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Investment Sciences

Marketing Department Churn Is Bad for Consumer Products Sales and Bond Returns

Marketing is a core capability of consumer product companies, and churn in the marketing department hurts credit returns: Churn, the percentage of marketers leaving in a period, has predictive power for sales growth and credit returns for 31 securities in the consumer non-cyclical sector. This is an intuitively appealing result, with a very simple interpretation: on average, when CPG companies lose a lot of senior marketing staff, their businesses and bonds perform worse in the near future.

Revelio's staffing data gives us a new lens into levels and changes for different job functions: Revelio uses job listings and resume profile data to build granular staffing models for 5,000 public companies that detail the number of employees in 100 functions, divided by global region and seniority. This is information that has never previous been available for a cross-section of large companies. We have applied this data to equity returns in a companion note, but we also seek to investigate its predictive power for credit investors.

For credit investors, this provides an insight into as aspect of operations that might not normally be visible in real time. This data allows company analysts to place staffing levels and changes within a company into the full investment context. If an analyst already has questions about execution within a firm, the insight that the company has seen a higher share of marketers departing may confirm those concerns. On the other end of the spectrum, if a new CEO is raking the strategy in a direction that includes a refresh of talent, churn might suggest the opposite direction – that the required changes are now done, and the company is poised to deliver better results in the near future.

Supporting and challenging our existing views on specific credits: Our analysts discuss securities where the recent churn values support or challenge their view. High churn is not surprising for Post Holdings (because of M&A) or Kraft Heinz (because of weak recent performance alongside management changes). However, we are somewhat surprised at the decreasing churn at both Newell Brands and Coty. Both companies have had senior management changes, with the Jarden acquisition integration at Newell and a strategic review of divisions at Coty. That churn appears to be decreasing despite these issues suggests operations have been disrupted less than expected.

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INVESTMENT SCIENCES

Revelio Data on Marketing Churn Predicts Credit Returns

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Given the central role that marketing plays in the operating performance of Consumer Products / Consumer Packaged Goods (CPG) companies, we believe that insights into how companies are resourcing their marketing departments will prove investment relevant.. In the past, the relationship between workforces and performance have not received much attention, in part because it has been difficult to get robust data.

Revelio models the number of staff for 100 roles in each region and for four seniority levels

Revelio is a data provider that uses job postings, online professional profiles and resumes to create a point in time snapshot of a company's employees. Those snapshots can be used to understand how a given function is growing and changing over time. Every month Revelio models headcounts in a number of categories. Jobs are categorized into 100 standardised roles, four world regions and four job seniorities.

As a starting point for exploring this potential, we wanted to look at churn in the marketing function within CPG firms. We chose this because it is an intuitively appealing question: *when marketing professionals leave the firm, does the loss of their experience and brand knowledge hurt the business?*

Churn measures staff attrition of all types, we use the average monthly churn over a CY

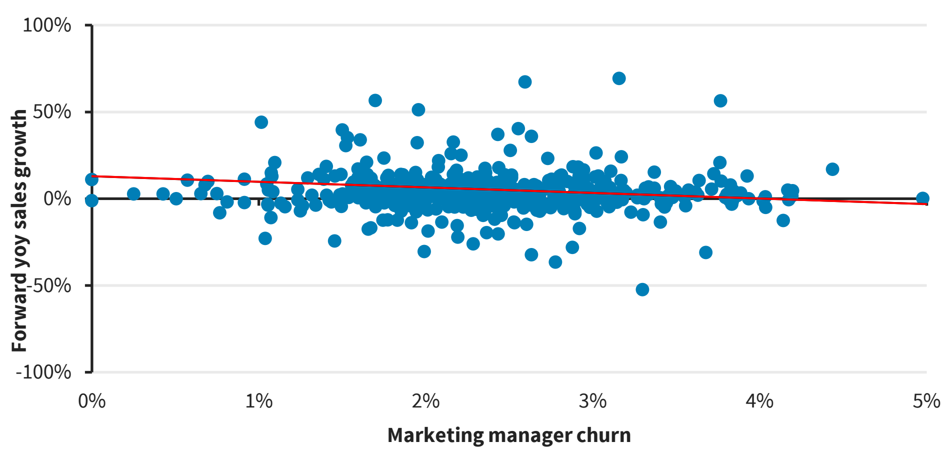
To test this, we started with 52 consumer staples companies for which we had Revelio data among marketers. To test the effect of marketing turmoil, we selected worldwide staff in the 'marketing manager' roles split by seniority levels as well as all seniorities. We define monthly staff churn as the proportion of staff outflow in a month to the count at the start of the month. An average of the monthly values for the calendar year is taken for the yearly churn.

Churn seen to negatively correlate with sales growth

We ran regressions on these churn ratios and we see a negative relationship between share of 'marketing managers' leaving the firm and annualised sales growth[1] (Figure 1). This result suggests that the more senior marketing employees leave the firm in a given year, the worse revenue growth is in the following year. More details on the relationship between churn and sales, as well as equity returns, can be found in our recently published equity research note, *Consumer Staples' Marketing Staff Churn Hurts Sales and Stock Prices*.

FIGURE 1

Among CPG Firms, Higher Marketing Manager Churn in One Year is Correlated to Slower Sales Growth in the Following Year



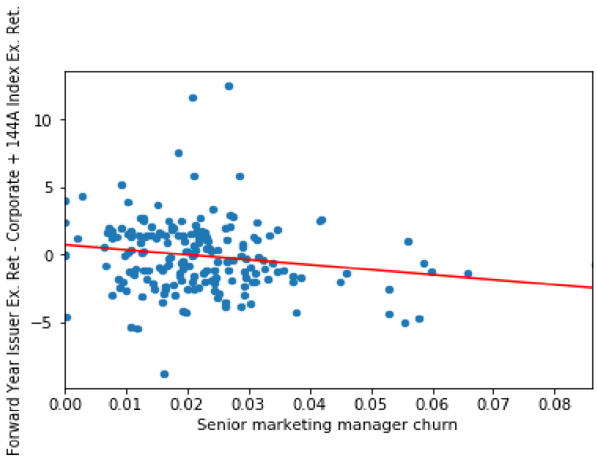
Source: Revelio, Bloomberg, Barclays Research

[1] Annualised sales growth as per Bloomberg's functionality

To evaluate whether this churn metric is predictive of returns, we narrowed the universe to 31 issuers that had bonds in the Bloomberg Consumer Non-Cyclical index. Then for each issuer we calculated the two annual return measures: issuer excess returns adjusted for the broader Corporate + 144A index returns, and issuer excess returns adjusted for Consumer Non-Cyclical index excess returns. We then compared those returns to each company's average annual churn in senior marketers (which is more predictive of returns than the churn in all marketers) in the prior year (Figures 2 and 3).

FIGURE 2

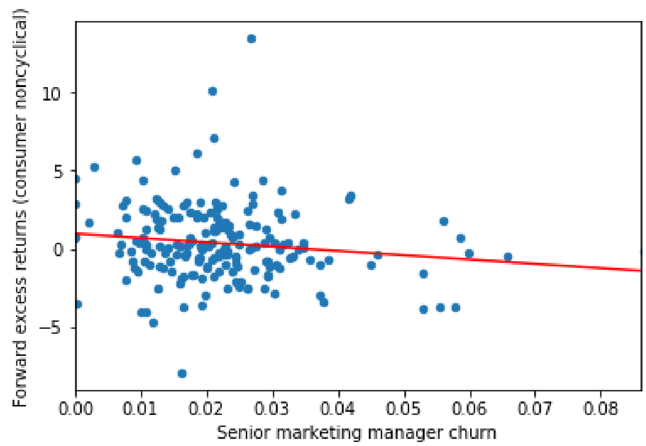
Consumer Staples Firms with Higher Churn Underperform a Broad Index of Credits…



Source: Bloomberg, Revelio, Barclays Research

FIGURE 3

…and also Lag Other Consumer Staples Firms with Lower Churn



Source: Bloomberg, Revelio, Barclays Research

The objective here was to see whether annual churn in one year tells us something about that issuer's relative out (or under) performance vs benchmarks in the subsequent year. As it turns out, higher churn has a statistically significant negative relationship with subsequent returns (Figures 4 and 5). As more senior marketing employees leave the firm, the worse revenue growth is, and the more bonds underperform those of issuers with lower churn.

This relationship is consistent with the one observed in equities, where companies with higher churn also have worse returns than lower-churn comparables, for more detail see *Consumer Staples' Marketing Staff Churn Hurts Sales and Stock Prices*.

FIGURE 4

Churn Has a Statistically Significant Predictive Value for Consumer Staples Returns Adjusted for a Broad Index…

```
                                 OLS Regression Results
==============================================================================
Dep. Variable:     Forward credit excess (144a)   R-squared:                       0.031
Model:                                      OLS   Adj. R-squared:                  0.026
Method:                           Least Squares   F-statistic:                     6.086
Date:                          Mon, 03 Feb 2020   Prob (F-statistic):             0.0145
Time:                                  11:52:44   Log-Likelihood:                -455.76
No. Observations:                           193   AIC:                             915.5
Df Residuals:                               191   BIC:                             922.0
Df Model:                                     1
Covariance Type:                      nonrobust
==================================================================================================
                                  coef    std err          t      P>|t|      [0.025      0.975]
--------------------------------------------------------------------------------------------------
const                           0.7336      0.378      1.940      0.054      -0.012       1.480
Senior marketing manager churn -36.8856     14.952     -2.467      0.015     -66.378      -7.394
==============================================================================
Omnibus:                       50.109   Durbin-Watson:                   2.052
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              209.994
Skew:                           0.921   Prob(JB):                     2.51e-46
Kurtosis:                       7.766   Cond. No.                         80.6
==============================================================================
```

Source: Bloomberg, Revelio, Barclays Research

FIGURE 5

…And also when Adjusted for Direct Peers

```
                                      OLS Regression Results
=========================================================================================================
Dep. Variable:     Forward excess returns (consumer noncyclical)   R-squared:                       0.020
Model:                                                       OLS   Adj. R-squared:                  0.014
Method:                                            Least Squares   F-statistic:                     3.813
Date:                                           Mon, 03 Feb 2020   Prob (F-statistic):             0.0523
Time:                                                   11:51:51   Log-Likelihood:                -445.08
No. Observations:                                            193   AIC:                             894.2
Df Residuals:                                                191   BIC:                             900.7
Df Model:                                                      1
Covariance Type:                                       nonrobust
==================================================================================================
                                  coef    std err          t      P>|t|      [0.025      0.975]
--------------------------------------------------------------------------------------------------
const                           0.9676      0.358      2.704      0.007       0.262       1.673
Senior marketing manager churn -27.6233     14.147     -1.953      0.052     -55.528       0.281
==============================================================================
Omnibus:                       58.317   Durbin-Watson:                   2.075
Prob(Omnibus):                  0.000   Jarque-Bera (JB):              268.190
Skew:                           1.065   Prob(JB):                     5.80e-59
Kurtosis:                       8.368   Cond. No.                         80.6
==============================================================================
```

Source: Bloomberg, Revelio, Barclays Research

The usual caveats that come with any statistical analysis apply here. In particular, the regressions have R-squared (R^2) between 2-3%, meaning that churn only explains a small portion of sales growth and stock returns. It is statistically significant, but still one driver among many, so at any given company in any given year, other factors can combine to produce results that are contrary to what is suggested by churn alone. In addition, we think that this data is more difficult to interpret in the following contexts:

- Where companies have very small marketing staff, a small number of departures can make the values appear very high, even if a more thoughtful assessment would not suggest an unusual volume of change.
- When firms are making divestitures, it can also make the churn appear high relative to what we would consider to be "true" churn, as employees maintain roles with departing businesses.
- Mergers are handled in the data by combining the marketing staffs of both firms into the successor. We believe this provides for consistent measures of churn, but is important to consider in analysis of post-merger companies.

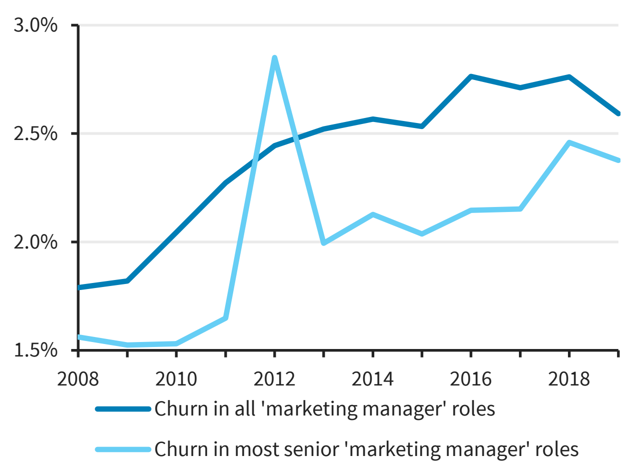
Revelio Data Matches Official Sources in Churn Increasing Since 2008

We note from Figure 6 that churn of 'marketing managers' in the sample companies has been increasing since 2008. In Figure 7, we calculate churn in all Northern American roles for the sample companies and compare with the US QUITS rate provided by the Fed. The sample of consumer staples companies is consistently lower than the QUITS rate, but tracks the increasing trend. In the financial crises and its immediate aftermath, it would seem logical that employees would wish to keep their current role and opportunities to move into new roles would be lower.

Could the change over time of job market churn bias the regressions tested earlier? As a sense check, we introduce a normalised churn metric, by subtracting the average annual churn for all sample companies. We observe better statistical significance in both metrics and a c13% increase in R-squared for sales predictability, but no increase in R-squared for return predictability. For simplicity, we have maintained the simpler non normalised metrics in our core analysis.

FIGURE 6

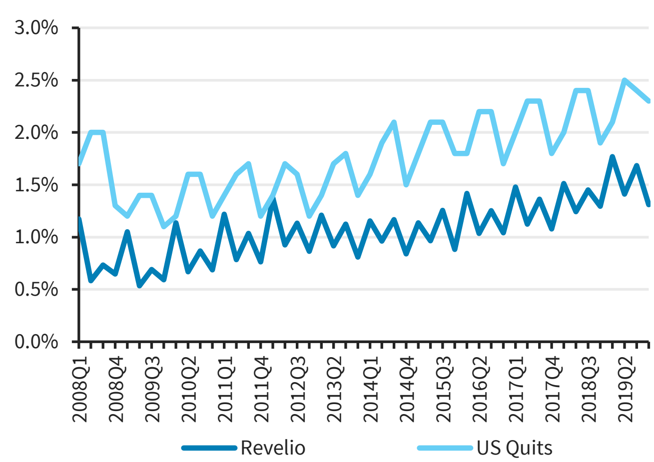
Average Monthly Churn of All 'Marketing Manager' Roles In Sample Companies and the Most Senior in the Role



Source: Revelio, Barclays Research

FIGURE 7

Quarterly US QUITS Rate and Revelio Job Churn in All Roles in North America.



Source: Bloomberg, Revelio, Barclays Research

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Who Experienced the Most Marketing Churn in 2019, And What That Might Mean for 2020

Given the statistically significant, but not perfectly predictive, relationship between churn, sales, and returns, we think discretionary investors can make use of this information as long as they place it in the broader context of what is happening with each firm. To that end, we show the securities' most recent senior 'marketing manager' churn in Figure 8; our fundamental analysts provide additional commentary for some of the most interesting or notable companies in those groups.

HY Food/Beverage/Consumer Products – Hale Holden

Post Holding (POST):

We view the increase in annual increase churn for senior marketing managers at Post Holdings as a reflective of the company's recent M&A activity. The company over the last several years made a serious of acquisitions including Bob Evan's Farm in 2018 and Weetabix in 2017. More recently it has partly divested stakes in 8th Avenue and Bellring brands. We view the increase in marketing manager churn is reflective of those acquisitions. In general, we view Post as a thoughtful deplorer of marketing dollars. Specifically, the company has had recent wins in licensed sugar ready to eat cereal and noted recently given an overheated promotional cadence in the category it was stepping back promotional intensity until the second half of the fiscal year when it expects newer innovation. We rate Post Holdings Market Weight across the debt structure.

Newell Brands (NWL)

We are very surprised at the decline in marketing churn at Newell Brands. For the last 18 months the company has been operating in a relatively difficult environment due to integration issues around the Jarden transaction, activist pressure, and recent senior management changes (new CEO). We would have expected Newell to have higher churn given the high level of external noise surrounding the company. We view the decline as positive and potentially indicative of a quicker recovery than market participants are currently baking in. We rate NWL 2023s, 2024s, 2025s, and 2026s Overweight and the 2046s and 2036s Market Weight.

Coty (COTY)

Similar to Newell, from the outside of the company we would have expected an increase in marketing manager churn and not the decrease that is being shown. Coty has had a series of senior management changes (new CEO, new CFO, etc) over the last 18 months, has instituted a strategic review of the sale process for material divisions (i.e., Professional, Brazil) while working to revitalize its brand portfolio. This revitalization effort has included concentrating marketing dollars around fewer brands. We would have expected to see higher levels of churn given the strategic changes that the company is implementing. We note that Revelio data is for English language posts only, so could feasibly underrepresent headcount and churn from regions like Brazil. We view the decline in churn as a net credit positive. We rate Coty Market Weight.

FIGURE 8

Recent Churn of "Senior Marketing Managers"

Security	2016	2017	2018	2019
Mondelez International Inc	3.3%	4.2%	5.6%	7.8%
Hershey Company	2.9%	4.2%	5.8%	6.3%
Kraft Heinz CoThe	1.7%	2.5%	5.5%	4.9%
General Mills Inc	3.0%	3.1%	3.8%	4.8%
Keurig Dr Pepper Inc	2.8%	4.2%	5.3%	4.2%
Danone SA	2.7%	3.1%	4.6%	3.9%
Post Holdings	1.7%	1.9%	3.1%	3.5%
Kellogg Co	2.1%	2.1%	2.5%	2.9%
Pernod Ricard SA	2.9%	1.8%	2.7%	2.7%
Colgate-Palmolive Co	2.4%	2.7%	3.1%	2.7%
Kimberly-Clark Corp	2.7%	2.3%	3.5%	2.6%
Nestle SA	2.0%	2.0%	2.0%	2.6%
Campbell Soup Co	2.4%	3.0%	3.7%	2.6%
PepsiCo Inc	1.3%	1.1%	2.1%	2.2%
Reckitt Benckiser Group PLC	2.9%	3.3%	2.3%	2.2%
Coca-Cola Company	1.8%	2.1%	2.6%	2.2%
Constellation Brands Inc	0.2%	1.2%	1.6%	2.1%
Molson Coors Brewing Co	1.0%	3.8%	2.9%	1.8%
Estee Lauder Cos IncThe	0.7%	2.0%	1.4%	1.8%
Diageo PLC	2.4%	1.5%	2.3%	1.8%
Newell Brands	2.5%	2.1%	2.3%	1.4%
Heineken NV	3.2%	3.2%	2.2%	1.3%
Anheuser-Busch InBev SANV	1.9%	1.2%	2.4%	1.2%
Coty Inc	2.5%	1.1%	1.6%	1.0%
Tyson Foods Inc	1.7%	2.5%	1.4%	1.0%
Procter & Gamble CoThe	1.3%	0.7%	0.8%	0.9%
Church & Dwight Co Inc	0.9%	0.8%	0.9%	0.9%
Clorox Company	2.4%	2.2%	1.5%	0.7%
McCormick & Co IncMD	1.1%	2.0%	1.1%	0.6%
Edgewell Personal Care Co	1.5%	1.2%	1.0%	0.3%

Source: Revelio, Barclays Research

IG Food/Beverage/Consumer Products – Priya Ohri-Gupta

Mondelez (MDLZ)

We think that the uptick in churn in 2018 and 2019 likely reflects, in part, broader management changes at the company in early 2018, including a new CEO in April of that year and a new Chief Marketing Officer in late March. Despite the higher churn, Mondelez remains an outlier among packaged food companies, with 4.1% organic net revenue growth in 2019 and expectations for another year of ahead-category growth projected in 2020, with an outlook for 3%+ organic revenue growth. That said, gum & candy remains an area that lags the rest of the portfolio, with organic revenue growth of just above flat in 2019 and only 35% of the business gaining or holding market share (versus three-fourths of the overall snacks business). The key driver of this performance has been the US (skewed to the gum side) where the company has been losing share due to both category challenges as well as brand-specific issues. We would not be surprised if a deeper examination into the churn data showed a skew to this area/category. We maintain an Underweight rating on the credit largely owing to valuation, as we see the name trading rich for its rating with limited room for upside ratings movement given the current financial policy, and continued prowess for M&A, albeit more focused on bolt-ons in the near-term.

Kraft Heinz (KHC)

The higher pace of churn in 2018 and 2019 is somewhat unsurprising as the company began exhibiting weaker financial performance over the latter half of 2018, with the trend persisting through 2019. Further, a new CEO took over in the middle of 2019, and created the role of Chief Growth Officer in September 2019, who is responsible for developing the enterprise strategy to support organic growth, and encompasses overall channel growth (including e-commerce), innovation, marketing and R&D. We think that KHC is entering a critical juncture in 2020, as its actions around financial policy (specifically its dividend) as well as its portfolio (i.e. divestitures), are not only necessary to support retention of its IG rating, but also to set a foundation from which to return the business to growth in a more consistent and profitable manner. Clarity around these steps are expected in coming weeks as the company discusses its 4Q19 results and the outcome of its strategic view (expected to follow, and not be commensurate with, earnings). We maintain a Market Weight rating, and recommend investors have select exposure to the credit through the KHC 2030s and 2046s (see *Top Catalyst Ideas*), as we expect that the company will take actions to support its IG rating.

General Mills (GIS)

We think that the recent uptick in churn is in part related to the company's acquisition of Blue Buffalo in April 2018, coupled with select underperformance in its legacy snack bars and yogurt portfolio. In our view, the company's progress in bringing leverage close to its target following the Blue Buffalo acquisition has been a far more significant driver of credit performance. The company has highlighted a desire to continue deleveraging even after it reaches its objective of 3.5x net leverage by FY20. We estimate that the company could further deleverage to the low-3x area in FY21 depending on whether it begins to resume share repurchases after raising its dividend (see *General Mills (GIS): F2Q20 Review*). We maintain an Underweight rating on the name owing to valuation.

APPENDIX: REVELIO

Revelio is a HR database built from hundreds of millions of unstructured online profiles, resumes, and job postings. The data is segmented into a taxonomy of one of 100 Revelio-defined job roles, one of four regions of the world and one of four role seniorities. In this report, we primarily group together data into a worldwide panel for each company, for both "all seniority" levels and for the most senior roles. Contingent roles within companies are included, which can differ from annual report staffing figures.

Yearly churn could be defined as the count of staff leaving in year as a proportion of the starting value. However, if a company's net headcount is materially changing over a year, this metric can become skewed.

FIGURE 9

Stylized Example of How Changes in Headcount Would Translate Into Measured Churn

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Headcount	1000	1015	1030	1045	1059	1074	1088	1102	1116	1130	1143	1157
Monthly inflow	25	25	25	25	25	25	25	25	25	25	25	25
Monthly (1%) outflow	10	10	10	10	11	11	11	11	11	11	11	12
Monthly churn	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Year start headcount / sum(outflow)	13.0%											
Yearly figure / 12	1.1%											
Average monthly churn (metric used)	1.0%											

Source: Barclays Research

To illustrate this dynamic we present an example in Figure 10, where for each month 25 hires are added and the company loses 1% of the staff at the start of the month. As the year advanced, the headcount increased so the absolute number of staff leaving also increased. Hence, a simple yearly figure of 13.0% (or 1.1% monthly) using only the year's starting headcount, is inflated. In December the company starts with 1157 staff and churns 1%=12, but as a proportion of January headcount this is 20% larger. Instead, the monthly churn is calculated and the mean for the year taken. Hence, we take the average of monthly churn figures, in this case 1%.

More details on the data have been summarised by Revelio Labs in the box below.

The Vendors' overview of Revelio Labs

Overview: Revelio Labs is a workforce intelligence company that absorbs and standardizing hundreds of millions of public employment records to create the world's first universal HR database. This enables a deep understanding of the workforce dynamics of any company. Customers include investment analysts, corporate strategists, HR teams, and governments.

Data Source: The underlying data used to create the workforce dataset is collected from unstructured online public profiles, resumes, immigration data, and job postings. The data is curated and structured, to provide employee counts, inflows, outflows, salaries, and prestige. These are then organized by occupation, skill, geography, seniority, education, and gender, for each company in each month. The history extends to 2008.

Key Features

- Occupational Taxonomy: The key issue with public employment data across multiple companies is that each company has an entirely different way of understanding their workforce. To classify the same occupation, different companies use different titles. It is also not uncommon for identical titles to represent fundamentally different occupations when they are used in different industries. For example, an associate at an investment bank will fundamentally differ from an associate at a law firm. To solve for issues of idiosyncratic names, it is necessary to have a universal occupational taxonomy that every job can be mapped to. This is done in a completely unsupervised way with no human in the loop, so that the taxonomy adjusts to changes in the occupational landscape. Through this taxonomy, every title is mapped to an occupation and a seniority level. This is done in a way that allows for the same titles to be grouped in different occupations, if they are described sufficiently differently.

- Sampling Weights: The raw data from the public web contains a non-random sample of each company's population. To generate data that is representative of the true underlying population of interest, it is necessary to employ sampling techniques based on the representativeness of the different groups we observe. The variables used to stratify estimates are by occupation and country. This is validated through the Bureau of Labor Statistics and the International Labor Organization.

- Lags: Individuals may often delay the rate at which they update their online professional profiles. This introduces a systematic underrepresentation of the rate at which people transition in the very recent past, relative to the distant past. To adjust for this, it is necessary to estimate the adjustment lag based on a set of employee criteria. From that distribution, it is possible to predict the retroactive transition updates that will be revealed in future months. This ensures that the calculated flows are an unbiased point-in-time estimate of true flows in each time period.

The Revelio Labs team has deep experience in natural language processing, labor economics, and internal strategic planning at large technology companies.

For more information about the process, or to receive a historical sampling of the Revelio Labs data, please reach out at info@reveliolabs.com..

Analyst Certification

We, Bradford Elliott, CFA, Hale Holden, Ben McSkelly, CFA, Priya Ohri-Gupta, CFA and Ryan Preclaw, hereby certify (1) that the views expressed in this research report accurately reflect our personal views about any or all of the subject securities or issuers referred to in this research report and (2) no part of our compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this research report.

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Materially Mentioned Issuers/Bonds

COTY INC, CD/CE/J/K/M
COTY 6 1/2 04/15/26, Market Weight (USD 105.75, 10-Feb-2020)

GENERAL MILLS INC, Underweight, A/CD/CE/D/J/K/L/M/N
Representative Bond: GIS 4.2 04/17/28 (USD 113.45, 10-Feb-2020)
Representative Bond: GIS 4.7 04/17/48 (USD 122.85, 10-Feb-2020)

KRAFT HEINZ FOODS CO, Market Weight, A/CD/D/J/K/L/M
Representative Bond: KHC 4 5/8 01/30/29 (USD 112.20, 10-Feb-2020)

MONDELEZ INTERNATIONAL INC, Underweight, A/CD/CE/D/J/K/L/M
Representative Bond: MDLZ 4 1/8 05/07/28 (USD 113.66, 10-Feb-2020)
Representative Bond: MDLZ 4 5/8 05/07/48 (USD 122.37, 10-Feb-2020)

NEWELL BRANDS INC, CD/CE/D/J/K/L/M/N
NWL 5 1/2 04/01/46, Market Weight (USD 109.29, 10-Feb-2020)
NWL 5 3/8 04/01/36, Market Weight (USD 110.36, 10-Feb-2020)
NWL 3 3/4 10/01/21, Market Weight (EUR 104.47, 10-Feb-2020)
NWL 3.15 04/01/21, Market Weight (USD 100.83, 10-Feb-2020)
NWL 4.7 08/15/20, Market Weight (USD 101.33, 10-Feb-2020)
NWL 3.85 04/01/23, Overweight (USD 104.19, 10-Feb-2020)
NWL 3.9 11/01/25, Overweight (USD 100.69, 10-Feb-2020)
NWL 4 06/15/22, Market Weight (USD 103.31, 10-Feb-2020)
NWL 4 12/01/24, Overweight (USD 104.06, 10-Feb-2020)
NWL 4.2 04/01/26, Overweight (USD 104.83, 10-Feb-2020)

POST HOLDINGS INC, A/CD/CE/D/E/J/K/L/M/N
POST 5 08/15/26, Market Weight (USD 103.50, 10-Feb-2020)
POST 5 1/2 12/15/29, Market Weight (USD 107.00, 10-Feb-2020)
POST 5 3/4 03/01/27, Market Weight (USD 106.50, 10-Feb-2020)
POST 5 5/8 01/15/28, Market Weight (USD 106.50, 10-Feb-2020)

All pricing information is indicative only. Unless otherwise indicated, prices are sourced from Refinitiv and reflect the closing price in the relevant trading market, which may not be the last available price at the time of publication.

Disclosure Legend:

A: Barclays Bank PLC and/or an affiliate has been lead manager or co-lead manager of a publicly disclosed offer of securities of the issuer in the previous 12 months.

B: An employee or non-executive director of Barclays PLC is a director of this issuer.

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D: Barclays Bank PLC and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.

E: Barclays Bank PLC and/or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer within the next 3 months.

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GD: One of the Research Analysts on the fundamental credit coverage team (or a member of his or her household) has a long position in the common equity securities of this issuer.

GE: One of the Research Analysts on the fundamental equity coverage team (or a member of his or her household) has a long position in the common equity securities of this issuer.

H: This issuer beneficially owns more than 5% of any class of common equity securities of Barclays PLC.

I: Barclays Bank PLC and/or an affiliate is party to an agreement with this issuer for the provision of financial services to Barclays Bank PLC and/or an affiliate.

J: Barclays Bank PLC and/or an affiliate is a liquidity provider and/or trades regularly in the securities of this issuer and/or in any related derivatives.

K: Barclays Bank PLC and/or an affiliate has received non-investment banking related compensation (including compensation for brokerage services, if applicable) from this issuer within the past 12 months.

L: This issuer is, or during the past 12 months has been, an investment banking client of Barclays Bank PLC and/or an affiliate.

M: This issuer is, or during the past 12 months has been, a non-investment banking client (securities related services) of Barclays Bank PLC and/or an affiliate.

N: This issuer is, or during the past 12 months has been, a non-investment banking client (non-securities related services) of Barclays Bank PLC and/or an affiliate.

O: Not in use.

P: A partner, director or officer of Barclays Capital Canada Inc. has, during the preceding 12 months, provided services to the subject company for remuneration, other than normal course investment advisory or trade execution services.

Q: Barclays Bank PLC and/or an affiliate is a Corporate Broker to this issuer.

R: Barclays Capital Canada Inc. and/or an affiliate has received compensation for investment banking services from this issuer in the past 12 months.

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U: The equity securities of this Canadian issuer include subordinate voting restricted shares.

V: The equity securities of this Canadian issuer include non-voting restricted shares.

Explanation of the Barclays Research Corporate Credit Sector Rating System

Overweight (OW):

For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to exceed the six-month excess return of the relevant index.

For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to exceed the six-month total return of the relevant index.

Market Weight (MW):

For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to be in line with the six-month excess return of the relevant index.

For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to be in line with the six-month total return of the relevant index.

Underweight (UW):

For sectors rated against the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or the Bloomberg Barclays EM USD Corporate and Quasi-Sovereign Index, the analyst expects the six-month excess return of the sector to be less than the six-month excess return of the relevant index.
For sectors rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index, the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials, the Bloomberg Barclays Pan-European High Yield Finance Index or the Bloomberg Barclays EM Asia USD High Yield Corporate Credit Index, the analyst expects the six-month total return of the sector to be less than the six-month total return of the relevant index.

Sector definitions:
Sectors in U.S. High Grade Research are defined using the sector definitions of the Bloomberg Barclays U.S. Credit Index and are rated against the Bloomberg Barclays U.S. Credit Index.
Sectors in U.S. High Yield Research are defined using the sector definitions of the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index and are rated against the Bloomberg Barclays U.S. High Yield 2% Issuer Capped Credit Index.

Sectors in European High Grade Research are defined using the sector definitions of the Bloomberg Barclays Pan-European Credit Index and are rated against the Bloomberg Barclays Pan-European Credit Index.
Sectors in Industrials and Utilities in European High Yield Research are defined using the sector definitions of the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials and are rated against the Bloomberg Barclays Pan-European High Yield 3% Issuer Capped Credit Index excluding Financials.
Sectors in Financials in European High Yield Research are defined using the sector definitions of the Bloomberg Barclays Pan-European High Yield Finance Index and are rated against the Bloomberg Barclays Pan-European High Yield Finance Index.

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To view sector definitions and monthly sector returns for Asia, EEMEA and Latin America Research, go to https://live.barcap.com/go/research/EMSectorReturns on Barclays Live.

Explanation of the Barclays Research Corporate Credit Rating System

For all High Grade issuers covered in the US, Europe or Asia, and for all issuers in Latin America and EEMEA, the credit rating system is based on the analyst's view of the expected excess return over a six-month period of the issuer's index-eligible corporate debt securities* relative to the expected excess return of the relevant sector, as specified on the report.

Overweight (OW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to exceed the six-month expected excess return of the relevant sector.
Market Weight (MW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to be in line with the six-month expected excess return of the relevant sector.
Underweight (UW): The analyst expects the six-month excess return of the issuer's index-eligible corporate debt securities to be less than the six-month expected excess return of the relevant sector.
Rating Suspended (RS): The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity in a merger or strategic transaction involving the company.
Coverage Suspended (CS): Coverage of this issuer has been temporarily suspended.
Not Covered (NC): Barclays' fundamental credit research team does not provide formal, continuous coverage of this issuer and has not assigned a rating to the issuer or its debt securities. Any analysis, opinion or trade recommendation provided on a Not Covered issuer or its debt securities is valid only as of the publication date of this report and there should be no expectation that additional reports relating to the Not Covered issuer or its debt securities will be published thereafter.

For all High Yield issuers (excluding those covered in EEMEA or Latin America), the credit rating system is based on the analyst's view of the expected total returns over a six-month period of the rated debt security relative to the expected total return of the relevant sector, as specified on the report.

Overweight (OW): The analyst expects the six-month total return of the debt security subject to this rating to exceed the six-month expected total return of the relevant sector.
Market Weight (MW): The analyst expects the six-month total return of the debt security subject to this rating to be in line with the six-month expected total return of the relevant sector.
Underweight (UW): The analyst expects the six-month total return of the rated debt security subject to this rating to be less than the six-month expected total return of the relevant sector.
Rating Suspended (RS): The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity in a merger or strategic transaction involving the company.

Coverage Suspended (CS): Coverage of this issuer has been temporarily suspended.
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Where a recommendation is made at the issuer level, it does not apply to any sanctioned securities, where trading in such securities would be prohibited under applicable law, including sanctions laws and regulations.

*In EEMEA and Latin America (and in certain other limited instances in other regions), analysts may occasionally rate issuers that are not part of the Bloomberg Barclays U.S. Credit Index, the Bloomberg Barclays Pan-European Credit Index, the Bloomberg Barclays EM Asia USD High Grade Credit Index or Bloomberg Barclays EM USD Corporate and Quasi Sovereign Index. In such cases the rating will reflect the analyst's view of the expected excess return over a six-month period of the issuer's corporate debt securities relative to the expected excess return of the relevant sector, as specified on the report.

Distribution of ratings assigned by Barclays Corporate Credit Research at the issuer level:
27% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 61% of issuers with this rating category are investment banking clients of the Firm; 78% of the issuers with this rating have received financial services from the Firm.
46% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 61% of issuers with this rating category are investment banking clients of the Firm; 83% of the issuers with this rating have received financial services from the Firm.
27% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 44% of issuers with this rating category are investment banking clients of the Firm; 79% of the issuers with this rating have received financial services from the Firm.

Distribution of ratings assigned by Barclays Corporate Credit Research at the bond level:
21% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 51% of bonds with this rating category are investment banking clients of the Firm; 68% of the issuers with this rating have received financial services from the Firm.
54% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 56% of bonds with this rating category are investment banking clients of the Firm; 78% of the issuers with this rating have received financial services from the Firm.
25% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 45% of bonds with this rating category are investment banking clients of the Firm; 70% of the issuers with this rating have received financial services from the Firm.

Explanation of the Barclays EM Sovereign Credit Issuer Rating System
Overweight (OW):
The analyst expects the six-month excess return of the country's index eligible bonds to exceed the six-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Market Weight (MW):
The analyst expects the six-month excess return of the country's index eligible bonds to be in line with the six-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Underweight (UW):
The analyst expects the six-month excess return of the country's index eligible bonds to be less than the six-month excess return of the Bloomberg Barclays EM USD Sovereign Index.
Rating Suspended (RS):
The rating has been suspended temporarily due to market events that make coverage impracticable or to comply with applicable regulations and/or firm policies in certain circumstances including where the Investment Bank of Barclays Bank PLC is acting in an advisory capacity.

Distribution of ratings assigned by Barclays Emerging Markets Sovereign Research at the issuer level:
32% have been assigned an Overweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Buy rating; 9% of issuers with this rating category are investment banking clients of the Firm; 64% of the issuers with this rating have received financial services from the Firm.
35% have been assigned Market Weight rating which, for purposes of mandatory regulatory disclosures, is classified as a Hold rating; 8% of issuers with this rating category are investment banking clients of the Firm; 83% of the issuers with this rating have received financial services from the Firm.
32% have been assigned an Underweight rating which, for purposes of mandatory regulatory disclosures, is classified as a Sell rating; 9% of issuers with this rating category are investment banking clients of the Firm; 91% of the issuers with this rating have received financial services from the Firm.

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