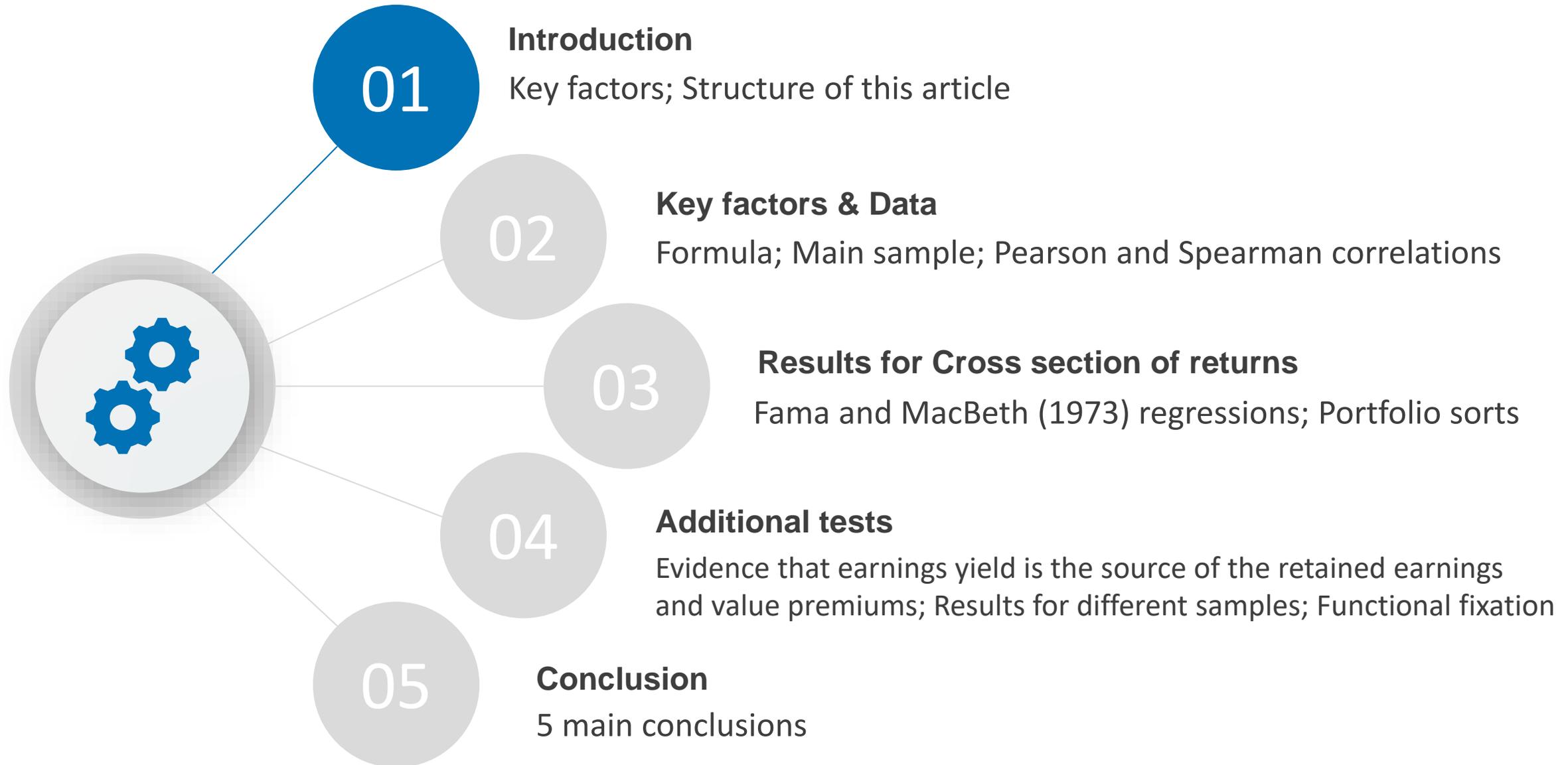




▶ **Earnings, retained earnings,
and book-to-market in the
cross section of expected
returns**

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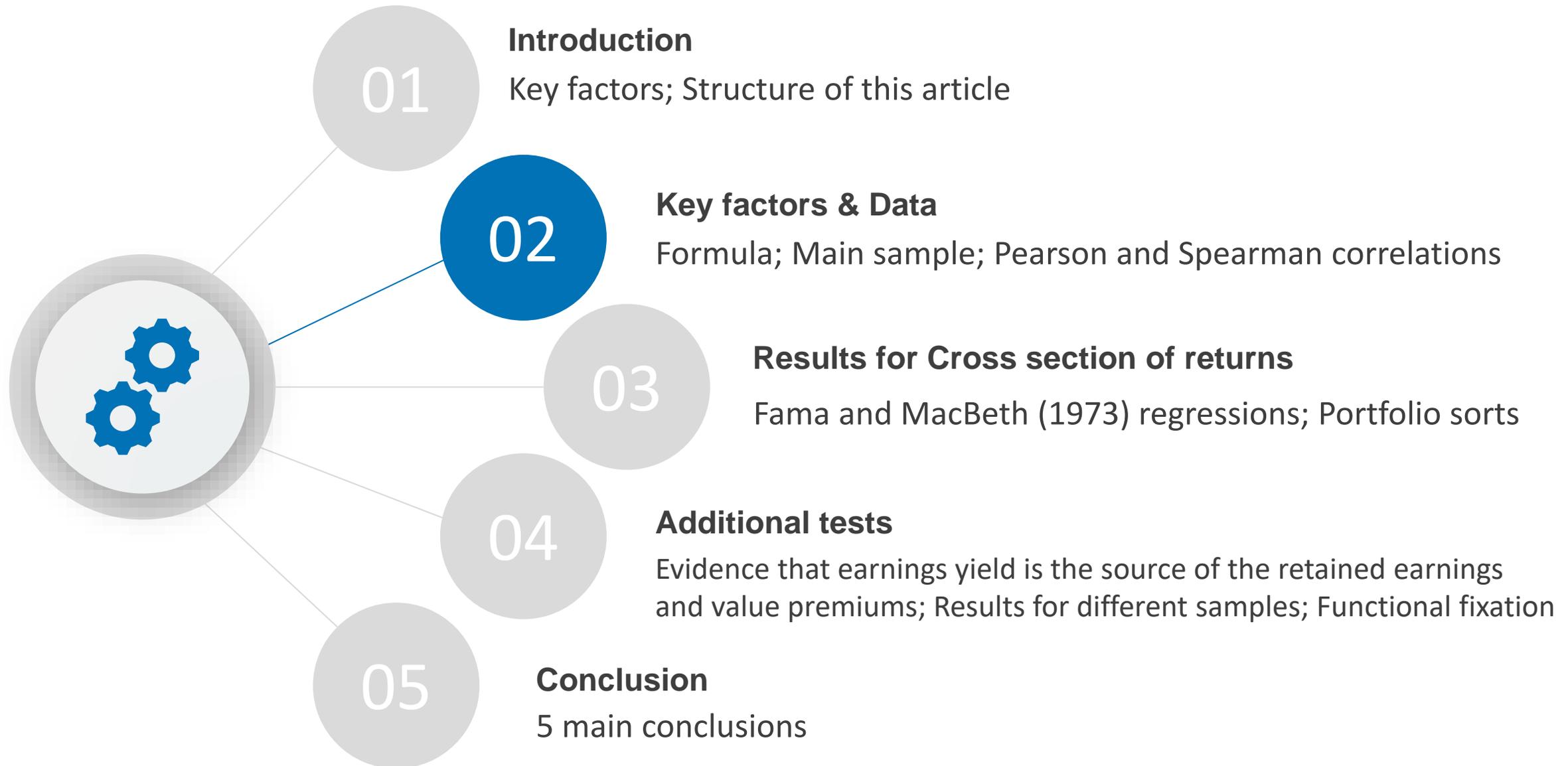
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Introduction

- **Book value of equity** consists of **two main parts: contributed capital** and **retained earnings**. These parts are of approximately equal size but represent different economic constructs.
- The book-to-market ratio has long been used as an indicator of value, but **book-to-market predicts returns only because it contains retained earnings-to-market and retained earnings contain past earnings**.
- We estimate **Fama and MacBeth regressions** to **compare the information contained in retained earnings and contributed capital**.
 - Several **additional tests** demonstrate **the stability of retained earnings-to-market's predictive power**, and thus **provide comfort that it does not represent a statistical artifact**.
 - **Functional fixation test** to find whether investors overweight current earnings, or components of current earnings, when forecasting future earnings.

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Key factors & Data

- **Common/Ordinary Equity (CEQ) = Contributed capital + Retained earnings + Other**
- **Contributed capital = Common/Ordinary Stock (CSTK) + Capital Surplus/Share Premium Reserve (CAPS) – Treasury Stock (TSTK)**
 - **Contributed capital component** records the **net capital transactions** between the firm and its shareholders and comprises **accumulated past equity issuances less past share repurchases.**
 - Treasury stock is the cost of stock repurchased from shareholders.
- **Retained earnings = Retained Earnings (RE) – Accumulated Other Comprehensive Income (ACOMINC)**
 - **Retained earnings** comprise the **accumulated total earnings** the firm generated over its history **less accumulated dividend distributions.**
- **Other = Accumulated Other Comprehensive Income (ACOMINC)**
 - Accumulated other comprehensive income measures price changes and liabilities that are largely unrelated to firms' operations.

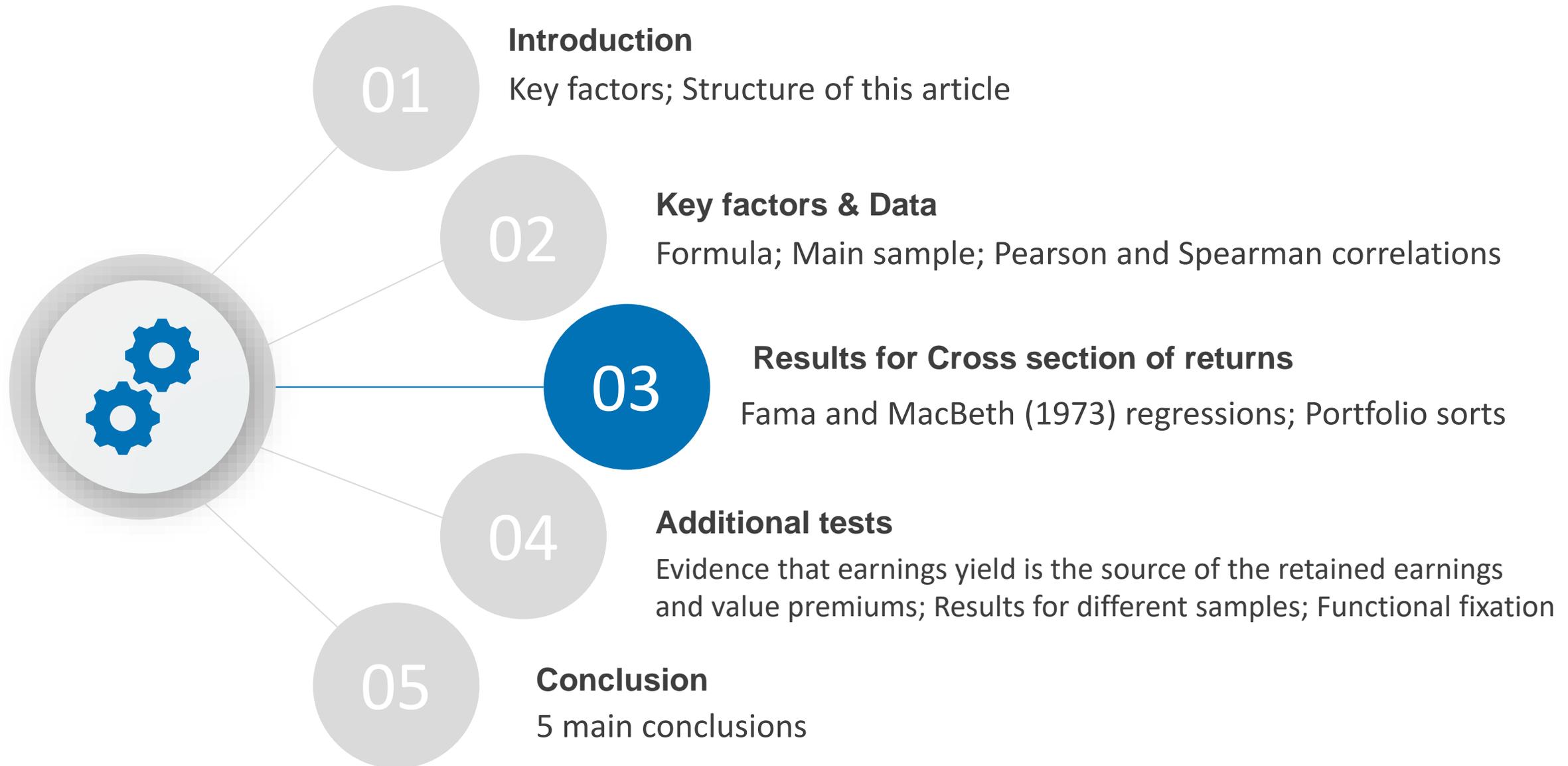
Key factors & Data

- Our primary sample is **U.S.-listed securities over 1964– 2017**.
- We start our sample with all firms traded on **NYSE, Amex, and Nasdaq**, and **exclude securities other than ordinary common shares**. We **exclude financial firms**.
- We match the firms on CRSP against Compustat and **lag annual accounting information by six months**.
- We generate **two measures of book-to-market** that differ in their numerators.
 - First, we follow **Fama and French and calculate the book value of equity** as shareholders' equity, plus balance sheet deferred taxes, plus balance sheet investment tax credits, plus post-retirement benefit liabilities minus preferred stock.
 - For the second measure of book-to-market, we use **Compustat's book value of common shareholders' equity (CEQ)**. The benefits of the second measure are that it reflects the book value of common equity reported on firms' balance sheets and that it can be exactly broken down into the components that we expect to be differently priced, including contributed capital and retained earnings.
 - The distributions of the two measures are almost identical.

Key factors & Data

- **Contributed capital** represents a **larger percentage of the book value of equity (54%)**.
- On average, **retained earnings are 41% of the book value of equity**.
- **Accumulated other comprehensive income** represents the **smallest share of the book value of equity, with a mean of 5%**.
- **Pearson and Spearman correlations** indicates that **relations between book to market and its components**.
- Distributions of the ratios of components to the total value of equity for the 6 Fama and French Portfolios.

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Cross section of returns

- Fama and MacBeth (1973) regressions to compare book-to-market, retained earnings-to-market, and contributed capital-to-market in predicting monthly returns.

1. Results of the book-to-market definition as per Fama and French.

Variables	Reg1	Reg2	Reg3	Reg4	Reg5	Reg6	Reg7	Reg8
Book-to-market	0.22* (3.17)		0.05 (0.69)		0.32* (4.12)		0.21* (3.40)	
Retained earnings-to-market		0.18* (4.39)	0.17* (4.60)					0.18* (4.84)
Contributed capital-to-market				0.00 (0.09)	-0.12* (-4.11)			0.01 (0.35)
Accumulated other comprehensive income-to-market						0.01 (1.77)	0.00 (0.32)	0.00 (0.74)

Cross section of returns

2. Results of using the book-to-market ratio based on the book value of equity reported on the firm's balance sheet (i.e., without the adjustments implemented by Fama and French).

Variables	Reg1	Reg2	Reg3	Reg4
Book-to-market	0.22* (3.35)	0.04 (0.60)	0.33* (4.40)	0.21* (3.50)
Retained earnings-to-market		0.17* (4.61)		
Contributed capital-to-market			-0.12* (-4.25)	
Accumulated other comprehensive income-to-market				0.00 (0.70)

- Findings are **not sensitive to the definition of the book value of equity**.
- Regressions in 1 and 2 show that **book-to-market predicts the cross section of returns only because it contains retained earnings. The other components of the book value of equity provide no significant information about the cross section of average returns, and removing these other components increases the t-value.**

Cross section of returns-Portfolio sorts

- Portfolio tests, which provide a potentially more robust method to evaluate predictive ability.
- Value-weighted average excess returns and CAPM and three-factor model alphas for portfolios sorted by book-to-market, retained earnings-to-market, and contributed capital-to-market.

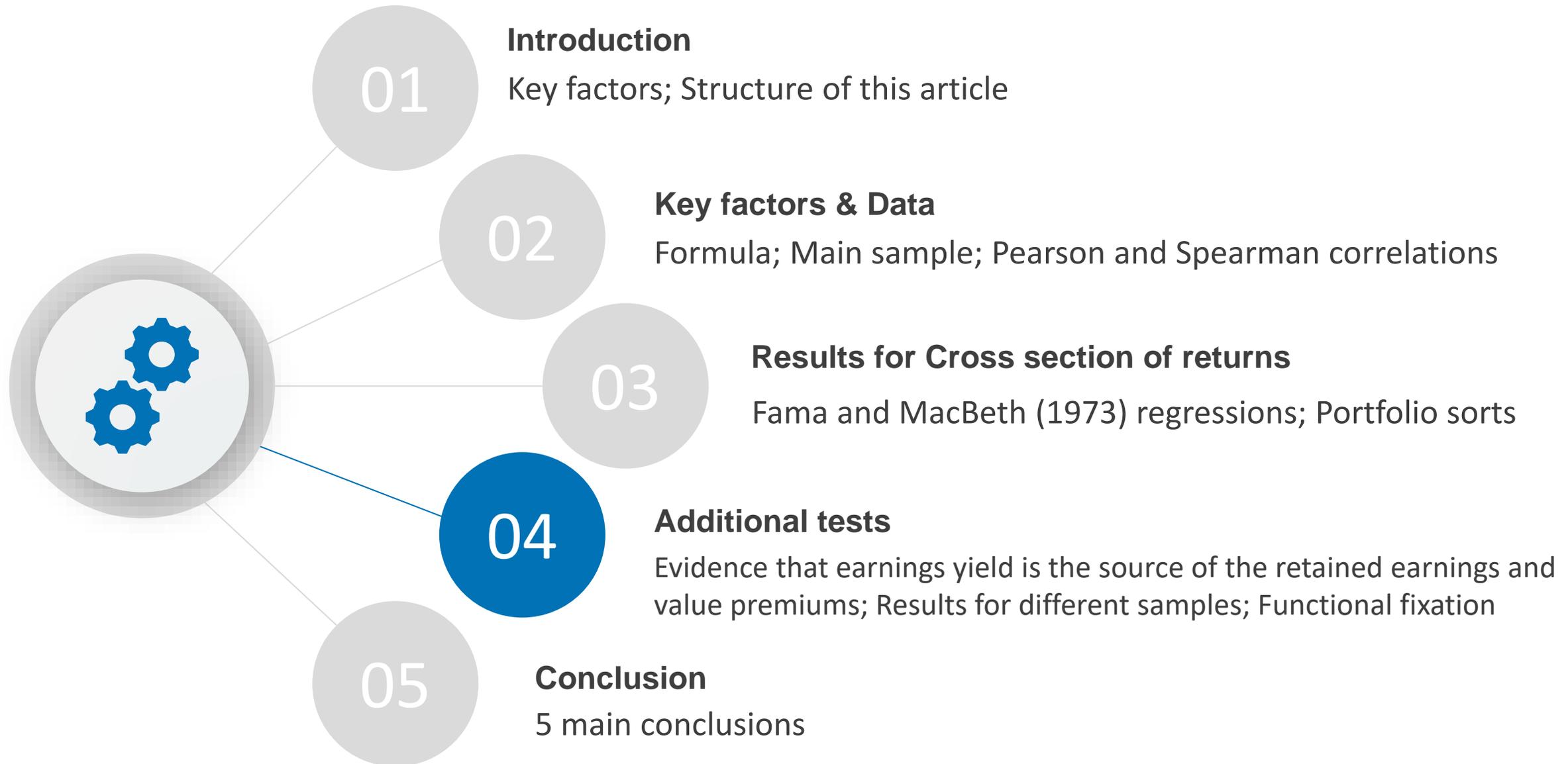
	book-to-market	retained earnings-to-market	contributed capital-to-market
Excess Returns High-minus-low	0.35* (2.43)	0.45* (2.81)	0.12 (0.91)
CAPM Alpha High-minus-low	0.40* (2.83)	0.58* (3.68)	0.09 (0.67)
3-Factor Model Alphas High-minus-low	-0.10 (-1.36)	0.12 (1.16)	-0.23* (-2.18)

- **Excess Returns and CAPM alphas have the same pattern:** book-to-market and retained earnings-to-market spread returns, while contributed capital-to-market does not.
- **The three-factor model alphas display a different pattern.** In that regression, the coefficient on contributed capital-to-market is significantly negative.

Cross section of returns-Portfolio sorts

- In sum, book-to-market predicts returns only because of the retained-earnings component. Neither book-to-market nor contributed capital-to-market carries additional information about the cross section of stock returns.
- We next construct factors that capture the **relation between average returns and the major components of book value of equity**.
- We **sort stocks by size into small and big sub-groups** depending on whether a company is **below or above the median NYSE market capitalization break-point**.
- We estimate **spanning regressions** in which the **dependent variable is the monthly return** on the factor of interest and the **independent variables are the other factors (HML/HMLre/HMLcc/EP)**. If the intercept (alpha) is significant in these regressions, then these factors is valuable to an investor who already trades all the dependent variable factors.
- The results show that when combined with MKT(market return minus the risk free rate) and SMB(size), the **retained earnings based factor captures the valuable information in HML**. **HML and HML based on contributed capital-to-market (HMLcc) do not capture all of the information embedded in the retained earnings based factor**.

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Additional tests

Evidence that earnings yield is the source of the retained earnings and value premiums

- To examine more closely **whether the accumulation of earnings in retained earnings drives retained earnings' predictive ability**, we construct our **own accumulation of earnings backward in time**. We accumulate over windows ending with the most recent year and extending back to five years. We deflate the sum by the most recent market value of equity and then take the natural logarithm. **Importantly, this measure is unaffected by share repurchases**, which could be **source of retained earnings' predictive power**.
- We accumulate both income net of dividends and dividends backward in time. If **accumulated past earnings drive retained earnings-to-market's predictive power**, then the **estimated coefficients on two accumulation measures should be similar in magnitude**. If **dividend payout policies drive the explanatory power**, then the estimated coefficients **should differ**. For all five accumulation windows, we find that the **differences between the two estimated coefficients are all within one standard error of zero, showing that accumulated earnings, not payout policies, drive retained earnings-to-market's predictive power**.
- Retained earnings-to-market being a good proxy for the firm's underlying earnings yield, **it is a significant and positive predictor of growth in future earnings across all three horizons**, while book-to-market's sign and significance vary by horizon and specification.

Additional tests

Predicting average returns over increasing horizons

- We next compare **how far ahead book-to-market and retained earning-to-market predict returns**. We modify the Fama and MacBeth (1973) regressions by **replacing the current values of book-to-market and retained earnings-to-market with increasingly stale values**, but retaining the current values of the control variables. Thus, we assume the **investor knows the current values of the control variables but does not know the current values of the balance sheet measures**.
- Would an investor still benefit from these stale measures? How far ahead do these measures predict the cross section of returns?
- **Both book-to-market and retained earnings-to-market reliably predict returns several years ahead.** Book-to-market has significant explanatory power for approximately three years. The **effect of retained earnings-to-market is stronger and persists for four years.**
- **Reasons:** First, the accumulation of earnings in retained earnings **washes out accounting issues** that affect earnings in individual years but reverse over time. Then, when deflated by current market value of equity, they proxy for expected returns. Second, the ability of variables deflated by current market values to predict stock returns inevitably declines over longer horizons, because **expected returns are unlikely to be constant over time**.

Additional tests

Results for different samples

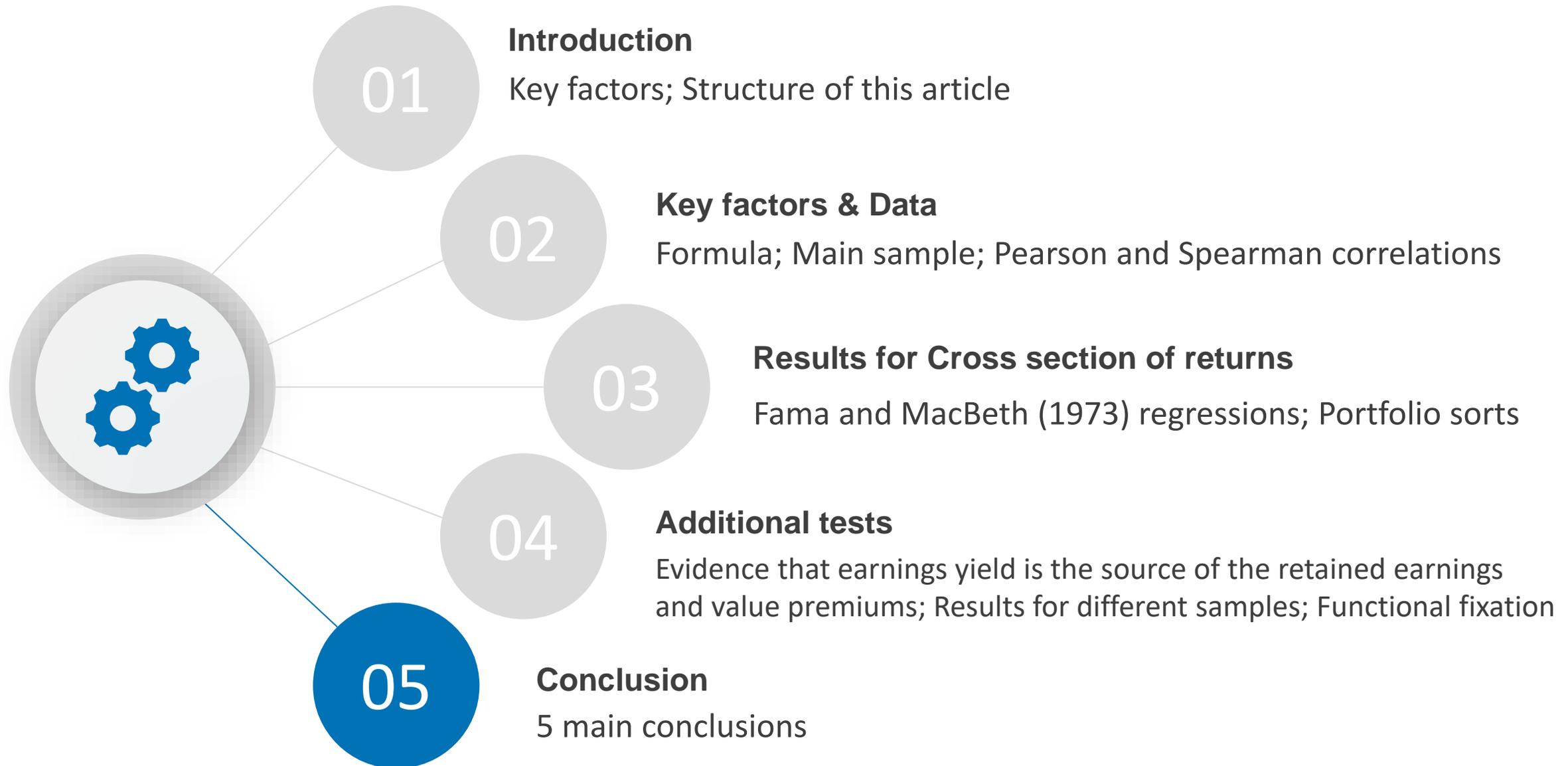
- In this section, we test our **hypothesis using data from different countries and time periods**. These tests corroborate our main results and address concerns that they could represent statistical artifacts.
- First, we find similar results for non-U.S. firms. Second, when we split the U.S. sample into subperiods, retained earnings-to-market predicts returns both pre- and post-1990, even though book-to-market fails to do so in the latter subperiod. Third, we show that book-to-market loses its predictive power in the latter subperiod because its correlation with retained earnings-to-market drops. Fourth, we obtain similar results for U.S. firms over a pre-Compustat period from 1938 through 1964.
- **Overall, the results are consistent across time and across countries.**

Additional tests

Functional fixation

- An alternative explanation of our results is based on the notion that **investors functionally fixate on reported earnings** and consequently **weight its components sub-optimally**.
- We provide additional evidence that bears on the earnings yield versus the functional fixation explanations for retained earnings-to-market's predictive power for the cross section of average returns.
- Under **functional fixation**, when **returns are regressed on earnings-to-price and retained earnings-to-market**, the **coefficient** on earnings-to-price should **be negative and significant because investors initially overweight transitory components of income**, while the **coefficient on retained earnings-to-market should be positive** and significant because it **contains information about future earnings that investors initially underweight**.
- Inconsistent with the predictions of functional fixation, all coefficients on earnings-to-price are positive. **We conclude that the retained earnings-to-market premium we find is unrelated to the thesis that the market initially overweights and subsequently corrects the transitory earnings component known as special items.**

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Conclusion

- Book-to-market consists of two major and economically different components: retained earnings and contributed capital, both deflated by the market value of equity.
- We show that **retained earnings-to-market entirely subsumes book-to-market in predicting returns** even though retained earnings represent averages only 41% of the book value of equity and retained earnings-to-market explains less than 50% of book-to-market's variance.
- **Contributed capital-to-market has no ability to predict future returns when controlling for retained earnings-to-market.** These results are evident in U.S. and non-U.S. data over different periods.
- **Our conclusion is that retained earnings-to-market is comparatively free of the individual-year accounting issues that affect current-period earnings yield and, consequently, is a better proxy for underlying earnings yield, which has a direct conceptual link with expected returns.**
- Our results also confirm that "current earnings should not be the primary focus of appraisal," which should be based on an average earnings estimate that is free of transitory real business factors and accounting effects, "legitimate or otherwise" .

Conclusion

- First, **book-to-market explains the cross section of average returns only because of its retained earnings-to-market component.**
- Second, in value investing strategies, **the book value of equity in book-to-market does not act as a measure of intrinsic value.**
- Third, in later years, **book-to-market fails to predict the cross section of average returns because it loses most of its correlation with retained earnings-to-market.**
- Fourth, our results imply that in **asset pricing tests it is preferable to use a retained earnings-to-market factor rather than a book-to-market factor, especially in later years.**
- Fifth, **retained earnings-to-market is a good proxy for earnings yield**, because retained earnings attenuate accounting effects on individual-year earnings.

THANK YOU