratio

Quarterly   Ratio
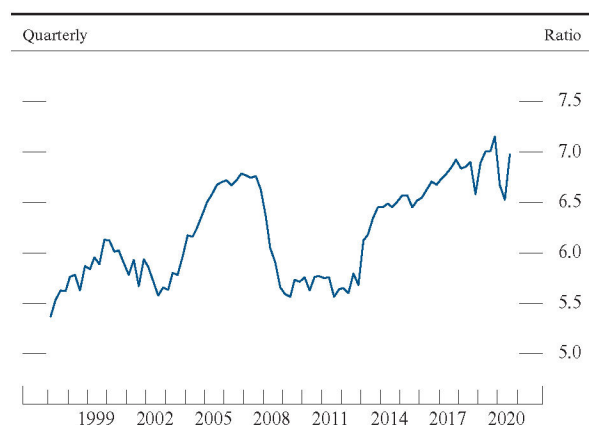
NOTE: The series is the ratio of household net worth to disposable personal income. Data extend through 2020:Q3.

SOURCE: For net worth, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States"; for income, Bureau of Economic Analysis via Haver Analytics.

17.   Consumer credit flows

Billions of dollars, monthly rate

Student loans
Auto loans
Credit cards
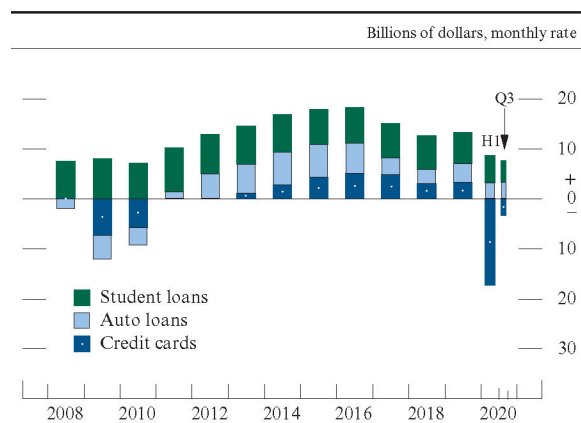
NOTE: The data are seasonally adjusted by the Federal Reserve Board.
SOURCE: Federal Reserve Board, Statistical Release G.19, "Consumer Credit."

rose appreciably in January, likely in part because of additional fiscal support from the Consolidated Appropriations Act, 2021, which was enacted in late December.

Soaring equity and house prices have pushed aggregate household wealth to record highs

Stock markets rallied after plunging in the spring and, more recently, have reached record highs, largely reflecting the arrival of effective vaccines, optimism about further fiscal stimulus, and notable improvement in the outlook for corporate earnings. House prices—which are of particular importance for the value of assets held by many households— have also soared, boosted by strong demand from record-low mortgage rates, a shift in demand from multifamily to single-family homes during the pandemic, and a shortage of inventory (figure 15). As a result, aggregate household wealth is elevated relative to income, which is supporting consumption, particularly of relatively well-off households (figure 16).

Lending standards for households are less accommodative than before the pandemic, but credit is still available to households with good credit profiles

Consumer lending standards remain less accommodative than before the pandemic, on balance, and are particularly tight for individuals with low credit ratings. Banks tightened lending standards substantially in the first half of 2020, but the tightening moderated in the second half and credit remains available to higher-score borrowers. Banks also reported considerably weaker demand for consumer credit on balance. Credit card lending volumes have been weak, consistent with the incomplete recovery in overall consumer spending, but auto lending has been stronger amid the rapid recovery in motor vehicle sales to consumers (figure 17). Mortgage lending has also been robust, boosted both by record-low mortgage interest rates and by mortgage credit that is generally available to those with good credit scores who are seeking traditional mortgage

products (figure 18). Overall, loan defaults have remained low despite the weak labor market, supported by various forbearance programs.

The housing sector made a remarkable recovery in the second half of 2020 . . .

Residential investment grew at a robust pace of 14 percent over the four quarters of 2020, as booming home sales and housing construction in the second half more than offset the outsized declines in the second quarter that resulted from the COVID-19 outbreak and mitigation efforts. Historically low mortgage rates and the swift adaptation of the real estate sector to the pandemic boosted housing activity later in the year, with both single-family housing starts and existing home sales rising to their highest levels since the mid-2000s (figures 19 and 20).[9] The burst of housing demand has left inventories of both new and existing homes at all-time lows, putting upward pressure on home prices and supporting new construction. Some of these patterns in the data likely reflect changes in preferences during the pandemic, with households opting for larger homes and housing in less dense areas, but the degree to which these changes will persist remains unclear.

. . . and business fixed investment also rebounded rapidly . . .

Business fixed investment—that is, private expenditures for equipment, structures, research and development, and other intellectual property—contracted sharply in the first half of 2020 but largely retraced its decline in the second half. The recovery in business investment has been centered in equipment and intellectual property, which rose 2.4 percent over the four quarters of 2020, supported by stronger business sentiment, improved financing conditions, and the

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9. In particular, during the pandemic, the real estate sector has made increased use of virtual tours, remote closings, and waivers on inspections and appraisals.

18.   Mortgage rates

Weekly   Percent

NOTE: The data extend through February 11, 2021.
SOURCE: Freddie Mac Primary Mortgage Market Survey.
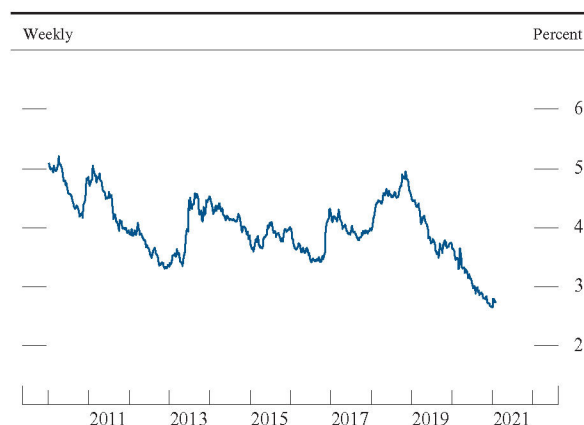
19.   Private housing starts and permits

Monthly   Millions of units, annual rate

NOTE: The data extend through December 2020.
SOURCE: Census Bureau via Haver Analytics.

20.   New and existing home sales

Millions, annual rate   Millions, annual rate
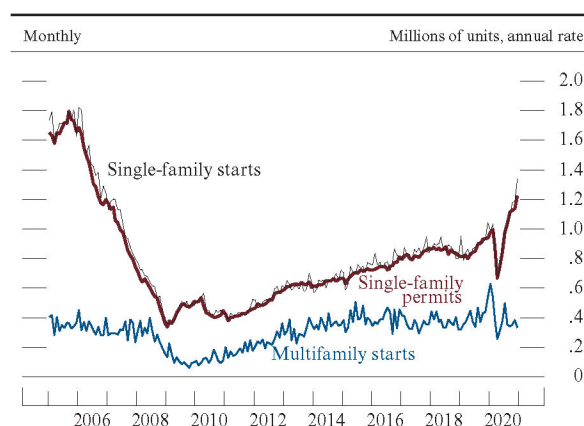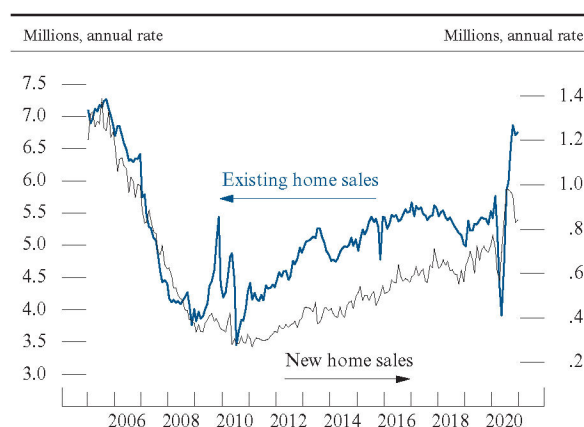
NOTE: Data are monthly and extend through December 2020. New home sales include only single-family sales. Existing home sales include single-family, condo, and co-op sales.
SOURCE: For new home sales, Census Bureau; for existing home sales, National Association of Realtors; all via Haver Analytics.

21.   Real business fixed investment
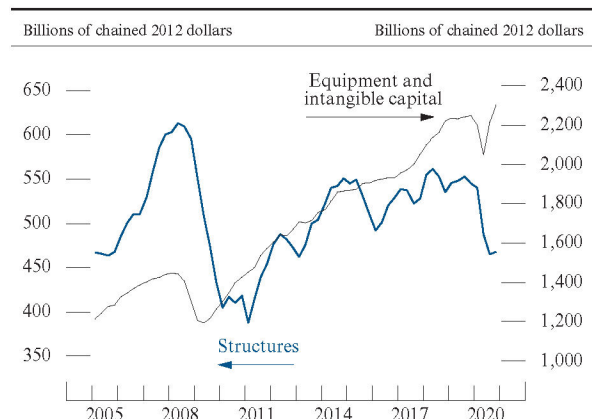
NOTE: Business fixed investment is known as "private nonresidential fixed investment" in the national income and product accounts. The data are quarterly.
SOURCE: Bureau of Economic Analysis via Haver Analytics.

22.   Selected components of net debt financing for nonfinancial businesses
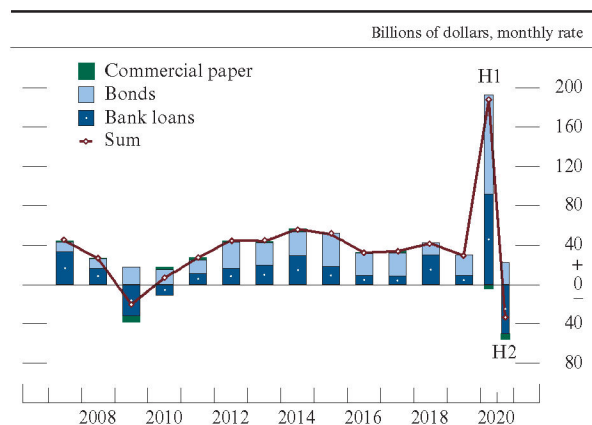
SOURCE: Mergent Inc., Fixed Income Securities Database; S&P Global, Leveraged Commentary & Data; DTCC Solutions LLC, an affiliate of The Depository Trust & Clearing Corporation. This publication includes data licensed from DTCC Solutions LLC, an affiliate of The Depository Trust & Clearing Corporation. (For the DTCC licensing disclaimer, see the note on the Contents page.)

unwinding of direct disruptions from social distancing (figure 21). In addition, the health crisis and the shift to widespread teleworking have led to a surge in investment in both medical equipment and computers. In contrast, investment in nonresidential structures continued to decline sharply in the second half. Drilling investment was particularly hard hit and fell 30 percent in 2020 as a result of declines in energy demand and oil prices. Investment in nondrilling structures also fell, although more moderately. Long build times imply that the decline in new construction projects started in the first half of 2020 led to less ongoing spending in the second half; moreover, firms likely remain uncertain about future demand for many types of structures in the wake of the pandemic.

. . . amid notable improvements in corporate financing conditions

Financing conditions for nonfinancial firms through capital markets have improved notably since June. In particular, interest rates have remained very low and corporate bond spreads have narrowed. Gross issuance of nonfinancial corporate bonds was solid in the second half of the year, although it slowed from the exceptional pace in the second quarter (figure 22). In contrast, aggregate bank lending to businesses contracted in the second half, reflecting lower demand for new loans, the repayment of outsized draws on credit lines earlier this year, the forgiveness of some loans under the Paycheck Protection Program, and tighter bank credit standards. In part because of policy actions to foster smooth market functioning, corporations have been able to take advantage of favorable funding conditions in capital markets to refinance debt and bolster their balance sheets; as a result, corporate cash holdings are at record levels. In the small business sector, privately financed lending also picked up over the summer, and loan performance improved, supported by the Paycheck Protection Program. Nevertheless,

credit availability for small businesses remains fairly tight, demand for such credit is weak, and default risk is still elevated.

Exports remain lower, but imports have recovered

U.S. exports remain well below pre-pandemic levels. With many foreign economies still weak, U.S. exports of goods have not quite fully recovered from their earlier sharp declines, while exports of services remain depressed because of the continued suspension of most international travel. In contrast, imports have regained most of their lost ground. Reduced imports of services have been offset by a full rebound of goods imports, which reflects strong U.S. demand for household goods (figure 23). Both the nominal trade deficit and current account deficit, relative to GDP, widened since 2019 (figure 24).

Federal fiscal stimulus provided substantial support to economic activity while also significantly boosting the budget deficit and debt

Federal fiscal policy measures enacted in response to the pandemic continue to provide crucial income support to households and businesses, as well as grants-in-aid to state and local governments. These measures have also facilitated loans to businesses, households, states, and localities.[10] In total, the Congressional Budget Office projects that in fiscal years 2020 and 2021, the additional federal government expenditures and foregone revenues from these policies will total roughly $3 trillion—around 15 percent of nominal GDP.[11] In addition, the decline in economic

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10. These policy measures include the CARES Act from last spring and the Consolidated Appropriations Act, 2021, enacted in December. Passage of additional fiscal support remains under discussion.

11. The CBO's projection and estimate can be found at Congressional Budget Office (2020), *An Update to the Budget Outlook: 2020 to 2030* (Washington: CBO, September 2), https://www.cbo.gov/publication/56517; and Congressional Budget Office and Joint Committee

23. Real imports and exports of goods and services

Quarterly   Billions of chained 2012 dollars
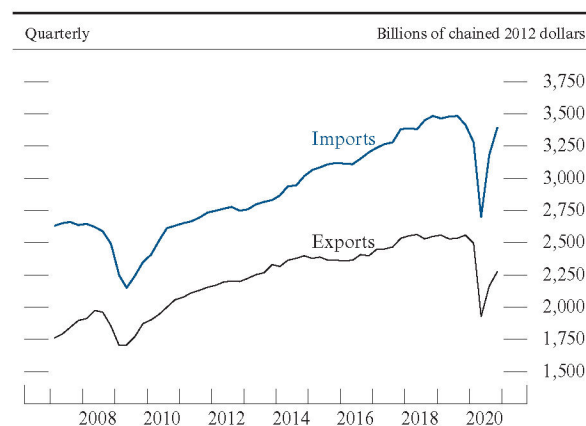
SOURCE: Bureau of Economic Analysis via Haver Analytics.

24. U.S. trade and current account balances

Annual   Percent of nominal GDP
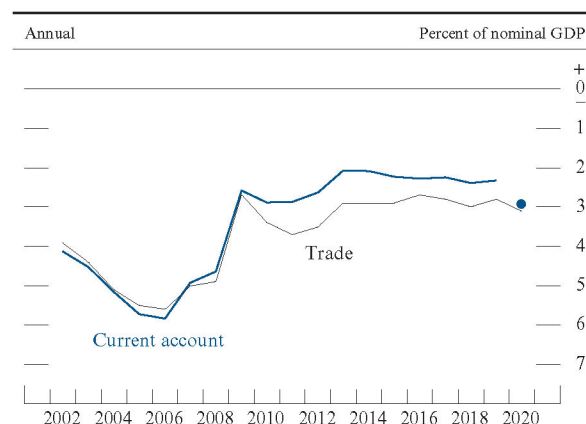
NOTE: GDP is gross domestic product. The data for the trade balance extend through 2020. The data for the current account balance extend through 2019. The blue dot refers to the average current account balance for 2020:Q1–2020:Q3.

SOURCE: Bureau of Economic Analysis via Haver Analytics.

25.   Federal receipts and expenditures
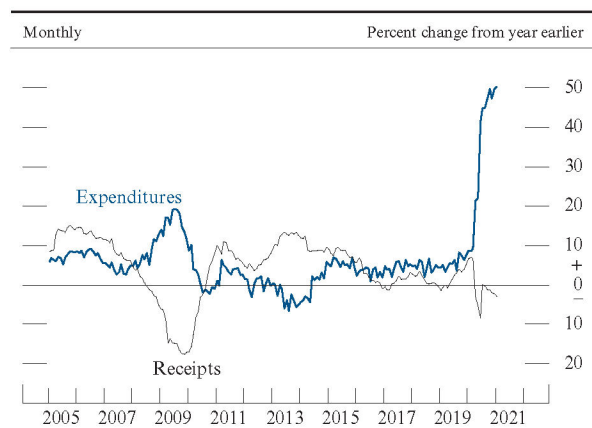
NOTE: The data are 12-month moving sums.
SOURCE: Office of Management and Budget via Haver Analytics.

26.   Federal government debt and net interest outlays
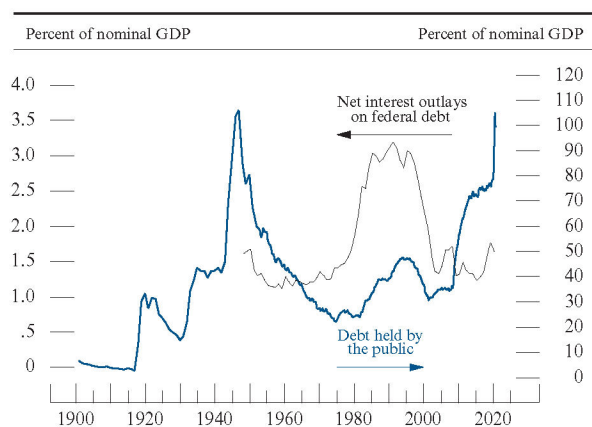
NOTE: The data for net interest outlays are annual, begin in 1948, and extend through 2020. Net interest outlays are the cost of servicing the debt held by the public. Federal debt held by the public equals federal debt less Treasury securities held in federal employee defined-benefit retirement accounts, evaluated at the end of the quarter. The data for federal debt begin in 1900 and are annual from 1900 to 1951 and quarterly thereafter. The data for gross domestic product (GDP) and federal debt extend through 2020:Q3.
SOURCE: For GDP, Bureau of Economic Analysis via Haver Analytics; for federal debt, Federal Reserve Board, Statistical Release Z.1, "Financial Accounts of the United States."

activity has pushed down tax receipts while pushing up outlays for certain transfer programs—most notably for unemployment insurance and Medicaid (figure 25). These tax decreases and transfer increases (referred to as automatic stabilizers) worked in tandem with the discretionary stimulus to support aggregate demand and blunt the extent of the economic downturn.

The combination of the discretionary stimulus measures and the automatic stabilizers caused the budget deficit in fiscal 2020 to rise to 15 percent of nominal GDP—the largest deficit as a share of GDP in the post–World War II era—up from its already elevated level of 4½ percent in fiscal 2019. Consequently, the ratio of federal debt held by the public to nominal GDP rose from 79 percent in fiscal 2019 to 100 percent by the end of fiscal 2020, the highest debt-to-GDP ratio since 1947 (figure 26). Even so, the cost of servicing the federal debt is not particularly elevated by historical standards, because Treasury rates are extremely low.

State and local governments are facing challenging fiscal conditions

State and local governments are confronting challenging budget conditions because of weak tax collections and extraordinary expenses related to the pandemic. Nominal state government tax collections in 2020 were about 1 percent below their 2019 level and well below levels generally expected before the pandemic (figure 27).[12] The magnitude of

on Taxation (2021), "H.R. 133, Summary Estimate for Divisions M Through FF Consolidated Appropriations Act, 2021 Public Law 116–260," cost estimate, January 14, https://www.cbo.gov/publication/56963.

12. State tax collection data are available through November 2020. For additional details, see Urban Institute (2020), "State Tax and Economic Review," State and Local Finance Initiative, November, https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/projects/state-tax-and-economic-review (accessed January 2021).

Although depressed, tax receipts have not fallen as significantly as economic activity, for several reasons. First, some of the federal fiscal aid to households (for

these revenue shortfalls varied considerably across states, with the largest shortfalls in states that rely heavily on sales taxes, tourism, and energy production. In contrast, property taxes—the principal local government tax—have continued to rise apace, and state and local governments have received federal aid that has assisted with COVID-related expenses and helped ease budget strains. Meanwhile, bond market conditions for state and local governments have been generally accommodative in the second half of the year, as robust municipal bond issuance has been supported by historically low yields and tax-exempt municipal bond funds have seen solid inflows. Even so, in response to social-distancing restrictions (including virtual learning), current budget pressures, and concerns over future budgetary challenges, state and local governments have cut payrolls—particularly in the education sector—an unprecedented 6½ percent over the past year (figure 28). Notably, public-sector employment is down significantly in nearly all states, including those that have experienced relatively smaller revenue shocks.

Vaccines offer hope of an end to the pandemic, but risks to the outlook are still substantial

The economic outlook presented in Part 3 depends crucially on the course of the COVID-19 pandemic. The vaccination campaign now under way offers the prospect of a return to more normal conditions by the end of this year. But the pace of vaccinations, the rate of decline in the spread of the virus, and the speed with which people return to normal activities all remain highly uncertain, particularly given the emergence of new, apparently more contagious strains. The longer-run economic effects of the pandemic are also difficult to predict. Many

example, unemployment benefits) is taxable. Second, goods consumption, which is likelier to be subject to sales taxes than services, has largely held up. Finally, unemployment has been concentrated among low-income individuals, who pay less in income taxes.

27. State and local tax receipts
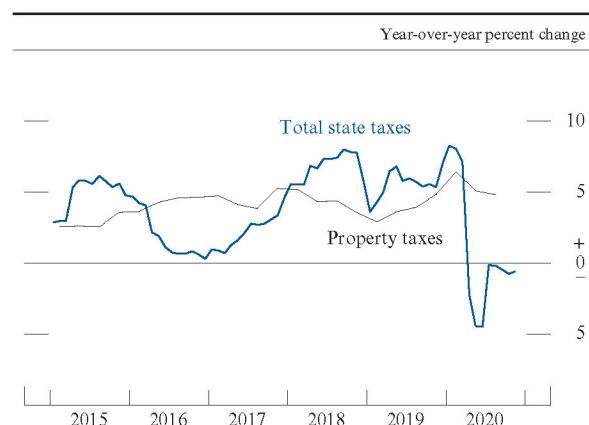
NOTE: State tax data are 12-month percent changes of 4-quarter moving averages, extend through November 2020, and are aggregated over all states except Wyoming, for which data are not available. Revenues from Washington, DC, are also excluded. Data for October and November are missing for New Mexico, as this state has longer reporting lags than others. Property tax data are 4-quarter percent changes of 4-quarter moving averages, extend through 2020:Q3, and are primarily collected by local governments.
SOURCE: State Tax and Economic Review Project; State and Local Finance Initiative at Urban Institute; Census Bureau.

28. State and local government payroll employment
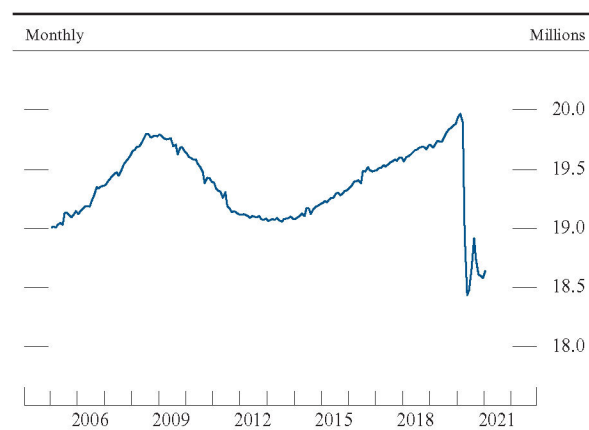
NOTE: The data are seasonally adjusted.
SOURCE: Bureau of Labor Statistics, National Compensation Survey.

small businesses have shut down and may not reopen. Some pandemic-driven shifts in economic activity, such as from in-person to online shopping and from office-based to remote work, may prove to be permanent. These shifts could increase productivity by substituting remote interactions for costly travel and commuting, but they could also put persistent upward pressure on unemployment, as affected workers may need to seek new jobs and perhaps new occupations. The pandemic has also disrupted schooling at all levels, which could have persistent negative effects on educational attainment and economic outcomes for affected students.

Financial Developments

The expected level of the federal funds rate over the next few years has remained near zero

Economic forecasters and financial market participants expect the federal funds rate over the next several years to remain at the effective lower bound. Market-based measures of federal funds rate expectations over the next few years have increased moderately since June and remain below 0.25 percent until the second quarter of 2023 (figure 29).[13] According to the results of the Survey of Primary Dealers and the Survey of Market Participants, both conducted by the Federal Reserve Bank of New York in January, the median respondent views the most likely path of the federal funds rate as remaining in its current range of 0 to ¼ percent until the first half of 2024.[14]

29.   Market-implied federal funds rate path
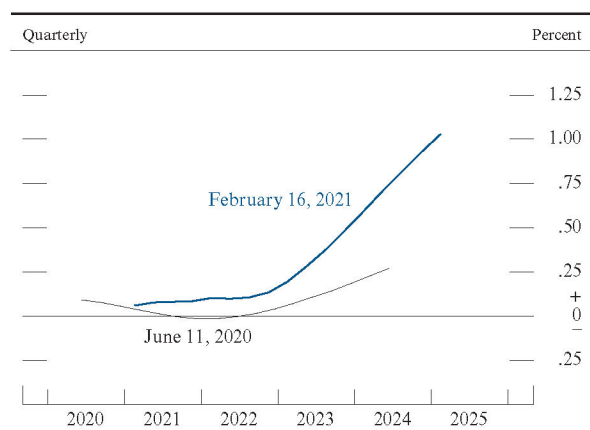
NOTE: The federal funds rate path is implied by quotes on overnight index swaps—a derivative contract tied to the effective federal funds rate. The implied path as of June 11, 2020, is compared with that as of February 16, 2021. The path is estimated with a spline approach, assuming a term premium of 0 basis points. The June 11, 2020, path extends through June 2024 and the February 16, 2021, path through January 2025.

SOURCE: Bloomberg; Federal Reserve Board staff estimates.

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13. These measures are based on a straight read of market quotes and are not adjusted for term premiums.

14. The results of the Survey of Primary Dealers and the Survey of Market Participants are available on the Federal Reserve Bank of New York's website at https://www.newyorkfed.org/markets/primarydealer_survey_questions.html and https://www.newyorkfed.org/markets/survey_market_participants, respectively.

Yields on longer-term U.S. nominal Treasury securities increased markedly...

Yields on nominal Treasury securities at longer maturities increased markedly since mid-2020 after falling sharply in late February and early March as investors' concerns regarding the implications of the COVID-19 outbreak for the economic outlook led to both falling policy rate expectations and flight-to-safety flows (figure 30). The increase in yields on longer-term Treasury securities followed news of the imminent arrival of multiple highly effective COVID-19 vaccines in the fall of 2020 and expectations of further fiscal support, as well as an increase in the issuance of longer-term Treasury securities. Near-term uncertainty about longer-dated nominal Treasury yields—as measured by volatility of near-term swaptions of 10-year interest rates—has remained low.

... while spreads of other long-term debt to Treasury securities narrowed ...

Despite the rise in Treasury yields, yields on 30-year agency mortgage-backed securities (MBS)—an important determinant of mortgage interest rates—decreased somewhat, on balance, amid the Federal Reserve's ongoing purchases of MBS and have remained near their historical lows (figure 31). Thus, the spread between yields on 30-year agency MBS and comparable-maturity Treasury yields has narrowed.

Approval of the effective vaccines late last year, optimism about further fiscal support, and notable improvement in the outlook for corporate earnings boosted investors' optimism, and improvement in the credit quality of firms drove declines in yields on investment- and speculative-grade corporate bonds (figure 32). As with mortgage securities, spreads on corporate bond yields over comparable-maturity nominal Treasury yields have narrowed considerably since the end of June—as corporate bond yields declined and yields on nominal Treasury

30. Yields on nominal Treasury securities
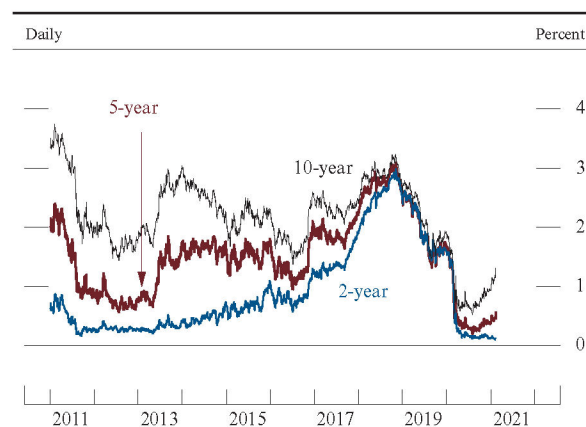
SOURCE: Department of the Treasury via Haver Analytics.

31. Yield and spread on agency mortgage-backed securities
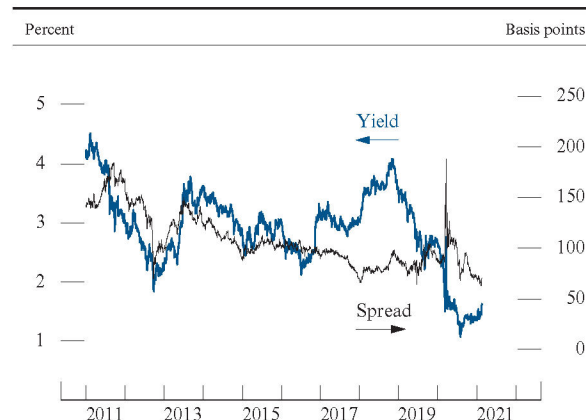
NOTE: The yield is on mortgage-backed securities from Fannie Mae through May 31, 2019, and from uniform mortgage-backed securities thereafter. Data are daily.
SOURCE: Department of the Treasury; J.P. Morgan. Courtesy of J.P. Morgan Chase & Co., Copyright 2021.

32. Corporate bond yields, by securities rating, and
     municipal bond yield
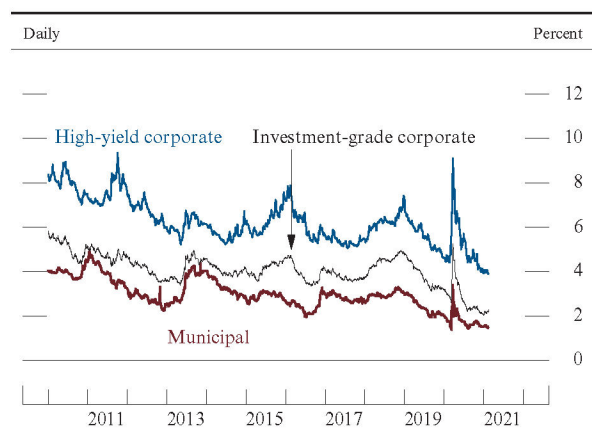
NOTE: Investment-grade corporate is the 10-year triple-B, which reflects the effective yield of the ICE BofAML 7-to-10-year triple-B U.S. Corporate Index (C4A4). High-yield corporate is the 10-year high yield and reflects the effective yield of the ICE BofAML 7-to-10-year U.S. Cash Pay High Yield Index (J4A0). Municipal is the Municipal Market Advisors 20-year yield.

SOURCE: ICE Data Indices, LLC, used with permission; Municipal Market Advisors.

securities increased—and have returned to levels observed before the pandemic. Yields on municipal debt continued to decline in the second half of 2020, and spreads on municipal bonds over comparable-maturity nominal Treasury yields have narrowed substantially since the end of June, as nominal Treasury yields increased and investors grew more optimistic about further fiscal stimulus and aid to state and local governments. The year-end expiration of lending facilities that were authorized under section 13(3) of the Federal Reserve Act and that use CARES Act funding did not lead to upward pressure on corporate or municipal bond spreads.

. . . and market functioning for Treasury securities, corporate bonds, mortgage-backed securities, and municipal bonds continued to improve . . .

After having improved substantially in the spring of last year, measures of market liquidity for Treasury securities—such as measures of market depth and trade sizes—continued to improve somewhat in the second half of 2020 and moved closer to pre-pandemic levels, especially for shorter-dated Treasury securities. However, measures of liquidity for longer-dated Treasury securities and in some portions of the MBS market—notably for those securities excluded from Federal Reserve open market purchases—remained somewhat below pre-pandemic levels. Measures of market functioning of the corporate bond market continued to improve as bid-ask spreads narrowed considerably and returned to their pre-pandemic levels and issuance of corporate bonds in primary markets was robust. Measures of market functioning of the municipal bond market—such as robust issuance of municipal bonds in primary markets and round-trip transaction costs—indicate that market conditions remained stable in the second half of 2020.

. . . while conditions in short-term funding markets remained stable

The effective federal funds rate and other secured and unsecured short-term rates continued to trade within the target range of the federal funds rate, as ample liquidity, primarily due to substantial increases in reserves, has kept markets functioning smoothly. Since June, measures of stress in short-term funding markets—including trading volumes, issuance, and spreads to overnight index swaps—have remained stable at or near pre-pandemic levels, and year-end funding pressures were minimal.

Broad stock prices have risen notably

After starting to rebound last spring from their COVID-related declines, broad stock prices have risen notably further since mid-2020, as the arrival of effective vaccines, optimism about further fiscal support, and notable improvement in the outlook for corporate earnings outweighed investor concerns regarding the rise in COVID-19 cases (figure 33). The prospect of an economic recovery aided by effective vaccines and fiscal support led to outsized price gains in some cyclical sectors, such as the consumer discretionary, materials, and information technology sectors. Similarly, stock prices of smaller corporations considerably outperformed large-cap stock price indexes. After experiencing depressed levels through early fall, bank stock price indexes increased considerably in late 2020, boosted by positive vaccine news, a generally improved investor outlook for loan losses and bank profitability, and the release of favorable stress-test results in late 2020. Measures of realized and implied stock price volatility for the S&P 500 index—the 20-day realized volatility and the VIX—decreased sharply from their very high levels at the end of the second quarter but remained moderately above their historical medians, respectively (figure 34). (For a discussion of financial stability issues, see the box "Developments Related to Financial Stability.")

33.   Equity prices

Daily   December 31, 2009 = 100
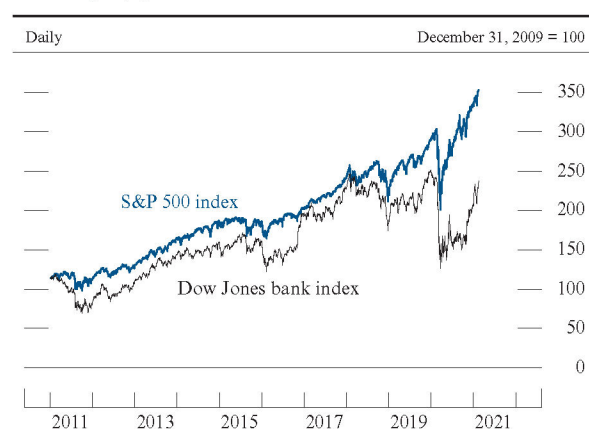
SOURCE: S&P Dow Jones Indices LLC via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

34.   S&P 500 volatility

Daily   Percent
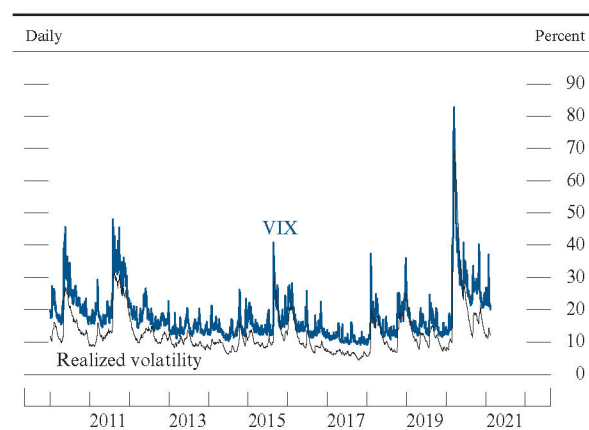
NOTE: The VIX is a measure of implied volatility that represents the expected annualized change in the S&P 500 index over the following 30 days. For realized volatility, 5-minute S&P 500 returns are used in an exponentially weighted moving average with 75 percent of weight distributed over the past 20 days.
SOURCE: Cboe Volatility Index® (VIX®) via Bloomberg; Federal Reserve Board staff estimates.

Developments Related to Financial Stability

This discussion reviews vulnerabilities in the U.S. financial system since the COVID-19 outbreak and summarizes recent actions and developments at facilities established by the Federal Reserve to support the flow of credit throughout the economy.[1] The framework used by the Federal Reserve Board for assessing the resilience of the U.S. financial system focuses on financial vulnerabilities in four broad areas: asset valuations, business and household debt, leverage in the financial sector, and funding risks.

Overall, asset valuation pressures, which were elevated before the COVID-19 outbreak in the United States, briefly subsided at the onset of the outbreak as asset prices plummeted but have since retraced in most markets. In particular, prices in equity, corporate bond, and residential real estate (RRE) markets have returned to or exceeded pre-pandemic levels, buoyed in part by recent developments related to vaccines. Equity prices have more than recovered from the steep declines at the onset of the pandemic, with investor appetite broadly rebounding across most sectors. Equity market volatility remains high, indicating persistent uncertainty regarding the pandemic and the related course of economic activity. Yields on corporate bonds over comparable-maturity Treasury securities have narrowed considerably. Treasury yields across the maturity spectrum declined at the onset of the pandemic and remain near historical lows. The credit quality of outstanding leveraged loans deteriorated early this year, but investor appetite remains strong and new issuance has increased in the second half of 2020. RRE prices also rose rapidly in the second half of 2020, outpacing rent increases. Commercial real estate prices remain at historically high levels despite high vacancy rates and appear susceptible to sharp declines, particularly if the pace of distressed transactions picks up or, in the longer term, the pandemic leads to permanent changes in demand.

Vulnerabilities associated with business and household debt increased over the course of 2020. Business debt has risen from levels that were already

elevated before the outbreak of the pandemic. Business leverage now stands near historical highs. While near-term risks associated with debt service may be limited by large cash balances at large firms, low interest rates, and recently improved earnings prospects, insolvency risks at small and medium-sized firms, as well as at some large firms, remain considerable. The household sector entered the downturn with relatively low debt but experienced significant financial strains because of the unprecedented spike in unemployment and business closures. Government programs—including expanded unemployment insurance and direct stimulus payments in the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act—and a rebound in economic activity in the second half of 2020 reduced economic hardship for households and mitigated the deterioration in household credit quality.

In the financial sector, bank profitability and capital positions, which were strained by the outbreak of the pandemic, improved in the second half of 2020 because of a combination of lower-than-expected losses, a better economic outlook, and restrictions imposed by the Federal Reserve on capital distributions by the largest banks. In particular, the capitalization of U.S. global systemically important banks, or G-SIBs, exceeds pre-pandemic levels. In addition, the results of stress tests released in June and December 2020 indicated that banks would generally remain well capitalized under extremely severe recession scenarios. Leverage at broker-dealers changed little over 2020 and remains at historically low levels. While the liquidity deterioration across dealer-intermediated markets in March 2020 demonstrated potential fragility despite dealers' low leverage, this fragility has been likely mitigated by emergency lending facilities and the supervisory action of the Federal Reserve. By contrast, leverage at life insurance companies has risen to post-2008 highs. Vulnerabilities from leverage at hedge funds remain elevated. Finally, securitization volumes increased after coming to a halt in March 2020 but remain significantly below pre-pandemic levels.

Over the course of 2020, banks relied only modestly on short-term wholesale funding and maintained significant levels of high-quality liquid assets. By contrast, developments at the onset of the pandemic demonstrated significant structural vulnerabilities at money market mutual funds and open-end investment funds, particularly those that invest substantially in

(continued)

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1. The *Financial Stability Report* published in November 2020 presents the most recent, detailed assessment of U.S. financial system vulnerabilities and a summary of Federal Reserve actions and developments at facilities during the COVID-19 crisis. See Board of Governors of the Federal Reserve System (2020), *Financial Stability Report* (Washington: Board of Governors, November), https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf.

corporate and municipal debt. These funds experienced large, sudden redemptions in March 2020, which contributed to strains in broader short-term funding markets and fixed-income debt markets. Federal Reserve actions, including emergency lending facilities, have mitigated these vulnerabilities for now, but without structural reforms, the vulnerabilities demonstrated in March 2020 will persist and could significantly amplify future shocks.

The outlook for the pandemic and economic activity remains uncertain globally. In response to the economic disruptions caused by the pandemic, many foreign governments have ramped up spending to support households and businesses. Nevertheless, financial systems in some foreign economies are more vulnerable than before the pandemic, and these vulnerabilities may grow in the near term. Risks from widespread and persistent stresses in emerging markets and dollar funding markets could interact with risks associated with the course of COVID-19 for the U.S. financial system. In turn, these risks could be amplified by the vulnerabilities identified in this discussion and produce additional strains for the U.S. financial system and economic activity.

Developments Associated with Facilities to Support the Economy during the COVID-19 Crisis

In the immediate wake of the pandemic, the Federal Reserve took forceful actions and established emergency lending facilities, with the approval of the Secretary of the Treasury as needed. These actions and facilities have supported the flow of credit to households and businesses and have served as backstop measures that have given investors confidence that support will be available should conditions deteriorate substantially.

Some of the facilities established at the onset of the pandemic are still operational. The Commercial Paper Funding Facility (CPFF), the Money Market Mutual Fund Liquidity Facility (MMLF), and the Primary Dealer Credit Facility (PDCF) stabilized short-term funding markets and improved the flow of credit to households and businesses. Although balances in the PDCF, CPFF, and MMLF have fallen from their initial highs to low levels, the facilities will continue to serve as important backstops against further market stress until their scheduled expiration at the end of March 2021.

The Paycheck Protection Program Liquidity Facility (PPPLF) was established to extend credit to lenders that participate in the Paycheck Protection Program of the Small Business Administration (SBA), which has provided payroll support for small businesses. Through mid-January 2021, the Federal Reserve has made nearly 15,000 PPPLF advances to more than 850 banking institutions, totaling more than $110 billion in liquidity.

The Federal Reserve has taken actions that reduce spillovers to the U.S. economy from foreign financial stresses. Temporary U.S. dollar liquidity swap lines were established in March 2020, in addition to the preexisting standing lines, and have improved liquidity conditions in dollar funding markets in the United States and abroad by providing foreign central banks with the capacity to deliver U.S. dollar funding to institutions in their jurisdictions during times of market stress. The FIMA (Foreign and International Monetary Authorities) Repo Facility has helped support the smooth functioning of the U.S. Treasury market by providing a temporary source of U.S. dollars to a broad range of countries, many of which do not have swap line arrangements with the Federal Reserve. The temporary swap lines and the FIMA Repo Facility will continue to serve as liquidity backstops until their scheduled expiration at the end of September 2021.

Other facilities established at the onset of the pandemic expired either at the end of December 2020 or at the beginning of January 2021. The Primary Market Corporate Credit Facility, the Secondary Market Corporate Credit Facility, and the Municipal Liquidity Facility were established to improve the flow of credit through bond markets, where large firms and municipalities obtain most of their long-term funding. The Term Asset-Backed Securities Loan Facility was also set up to support the issuance of securities backed by student loans, auto loans, credit card loans, loans backed by the SBA, and certain other assets. Altogether, before expiring at the end of 2020, these facilities brought rapid improvements to credit markets, with only modest direct interventions. The Main Street Lending Program (Main Street) expired at the beginning of January 2021. In its period of operation, Main Street purchased about 1,800 loan participations, totaling more than $16 billion, which helped small and medium-sized businesses from some of the hardest-hit areas of the country and covered a wide range of industries.

35.   Commercial and industrial loan growth
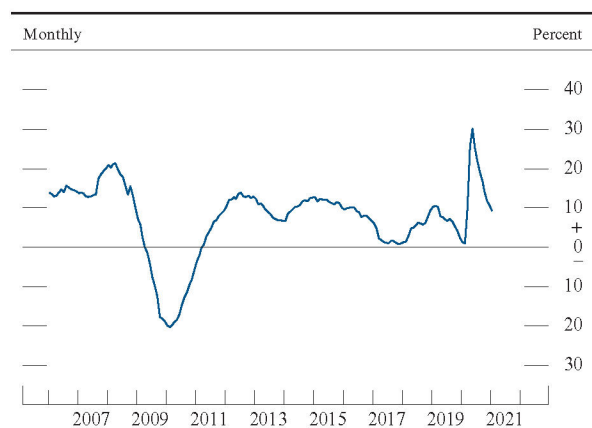
NOTE: Data are calculated as monthly year-over-year growth rates.
SOURCE: Federal Reserve Board, Statistical Release H.8, "Assets and Liabilities of Commercial Banks in the United States."

36.   Profitability of bank holding companies
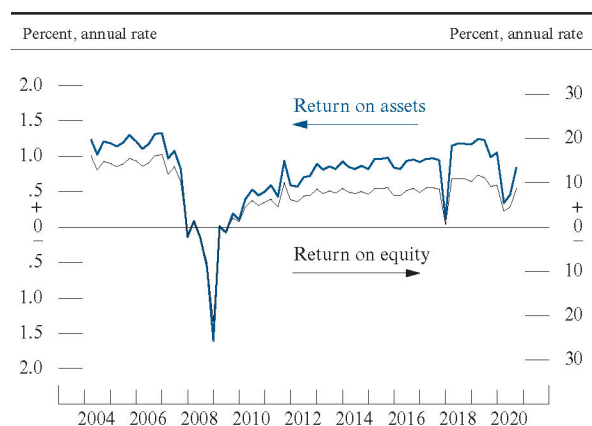
NOTE: The data are quarterly, extend through 2020:Q3, and are seasonally adjusted.
SOURCE: Federal Reserve Board, Form FR Y-9C, Consolidated Financial Statements for Bank Holding Companies.

37.   Foreign real gross domestic product
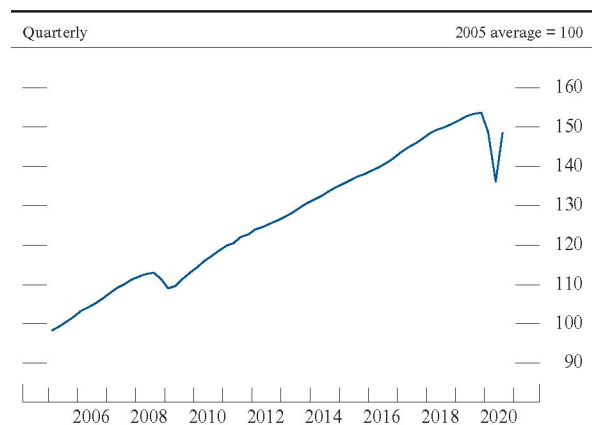
NOTE: The data extend through 2020:Q3. Foreign GDP computed on a representative sample of 40 countries and aggregated using U.S. trade weights.
SOURCE: Federal Reserve Bank of Dallas, Database of Global Economic Indicators, https://www.dallasfed.org/institute/dgei/gdp.aspx.

Bank credit contracted, while bank profitability improved

In contrast with strong debt issuance through securities markets, outstanding bank loan balances across most major loan categories have contracted since mid-June amid generally weak borrower demand and tight lending standards. Commercial and industrial (C&I) loans at banks declined sharply in the second half of 2020, reflecting the repayment of large credit-line draws made earlier in the year and the forgiveness of some loans under the Paycheck Protection Program, as well as generally weak borrower demand for such loans and tighter bank lending standards. However, overall C&I loan balances at banks remained higher compared with a year earlier (figure 35). Measures of bank profitability, such as return on assets and return on equity, rebounded in the second half of 2020 following very low readings in the second quarter, when banks significantly increased their loan loss provisions, but have remained below pre-pandemic levels (figure 36). Delinquency rates on bank loans remained low, as banks' loss-mitigation and forbearance programs allowed many borrowers to stay current on their loans. Large banks posted higher-than-expected earnings in the fourth quarter, bolstered by capital market activity and loan loss reserve releases, while low rates continued to weigh on profit margins.

International Developments

Economic activity abroad snapped back in the third quarter . . .

As in the United States, foreign GDP partially rebounded in the third quarter of 2020 (figure 37). Nonetheless, foreign economic

activity remains well below its pre-pandemic level, as a resurgence of infections in many economies has recently led to renewed social-distancing restrictions. The accompanying slowdown in economic activity appears to have been less dramatic than that in the spring, as economies have adjusted to function better under social-distancing restrictions. In addition, many current containment measures have been less stringent relative to those in the spring, and fiscal and monetary policies continue to support the path to recovery.

Since last spring, manufacturing has generally recovered more than services, which remain depressed because consumers have avoided socially intensive activities, especially in the hospitality and leisure sectors (figure 38). Some higher-income Asian economies, where infections are more under control, experienced relatively better GDP growth than many advanced economies and benefited from increased export demand in the second half of 2020. Most notably, China's GDP was 6.5 percent higher in the fourth quarter of 2020 compared with a year ago. In many Latin American countries and advanced foreign economies (AFEs), fourth-quarter GDP contracted relative to a year earlier (figure 39).

Although the ongoing spread of the virus—including new variants—is concerning, many AFEs have already started immunizing their populations and have commitments to purchase substantial stocks of vaccines. Controlling the virus globally, however, will be challenging, in part because many emerging market economies (EMEs) have more limited access to vaccines and face greater distribution challenges.

38. Services purchasing managers index in selected foreign economies

NOTE: For the foreign services output purchasing managers index (PMI), values greater than (less than) 50 indicate better (worse) business conditions, on average, for the participants surveyed relative to conditions at the time of the previous survey.
SOURCE: IHS Markit, Global Sector PMI.

39. Real gross domestic product in selected foreign economies
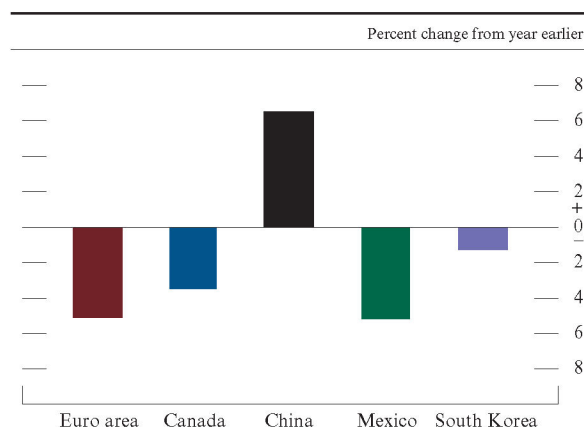
NOTE: The data are for 2020:Q4. For Canada, the euro area, and Mexico, the values correspond to flash estimates of GDP. For South Korea, the value is the advance GDP estimate. For China, the value corresponds to preliminary GDP.
SOURCE: For the euro area, Eurostat; for Canada, Statistics Canada; for China, National Bureau of Statistics of China; for Mexico, Instituto Nacional de Estadística y Geografía; for South Korea, Bank of Korea; all via Haver Analytics.

40.   24-month policy expectations for selected advanced
foreign economies
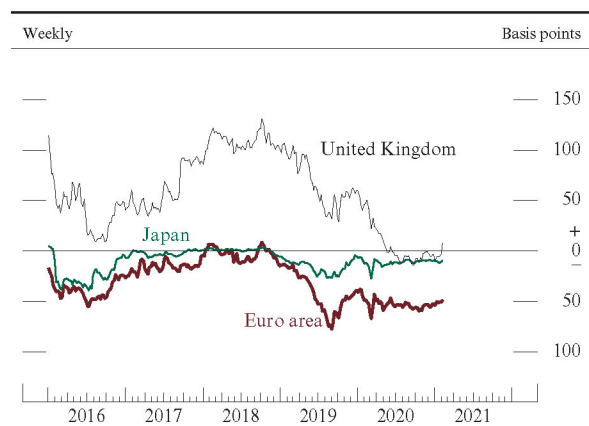
NOTE: The data are weekly averages of daily 24-month market-implied central bank policy rates. The 24-month policy rates are implied by quotes on overnight index swaps tied to the policy rates. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: Bloomberg; Federal Reserve Board staff estimations.

41.   Unemployment rate in selected advanced economies
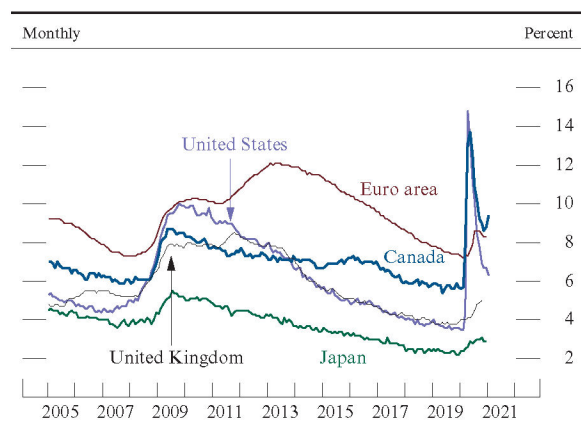
NOTE: The data for the United Kingdom extend through October 2020 and are centered 3-month averages of monthly data. The data for the euro area and Japan extend through December 2020.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of Health, Labour, and Welfare; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; for the United States, Bureau of Labor Statistics; all via Haver Analytics.

. . . with considerable policy support and subdued inflation

Efforts to contain the virus's resurgence in the fourth quarter prompted some foreign central banks and fiscal authorities to provide additional support to households and businesses, particularly in the AFEs. High debt levels limited the fiscal space in some EMEs, and emergency aid to sustain employment and household spending expired in some EMEs with elevated fiscal concerns. Monetary policy across foreign economies was highly accommodative, and financing conditions remained supportive of growth, with a few major AFE central banks introducing new stimulus measures late last year. Indeed, market-implied policy paths for the Japanese, U.K., and European central banks signal a prolonged period of monetary accommodation (figure 40).

Even with substantial policy support, AFE unemployment rates at the end of 2020 are higher than they were before the pandemic. Unemployment rates in Europe and Japan rose moderately during the spring and have remained relatively unchanged (figure 41). Canada, however, endured a large and rapid increase in unemployment during the spring and a commensurate decline by year-end, similar to the U.S. experience. The country-specific dynamics of unemployment partly reflect differences in labor market structures, employment protection regulations, and the expansion of wage subsidy programs. In general, unemployment rates in the EMEs increased since the start of the pandemic, and some Asian economies adopted direct wage subsidies to avert large dislocations in their labor markets.

Despite the recovery in activity and employment in some sectors of the economy, lower overall demand and continued uncertainty about the path of the virus helped keep inflation subdued abroad. In many foreign economies, inflation remains below central banks' targets. In the euro area and Japan, the consumer price index fell in 2020, reflecting subdued inflation expectations and persistent economic slack (figure 42).

Longer-term sovereign yields remained low, while risk sentiment improved . . .

Longer-term sovereign yields in major AFEs have moved up, on net, but remained near historically low levels amid continued monetary policy accommodation (figure 43). Foreign equity markets rebounded in the second half of 2020, reflecting not only supportive monetary and fiscal policies, but also the development of effective vaccines. Although AFE stock markets largely recovered, they still underperformed U.S. equities, with greater restrictions on activity abroad and a lower share of companies that benefited from the digital economy (figure 44).

42. Consumer price inflation in selected advanced foreign economies
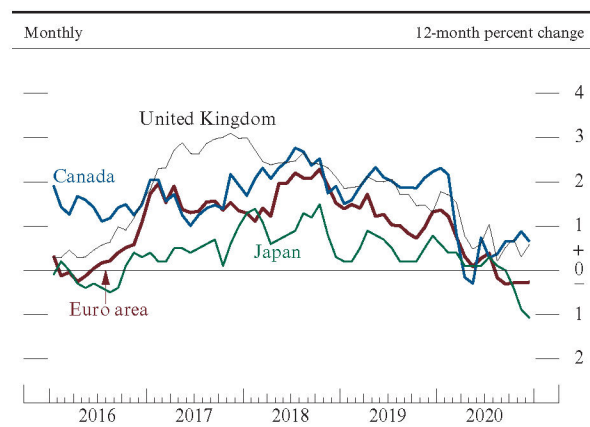
Monthly   12-month percent change

NOTE: The data extend through December 2020.
SOURCE: For the United Kingdom, Office for National Statistics; for Japan, Ministry of Internal Affairs and Communications; for the euro area, Statistical Office of the European Communities; for Canada, Statistics Canada; all via Haver Analytics.

43. Nominal 10-year government bond yields in selected advanced economies

Weekly   Percent
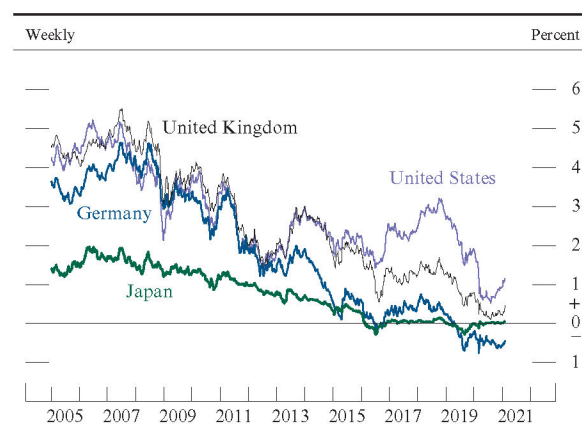
NOTE: The data are weekly averages of daily benchmark yields. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: Bloomberg.

44. Equity indexes for selected advanced economies

Weekly   Week ending January 6, 2016 = 100

NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 2021.
SOURCE: For euro area, DJ Euro Stoxx Index; for Japan, TOPIX Stock Index; for United Kingdom, FTSE 100 Stock Index; for United States, S&P 500 Index; all via Bloomberg. (For Dow Jones Indices licensing information, see the note on the Contents page.)

45.   Emerging market mutual fund flows and spreads
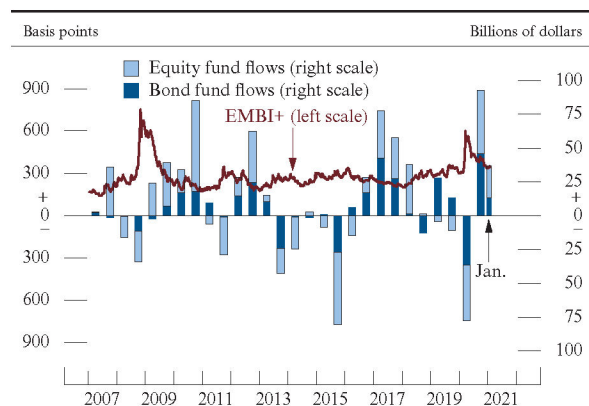
NOTE: The bond and equity fund flows data are semiannual sums of weekly data from December 28, 2006, to December 30, 2020, and a monthly sum of weekly data from December 31, 2020, to January 26, 2021. Weekly data span Thursday through Wednesday, and the semiannual and monthly values are sums over weekly data for weeks ending in that half year or month. The fund flows data exclude funds located in China. The J.P. Morgan Emerging Markets Bond Index Plus (EMBI+) data are weekly averages of daily data. The weekly data begin on Thursdays and extend through February 10, 2021. The EMBI+ data exclude Venezuela.

SOURCE: For bond and equity fund flows, EPFR Global; for EMBI+, J.P. Morgan Emerging Markets Bond Index Plus via Bloomberg.

46.   Equity indexes for selected emerging market economies

NOTE: The data are weekly averages of daily data. The data begin on Thursdays and extend through February 10, 2021.

SOURCE: For China, Shanghai Composite Index; for Brazil, Bovespa Index; for South Korea, Korean Composite Index; for Mexico, IPC Index; for Taiwan, TAIEX; all via Bloomberg.

EME equity markets have recovered since the spring, with recent strong capital inflows (figure 45). Asian equity indexes rose well above pre-pandemic levels, while those in Latin America posted modest gains relative to a year ago, largely reflecting Asian economies' lower infection rates, better fundamentals, and larger fiscal space to provide additional stimulus (figure 46). Along with the improvement in equity markets, sovereign borrowing spreads generally narrowed, although they are still above pre-pandemic levels.

. . . and the broad dollar depreciated

The broad dollar index—a measure of the trade-weighted value of the dollar against

foreign currencies—fell in the second half of last year. Both the continued improvement in market conditions following the stresses of last March and highly accommodative U.S. monetary policy contributed to dollar depreciation. On balance, the dollar has depreciated about 3.5 percent relative to a year ago (figure 47). The dollar broadly weakened against AFE currencies, notably the euro. The dollar also fell against some Asian emerging market currencies, particularly the Chinese renminbi and Korean won (figure 48).

47. U.S. dollar exchange rate indexes
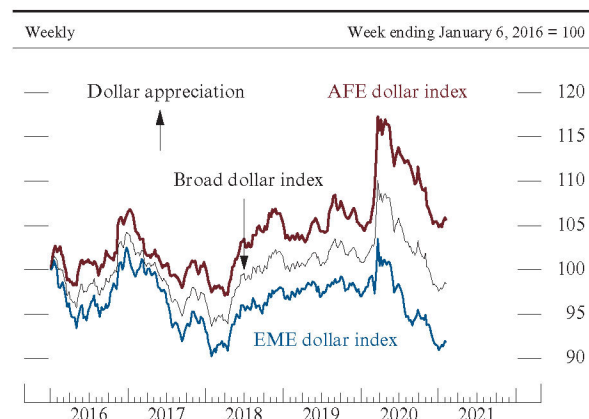
NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily values of the broad dollar index, advanced foreign economies (AFE) dollar index, and emerging market economies (EME) dollar index. The weekly data begin on Thursdays and extend through February 10, 2021. As indicated by the leftmost arrow, increases in the data reflect U.S. dollar appreciation and decreases reflect U.S. dollar depreciation.

SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

48. Exchange rate indexes for selected emerging market economies
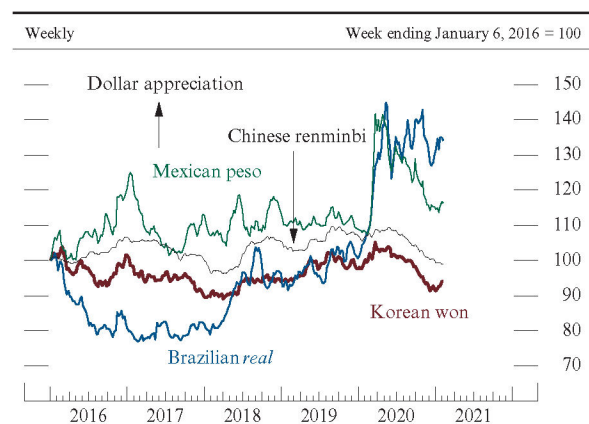
NOTE: The data, which are in foreign currency units per dollar, are weekly averages of daily data. The weekly data begin on Thursdays and extend through February 10, 2021. As indicated by the leftmost arrow, increases in the data reflect U.S. dollar appreciation and decreases reflect U.S. dollar depreciation.

SOURCE: Federal Reserve Board, Statistical Release H.10, "Foreign Exchange Rates."

PART 2
MONETARY POLICY

The Federal Open Market Committee maintained the federal funds rate near zero as it seeks to achieve maximum employment and inflation at the rate of 2 percent over the longer run . . .

In light of the effects of the continuing public health crisis on the economy and the associated risks to the outlook, the Federal Open Market Committee (FOMC) has maintained the target range for the federal funds rate at 0 to ¼ percent since March 2020, when the global pandemic led the Committee to quickly lower the target range to the effective lower bound (figure 49).[15] In its revised Statement on Longer-Run Goals and Monetary Policy Strategy, issued in August, the Committee reaffirmed its commitment to achieving maximum employment and inflation at the rate of 2 percent over the longer run and noted that "following periods when inflation has been running persistently below 2 percent,

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15. See the FOMC statements issued since the March meetings, which are available (along with other postmeeting statements) on the Monetary Policy portion of the Board's website at https://www.federalreserve.gov/monetarypolicy.htm.

appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time" so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent. (See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy.") The Committee expects to maintain an accommodative stance of monetary policy until these outcomes are achieved and has indicated that it expects it will be appropriate to maintain the target range for the federal funds rate at 0 to ¼ percent until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time.

. . . and the Committee increased the holdings of Treasury securities and agency mortgage-backed securities in the System Open Market Account

In addition, the Federal Reserve has continued to expand its holdings of Treasury securities by $80 billion per month and its holdings of

49. Selected interest rates
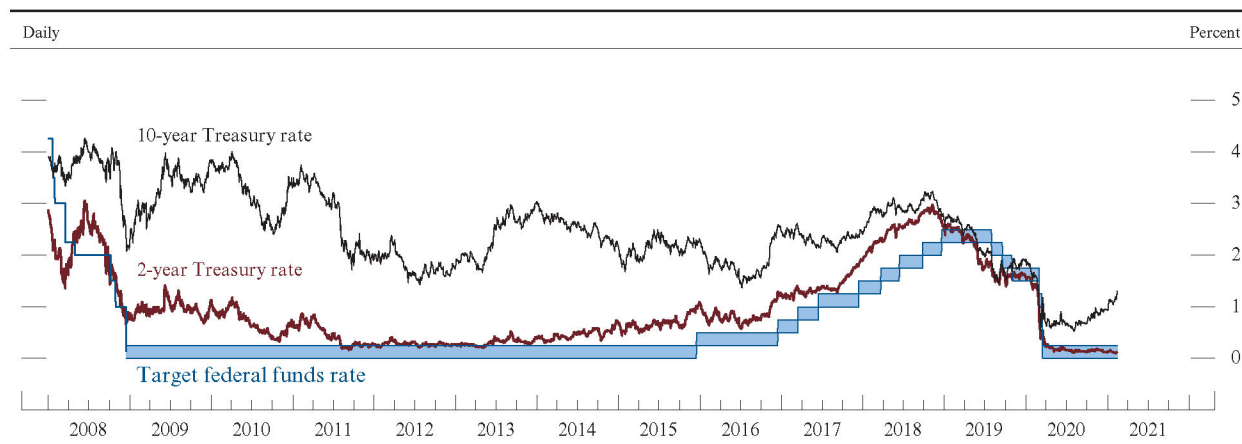
NOTE: The 2-year and 10-year Treasury rates are the constant-maturity yields based on the most actively traded securities.
SOURCE: Department of the Treasury; Federal Reserve Board.

The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy

On August 27, 2020, the Federal Open Market Committee (FOMC) issued a revised Statement on Longer-Run Goals and Monetary Policy Strategy.[1] This document, first released in January 2012, lays out the Committee's goals, articulates its framework for monetary policy, and serves as the foundation for its policy actions. The revised statement encapsulates the key conclusions from the Federal Reserve's review of the monetary policy strategy, tools, and communication practices it uses to pursue its statutory dual-mandate goals of maximum employment and price stability.

The review, which commenced in early 2019, was undertaken because the U.S. economy has changed in ways that matter for monetary policy. In particular, the neutral level of the policy interest rate—the policy rate consistent with the economy operating at full strength and with stable inflation—has fallen over recent decades in the United States and abroad. This decline in the neutral policy rate increases the risk that the effective lower bound (ELB) on interest rates will constrain central banks from reducing their policy interest rates enough to effectively support economic activity during downturns. In addition, during the economic expansion that followed the Global Financial Crisis—the longest U.S. expansion on record—the unemployment rate hovered near 50-year lows for roughly 2 years, resulting in new jobs and opportunities for many who have typically been left behind. At the same time, with brief exceptions, inflation ran below the Committee's 2 percent objective.

The revised statement begins by reaffirming the Committee's commitment to its statutory mandate from the Congress to promote maximum employment, price stability, and moderate long-term interest rates. It also describes the benefits of explaining policy actions to the public as clearly as possible. The statement then outlines important changes to the characterization of the Committee's policy framework for achieving its dual-mandate goals of maximum employment and price stability. After stating that economic variables fluctuate in response to disturbances and that monetary policy plays an important role in stabilizing the economy, the statement notes that the Committee's primary means of adjusting policy is through changes in the policy interest rate (the target range for the federal funds rate). Furthermore, because the neutral level of the policy rate is now lower than its historical average, "the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past." Therefore, "the Committee judges that downward risks to employment and inflation have increased." The statement then notes that the "Committee is prepared to use its full range of tools to achieve its maximum employment and price stability goals," indicating that it could deploy other policy tools, such as forward guidance and asset purchases, when the policy rate is at its ELB.

In its revised statement, the Committee characterizes maximum employment as a "broad-based and inclusive goal" in addition to saying—as it did in the 2012 statement—that maximum employment is not directly measurable and that it changes over time and depends largely on nonmonetary factors. During the *Fed Listens* events that were a pillar of the review of monetary policy strategy, tools, and communication practices, policymakers heard from a broad range of stakeholders in the U.S. economy about how monetary policy affects peoples' daily lives and livelihoods.[2]

(continued)

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1. The FOMC's revised Statement on Longer-Run Goals and Monetary Policy Strategy, which was unanimously reaffirmed at the FOMC's January 2021 meeting, appears in the front matter of this report. Additional information about the Federal Reserve's review of monetary policy strategy, tools, and communication practices and the revised statement is available on the Board's website at https://www.federalreserve. gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications.htm.

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2. Between February 2019 and May 2020, the Federal Reserve System hosted 15 *Fed Listens* events with representatives of the public. See Board of Governors of the Federal Reserve System (2020), *Fed Listens: Perspectives*

A key takeaway from these events was that a strong labor market during the late stages of an economic expansion—conditions that were in effect in 2019 and early 2020—offers significant benefits to residents of low- and moderate-income communities, primarily by providing employment opportunities for people who have had difficulty finding jobs in the past.

The revised statement says that "the Committee's policy decisions must be informed by assessments of the *shortfalls* [emphasis added] of employment from its maximum level" rather than by "deviations"— the word used in the earlier statement.[3] In previous decades, inflation tended to rise noticeably in response to a strengthening labor market. It was sometimes appropriate for the Fed to tighten monetary policy as employment rose toward its estimated maximum level in order to stave off an unwelcome rise in inflation. The change to "shortfalls" clarifies that, in the future, the Committee will not have concerns when employment runs at or above real-time estimates of its maximum level unless accompanied by signs of unwanted increases in inflation or the emergence of other risks that could impede the attainment of the dual-mandate goals.

The Committee's longer-run goal for inflation remains 2 percent, unchanged from the 2012 statement.[4] The revised statement emphasizes that

the FOMC's policy actions to achieve maximum employment and price stability will be most effective if longer-term inflation expectations remain well anchored at 2 percent. However, if inflation runs below 2 percent following economic downturns but never moves above 2 percent even when the economy is strong, then, over time, inflation will average less than 2 percent. Households and businesses will come to expect this result, meaning that inflation expectations would tend to move below the 2 percent inflation goal and pull down realized inflation. Lower inflation expectations also pull down the level of nominal interest rates, further diminishing the scope for monetary policy to reduce the policy rate during a downturn and further worsening economic outcomes. To prevent inflation expectations from falling below 2 percent and the adverse cycle that could ensue, the statement indicates that "the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."

The revised statement acknowledges that "sustainably achieving maximum employment and price stability depends on a stable financial system." Therefore, as with the 2012 statement, the Committee's policy decisions will take into account "its assessments of the balance of risks, including risks to the financial system that could impede the attainment" of the statutory goals.

The Committee concludes its revised statement by indicating its intention to undertake a review of the Federal Reserve's monetary policy strategy, tools, and communication practices roughly every five years. Conducting a review at regular intervals is a good institutional practice, provides valuable feedback, and enhances transparency and accountability.

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from the Public (Washington: Board of Governors, June), https://www.federalreserve.gov/publications/files/fedlistens-report-20200612.pdf. In addition, see the box "Federal Reserve Review of Monetary Policy Strategy, Tools, and Communication Practices" in Board of Governors of the Federal Reserve System (2020), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 40–41, https://www.federalreserve.gov/monetarypolicy/files/20200207_mprfullreport.pdf.

3. The most recent version of the 2012 statement is available on the Board's website at https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals_201901.pdf.

4. The inflation goal is measured by the annual change in the price index for personal consumption expenditures. The statement says: "The Committee reaffirms its judgment that inflation at the rate of 2 percent, as measured by the annual change in the price index for personal consumption

expenditures, is most consistent over the longer run with the Federal Reserve's statutory mandate."

agency mortgage-backed securities (MBS) by $40 billion per month. These asset purchases help foster smooth market functioning and accommodative financial conditions, thereby supporting the flow of credit to households and businesses. The Committee's current guidance regarding asset purchases indicates that increases in the holdings of Treasury securities and agency MBS in the System Open Market Account will continue at least at this pace until substantial further progress has been made toward its maximum-employment and price-stability goals. In addition, the minutes of the January 2021 FOMC meeting noted the importance attached to clear communications about the Committee's assessment of progress toward its longer-run goals well in advance of the time when progress could be judged substantial enough to warrant a change in the pace of purchases.[16]

The FOMC is committed to using its full range of tools to promote maximum employment and price stability

The ongoing public health crisis continues to weigh on economic activity, employment, and inflation, and it poses considerable risks to the economic outlook. The Federal Reserve is committed to using its full range of tools to support the U.S. economy in this challenging time, thereby promoting its maximum-employment and price-stability goals. The Committee will continue to monitor the implications of incoming information for the economic outlook and is prepared to adjust the stance of monetary policy as appropriate if risks emerge that could impede the attainment of the Committee's goals. The Committee's assessments will take into account a wide range of information, including readings on public health, labor market conditions, inflation pressures and inflation expectations, and financial and international developments.

In addition to evaluating a wide range of economic and financial data and information

gathered from business contacts and other informed parties around the country, policymakers routinely consult prescriptions for the policy interest rate provided by various monetary policy rules. Such prescriptions can provide useful benchmarks for the FOMC. Although simple rules cannot capture the complexities of monetary policy and many practical considerations make it undesirable for the FOMC to adhere strictly to the prescriptions of any specific rule, some principles of good monetary policy can be illustrated by these policy rules (see the box "Monetary Policy Rules and Shortfalls from Maximum Employment").

The size of the Federal Reserve's balance sheet has grown since the end of June, reflecting continued asset purchases of U.S. Treasury securities and agency mortgage-backed securities

The Federal Reserve's balance sheet has grown to $7.4 trillion from $7 trillion at the end of June, reflecting continued asset purchases to help foster accommodative financial conditions and smooth market functioning, thereby supporting the flow of credit to households and businesses (figure 50). The Federal Reserve has continued rolling over at auction all principal payments from its holdings of Treasury securities. Principal payments received from agency MBS and agency debt continue to be reinvested into agency MBS. Agency commercial mortgage-backed securities purchases have also continued, but in very small amounts.

The increase in asset holdings on the Federal Reserve's balance sheet due to Treasury securities and agency MBS purchases has been partially offset by declines in several other asset categories. Outstanding balances at many of the Federal Reserve's emergency liquidity and credit facilities have declined since June.[17]

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16. The minutes for the January 2021 FOMC meeting are available on the Board's website at https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm.

17. A list of funding, credit, liquidity, and loan facilities established by the Federal Reserve in response to COVID-19 is available on the Board's website at https://www.federalreserve.gov/funding-credit-liquidity-and-loan-facilities.htm.

50.   Federal Reserve assets and liabilities

Weekly   Trillions of dollars

- Other assets
- Credit and liquidity
- Agency debt and mortgage-backed securities holdings
- Treasury securities held outright

- Federal Reserve notes in circulation
- Deposits of depository institutions
- Capital and other liabilities

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
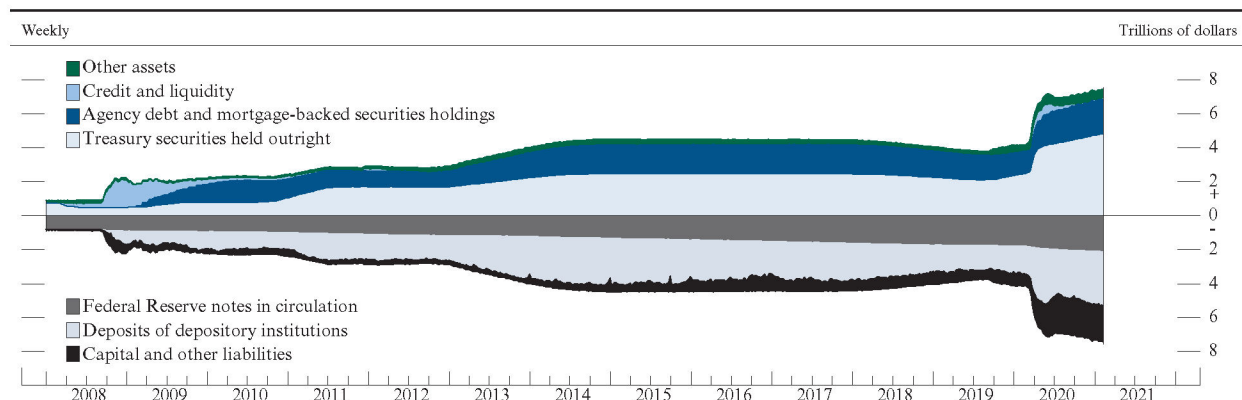
NOTE: "Agency debt and mortgage-backed securities holdings" includes agency residential mortgage-backed securities and agency commercial mortgage-backed securities. "Credit and liquidity facilities" consists of primary, secondary, and seasonal credit; term auction credit; central bank liquidity swaps; support for Maiden Lane, Bear Stearns Companies, Inc., and AIG; and other credit and liquidity facilities, including the Primary Dealer Credit Facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility, the Commercial Paper Funding Facility, the Term Asset-Backed Securities Loan Facility, the Primary and Secondary Market Corporate Credit Facilities, the Paycheck Protection Program Liquidity Facility, the Municipal Liquidity Facility, and the Main Street Lending Program. "Other assets" includes repurchase agreements, FIMA (Foreign and International Monetary Authorities) repurchase agreements, and unamortized premiums and discounts on securities held outright. "Capital and other liabilities" includes reverse repurchase agreements, the U.S. Treasury General Account, and the U.S. Treasury Supplementary Financing Account. The data extend through February 10, 2021. Key identifies shaded areas in order from top to bottom.
SOURCE: Federal Reserve Board, Statistical Release H.4.1, "Factors Affecting Reserve Balances."

In particular, outstanding balances for the Primary Dealer Credit Facility, Commercial Paper Funding Facility, and Money Market Mutual Fund Liquidity Facility have all fallen to near zero. Draws on central bank liquidity swap lines have decreased substantially, and, despite continued large-scale offerings, usage of repurchase operations has been essentially zero since their minimum bid rate was increased in mid-June (figure 51).

The expansion in the balance sheet was accompanied by a substantial increase in Federal Reserve liabilities, including reserve balances held by depository institutions as well as nonreserve liabilities such as currency and other deposits.

The Federal Reserve concluded the review of its strategic framework for monetary policy in the second half of 2020

Over 2019 and 2020, the Federal Reserve conducted a broad review of the monetary policy strategy, tools, and communication practices it uses to pursue its statutory dual-mandate goals of maximum employment and price stability. In addition to the release of

51.   Federal Reserve open market operations

Daily   Billions of dollars

- Overnight repos
- Outstanding term repos
- Cumulative MBS purchases
- Cumulative coupon purchases
- Cumulative bill purchases

Feb.   May   Aug.   Nov.   Feb.
       2020   2021
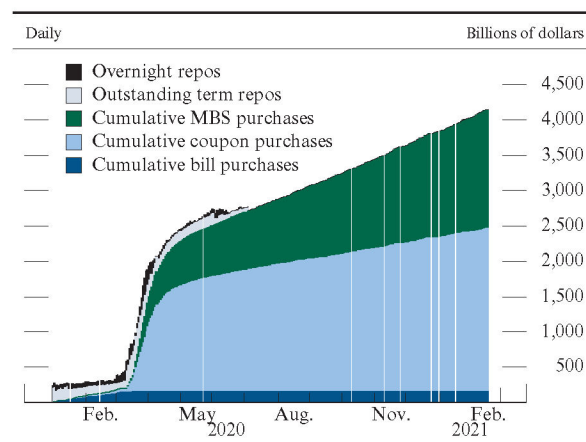
NOTE: The data are at a business-day frequency, excluding federal holidays. The data begin January 1, 2020. Repo is repurchase agreement. MBS is mortgage-backed security. Key identifies bars in order from top to bottom.
SOURCE: Federal Reserve Bank of New York; Federal Reserve Board staff calculations.

the revised Statement on Longer-Run Goals and Monetary Policy Strategy in August (see the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy"), analytical work that was prepared by Federal Reserve System staff and that served as background to the review was released to the public.[18]

In December, two changes were made to the Summary of Economic Projections (SEP)

to enhance the information provided to the public. First, the release of the full set of SEP exhibits was accelerated by three weeks: Starting with the December 2020 meeting, the FOMC began releasing all SEP exhibits on the day of the policy decision (following the conclusion of an FOMC meeting) rather than with the release of the FOMC meeting minutes. As such, the written summary of the projections that had been included as an addendum to the minutes of the corresponding FOMC meeting was discontinued. Second, two new exhibits were added that display a time series of diffusion indexes for participants' judgments of uncertainty and risks. These diffusion indexes illustrate how FOMC participants' assessments of uncertainties and risks have evolved over time.

18. A report on the *Fed Listens* initiative, a key component of the review process, was released in June 2020 and is available on the Board's website at https://www.federalreserve.gov/publications/files/ fedlistens-report-20200612.pdf. The analytical materials prepared by System staff are accessible from the Board's main webpage on the review (https://www.federalreserve. gov/monetarypolicy/review-of-monetary-policy-strategy- tools-and-communications.htm).

Monetary Policy Rules and Shortfalls from Maximum Employment

Simple interest rate rules relate a policy interest rate, such as the federal funds rate, to a small number of other economic variables—typically including the deviation of inflation from its target value and a measure of resource slack in the economy. Policymakers consult policy rate prescriptions derived from a variety of policy rules as part of their monetary policy deliberations without mechanically following the prescriptions of any particular rule. Most rules analyzed in the research literature respond to deviations—both positive and negative—of resource utilization from its longer-run level because their design was informed by historical periods and economic models in which high resource utilization and a strong labor market are accompanied by inflation pressure and in which policy rates remain well above the effective lower bound (ELB).

Economic performance in recent decades, including during the previous economic expansion, has demonstrated that a strong labor market can be sustained without inducing an unwanted increase in inflation. During that expansion, the unemployment rate fell to low levels—it remained at or below 4 percent from early 2018 until the start of the pandemic—bringing many benefits to families and communities that, all too often, had been left behind, with no sign of excessive pressures on prices. The lack of undue inflation pressures during this period illustrates that a strong labor market, by itself, need not cause concern unless accompanied by signs of unwanted increases in inflation or the emergence of other risks that could impede the attainment of the Committee's goals. In addition, the expansion reinforced the view that assessments of the maximum level of employment are imprecise and may change over time.[1] Tightening monetary policy in the absence of evidence of excessive inflation pressures may result in an unwarranted loss of opportunity for many Americans, whereas if an undue increase in inflation were to arise, policymakers would have the tools to address such an increase. Reflecting these considerations, the Federal Open Market Committee's (FOMC) revised Statement on Longer-Run Goals and Monetary Policy Strategy refers to "shortfalls of employment" from the Committee's assessment of its maximum level rather than the "deviations of employment" used in the previous statement.[2] This change has important implications for the design of simple interest rate rules.

This discussion examines the prescriptions from a number of commonly studied monetary policy rules, along with the prescriptions from a modified simple rule that, all else being equal, would not call for increasing the policy rate as employment moves higher and unemployment drops below its estimated longer-run level. This modified rule aims to illustrate, in a simple way, the Committee's focus on shortfalls of employment from assessments of its maximum level. Other key changes to the Committee's monetary policy strategy, including the aim of having inflation average 2 percent over time to ensure that longer-term inflation expectations remain well anchored, are not incorporated in the simple rules analyzed in this discussion.

Policy Rules: Some Key Design Principles and Limitations

In many stylized models of the economy, desirable economic outcomes can be achieved by following a monetary policy rule that incorporates key principles of good monetary policy. One such principle is that monetary policy should respond in a predictable way to changes in economic conditions, thus fostering public understanding of policymakers' goals and strategy.[3] A second principle is that, to stabilize inflation, the policy rate should be adjusted over time in response to persistent increases or decreases in inflation to an extent sufficient to ensure a return of inflation to the longer-run objective.

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1. In recent years, forecasters covered by the Blue Chip Survey, as well as FOMC participants in the Summary of Economic Projections, have substantially reduced their implied estimates of the unemployment rate that is sustainable in the longer run. For a discussion, see the box "Monetary Policy Rules and Uncertainty in Monetary Policy Settings" in Board of Governors of the Federal Reserve System (2020), *Monetary Policy Report* (Washington: Board of Governors, February), pp. 33–37, https://www.federalreserve.gov/monetarypolicy/files/20200207_mprfullreport.pdf.

2. See the box "The FOMC's Revised Statement on Longer-Run Goals and Monetary Policy Strategy" (earlier in Part 2) for a discussion of this change and other changes made to the statement.

3. The effectiveness of monetary policy is enhanced when it is well understood by the public. For a discussion of how the public's understanding of monetary policy matters for the effectiveness of monetary policy, see Janet L. Yellen (2012), "Revolution and Evolution in Central Bank Communications," speech delivered at the Haas School of Business, University of California, Berkeley, November 13, https://www.federalreserve.gov/newsevents/speech/yellen20121113a.htm.

Monetary Policy Rules *(continued)*

Simple monetary policy rules also have important limitations. A first limitation is that many formulations of simple rules do not recognize that the ELB limits the extent that the policy rate can be lowered to support the economy, which may impart a downward bias to both inflation and inflation expectations. As part of the FOMC's revised strategy to mitigate the challenges posed by the ELB and anchor longer-term inflation expectations at 2 percent, the Committee states that it "seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time." None of the simple rules analyzed in this discussion take into account average inflation performance or developments in measures of inflation expectations. As such, they do not reflect this important aspect of the FOMC's monetary policy strategy.[4]

A second limitation is that simple rules respond to only a small set of economic variables and thus necessarily abstract from many of the considerations taken into account by the FOMC. For example, a simple rule might respond to movements in a specific labor market indicator, such as the overall unemployment rate. However, no single labor market indicator can precisely capture the size of the shortfall from maximum employment or identify when a strong labor market can be sustained without putting undue upward pressure on inflation.[5] A third limitation of simple rules for the policy rate is that they generally do not recognize the fact that the monetary policy toolkit includes other tools—notably, large-scale asset purchases and forward guidance, which are especially relevant when the policy rate is near or at the ELB.

Policy Rules: Historical Prescriptions

Economists have analyzed many monetary policy rules, including the well-known Taylor (1993) rule, the "balanced approach" rule, the "adjusted Taylor (1993)" rule, and the "first difference" rule.[6] In addition to these rules, figure A shows a "balanced approach (shortfalls)" rule, which represents one simple way to illustrate the Committee's focus on shortfalls from maximum employment. All of the policy rules analyzed in this discussion embody the key principles of good monetary policy previously noted. They are also subject to the associated limitations. Thus, the balanced-approach (shortfalls) rule, as is the case with all simple rules, does not fully capture the monetary policy strategy that the FOMC announced in August 2020.

All five rules feature the unemployment rate gap, measured as the difference between an estimate of the rate of unemployment in the longer run (u_t^{LR}) and the current unemployment rate; the first-difference rule includes the change in the unemployment rate gap rather than its level.[7] All of the rules abstract from the uncertainty affecting estimates of the unemployment rate gap. In addition, all of the rules include the

(continued)

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4. For a discussion of policy strategies that seek to make up for past inflation shortfalls, see Jonas Arias, Martin Bodenstein, Hess Chung, Thorsten Drautzburg, and Andrea Raffo (2020), "Alternative Strategies: How Do They Work? How Might They Help?" Finance and Economics Discussion Series 2020-068 (Washington: Board of Governors of the Federal Reserve System, August), https://dx.doi.org/10.17016/FEDS.2020.068; and James Hebden, Edward P. Herbst, Jenny Tang, Giorgio Topa, and Fabian Winkler (2020), "How Robust Are Makeup Strategies to Key Alternative Assumptions?" Finance and Economics Discussion Series 2020-069 (Washington: Board of Governors of the Federal Reserve System, August), https://dx.doi.org/10.17016/FEDS.2020.069.

5. See Lael Brainard (2020), "Achieving a Broad-Based and Inclusive Recovery," speech delivered at "Post-COVID—Policy Challenges for the Global Economy," Society of Professional Economists Annual Online Conference (via webcast), October 21, https://www.federalreserve.gov/newsevents/speech/brainard20201021a.htm.

6. The Taylor (1993) rule was suggested in John B. Taylor (1993), "Discretion versus Policy Rules in Practice," *Carnegie-Rochester Conference Series on Public Policy,* vol. 39 (December), pp. 195–214. The balanced-approach rule was analyzed in John B. Taylor (1999), "A Historical Analysis of Monetary Policy Rules," in John B. Taylor, ed., *Monetary Policy Rules* (Chicago: University of Chicago Press), pp. 319–41. The adjusted Taylor (1993) rule was studied in David Reifschneider and John C. Williams (2000), "Three Lessons for Monetary Policy in a Low-Inflation Era," *Journal of Money, Credit and Banking,* vol. 32 (November), pp. 936–66. The first-difference rule is based on a rule suggested in Athanasios Orphanides (2003), "Historical Monetary Policy Analysis and the Taylor Rule," *Journal of Monetary Economics,* vol. 50 (July), pp. 983–1022. A review of policy rules is in John B. Taylor and John C. Williams (2011), "Simple and Robust Rules for Monetary Policy," in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics,* vol. 3B (Amsterdam: North-Holland), pp. 829–59. The same volume of the *Handbook of Monetary Economics* also discusses approaches other than policy rules for deriving policy rate prescriptions.

7. The original Taylor (1993) rule represented slack in resource utilization using an output gap (the difference between the current level of real gross domestic product (GDP) and the level that GDP would be if the economy were operating at maximum employment, measured in percent of the latter). The rules in figure A represent slack in resource utilization using the unemployment rate gap instead, because that gap better captures the FOMC's statutory goal to promote maximum employment. However, movements in these alternative measures of resource utilization are highly correlated. For more information, see the note below figure A.

A. Monetary policy rules

Taylor (1993) rule	$R_t^{T93} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t)$
Balanced-approach rule	$R_t^{BA} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2(u_t^{LR} - u_t)$
Balanced-approach (shortfalls) rule	$R_t^{BAS} = r_t^{LR} + \pi_t + 0.5(\pi_t - \pi^{LR}) + 2min\{(u_t^{LR} - u_t), 0\}$
Adjusted Taylor (1993) rule	$R_t^{T93adj} = max\{R_t^{T93} - Z_t, \text{ELB}\}$
First-difference rule	$R_t^{FD} = R_{t-1} + 0.5(\pi_t - \pi^{LR}) + (u_t^{LR} - u_t) - (u_{t-4}^{LR} - u_{t-4})$

NOTE: R_t^{T93}, R_t^{BA}, R_t^{BAS}, R_t^{T93adj}, and R_t^{FD} represent the values of the nominal federal funds rate prescribed by the Taylor (1993), balanced-approach, balanced-approach (shortfalls), adjusted Taylor (1993), and first-difference rules, respectively.

R_t denotes the realized nominal federal funds rate for quarter t, π_t is the four-quarter price inflation for quarter t, u_t is the unemployment rate in quarter t, and r_t^{LR} is the level of the neutral real federal funds rate in the longer run that is expected to be consistent with sustaining maximum employment and inflation at the FOMC's 2 percent longer-run objective, denoted π^{LR}. In addition, u_t^{LR} is the rate of unemployment expected in the longer run. Z_t is the cumulative sum of past deviations of the federal funds rate from the prescriptions of the Taylor (1993) rule when that rule prescribes setting the federal funds rate below an ELB of 12.5 basis points.

The Taylor (1993) rule and other policy rules are generally written in terms of the deviation of real output from its full capacity level. In these equations, the output gap has been replaced with the gap between the rate of unemployment in the longer run and its actual level (using a relationship known as Okun's law) to represent the rules in terms of the unemployment rate gap. The rules are implemented as responding to core PCE inflation rather than to headline PCE inflation because current and near-term core inflation rates tend to outperform headline inflation rates as predictors of the medium-term behavior of headline inflation. Box note 6 provides references for the policy rules.

difference between inflation and the FOMC's longer-run objective of 2 percent. All but the first-difference rule include an estimate of the neutral real interest rate in the longer run (r_t^{LR}).[8]

By construction, the balanced-approach (shortfalls) rule prescribes identical policy rates to those prescribed by the balanced-approach rule at times when the unemployment rate is above its estimated longer-run level. However, when the unemployment rate is below that level, the balanced-approach (shortfalls) rule is more accommodative than the balanced-approach rule because it does not call for the policy rate to rise as the unemployment rate drops further.

Contrary to the other simple rules featured here, the adjusted Taylor (1993) rule recognizes that the federal funds rate cannot be reduced materially below the ELB. To make up for the cumulative shortfall in accommodation following a recession during which the federal funds rate has fallen to its ELB, the adjusted Taylor (1993) rule prescribes only a gradual return of the policy rate to the (positive) levels prescribed by the standard Taylor (1993) rule after the economy begins to recover.

Figure B shows historical prescriptions for the federal funds rate from the five rules. For each period, the figure reports the policy rates prescribed by the rules, taking as given the prevailing economic conditions and estimates of u_t^{LR} and r_t^{LR} at the time. The four rules whose formulas do not impose the ELB imply prescriptions of strongly negative policy rates in response to the pandemic-driven recession, well below their respective troughs in the 2008–09 recession. These deeply negative prescribed policy rates show the extent to which policymakers' ability to support the economy through cuts in the policy rate was constrained by

8. The neutral real interest rate in the longer run (r_t^{LR}) is the level of the real federal funds rate that is expected to be consistent, in the longer run, with maximum employment and stable inflation. Like u_t^{LR}, r_t^{LR} is determined largely by nonmonetary factors. The expression of the first-difference rule shown in figure A does not involve an estimate of r_t^{LR}. However, this rule has its own shortcomings. For example, research suggests that this sort of rule often results in greater volatility in employment and inflation relative to what would be obtained under the Taylor (1993) and balanced-approach rules.

Monetary Policy Rules *(continued)*

B.   Historical federal funds rate prescriptions from simple policy rules
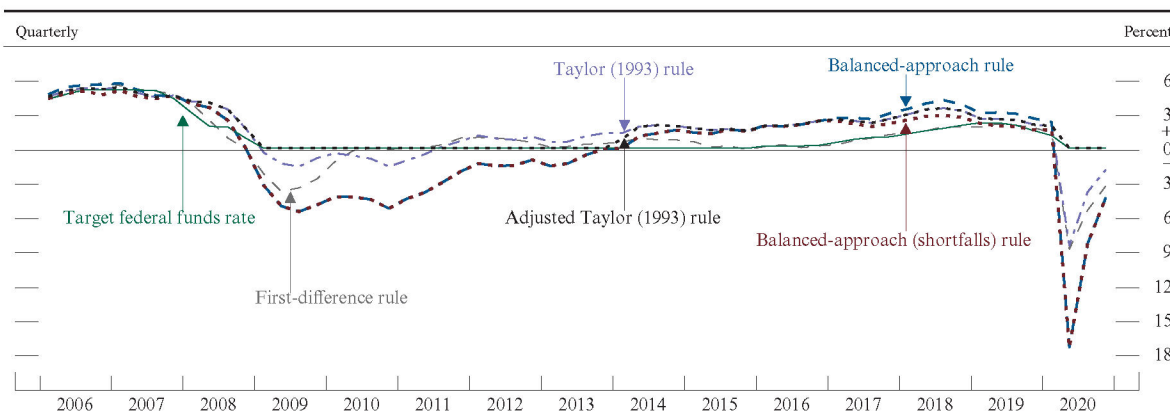
NOTE: The rules use historical values of the federal funds rate, core personal consumption expenditure inflation, and the unemployment rate. Quarterly projections of longer-run values for the federal funds rate and the unemployment rate are derived through interpolations of the biannual projections from Blue Chip Economic Indicators. The longer-run value for inflation is taken as 2 percent.
SOURCE: Federal Reserve Bank of Philadelphia; Wolters Kluwer, Blue Chip Economic Indicators; Federal Reserve Board staff estimates.

the ELB during the pandemic-driven recession—a constraint that helped motivate the FOMC's other policy actions at the time, including forward guidance and asset purchases.

Regarding the recovery from the 2008–09 recession, all of the simple rules shown here prescribe departure from the ELB well before the FOMC determined that it was appropriate to do so. The FOMC's judgment that it was appropriate to maintain a more accommodative path of the federal funds rate than prescribed by these rules was informed by a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.

The balanced-approach (shortfalls) rule calls for lower policy rates than the balanced-approach rule at times when unemployment is below its estimated longer-run level, thus providing somewhat more policy accommodation during the 2006–07 period and from late 2016 until the start of the pandemic. The fact that the policy rate prescriptions for the balanced-approach and balanced-approach (shortfalls) rules coincide from the 2008–09 recession up to the end of 2016 reflects the slow recovery in this period, during which unemployment remained above real-time estimates of its longer-run level.

Although these two rules prescribe identical policy rates over most of the period shown, including departure from the ELB about two years before the actual departure in December 2015, one should not conclude that they generally offer a similar degree of policy accommodation. Had the previous economic expansion not been cut short by the pandemic, the balanced-approach (shortfalls) rule would likely have continued to prescribe a lower policy rate than the balanced-approach rule. In addition, knowledge on the part of households and businesses that policymakers will respond to shortfalls rather than deviations from maximum employment can, in practice, help foster more accommodative financial conditions even when employment is below its maximum level because financial conditions are affected by the expected path of the policy rate. Expectations of lower policy rates in the future—once employment has recovered—can reduce longer-term interest rates, support accommodative financial conditions, and encourage aggregate spending in the present. These observations underline the importance of communication about future policy actions and demonstrate how a shift in focus to employment shortfalls, in the context of a simple rule, can provide more policy accommodation—even during times like today when employment remains depressed.

PART 3
SUMMARY OF ECONOMIC PROJECTIONS

The following material was released after the conclusion of the December 15–16, 2020, meeting of the Federal Open Market Committee.

In conjunction with the Federal Open Market Committee (FOMC) meeting held on December 15–16, 2020, meeting participants submitted their projections of the most likely outcomes for real gross domestic product (GDP) growth, the unemployment rate, and inflation for each year from 2020 to 2023 and over the longer run. Each participant's projections were based on information available at the time of the meeting, together with her or his assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other factors likely to affect economic outcomes. The longer-

run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the statutory mandate to promote maximum employment and price stability.

Beginning with the December 2020 FOMC meeting, all Summary of Economic

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, December 2020
Percent

Variable	Median[1]					Central tendency[2]					Range[3]				
	2020	2021	2022	2023	Longer run	2020	2021	2022	2023	Longer run	2020	2021	2022	2023	Longer run
Change in real GDP....	-2.4	4.2	3.2	2.4	1.8	-2.5--2.2	3.7-5.0	3.0-3.5	2.2-2.7	1.7-2.0	-3.3--1.0	0.5-5.5	2.5-4.0	2.0-3.5	1.6-2.2
September projection	-3.7	4.0	3.0	2.5	1.9	-4.0--3.0	3.6-4.7	2.5-3.3	2.4-3.0	1.7-2.0	-5.5-1.0	0.0-5.5	2.0-4.5	2.0-4.0	1.6-2.2
Unemployment rate....	6.7	5.0	4.2	3.7	4.1	6.7-6.8	4.7-5.4	3.8-4.6	3.5-4.3	3.9-4.3	6.6-6.9	4.0-6.8	3.5-5.8	3.3-5.0	3.5-4.5
September projection	7.6	5.5	4.6	4.0	4.1	7.0-8.0	5.0-6.2	4.0-5.0	3.5-4.4	3.9-4.3	6.5-8.0	4.0-8.0	3.5-7.5	3.5-6.0	3.5-4.7
PCE inflation..........	1.2	1.8	1.9	2.0	2.0	1.2	1.7-1.9	1.8-2.0	1.9-2.1	2.0	1.1-1.4	1.2-2.3	1.5-2.2	1.7-2.2	2.0
September projection	1.2	1.7	1.8	2.0	2.0	1.1-1.3	1.6-1.9	1.7-1.9	1.9-2.0	2.0	1.0-1.5	1.3-2.4	1.5-2.2	1.7-2.1	2.0
Core PCE inflation[4]....	1.4	1.8	1.9	2.0		1.4	1.7-1.8	1.8-2.0	1.9-2.1		1.3-1.5	1.5-2.3	1.6-2.2	1.7-2.2	
September projection	1.5	1.7	1.8	2.0		1.3-1.5	1.6-1.8	1.7-1.9	1.9-2.0		1.2-1.6	1.5-2.4	1.6-2.2	1.7-2.1	
Memo: Projected appropriate policy path															
Federal funds rate	0.1	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1-0.4	2.3-2.5	0.1	0.1	0.1-0.4	0.1-1.1	2.0-3.0
September projection	0.1	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1-0.4	2.3-2.5	0.1	0.1	0.1-0.6	0.1-1.4	2.0-3.0

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 15–16, 2020. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 15–16, 2020, meeting, and one participant did not submit such projections in conjunction with the December 15–16, 2020, meeting.

1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.

2. The central tendency excludes the three highest and three lowest projections for each variable in each year.

3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.

4. Longer-run projections for core PCE inflation are not collected.

Table 2. Average historical projection error ranges
Percentage points

Variable	2020	2021	2022	2023
Change in real GDP[1]	±0.8	±1.5	±1.9	±2.0
Unemployment rate[1]	±0.1	±0.8	±1.4	±1.9
Total consumer prices[2]	±0.2	±0.9	±1.0	±0.9
Short-term interest rates[3] . .	±0.1	±1.4	±2.0	±2.4

NOTE: Error ranges shown are measured as plus or minus the root mean squared error of projections for 2000 through 2019 that were released in the winter by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors: The Federal Reserve's Approach," Finance and Economics Discussion Series 2017-020 (Washington: Board of Governors of the Federal Reserve System, February), https://dx.doi.org/10.17016/FEDS.2017.020.

1. Definitions of variables are in the general note to table 1.
2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projections are percent changes on a fourth quarter to fourth quarter basis.
3. For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Projection errors are calculated using average levels, in percent, in the fourth quarter.

Projections charts and tables previously released with the minutes of a meeting will be released following the conclusion of an FOMC meeting. That is, the release of the distribution of participants' projections (Figures 3.A. through 3.E.), participants' assessments of uncertainty and risks associated with the projections (Figures 4.A. through 4.C. and Figure 5), and Table 2 and associated box, which describe projection error ranges, have been accelerated by three weeks. Two new exhibits, Figures 4.D. and 4.E., have been added to further enhance the information provided on uncertainty and risks by showing how FOMC participants' assessments of uncertainties and risks have evolved over time.

Figure 1. Medians, central tendencies, and ranges of economic projections, 2020–23 and over the longer run
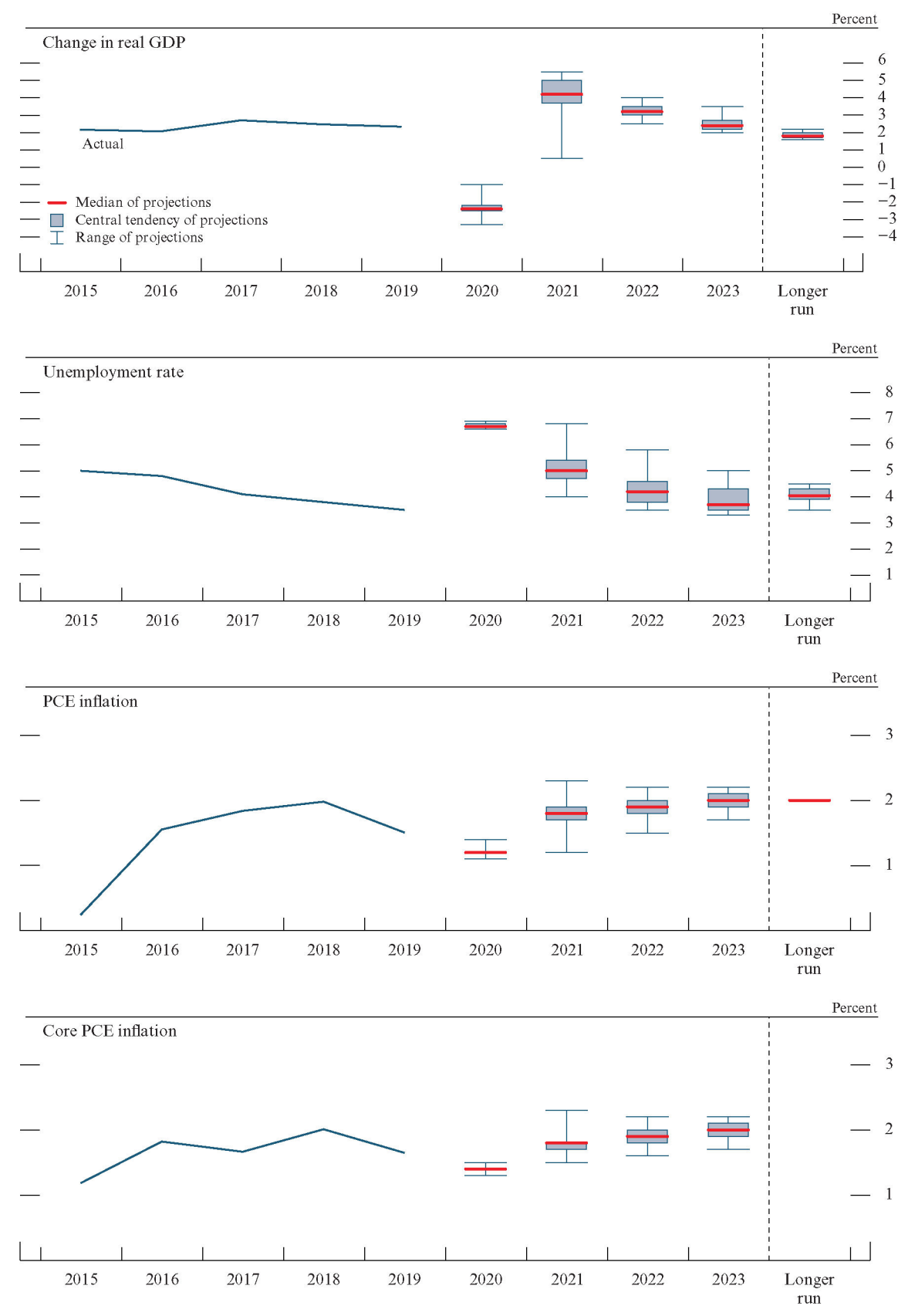
Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate
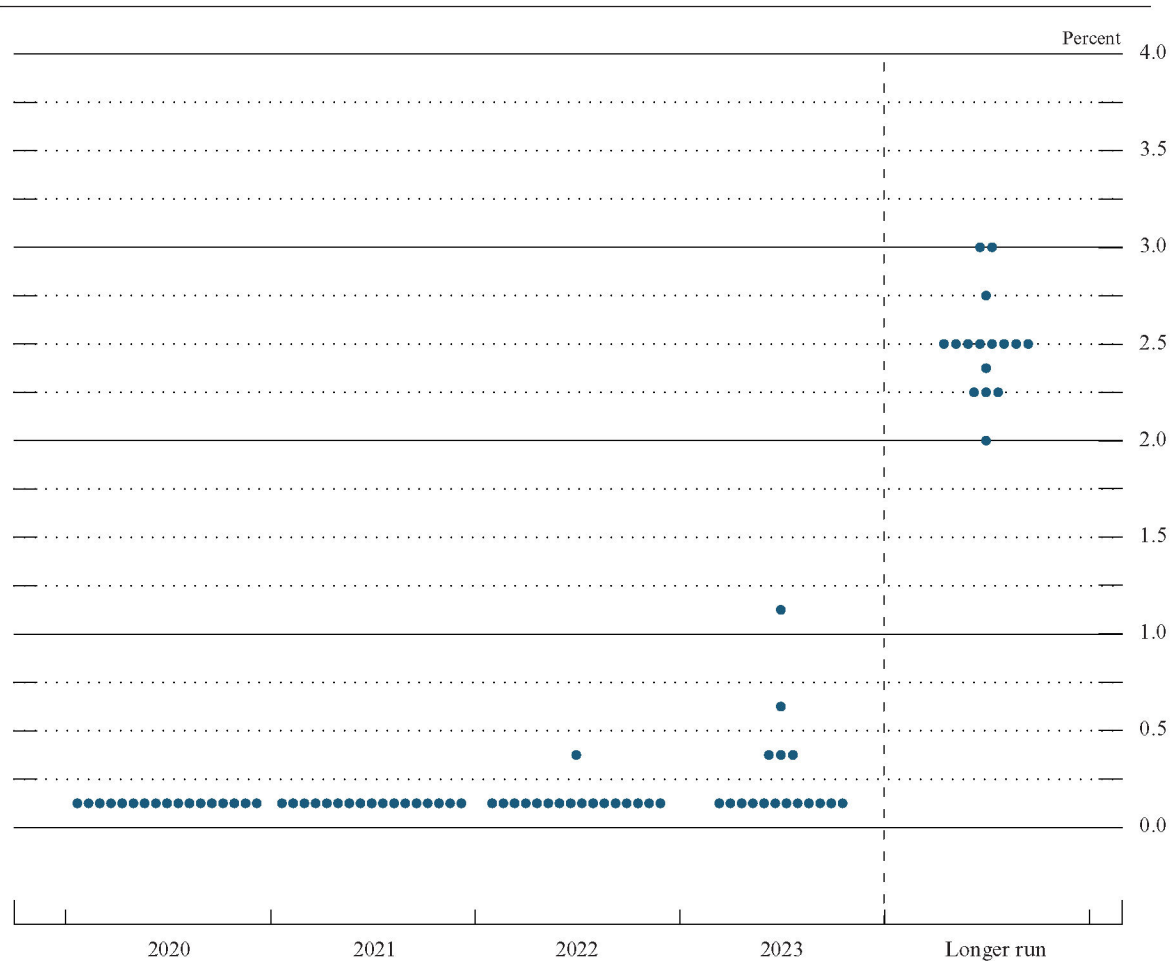
NOTE: Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. One participant did not submit longer-run projections for the federal funds rate.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2020–23 and over the longer run

2020

Number of participants

□ December projections
— September projections

−5.8– −5.2– −4.6– −4.0– −3.4– −2.8– −2.2– −1.6– −1.0– −0.4– 0.2– 0.8– 1.4– 2.0– 2.6– 3.2– 3.8– 4.4– 5.0–
−5.7 −5.1 −4.5 −3.9 −3.3 −2.7 −2.1 −1.5 −0.9 −0.3 0.3   0.9   1.5   2.1   2.7   3.3   3.9   4.5   5.1

Percent range

2021

Number of participants

−5.8– −5.2– −4.6– −4.0– −3.4– −2.8– −2.2– −1.6– −1.0– −0.4– 0.2– 0.8– 1.4– 2.0– 2.6– 3.2– 3.8– 4.4– 5.0–
−5.7 −5.1 −4.5 −3.9 −3.3 −2.7 −2.1 −1.5 −0.9 −0.3 0.3   0.9   1.5   2.1   2.7   3.3   3.9   4.5   5.1

Percent range

2022

Number of participants

−5.8– −5.2– −4.6– −4.0– −3.4– −2.8– −2.2– −1.6– −1.0– −0.4– 0.2– 0.8– 1.4– 2.0– 2.6– 3.2– 3.8– 4.4– 5.0–
−5.7 −5.1 −4.5 −3.9 −3.3 −2.7 −2.1 −1.5 −0.9 −0.3 0.3   0.9   1.5   2.1   2.7   3.3   3.9   4.5   5.1

Percent range

2023

Number of participants

−5.8– −5.2– −4.6– −4.0– −3.4– −2.8– −2.2– −1.6– −1.0– −0.4– 0.2– 0.8– 1.4– 2.0– 2.6– 3.2– 3.8– 4.4– 5.0–
−5.7 −5.1 −4.5 −3.9 −3.3 −2.7 −2.1 −1.5 −0.9 −0.3 0.3   0.9   1.5   2.1   2.7   3.3   3.9   4.5   5.1

Percent range

Longer run

Number of participants

−5.8– −5.2– −4.6– −4.0– −3.4– −2.8– −2.2– −1.6– −1.0– −0.4– 0.2– 0.8– 1.4– 2.0– 2.6– 3.2– 3.8– 4.4– 5.0–
−5.7 −5.1 −4.5 −3.9 −3.3 −2.7 −2.1 −1.5 −0.9 −0.3 0.3   0.9   1.5   2.1   2.7   3.3   3.9   4.5   5.1

Percent range

NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2020–23 and over the longer run
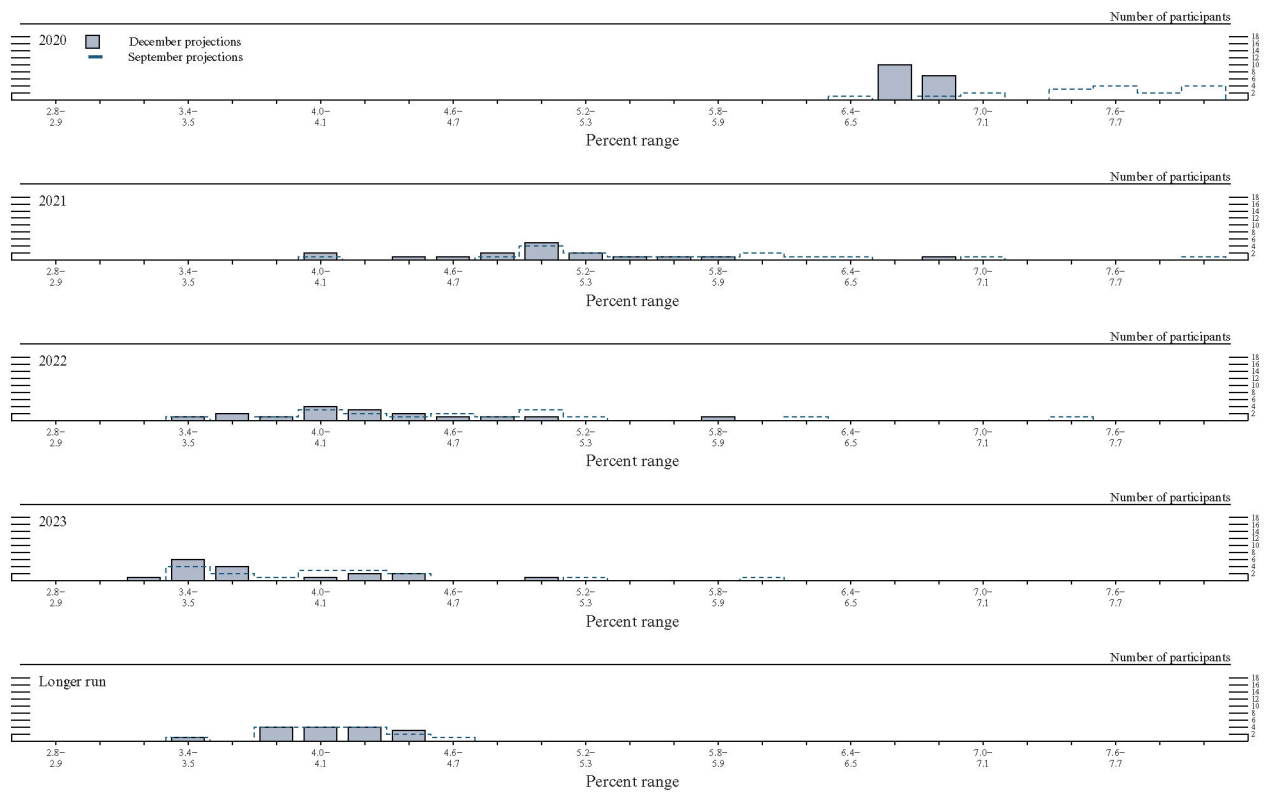
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2020–23 and over the longer run
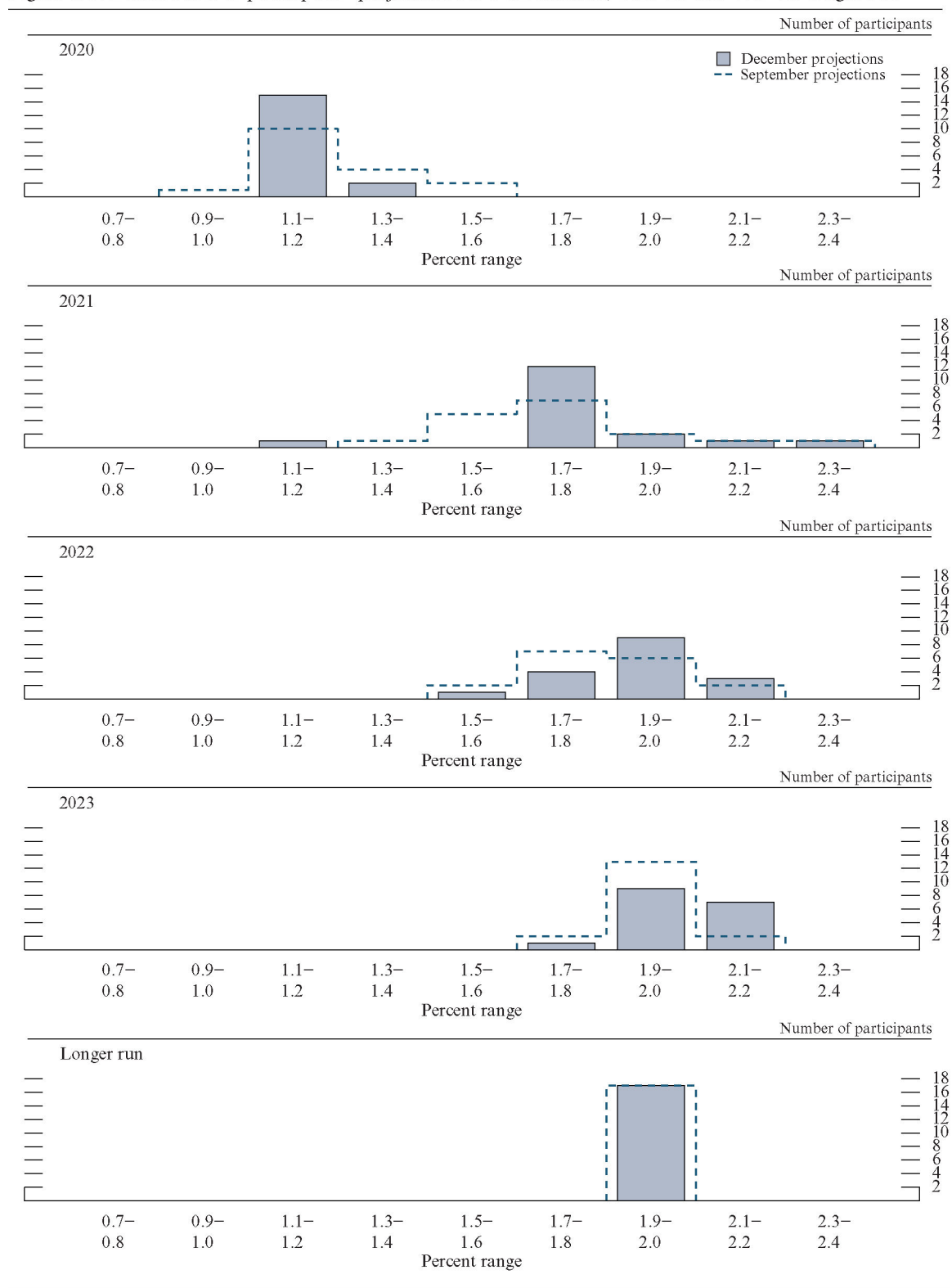
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2020–23
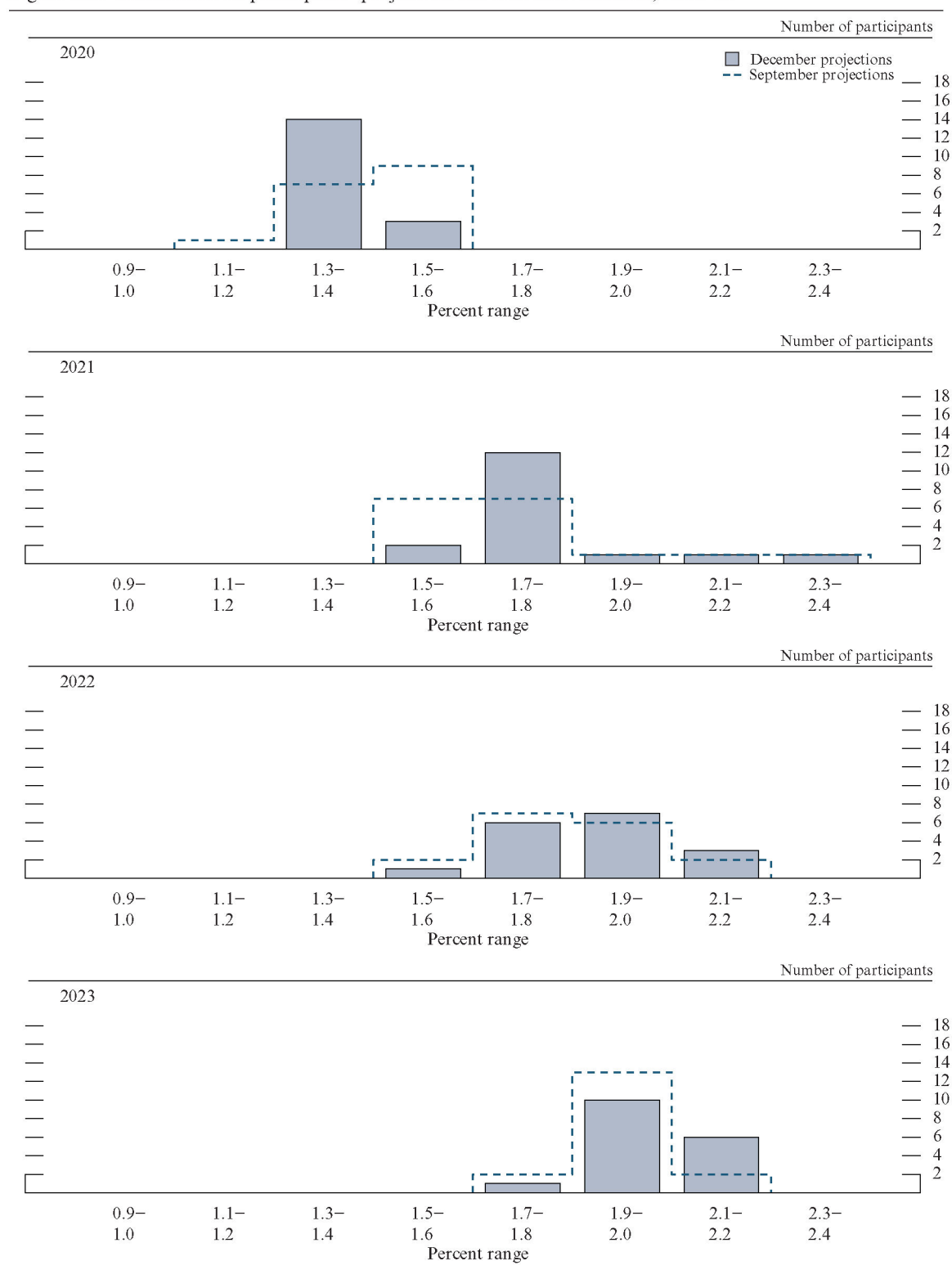
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2020–23 and over the longer run
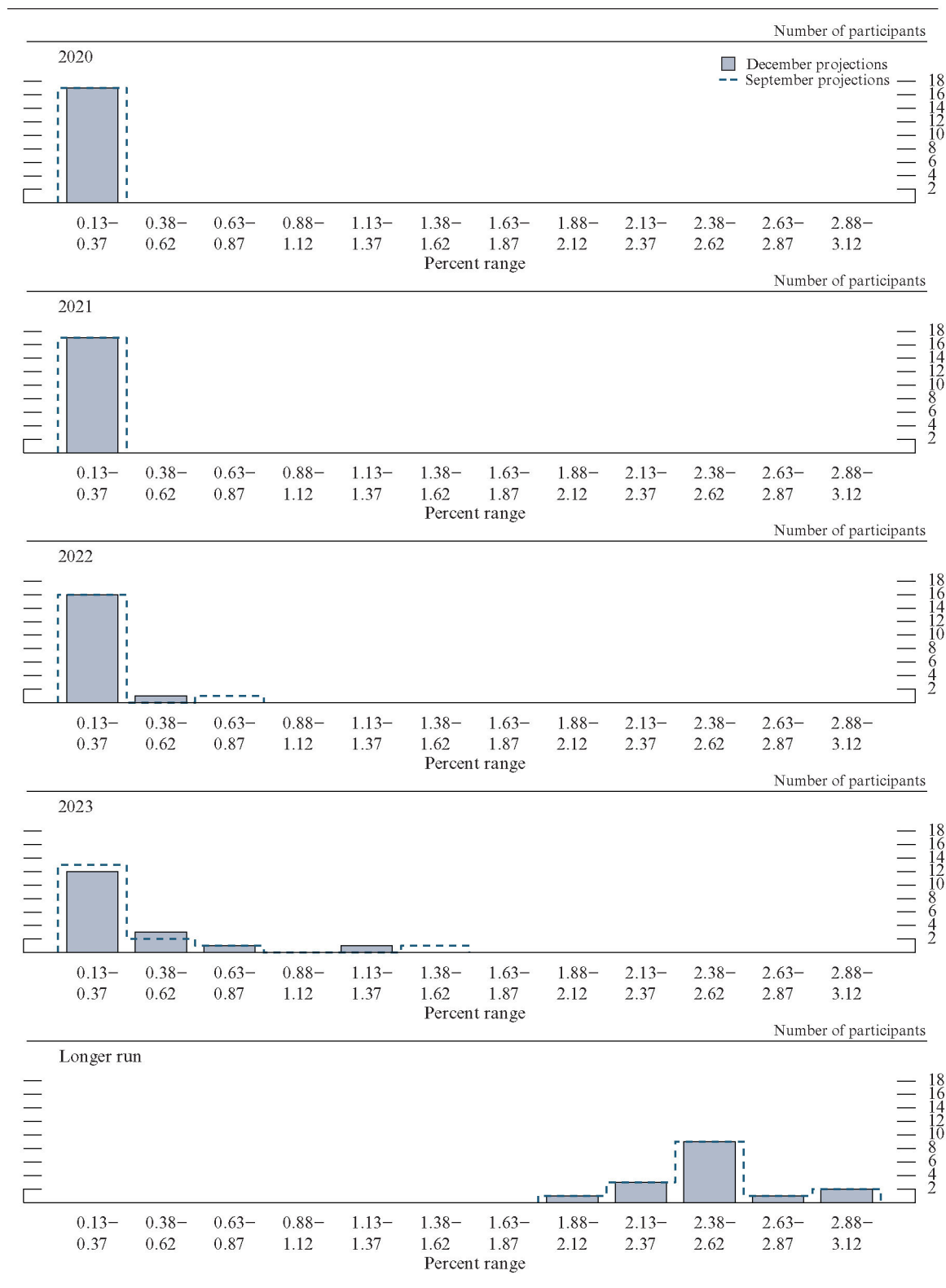
NOTE: Definitions of variables and other explanations are in the notes to table 1.

Figure 4.A. Uncertainty and risks in projections of GDP growth
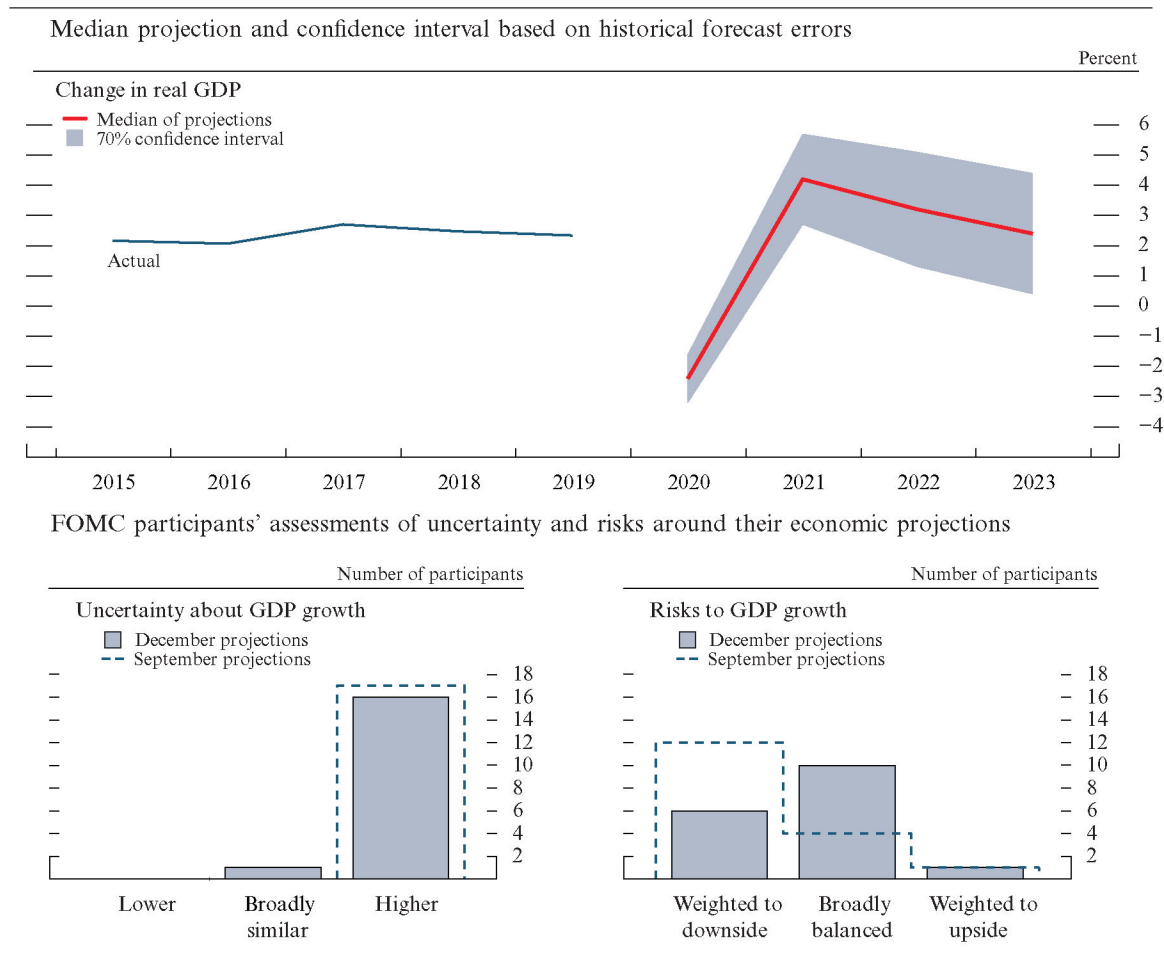
Median projection and confidence interval based on historical forecast errors

FOMC participants' assessments of uncertainty and risks around their economic projections

NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.B. Uncertainty and risks in projections of the unemployment rate
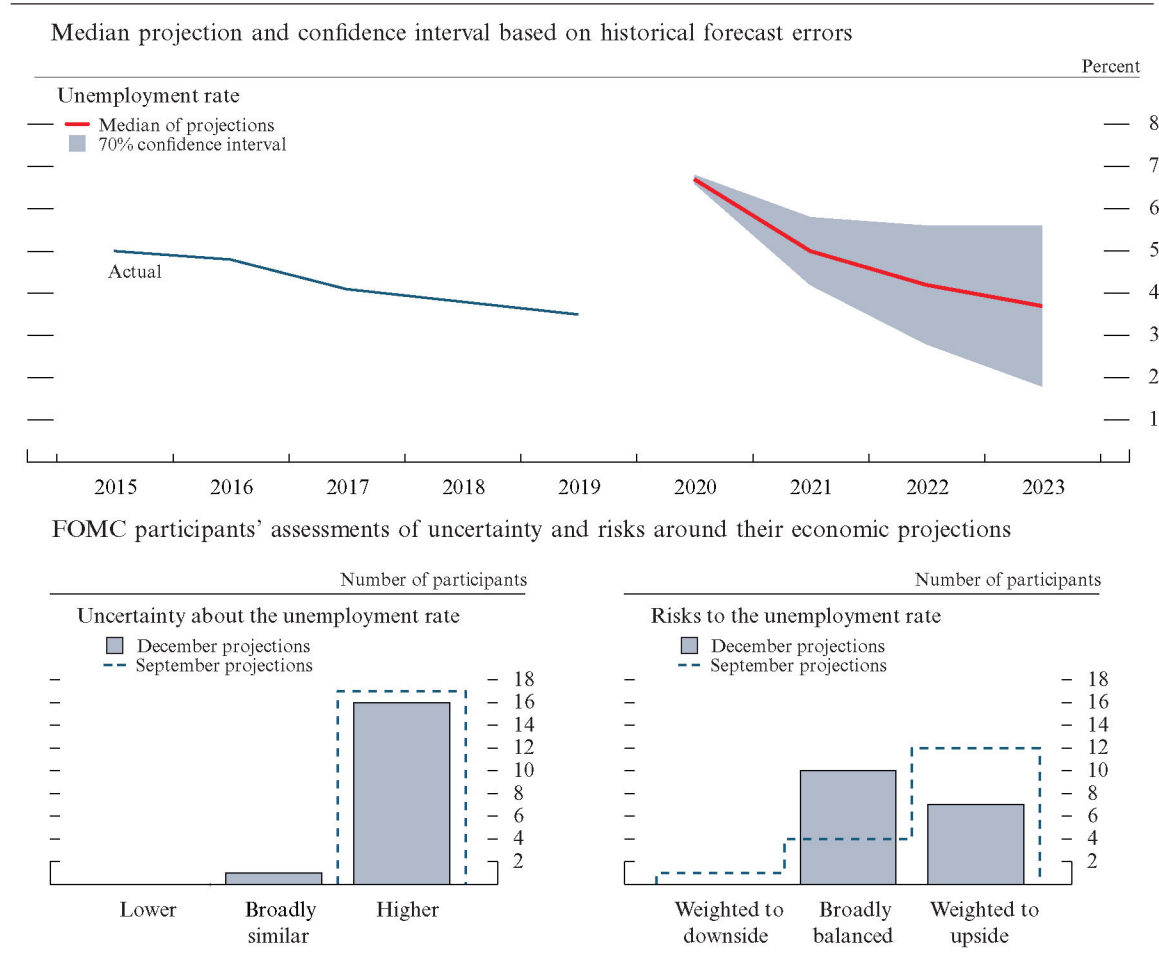
Median projection and confidence interval based on historical forecast errors

FOMC participants' assessments of uncertainty and risks around their economic projections

NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.C. Uncertainty and risks in projections of PCE inflation
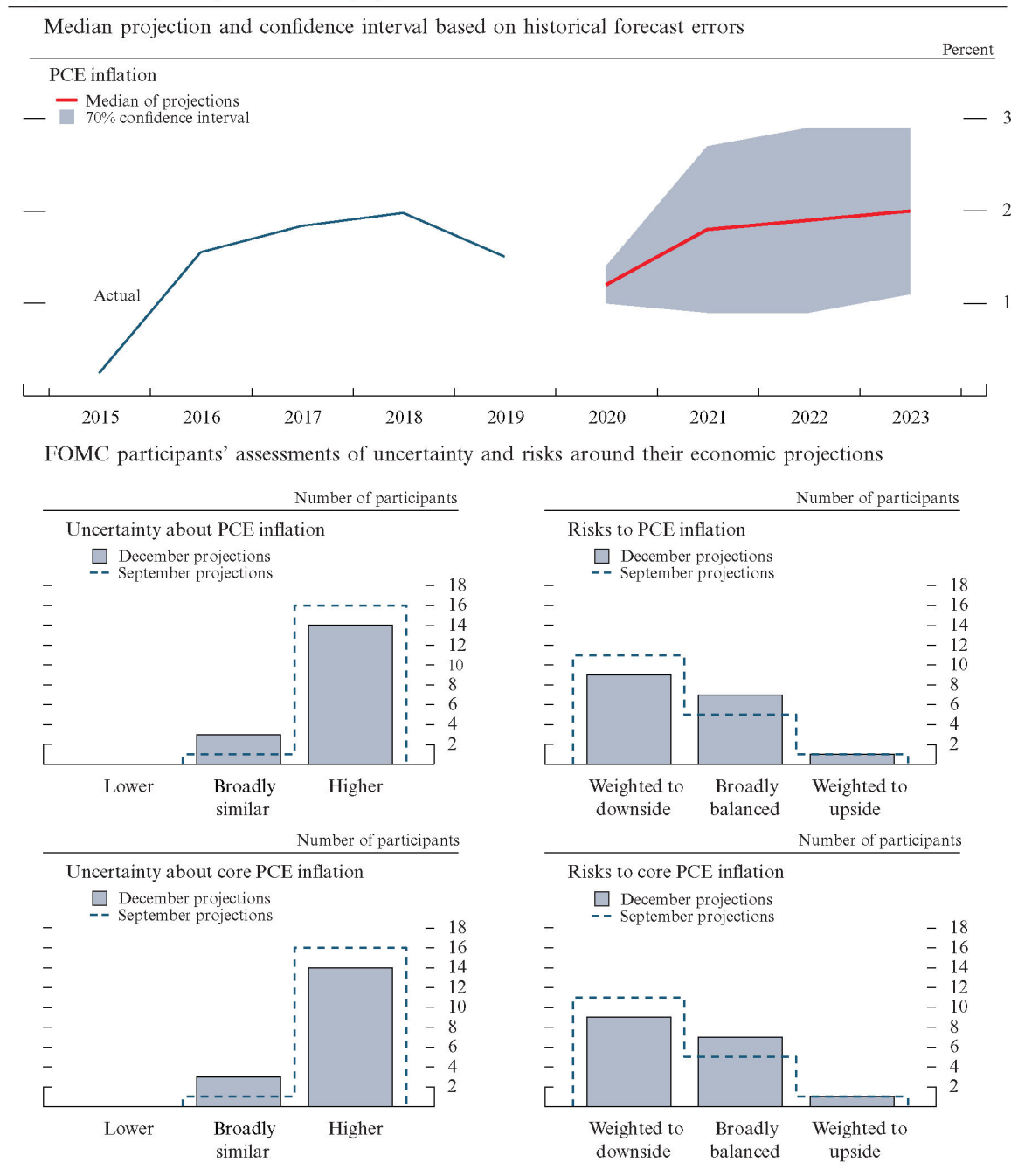
Median projection and confidence interval based on historical forecast errors

FOMC participants' assessments of uncertainty and risks around their economic projections

NOTE: The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years; more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections; these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.D. Diffusion indexes of participants' uncertainty assessments
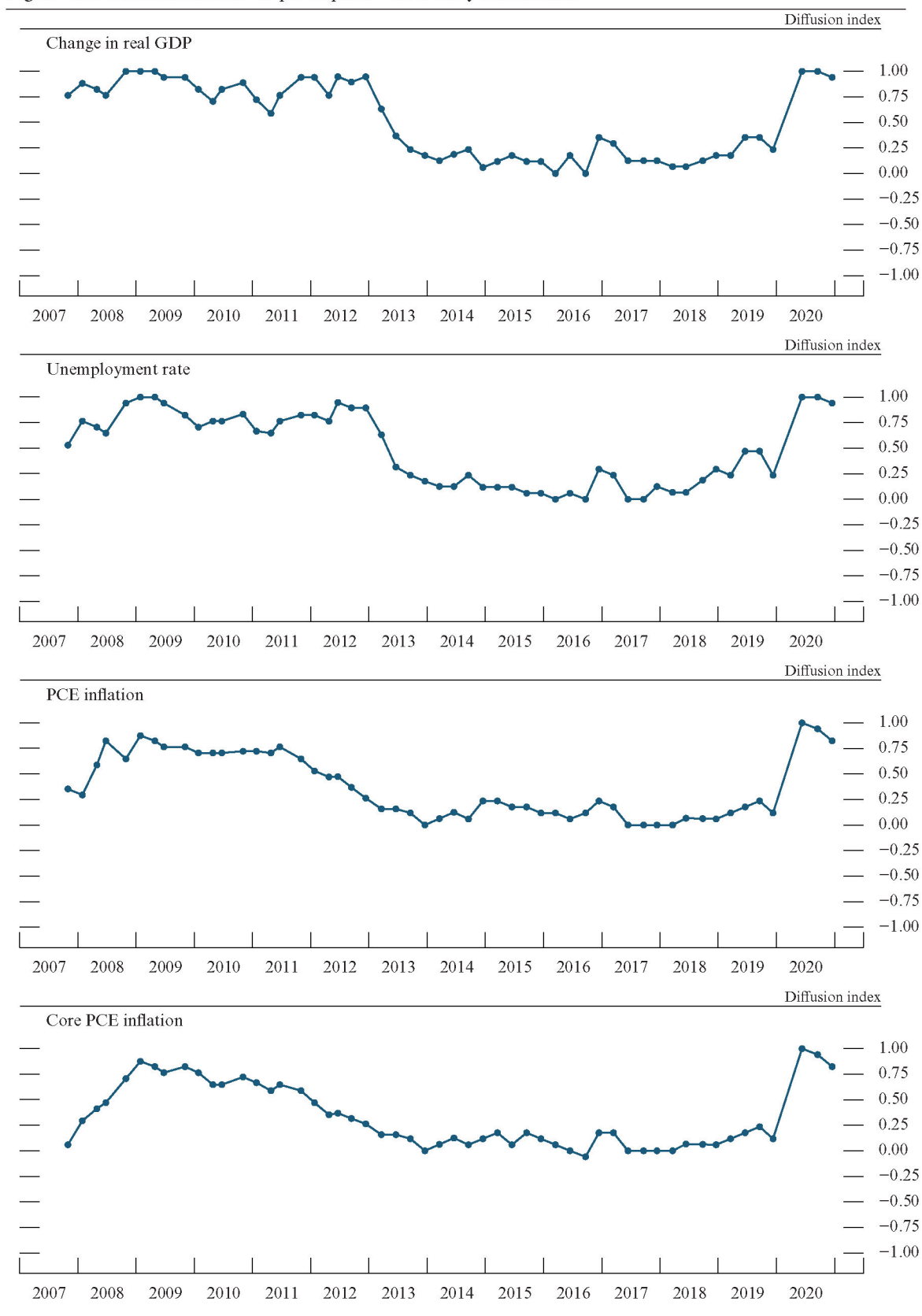
NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years." Each point in the diffusion indexes represents the number of participants who responded "Higher" minus the number who responded "Lower," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted.

Figure 4.E. Diffusion indexes of participants' risk weightings
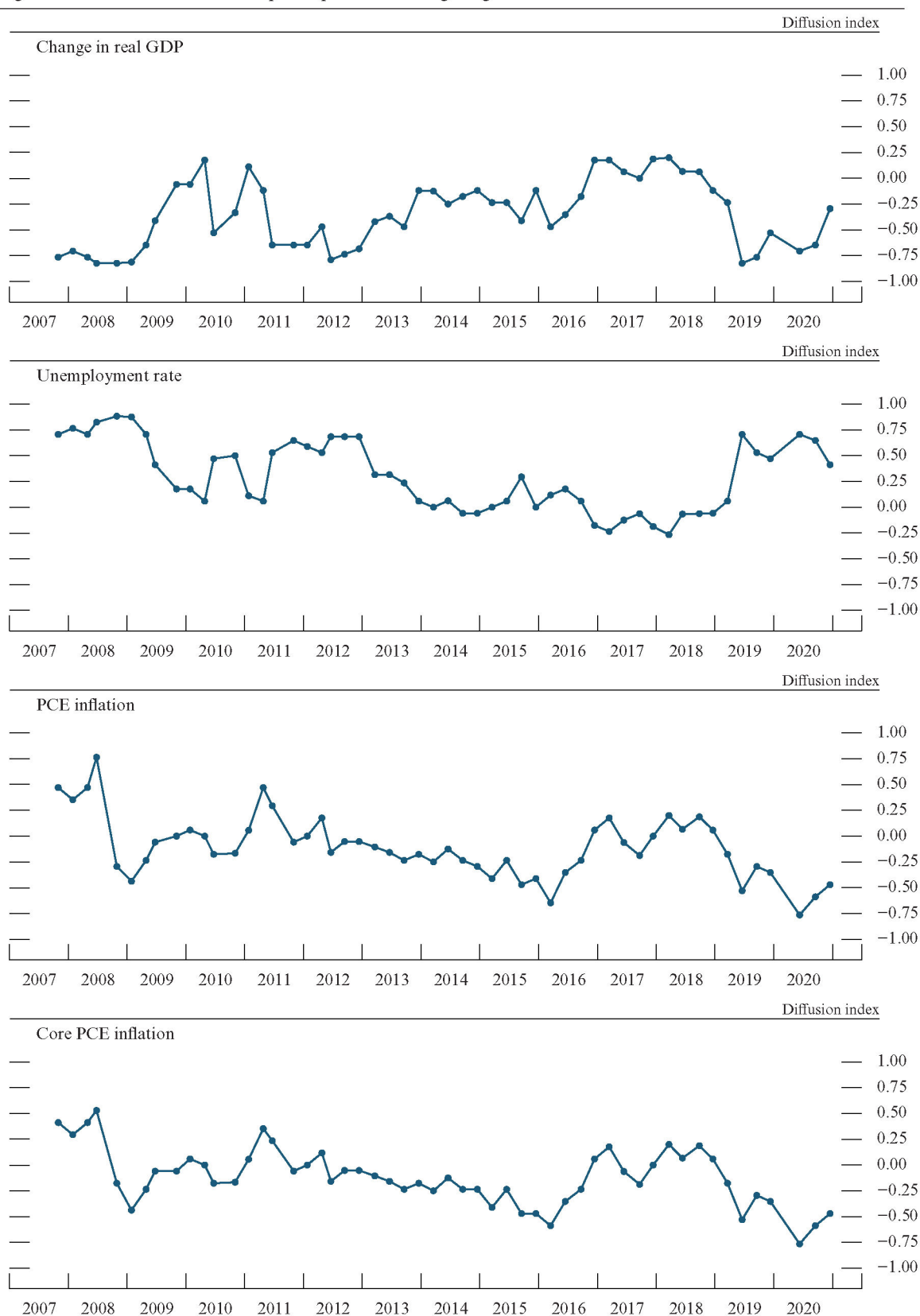
Change in real GDP

Unemployment rate

PCE inflation

Core PCE inflation

NOTE: For each SEP, participants provided responses to the question "Please indicate your judgment of the risk weighting around your projections." Each point in the diffusion indexes represents the number of participants who responded "Weighted to the Upside" minus the number who responded "Weighted to the Downside," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted.

Figure 5. Uncertainty and risks in projections of the federal funds rate
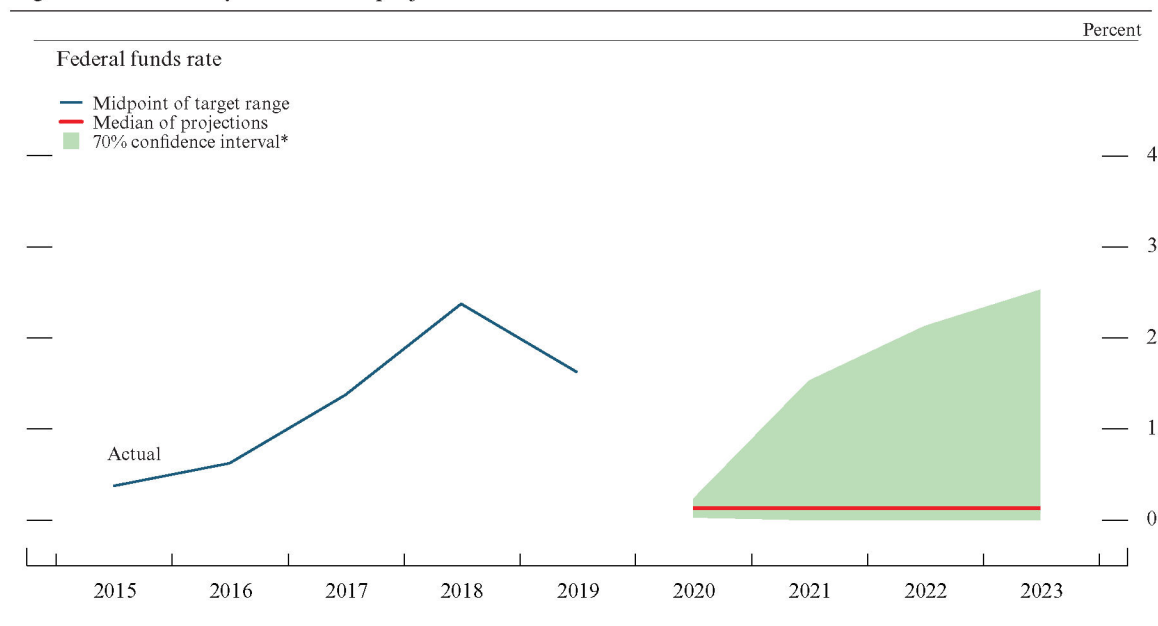
NOTE: The blue and red lines are based on actual values and median projected values, respectively, of the Committee's target for the federal funds rate at the end of the year indicated. The actual values are the midpoint of the target range; the median projected values are based on either the midpoint of the target range or the target level. The confidence interval around the median projected values is based on root mean squared errors of various private and government forecasts made over the previous 20 years. The confidence interval is not strictly consistent with the projections for the federal funds rate, primarily because these projections are not forecasts of the likeliest outcomes for the federal funds rate, but rather projections of participants' individual assessments of appropriate monetary policy. Still, historical forecast errors provide a broad sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that may be appropriate to onset the effects of shocks to the economy.

The confidence interval is assumed to be symmetric except when it is truncated at zero - the bottom of the lowest target range for the federal funds rate that has been adopted in the past by the Committee. This truncation would not be intended to indicate the likelihood of the use of negative interest rates to provide additional monetary policy accommodation if doing so was judged appropriate. In such situations, the Committee could also employ other tools, including forward guidance and large-scale asset purchases, to provide additional accommodation. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections.

* The confidence interval is derived from forecasts of the average level of short-term interest rates in the fourth quarter of the year indicated; more information about these data is available in table 2. The shaded area encompasses less than a 70 percent confidence interval if the confidence interval has been truncated at zero.

Forecast Uncertainty

The economic projections provided by the members of the Board of Governors and the presidents of the Federal Reserve Banks inform discussions of monetary policy among policymakers and can aid public understanding of the basis for policy actions. Considerable uncertainty attends these projections, however. The economic and statistical models and relationships used to help produce economic forecasts are necessarily imperfect descriptions of the real world, and the future path of the economy can be affected by myriad unforeseen developments and events. Thus, in setting the stance of monetary policy, participants consider not only what appears to be the most likely economic outcome as embodied in their projections, but also the range of alternative possibilities, the likelihood of their occurring, and the potential costs to the economy should they occur.

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Reports* and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 2.2 to 3.8 percent in the current year, 1.5 to 4.5 percent in the second year, 1.1 to 4.9 percent in the third year, and 1.0 to 5.0 percent in the fourth year. The corresponding 70 percent confidence intervals for overall inflation would be 1.8 to 2.2 percent in the current year, 1.1 to 2.9 percent in the second year, 1.0 to 3.0 percent in the third year, and 1.1 to 2.9 percent in the fourth year. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative; furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

Because current conditions may differ from those that prevailed, on average, over history, participants provide judgments as to whether the uncertainty attached to their projections of each economic variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty seen in the past 20 years, as presented in table 2 and reflected in the widths of the confidence intervals shown in the top panels of figures 4.A through 4.C. Participants'

(continued)

current assessments of the uncertainty surrounding their projections are summarized in the bottom-left panels of those figures. Participants also provide judgments as to whether the risks to their projections are weighted to the upside, are weighted to the downside, or are broadly balanced. That is, while the symmetric historical fan charts shown in the top panels of figures 4.A through 4.C imply that the risks to participants' projections are balanced, participants may judge that there is a greater risk that a given variable will be above rather than below their projections. These judgments are summarized in the lower-right panels of figures 4.A through 4.C.

As with real activity and inflation, the outlook for the future path of the federal funds rate is subject to considerable uncertainty. This uncertainty arises primarily because each participant's assessment of the appropriate stance of monetary policy depends importantly on the evolution of real activity and inflation over time. If economic conditions evolve in an unexpected manner, then assessments of the appropriate setting of the federal funds rate would change from that point forward. The final line in table 2 shows the error ranges for forecasts of short-term interest rates. They suggest that the historical confidence intervals associated with projections of the federal funds rate are quite wide. It should be noted, however, that these confidence intervals are not strictly consistent with the projections for the federal funds rate, as these projections are not forecasts of the most likely quarterly outcomes but

rather are projections of participants' individual assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

If at some point in the future the confidence interval around the federal funds rate were to extend below zero, it would be truncated at zero for purposes of the fan chart shown in figure 5; zero is the bottom of the lowest target range for the federal funds rate that has been adopted by the Committee in the past. This approach to the construction of the federal funds rate fan chart would be merely a convention; it would not have any implications for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate. In such situations, the Committee could also employ other tools, including forward guidance and asset purchases, to provide additional accommodation.

While figures 4.A through 4.C provide information on the uncertainty around the economic projections, figure 1 provides information on the range of views across FOMC participants. A comparison of figure 1 with figures 4.A through 4.C shows that the dispersion of the projections across participants is much smaller than the average forecast errors over the past 20 years.

ABBREVIATIONS

AFE	advanced foreign economy
BLS	Bureau of Labor Statistics
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CES	Current Employment Statistics
C&I	commercial and industrial
COVID-19	coronavirus disease 2019
CPFF	Commercial Paper Funding Facility
CPI	consumer price index
DPI	disposable personal income
ELB	effective lower bound
EME	emerging market economy
EPOP ratio	employment-to-population ratio
FIMA	Foreign and International Monetary Authorities
FOMC	Federal Open Market Committee; also, the Committee
GDP	gross domestic product
G-SIBs	global systemically important banks
LFPR	labor force participation rate
Main Street	Main Street Lending Program
MBS	mortgage-backed securities
MMLF	Money Market Mutual Fund Lending Facility
OPEC	Organization of the Petroleum Exporting Countries
PCE	personal consumption expenditures
PDCF	Primary Dealer Credit Facility
PPPLF	Paycheck Protection Program Liquidity Facility
QSS	Quarterly Services Survey
repo	repurchase agreement
RRE	residential real estate
SBA	Small Business Administration
SEP	Summary of Economic Projections
TIPS	Treasury Inflation-Protected Securities
VIX	implied volatility for the S&P 500 index

UTILITY STOCKS AND THE SIZE EFFECT: AN EMPIRICAL ANALYSIS

Annie Wong*

I. Introduction

The objective of this study is to examine whether the firm size effect exists in the public utility industry. Public utilities are regulated by federal, municipal, and state authorities. Every state has a public service commission with board and varying powers. Often their task is to estimate a fair rate of return to a utility's stockholders in order to determine the rates charged by the utility. The legal principles underlying rate regulation are that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks," and that the return to a utility should be sufficient to "attract capital and maintain credit worthiness." However, difficulties arise from the ambiguous interpretation of the legal definition of *fair and reasonable rate of return* to an equity owner.

Some finance researchers have suggested that the Capital Asset Pricing Model (CAPM) should be used in rate regulation because the CAPM beta can serve as a risk measure, thus making risk comparisons possible. This approach is consistent with the spirit of a Supreme Court ruling that equity owners sharing similar level of risk should be compensated by similar rate of return.

The empirical studies of Banz (1981) and Reinganum (1981) showed that small firms tend to earn higher returns than large firms after adjusting for beta. This phenomenon leads to the proposition that firm size is a proxy for omitted risk factors in determining stock returns. Barry and Brown (1984) and Brauer (1986) suggested that the omitted risk factor could be the differential information environment between small and large firms. Their argument is based on the fact that investors often have less publicly available information to assess the future cash flows of small firms than that of large

firms. Therefore, an additional risk premium should be included to determine the appropriate rate of return to shareholders of small firms.

The samples used in prior studies are dominated by industrial firms, no one has examined the size effect in public utilities. The objective of this study is to extend the empirical findings of the existing studies by investigating whether the size effect is also present in the utility industry. The findings of this study have important implications for investors, public utility firms, and state regulatory agencies. If the size effect does exist in the utility industry, this would suggest that the size factor should be considered when the CAPM is being used to determine the fair rate of return for public utilities in regulatory proceedings.

II. Information Environment of Public Utilities

In general, utilities differ from industriales in that utilities are heavily regulated and they follow similar accounting procedures. A public utility's financial reporting is mainly regulated by the Securities and Exchange Commission (SEC) and the Federal Energy Regulatory Commission (FERC). Under the Public Utility Holding Company Act of 1935, the SEC is empowered to regulate the holding company systems of electric and gas utilities. The Act requires registration of public utility holding companies with the SEC. Only under strict conditions would the purchase, sale or issuance of securities by these holding companies be permitted. The purpose of the Act is to keep the SEC and investors informed of the financial conditions of these firms. Moreover, the FERC is in charge of the interstate operations of electric and gas companies. It requires utilities to follow the accounting procedures set forth in its Uniform Systems of Accounts. In particular, electric and gas utilities must request their Certified Public Accountants to certify that certain schedules in the financial reports are in conformity with the Commission's accounting requirements. These detailed reports are submitted annually and are open to the public.

The FERC requires public utilities to keep accurate records of revenues, operating costs, depreciation expenses, and investment in plant and equipment. Specific financial accounting standards for these purposes are also issued by the Financial Accounting Standards Board (FASB). Uniformity is required so that utilities are not subject to different accounting regulations in each of the states in which they operate. The ultimate objective is to achieve comparability in financial reporting so that factual matters are not hidden from the public view by accounting flexibility.

Other regulatory reports tend to provide additional financial information about utilities. For example, utilities are required to file the FERC Form No. 1 with the state commission. This form is designed for state commissions to collect financial and operational information about utilities, and serves as a source for statistical reports published by state commissions.

Unlike industriales, a utility's earnings are predetermined to a certain extent. Before allowed earnings requests are approved, a utility's performance is analyzed in depth by the state commission, interest groups, and other witnesses. This process leads to the disclosure of substantial amount of information.

III. Hypothesis and Objective

Due to the Act of 1935, the Uniform Systems of Accounts, the uniform disclosure requirements, and the predetermined earnings, all utilities are reasonably homogeneous with respect to the information available to the public. Barry and Brown (1984) and Brauer (1986) suggested that the difference of risk-adjusted returns between small and large firms is due to their differential information environment. Assuming that the differential information hypothesis is true, then uniformity of information availability among utility firms would suggest that the size effect should not be observed in the public utility industry. The objective of this paper is to provide a test of the size effect in public utilities.

IV. Methodology

1. Sample and Data

To test for the size effect, a sample of public utilities and a sample of industriales matched by equity value are formed so that their results can be compared. Companies in both samples are listed on the Center for Research in Security Prices (CRSP)

Daily and Monthly Returns files. The utility sample includes 152 electric and gas companies. For each utility in the sample, two industrial firms with similar firm size (one is slightly larger and the other is slightly smaller than the utility) are selected. Thus, the industrial sample includes 304 non-regulated firms.

The size variable is defined as the natural logarithm of market value of equity at the beginning of each year. Both the equally-weighted and value-weighted CRSP indices are employed as proxies for the market returns. Daily, weekly and monthly returns are used. The Fama-MacBeth (1973) procedure is utilized to examine the relation between risk-adjusted returns and firm size.

2. Research Design

All utilities in the sample are ranked according to the equity size at the beginning of the year, and the distribution is broken down into deciles. Decile one contains the stocks with the lowest market values while decile ten contains those with the highest market values. These portfolios are denoted by MV_1, MV_2, ..., and MV_{10}, respectively.

The combinations of the ten portfolios are updated annually. In the year after a portfolio is formed, equally-weighted portfolio returns are computed by combining the returns of the component stocks within the portfolio. The betas for each portfolio at year t, β_p's, are estimated by regressing the previous five years of portfolio returns on market returns:

$$\tilde{R}_{pt} = \alpha_p + \beta_p \tilde{R}_{mt} + \tilde{U}_{pt} \qquad (1)$$

where

R_{pt} = periodic return in year t on portfolio p

R_{mt} = periodic market return in year t

U_{pt} = disturbance term.

Banz (1981) applied both the ordinary and generalized least squares regressions to estimate β; and concluded that the results are essentially identical (p.8). Since adjusting for heteroscedasticity does not necessarily lead to more efficient estimators, the ordinary least squares procedures are used in this study to estimate β in equation (1).

The following cross-sectional regression is then run for the portfolios to estimate γ_i, $i = 0$, 1, and 2:

$$R_{pt} = \gamma_{0t} + \gamma_{1t}\hat{\beta}_{pt} + \gamma_{2t}\hat{S}_{pt} + U_{pt} \qquad (2)$$

where

$\hat{\beta}_{pt}$ = estimated beta for portfolio p at year t, t=1968, ..., 1987

$\hat{S}_{pt}$ = mean of the logarithm of firm size in portfolio p at the beginning of year t

U_{pt} = disturbance term.

Depending on whether daily, weekly or monthly returns are used, a portfolio's average return changes periodically while its beta and size only change once a year. The γ_1 and γ_2 coefficients are estimated over the following four subperiods: 1968-72, 1973-77, 1978-82 and 1983-1987. If portfolio betas can fully account for the differences in returns, one would expect the average coefficient for the beta variable to be positive and for the size variable to be zero. A t-statistic will be used to test the hypothesis. The coefficients of a matched sample are also examined so that the results between industrial and utility firms can be compared.

V. Analysis of Results

1. Equity Value of the Utility Portfolios

The mean equity values of the ten size-based utility portfolios are reported in Table 1. Panels A and B present the average firm size of these portfolios at the beginning and end of the test period, 1968-1987. The first interesting observation from Table 1 is that the difference in magnitude between the smallest and the largest market value utility portfolios is tremendous. In Panel A, the average size of MV_1 is about $31 million while that of MV_{10} is over $1.4 billion. In Panel B, that is twenty years later, they are $62 million and $5.2 billion, respectively. Another interesting finding is that there is a substantial increase in average firm size from MV_9 to MV_{10}. Since these two findings are consistent over the entire test period, the average portfolio market values for interim years are not reported. These results are similar to the empirical evidence provided by Reinganum (1981).

The utility sample in this study contains 152 firms whereas Reinganum's sample contains 535 firms that are mainly industrial companies. Two conclusions may be drawn from the results of the Reinganum study and this one. First, utilities and industrials are similar in the sense that their market

values vary over a wide spectrum. Second, the fact that there is a huge jump in firm size from MV_9 to MV_{10} indicates that the distribution of firm size is positively skewed. To correct for the skewness problem, the natural logarithm of the mean equity value of each portfolio is calculated. This variable is then used in later regressions instead of the actual mean equity value.

2. Betas of the Utility and Industrial Samples

The betas based on monthly, weekly and daily returns are reported for the utility and industrial samples. For simplicity, they will be referred to as monthly, weekly, and daily betas. In all cases, five years of returns are used to estimate the systematic risk. The betas estimated over the 1963-67 time period are used to proxy for the betas in 1968, which is the beginning of the test period. By the same token, the betas obtained from the time period 1982-86 are used as proxies for the betas in 1987, which is the end of the test period.

The betas from using the equally-weighted and value-weighted indices are calculated in order to check whether the results are affected by the choice of market index. Since the results are similar, only those obtained from the equally-weighted index are reported and analyzed.

Table 2 reports the monthly, weekly and daily betas of the two samples at the beginning and end of the test period. Panel A shows the various betas of the industrial portfolios. Two conclusions may be drawn. First, in the 1960's, smaller market value portfolios tend to have relatively larger betas. This is consistent with the empirical findings by Banz (1981) and Reinganum (1981). Second, this trend seems to vanish in the 1980's, especially when weekly and daily returns are used.

The betas of the utility portfolios are presented in Panel B. The table shows that none of the utility betas are greater than 0.71. A comparison between Panels A and B reveals that utility portfolios are relatively less risky than industrial portfolios after controlling for firm size. The comparison also reveals that, unlike industrial stocks, betas of the utility portfolios are not related to the market values of equity.

The negative correlation between firm size and beta in the industrial sample may introduce a multicolinearity problem in estimating equation (2). Banz (p.11) had addressed this issue and concluded that the test results are not sensitive to the

multicolinearity problem. For the utility sample, this problem does not exist.

3. Tests on the Coefficients of Beta and Size

The beta and firm size are used to estimate γ_1 and γ_2 in equation (2). A t-statistic is used to test if the mean values of the gammas are significantly different from zero. The tests were performed for four 5-year periods which are reported in Table 3. The mean of the gammas and their t-statistic are presented in Panel A for the utilities and in Panel B for the industrial firms.

The empirical results for the utility sample are reported in Panel A of Table 3. When monthly returns are used, 60 regressions were run to obtain 60 pairs of gammas for each of the 5-year periods. When daily returns are used, over 1200 regressions were run for each period to obtain the gammas. The results are similar: in all of the time periods tested, none of the average coefficients for beta and size are significantly different from zero. When weekly returns are used, 260 pairs of gammas were obtained. The average coefficients for beta are not significant in any test period, and the average coefficients for size are not significant in three of the test periods. For the test period of 1978-82, the average coefficient for size is significantly negative at a 5% level.

The test results for the industrial sample are reported in Panel B of Table 3. When monthly returns are used, the average coefficient estimates for size and beta are significant and have the expected sign only in the 1983-87 test period. When weekly returns are used, only the size variable is significantly negative in the 1978-82 period. When daily returns are used, the coefficient estimates for betas and size are not significant at any conventional level.

According to the CAPM, beta is the sole determinant of stock returns. It is expected that the coefficient for beta is significantly positive. However, the empirical findings reported in this study and in Fama and French (1992) only provide weak support for beta in explaining stock returns. The empirical findings in this study also suggest that the size effect varies over time. It is not unusual to document the firm size effect at certain time periods but not at others. Banz (1981) found that the size effect is not stable over time with substantial differences in the magnitude of the coefficient of the size factor (p.9, Table 1). Brown, Kleidon and Marsh (1983) not only have shown that size effect is not constant over time but also have reported a reversal of the size anomaly for certain years.

The research design of this study allows us to keep the sample, test period, and methodology the same with the holding-period being the only variable. The size effect is documented for the industrial sample in one of the four test periods when monthly returns are used and in another when weekly returns are used. When daily returns are used, no size effect is observed. For the utility sample, the size effect is significant in only one test period when weekly returns are used. When monthly and daily returns are used, no size effect is found. Therefore, this study concludes that the size effect is not only time-period specific but also holding-period specific.

VI. Concluding Remarks

The fact that the two samples show different, though weak, results indicates that utility and industrial stocks do not share the same characteristics. First, given firm size, utility stocks are consistently less risky than industrial stocks. Second, industrial betas tend to decrease with firm size but utility betas do not. These findings may be attributed to the fact that all public utilities operate in an environment with regional monopolistic power and regulated financial structure. As a result, the business and financial risks are very similar among the utilities regardless of their sizes. Therefore, utility betas would not necessarily be expected to be related to firm size.

The objective of this study is to examine if the size effect exists in the utility industry. After controlling for equity values, there is some weak evidence that firm size is a missing factor from the CAPM for the industrial but not for the utility stocks. This implies that although the size phenomenon has been strongly documented for the industriales, the findings suggest that there is no need to adjust for the firm size in utility rate regulations.

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Table 1

Average Equity Size of the Utility Portfolios at the
Beginning and End of the Test Period
(Dollar figures in millions)

	A: Beginning (1968)	B: End (1987)
MV_1	$31	$62
MV_2	$77	$177
MV_3	$113	$334
MV_4	$161	$475
MV_5	$220	$715
MV_6	$334	$957
MV_7	$437	$1,279
MV_8	$505	$1,805
MV_9	$791	$2,665
MV_{10}	$1,447	$5,399

Table 2

Betas of the Two Samples at the Beginning and End of the Test Period

	Monthly Betas		Weekly Betas		Daily Betas	
	1963-67	1982-86	1963-67	1982-86	1963-67	1982-86
Panel A: Industrial Firms						
MV_1	0.89	1.00	1.15	0.95	1.11	0.92
MV_2	0.94	0.87	1.07	1.01	1.14	1.01
MV_3	0.88	0.82	1.12	0.86	1.14	1.04
MV_4	0.69	0.74	1.00	0.83	1.03	0.86
MV_5	0.73	0.80	1.05	0.96	1.13	1.01
MV_6	0.66	0.82	1.03	1.01	1.05	1.04
MV_7	0.64	0.81	0.97	1.04	0.98	1.09
MV_8	0.62	0.75	0.97	1.11	1.00	1.20
MV_9	0.52	0.78	0.84	1.06	0.94	1.16
MV_{10}	0.43	0.65	0.78	1.01	0.86	1.22
Panel B: Public Utilities						
MV_1	0.30	0.37	0.31	0.43	0.30	0.40
MV_2	0.28	0.38	0.37	0.47	0.36	0.44
MV_3	0.22	0.42	0.33	0.42	0.31	0.49
MV_4	0.27	0.35	0.36	0.52	0.34	0.54
MV_5	0.25	0.45	0.37	0.61	0.35	0.62
MV_6	0.25	0.41	0.39	0.54	0.40	0.65
MV_7	0.20	0.35	0.34	0.54	0.37	0.63
MV_8	0.17	0.38	0.34	0.65	0.33	0.68
MV_9	0.19	0.34	0.35	0.60	0.34	0.71
MV_{10}	0.18	0.29	0.38	0.59	0.39	0.71

Table 3

Tests on the Mean Coefficients of Beta (γ_1) and Size (γ_2)

$$R_{\mu} = \gamma_{\alpha} + \gamma_{1i}\hat{\beta}_{\mu} + \gamma_{2i}\hat{S}_{\mu} + U_{\mu}$$

Returns Used:		Monthly (t-value)	Weekly (t-value)	Daily (t-value)
Panel A: Utility Sample				
1968-72	γ_1	-0.46% (-0.26)	-0.32% (-0.42)	-0.02% (-0.18)
	γ_2	-0.07% (-0.78)	-0.01% (-0.51)	-0.00% (-0.46)
1973-77	γ_1	-0.28% (-0.13)	0.14% (0.14)	-0.03% (-0.21)
	γ_2	-0.11% (-0.70)	-0.03% (-0.67)	-0.00% (-0.53)
1978-82	γ_1	0.55% (0.36)	0.54% (1.00)	0.05% (0.43)
	γ_2	-0.10% (-0.75)	-0.05% (-1.71)*	-0.01% (-1.60)
1983-87	γ_1	1.74% (1.28)	-0.24% (-0.51)	-0.02% (-0.18)
	γ_2	-0.16% (-1.54)	-0.03% (-0.86)	-0.01% (-0.63)
Panel B: Industrial Sample				
1968-72	γ_1	-0.36% (-0.27)	-0.28% (-0.55)	-0.02% (-0.32)
	γ_2	0.07% (0.43)	-0.01% (-0.19)	0.00% (0.51)
1973-77	γ_1	1.34% (0.64)	-0.23% (-0.31)	0.14% (1.45)
	γ_2	-0.01% (-0.06)	-0.04% (-0.85)	-0.00% (-0.64)
1978-82	γ_1	-0.84% (-0.28)	-0.56% (-0.91)	-0.09% (-0.81)
	γ_2	-0.29% (-0.75)	-0.01% (-1.72)*	-0.00% (-1.33)
1983-87	γ_1	2.51% (1.83)*	0.34% (0.64)	0.11% (1.40)
	γ_2	-0.25% (-1.90)*	-0.01% (-0.43)	0.00% (0.14)

* Significant at the 5% level based on a one-tailed test.

A Note on the Relationship between Firm Size and Return in the Electric Utility Industry

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>> Version of Record - Jul 1, 1993

What is This?

A Note on the Relationship Between Firm Size and Return in the Electric Utility Industry

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Prior research has argued that given the well-documented inverse relationship between firm size and market returns, smaller utilities should be allowed to earn higher accounting rates of return than larger utilities. To test the validity of this argument, this study investigated the relationship between firm size and market returns in the electric utility industry for the period 1962 through 1985 and found no evidence of either a positive or negative size effect. Moreover, although market returns on utility stocks were found to be higher in January than in non-January months, this January effect was found to be unrelated to firm size. In short, this study found no evidence that allowable accounting rates of return should be adjusted by regulatory authorities to reflect a firm's size.

1. Introduction

The accounting rate of return (ARR) earned by firms operating in a regulated environment is generally established by regulatory authorities on the basis of measures produced under regulatory accounting principles. In some cases, the allowable ARR is based on the level of invested assets (e.g., ROA or ROE), whereas in others it is set as a percentage of costs incurred (e.g., cost plus X percent). In all cases, however, the allowable ARR is relatively unaffected by the size of the regulated firm in that standardized indices are used.[1]

Bolton and Besley [6] argue, however, that given the consistent higher market returns earned by small firms' stocks, a utility's cost of capital and therefore its allowable ARR should reflect its size. That is, smaller utilities should be allowed to earn a higher ARR than larger utilities.

Although there is substantial empirical support for the existence of a size effect [1,2,3,8,9,11,14,16,20,21,25, among others],[2] the presence of this stock market anomaly is not well documented in the utility industry, and what evidence there is suggests that there may be a *large* firm utility effect. Moreover, Schwert [24] questions the appropriateness of adjusting a firm's cost of capital, and by extension the allowable ARR, for the size effect.

Thus, this paper investigates the long-run relationship between firm size and market return for electric utility stocks. If regulatory authorities are to consider the adjustment of allowable ARR by firm size, then the existence of a size effect in the utility industry must first be clearly demonstrated.

2. Investigation

For purposes of this study, we assume the capital markets to be informationally efficient in a semistrong form. Thus, in spite of the presence of artificially controlled ARRs, risk and market return differentials may emerge in response to perceived variability in earnings and cash flows associated with firm size [7,11,12,22,23].

Prior research involving utilities has observed a *positive* relation between a utility's size and market return. For the period 1967–1972, Melicher [18] found a positive relationship between ex post beta and the log of total assets. Similarly, Reichenstein and Davidson [19] observed a significant positive relation between the market value of utilities' common stock and ex ante measures of stock price premiums for the period 1986–1987. Thus, contrary to the findings of the industrial-based size literature, available evidence involving utilities suggests the presence of a positive size effect.

2.1 Sample

The sample for the current study consists of all electric utilities listed on the Center for Research in Security Prices (daily) tapes for pairs of consecutive years, with not more than 10 days of missing data in either year. The only firms eliminated by this restriction are those whose stock was delisted during a two-year period. The study period is 1962 through

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2. Recent evidence [12,13] suggests that the size effect may be smaller than previously thought.

1985; however, because one additional year is needed to generate market model parameters, results are reported for only 1963–1985. The sample varies by year from 90 to 103 firms.

2.2 Analysis

At the end of each year $(t - 1)$, the market value of equity for each firm was computed and then used to assign the firm to one of four portfolios based on a ranking of relative market value. Firms assigned to MV_1 represent the lowest quartile of relative market value for a given year, whereas those assigned to MV_4 represent the highest quartile of relative market value. Using parameter estimates obtained for year $t - 1$, daily abnormal returns were computed for year t. These returns were then summed for each company to yield a cumulative abnormal return (CAR_t), and grouped by firm size to produce a portfolio CAR. Cumulative abnormal returns for each of the four equally weighted portfolios were calculated using two separate return-generating models. The first model was the market model, with parameter estimates for year $t - 1$ obtained by regressing daily returns against the returns on the value-weighted market index. The second model was the aggregate beta model proposed by Dimson [13] to minimize measurement problems associated with infrequently traded stocks. The results for the aggregate beta model are not specifically discussed here in that it yielded qualitatively similar results and supported similar conclusions to those of the market model.[3]

3. Empirical Results

3.1 Annual Results

Table 1 summarizes the average annual abnormal returns for the four portfolios generated by the market model. The average CARs do not differ significantly over the investigated period 1963 to 1985 $(F_{3,15} = 0.0394)$. The range of values is small (i.e., -0.0474 [MV_3] to -0.0290 [MV_4]), and they neither increase nor decrease monotonically with size. In short, the data provide no evidence of *either* a negative or a positive annual size effect.

Moreover, Table 2 shows the distributions of average raw returns and average betas across the four portfolios. Neither raw returns nor betas

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3. The Dimson model [13] is appropriate when stocks trade infrequently, which is primarily a small firm phenomenon. We reach the same conclusions with the market model and the Dimson aggregate beta model. The results for the aggregate beta model are presented in Table 1, but are not discussed.

TABLE 1

Tests for an Annual Firm Size Effect

Average Annual Abnormal Returns	MV_1	MV_2	MV_3	MV_4
Market Model $F_{3,15} = 0.0394$	-0.0313	-0.0343	-0.0474	-0.0290
Aggregate Beta Model $F_{3,15} = 0.0700$	0.0458	0.0449	0.0383	0.0301

vary systematically with firm size, which implies that there are no risk differences between small and large utilities.

3.2 January Effect

A January effect is closely associated with the size effect [4,26]. It appears in two distinct ways. First, average returns for all size categories are larger in January than in non-January months (referred to as the "seasonal returns effect"). And second, the difference between annual returns on smaller and larger firms is concentrated in January (referred to as the "January small firm effect").

The seasonal returns effect is a stock market anomaly, possibly indicating that stocks in general represent a riskier investment in January than in other months. The existence of such an effect among utility stocks neither suggests nor justifies an adjustment to a firm's cost of capital or allowable ARR. A January small firm effect, on the other hand, would suggest that the riskiness of stocks varies systematically with firm size, and thus if present, might imply that allowable ARRs should be adjusted to reflect firm size.

Table 3 summarizes the tests for a seasonal returns effect. The tests are based on abnormal returns cumulated monthly for each of the four portfolios and for the aggregate portfolio of all utility stocks. The monthly returns permit tests of significant difference between the abnormal returns in January

TABLE 2

Average Beta and Raw Returns by Portfolio

	MV_1	MV_2	MV_3	MV_4
Average Beta $F_{3,15} = 1.171$	.481	.532	.522	.539
Average Raw Return $F_{3,15} = 0.890$	.078	.079	.065	.084

TABLE 3

Summary of Tests for a Seasonal Returns Effect: Differences Between Abnormal Returns in January and Other Months

Market Model	MV_1		MV_2		MV_3		MV_4		All Firms	
Month	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests
February	−.0084	T,D,S	−.0165	T,D,S	−.0190	T,D,S	−.0112	T,D,S	−.0138	T,D,S
	(5.33*)		(8.51**)		(6.53*)		(4.92*)		(25.65**)	
March	−.0162	T,D,S	−.0097	T,D,S	−.0139	T,D,S	−.0111	T,D,S	−.0127	T,D,S
	(10.05**)		(6.81*)		(5.66*)		(6.66*)		(29.67**)	
April	−.0050		−.0108	T,D,S	−.0174	T,D,S	−.0135	T,D,S	−.0117	T,D,S
	(3.01)		(4.71*)		(4.43*)		(4.16*)		(16.60**)	
May	−.0151	T,D,S	−.0057	T,D,S	−.0043		−.0013		−.0066	T,D,S
	(5.65)		(4.62*)		(1.99)		(1.67)		(15.09**)	
June	.0023		.0001		.0009		.0005		.0009	T,D,S
	(1.85)		(2.17)		(0.66)		(1.50)		(6.17*)	
July	−.0018		−.0049	T,D,S	.0053		.0002		−.0003	T,D,S
	(3.59)		(4.77*)		(0.31)		(2.23)		(9.86**)	
August	−.0069	T,D,S	−.0092	T,D,S	−.0093		−.0057		−.0078	T,D,S
	(4.95*)		(5.54*)		(3.03)		(3.65)		(17.53**)	
September	−.0054		−.0031		−.0048		−.0001		−.0033	T,D,S
	(4.68*)		(3.95)		(2.01)		(2.16)		(12.82**)	

TABLE 3 (cont.)

Market Model	MV$_1$		MV$_2$		MV$_3$		MV$_4$		All Firms	
Month	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests	Mean	Other Tests
October	.0066		.0048		.0037		.0078		.0057	
	(1.21)		(1.47)		(0.38)		(0.50)		(3.45)	
November	.0037		.0027		−.0014		.0027		.0019	T,D,S
	(1.47)		(1.85)		(0.99)		(1.14)		(5.56*)	
December	−.0015		−.0052	T,D,S	−.0058		.0074		−.0013	T,D,S
	(2.89*)		(4.32**)		(2.11)		(0.66)		(9.56**)	
Eleven Months	.0043	T,D,S	.0052	T,D,S	.0059	T,D,S	.0022	T,D,S	.0044	T,D,S
	(9.25**)		(11.07**)		(4.65*)		(5.15*)		(29.18**)	

Note: In the mean column, the F statistic from a general linear model appears in parentheses below the mean. In the column labeled "Other Tests," significance is indicated by T, D, and/or S if the month's abnormal return is significantly different from January's according to Tukey's, Dunn's, and/or Scheffe's tests, respectively. Significance for the F test is noted with a ** or * for significance at the 0.01 and 0.05 levels, respectively.

TABLE 4

Summary of Tests for a January Firm Size Effect

Market Model	MV_1	MV_2	MV_3	MV_4
Average January Abnormal Return $F_{3,15} = 0.349$	0.0164	0.0232	0.0186	0.0109

and in the other individual months (rows 1 through 11), and between the abnormal returns in January and the other months in aggregate (row 12). The statistical significance of the differences was evaluated using an F statistic from a general linear model and with the Tukey, Dunn, and Scheffe tests; significant differences at the .05 level for these tests are labeled T, D, or S, respectively.

The results in Table 3 indicate that (1) the abnormal returns in January were significantly higher than the average of the non-January months for all four size portfolios and for the aggregate sample; (2) the abnormal returns in January were significantly higher than the returns for the other months in 8 of the 11 tests for the aggregate sample; and (3) for the four portfolios, the abnormal returns in January were significantly greater than the returns in individual months in 17 of the 44 comparisons. Thus, the data provide some evidence of a seasonal returns effect.[4]

Table 4 compares the January returns for MV_1 through MV_4 to investigate for the presence of a January small firm effect for the sample of utilities. The F statistic comparing the mean returns was 0.349 and is statistically insignificant. Even the nominal size of the returns indicates the absence of a relationship with firm size.

3.3 Analysis of Results

One explanation for the positive association between beta and firm size observed by Melicher [18] and between ex ante risk premium and size observed by Reichenstein and Davidson [19] may involve the time periods investigated.[5] Both studies examined periods when large firms generally

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4. One possible explanation for the seasonal returns effect is that more information becomes available in January than in other months because of the number of companies with December 31 year-end dates. The release (or leak) of year-end information may produce a significant reduction in uncertainty, lowering of risk, and raising of stock prices across the range of firm size [1]. If the seasonal returns effect represents a predictable pattern, presumably the natural workings of self-interested investors should have eliminated it.

5. Melicher [18] used data for the period 1967 to 1971. For this same time period, the average CAR for MV_1 through MV_4 for the current sample of utilities was $-.0569$, $-.0824$, $-.0783$, and $-.0682$, respectively. The F-statistic for these values is insignificant, suggesting that an explanation based on time period differences can be rejected.

outperformed small firms. Brown, Kleidon, and Marsh [8] report that the size effect is unstable over time; thus, it is possible that the direction and strength of the size effect may vary as a function of the time period investigated. Nonetheless, over the 23-year period investigated in this study, no evidence of a material size effect was observed.

Research since Melicher also suggests that his results may have been influenced by error-in-variables or estimation problems. The error-in-variables problems include questions involving the reliability of individual betas (see [5], and [23], among others), and the use of the log of total assets as a measure of size. Brown, Kleidon, and Marsh, for instance, indicate that the size effect is best measured by the log of market value of common equity. Moreover, the presence of heteroskedasticity in the cross-sectional sample—a possibility apparently not considered in earlier research—may produce biased t statistics.

Further, the size difference between the companies in our sample may not be as large as the size difference in other studies. The equity value of the largest firms in 1985 (valued as of 31 December 1984) was $6.5 billion and in 1963 was $72.5 million. Comparable figures for the smallest firms are $40.2 million in 1985 and $5.7 million in 1963.[6] Even this range, however, should permit detection of a significant size effect if it exists, and our results do not reveal even a nominal size effect (ignoring tests of significance).

Finally, recent research [10,11,16] suggests that the small firm effect is related to the losing firm effect: smaller firms on organized exchanges consist largely of firms that have recently lost market value, and because of the leverage effect or increased financial distress, they become risky firms. The relative stability of utility stocks, and the regulatory charge to avoid possible financial distress, suggest that utility companies may be relatively exempt from the losing firm effect.[7]

4. Summary and Implications

Substantial empirical evidence indicates that small firm stocks consistently produce higher risk-adjusted returns than large firm stocks. On the

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6. Basu [3] reports the median for his small firm portfolio to be $30.3 million over the period 1963 to 1979. Our small firm portfolio of utilities had a median of $49.8 million over this same time period. Hence, the utilities in our sample are not as small as the firms in Basu's small firm portfolio, but they are smaller than his second-ranked group, which had a median of $81.6 million. We believe there are sufficiently large size differences among the utilities in our sample to permit a valid test of the size effect.

7. We define a "losing firm" as one whose stock experienced negative returns in a given year. For most utilities, the largest component of return is dividend yield, so stock price decreases generally do not cause annual negative returns. For our sample, drawn from 1963 through 1985, the proportion of losing stocks in MV_1 through MV_4 was 22, 17, 22, and 24 percent, respectively. We conclude that small utility stocks are not dominated by losing stocks.

basis of this evidence, some researchers have argued that a utility's cost of capital and therefore its allowable ARR should be adjusted to reflect a firm's size.

Although the extant literature provides evidence of two within-industry studies indicating that the relation between utility size and returns is positive, we arrive at a different conclusion. On the basis of historical returns on electric utility stocks for the period 1963 through 1985, we are unable to reject the null hypothesis that annual and January-only abnormal returns are equal among utility portfolios of varying size. Further, raw returns and betas were not found to vary systematically with portfolio size.

The evidence obtained in this study indicates that abnormal returns in January exceed the average abnormal returns in the other eleven months. However, this seasonal returns effect was found to exist across *all* size portfolios, and hence we conclude that it is unrelated to firm size. Thus, our results suggest that neither large nor small utilities merit a premium because of their size.

The implications of our findings for regulatory officials and for regulatory accounting standard-setters are straightforward: we find no evidence among the electric utility industry during the period 1963 to 1985 to suggest that a utility's cost of capital or its allowable ARR should be adjusted to reflect firm size.

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