RESEARCH

Cash by Any Other Name

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RESEARCH

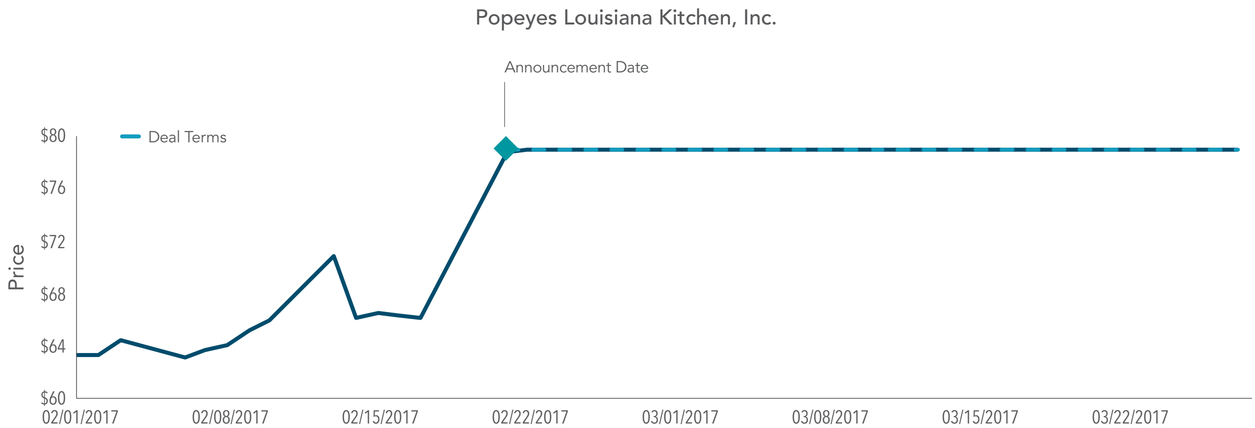
Why do we invest in stocks? Many of us do so because stocks offer higher expected returns than cash and Treasury bills. This difference in expected returns between stocks and Treasury bills is called the equity premium. When investors evaluate an equity strategy, they often look at the cash holdings of the strategy. A higher allocation to cash means lower exposure to the equity premium—not a desirable outcome for investors pursuing higher expected returns.[1] A high allocation to cash and cash-like instruments, however, is not the only way in which an equity strategy can reduce its exposure to the equity premium. A less obvious culprit is cash exposure through holdings in companies that are the targets of cash mergers.

Mergers and acquisitions are natural components of well-functioning capital markets. Every year, hundreds of publicly listed firms around the world become acquisition targets of other firms. From January 2011 through December 2018, more than 9,000 mergers were announced around the world. Most were initiated as cash deals, meaning the acquiring firm offered cash to the shareholders of the target firm.

In public, competitive markets, investors quickly incorporate new information into stock prices, including merger announcements. If the market expects a high probability that the acquisition will go through, the stock of the acquisition target becomes a source of cash that will flow to investors when the deal closes, and the amount of that cash is driven by the proposed acquisition price and the number of shares investors hold. As a result, when a firm becomes the target of a cash acquisition, its stock price generally moves toward the proposed acquisition price and stays there until the deal closes. While the stock price may stay slightly lower than acquisition price for reasons such as the time value of money, the stock effectively tends to trade like cash between the announcement date and the completion date. Investors holding stock of companies that are the target of a cash acquisition may therefore have unintentional cash-like exposure, meaning they

1. Equity premium refers to the difference in return between stocks and bonds.

Exhibit 1: Popeyes Louisiana Kitchen Stock Price from Merger Announcement until Completion
February 2017–March 2017



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Source: data are from Bloomberg L.P. Bloomberg Barclays data provided by Bloomberg.

may be giving up the desired expected returns associated with an equity investment. Indeed, through an examination of small cap mergers around the world following deal announcements, we find generally that stocks of companies targeted in a cash acquisition have offered returns no higher than those of a cash investment.

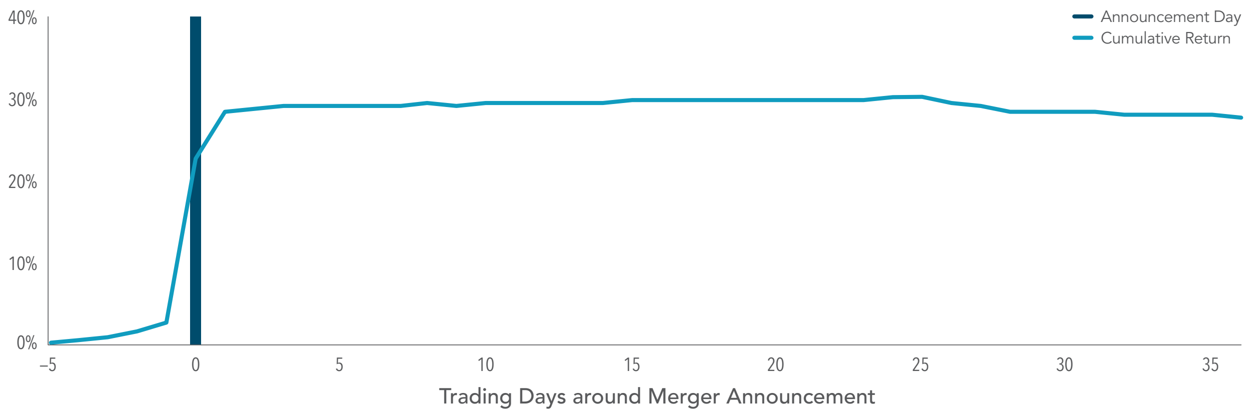
Consider an example. Restaurant Brands International announced its intent to acquire Popeyes Louisiana Kitchen for $79 per share on February 21, 2017. The same day, Popeyes's stock price surged 19% from $66.12 to $78.73, landing within 27 cents of the acquisition offer. Popeyes's stock price remained fairly flat following the announcement date, staying within $0.06 of deal terms, until the acquisition was completed one month later.[2]

Most cash mergers target small cap stocks and are successfully completed.[3] Do most result in unintentional cash-like exposure?

We explore this question by examining the return to cash merger targets in excess of the return to cash following the announcement of an intended acquisition of stock in exchange for cash. We focus on small cap stocks, which between 2011 and 2018 comprised 61% of cash mergers in the US and over 90% of cash mergers outside the US.[4] If the prices of cash merger targets generally trade at a fairly constant price, as observed in the Popeyes example, it is reasonable that they would have a return similar to cash.

2. Maggie McGrath, "A Whopper Of A Deal: Burger King Owner Restaurant Brands International Acquires Popeyes For $1.8 Billion" *Forbes*, February 21, 2017.
3. See Appendix for detailed information.
4. See Appendix for detailed information.

Exhibit 2: Cumulative Return over Cash Benchmark: US Small Cap Cash Merger Targets
January 2011–December 2018



Past performance is not a guarantee of future results. Performance may increase or decrease as a result of currency fluctuations.

Notes: universe includes 927 US small cap stocks that are targets of cash-only mergers announced from January 2011 to December 2018. Daily fed funds rate is used as the US cash benchmark; data from Bloomberg. Bloomberg Barclays data provided by Bloomberg. Cumulative return is determined for each stock and is market cap-weighted as of five days prior to announcement date, across all events. Small cap stocks are defined as approximately the bottom 10% of market capitalization, excluding stocks with the highest relative price and lowest profitability. We present a 36-day window because it is the period during which at least 50% of deals in the countries examined are still active following announcement. Filters were applied to data retroactively and with the benefit of hindsight. Groups of stocks and their returns are hypothetical, are not representative of indices, actual investments, or actual strategies managed by Dimensional, and do not reflect costs and fees associated with an actual investment.

Exhibit 2 plots the cumulative return of US small cap targets of cash mergers announced from 2011 through 2018 in excess of the daily federal funds rate from five days prior to the merger announcement to two months after the announcement. The cumulative return is determined for each stock and is market cap-weighted as of five days prior to announcement date, across all events. Stocks are removed from the weighted average once the deals are completed, terminated, or withdrawn. We present the approximately two-month window following the deal announcement because it is the period during which at least 50% of deals were still active across the countries examined. On the day of the merger announcement, indicated with the dark blue line as day 0, the excess return of the target was 19% on average as investors quickly incorporated news of the deal. We also observe a slight increase in return over cash on the day following the announcement, which can be attributed to mergers that are announced after market close on day 0. Following the announcement, the average excess return over cash stays close to zero.

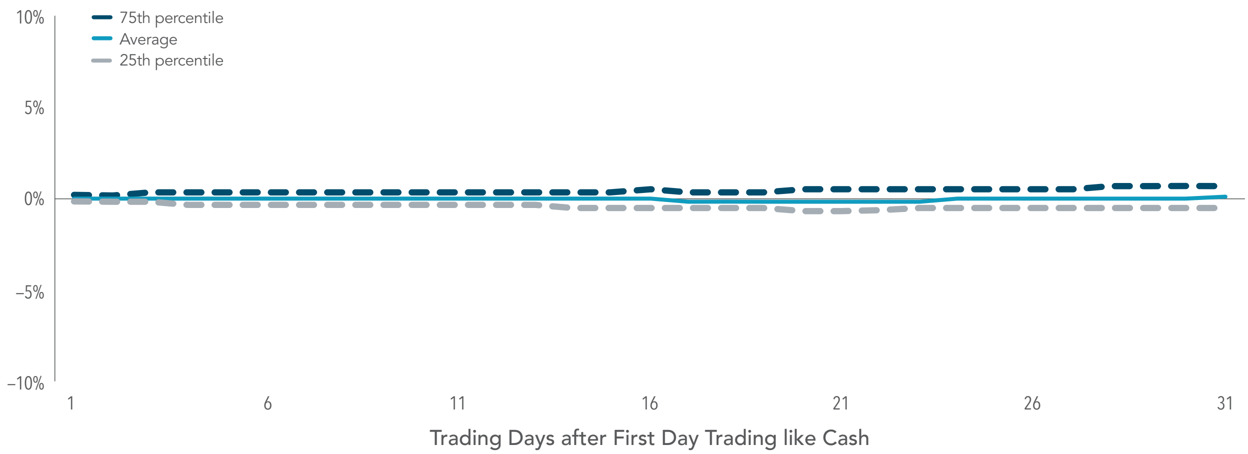
It is natural for the market to assign different probabilities of completion to different merger proposals.[5] Dispersion in expectations around deal success means the prices of some cash merger targets quickly move to deal terms, while the prices of other targets may go on trading more independently. We therefore focus next on the subset of merger targets that trade within +/−2% of deal terms at least once, a possible indication that market participants expect the deal to close.

Applying the same methodology to this subset of stocks, **Exhibit 3** plots the cumulative weighted average return in excess of the daily federal funds rate from the first day that a stock trades within +/−2% of deal terms. We see that the average excess return of these cash merger targets is zero, indicating that holding such stocks provides an investment experience akin to holding cash.[6] The dashed lines in the graph plot the average cumulative return at the 25th percentile and 75th percentile of all targets in this group and illustrate narrow dispersion across stocks.

5. For example, Singapore-based Broadcom made an unsolicited bid for Qualcomm in 2017, an action met with resistance by Qualcomm and later met with national security concerns, and ultimately blocked by the US government. See: "Timeline: Broadcom-Qualcomm Saga Comes to an Abrupt End," Reuters, March 14, 2018. This is quite a different market environment than the one in the proposed acquisition of Popeyes by Restaurant Brands International, for example.

6. A narrower definition of trading like cash with a boundary of +/−1% or +/−0.5% produces similar results.

Exhibit 3: Cumulative Return over Cash Benchmark after First Day Trading like Cash
US Small Cap Cash Merger Targets
January 2011–December 2018



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Notes: universe includes 822 US small cap stocks that are targets of cash-only mergers announced from January 2011 to December 2018 and trade like cash at least once. Trading like cash refers to stock price trading within +2% and –2% of deal terms. Daily federal funds rate is used as the US cash benchmark; data from Bloomberg. Bloomberg Barclays data provided by Bloomberg. Small cap stocks are defined as approximately the bottom 10% of market capitalization, excluding stocks with the highest relative price and lowest profitability. We present a 29-day window because it is the period during which at least 50% of deals in the countries examined are still active following the first day trading like cash. Filters were applied to data retroactively and with the benefit of hindsight. Groups of stocks and their returns are hypothetical, are not representative of indices, actual investments, or actual strategies managed by Dimensional, and do not reflect costs and fees associated with an actual investment.

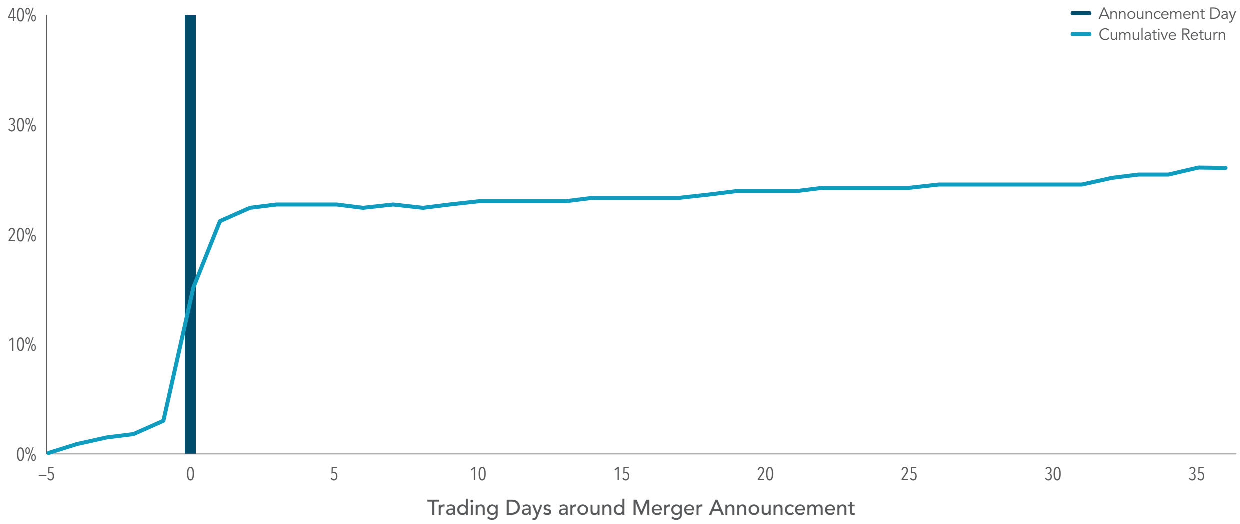
We repeat the analysis using data from 10 other countries for which we have access to a local cash benchmark with daily history available: six developed countries (Australia, Britain, Canada, Germany, Japan, and Switzerland) and four emerging markets countries (Brazil, China, India, and Korea). **Exhibit 4** shows the average cumulative return to small cap cash merger targets in excess of local cash benchmarks from five days prior to the merger announcement through 36 days following the announcement. **Panel A** shows a pattern in developed markets similar to that in the US: the average return goes up on the day of the merger announcement, as prices incorporate the news, and subsequently flattens out over the next two months.

In emerging markets, as shown in **Panel B**, the pattern is noisier. As mentioned, the market does not assign a high probability of completion to every announced merger, and the results suggest such skepticism may be more common in emerging markets. This is confirmed by the smaller percentage of cash mergers that trade within +/–2% of deal terms: 22% in emerging markets, compared to 53% in developed markets ex US and 80% in the US. Why? The differing behavior of M&A activity likely contributes to these outcomes. For example, the average cash merger in emerging markets seeks to acquire 44% of the target company, compared to over 61% in developed markets and over 88% in the US. Additional detail can be found in the **Appendix**.[7]

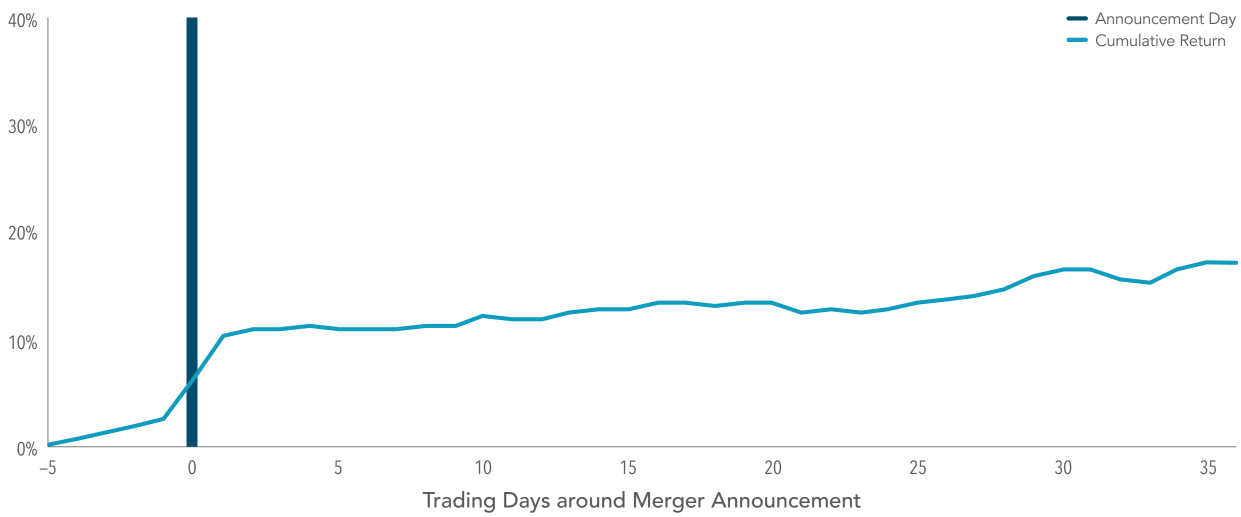
7. The upward slope in Panel B of Exhibit 4 is more pronounced farther out from announcement because mergers that take over 36 days to complete display more of an upward-sloping trend, in contrast to a flat pattern across mergers that complete in under 36 days and that are dropped from the graph upon deal completion.

Exhibit 4: Cumulative Return over Cash Benchmark around Merger Announcement
Developed ex US and Emerging Market Small Cap Cash Merger Targets
January 2011–December 2018

Panel A: Developed ex US



Panel B: Emerging Markets



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Notes on Developed ex US: universe includes 801 small cap stocks in six selected developed countries that are targets of cash-only mergers announced from January 2011 to December 2018. The six selected countries are Australia, Britain, Canada, Germany, Japan, and Switzerland. The cash benchmarks used are, respectively, the Australian bank bill rate 3-month, ICE LIBOR for British Pound 3 month, Canada IBOR 3-month, German Bubill 0-3 Month total return index unhedged, Japanese government discount bill rate 3 month, and ICE LIBOR for Swiss Franc 3 month. Small cap stocks are defined as approximately the bottom 12.5% of market capitalization, excluding stocks with the highest relative price and lowest profitability.

Notes on Emerging Markets: universe includes 583 small cap stocks in four selected EM countries that are targets of cash-only mergers announced from January 2011 to December 2018. The four selected countries are Brazil, China, India, and South Korea. The cash benchmarks used are, respectively, the Brazil interbank deposit overnight rate, Shanghai interbank offered rate 1 month, Mumbai interbank offered rate 1 month, and Korea interbank offered rate 1 month. Small cap stocks are defined as approximately the bottom 15% of market capitalization, excluding stocks with the highest relative price and lowest profitability.

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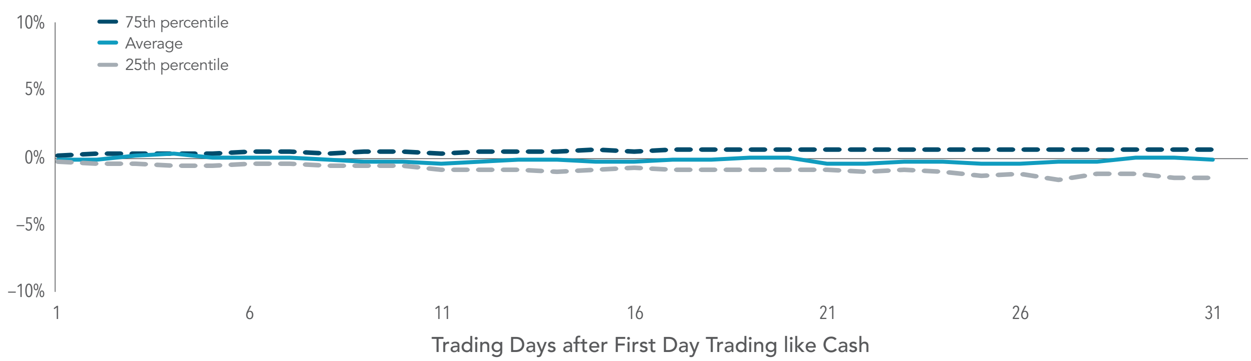
To focus on those with a higher expectation of deal completion, we examine the subset of merger targets that trade within +/−2% of deal terms at least once in **Exhibit 5**. We plot the average return to cash merger targets in excess of cash following the first day that the stock trades within the 2% bound, and the 25th and 75th percentile outcomes are indicated with dashed lines. As in the US, the merger targets within developed markets outside the US exhibit cash-like exposure, as seen in **Panel A**. Their average excess return over cash is zero.

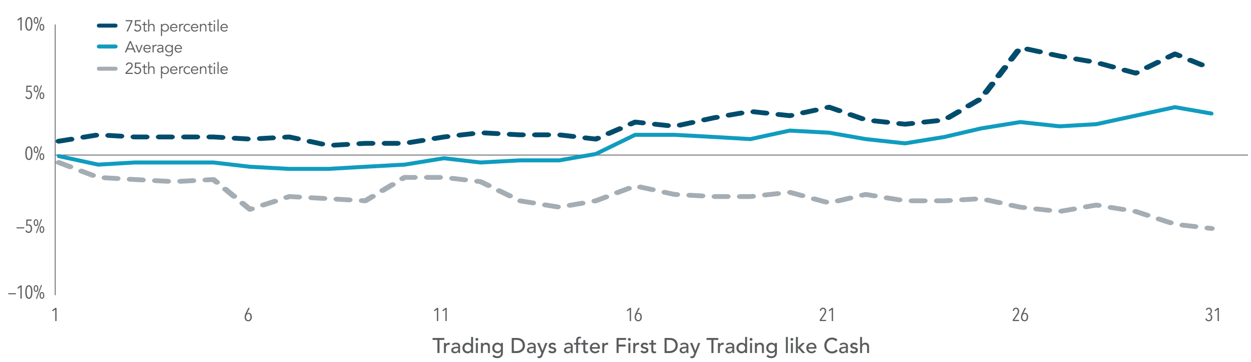
Again, the result is noisier within emerging markets in **Panel B**. This can largely be attributed to the smaller cross section and wider cross-sectional dispersion in returns across the four countries included in the analysis, as well as the lower average percentage of the target company acquired within emerging markets compared to developed markets.

Exhibit 5: Cumulative Return over Cash Benchmark after First Day Trading like Cash
Developed ex US and Emerging Market Small Cap Cash Merger Targets
January 2011–December 2018

Panel A: Developed ex US



Panel B: Emerging Markets



Past performance is not a guarantee of future results. Performance may increase or decrease as a result of currency fluctuations.

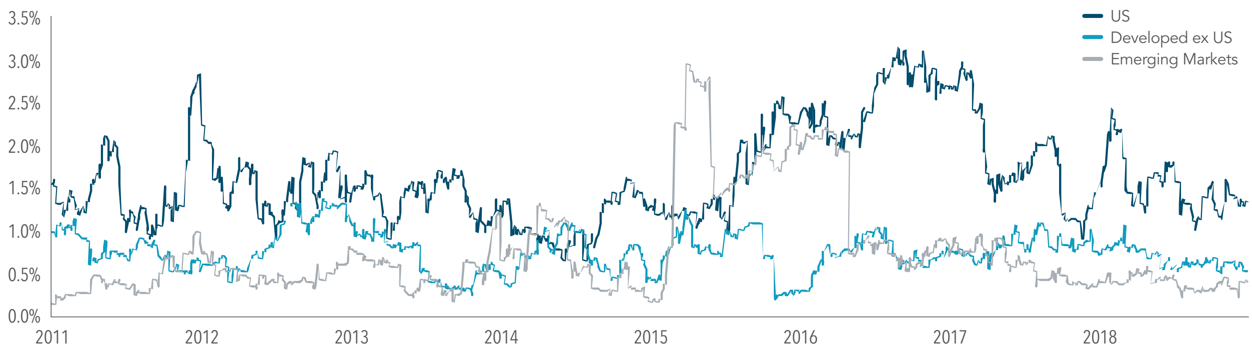
Notes on Developed ex US: universe includes 542 small cap stocks in six selected developed countries that are targets of cash-only mergers announced from January 2011 to December 2018. The six selected countries are Australia, Britain, Canada, Germany, Japan, and Switzerland. Trading like cash refers to stock price trading within +2% and –2% of deal terms. The cash benchmarks used are, respectively, the Australian bank bill rate 3-month, ICE LIBOR for British Pound 3 month, Canada IBOR 3-month, German Bubill 0-3 Month total return index unhedged, Japanese government discount bill rate 3 month, and ICE LIBOR for Swiss Franc 3 month. Small cap stocks are defined as approximately the bottom 12.5% of market capitalization, excluding stocks with the highest relative price and lowest profitability.

Notes on Emerging Markets: universe includes 278 small cap stocks in four selected EM countries that are targets of cash-only mergers announced from January 2011 to December 2018. The four selected countries are Brazil, China, India, and South Korea. Trading like cash refers to stock price trading within +2% and –2% of deal terms. The cash benchmarks used are, respectively, the Brazil interbank deposit overnight rate, Shanghai interbank offered rate 1 month, Mumbai interbank offered rate 1 month, and Korea interbank offered rate 1 month. Small cap stocks are defined as approximately the bottom 15% of market capitalization, excluding stocks with the highest relative price and lowest profitability.

Filters were applied to data retroactively and with the benefit of hindsight. Groups of stocks and their returns are hypothetical, are not representative of indices, actual investments, or actual strategies managed by Dimensional, and do not reflect costs and fees associated with an actual investment.

8. An examination of merger targets for which the acquirer seeks to own at least 60% of the target firm, for example, indeed produces an excess return closer to zero; however, the number of such merger targets falls to 102 within emerging markets in this period.

Exhibit 6: Percentage of Small Cap Stocks Targeted in Cash Mergers
January 2011– December 2018



Notes: data are from Bloomberg LP, compiled by Dimensional. Small cap stocks include the bottom 10%, 12.5%, and 15% of market capitalization within the US, developed ex US, and emerging markets, respectively. Small cap securities with the lowest profitability and lowest book-to-market ratios are excluded. Bloomberg Barclays data provided by Bloomberg.

INVESTOR IMPLICATIONS

Investors holding a portfolio of small cap stocks may unintentionally give up expected returns of an equity investment by holding stocks that are the target of cash acquisitions. The impact on investor outcomes will depend first on what portion of the holdings is providing unintentional cash-like exposure. **Exhibit 6** plots the percentage of the small cap universe in the US, developed ex US, and emerging markets that comprises cash merger targets. Cash merger targets made up 1.64% of the US small cap universe on average each day from 2011 through 2018. This figure is slightly lower in developed ex US markets and emerging markets, at 0.77% and 0.79%, respectively. Market characteristics, such as average deal duration, and differences in tax and accounting rules may drive differences in the weight of cash mergers across regions.

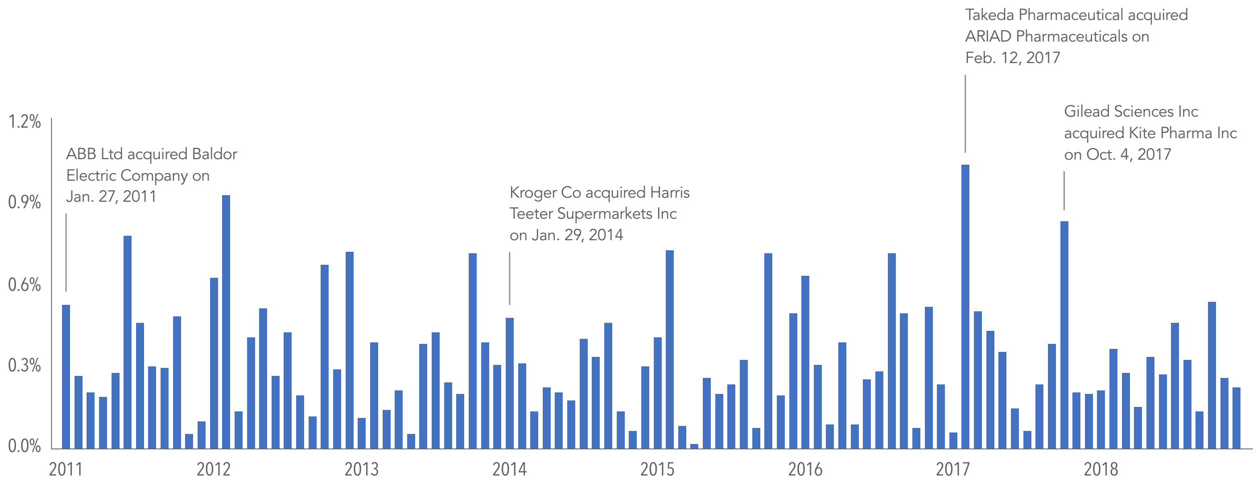
Overall, our analysis suggests that investing in global small cap stocks could result in about 1% unintentional cash-like exposure. Moreover, the timing of cash flows resulting from merger completion can also pose challenges for small cap investors. By holding merger targets to deal completion, investors give up some control on the timing of cash flows into the portfolio and may therefore be forced to demand immediacy in quickly deploying large cash flows when the deal completes. The concern is further exacerbated by the fact that small cap stocks tend to have higher trading costs. Cash inflows from mergers will naturally vary over time and may make up meaningful portions of the investment universe in some periods. We illustrate this finding for a widely followed universe of US small cap stocks, the Russell 2000 Index, in **Exhibit 7**.

For example, a $1 billion fund holding the stocks that make up the Russell 2000 Index at index weights as of October 3, 2017, when Gilead Sciences completed its acquisition of Kite Pharma, would have had $4.3 million in cash instead of Kite Pharma stock as of the next business day.[9] From 2011 through 2018, a portfolio of securities in the Russell 2000 Index would have had, on average, 4% of its assets turn into cash each year due to cash mergers, moving the portfolio away from the intended equity exposure.[10]

9. Index weights are as of previous month-end. Weight of Kite Pharma in Russell 2000 Index as of September 30, 2017, was 0.43%. Gilead Sciences, "Gilead Sciences Completes Acquisition of Kite Pharma, Inc.," press release, October 3, 2017.

10. Figure indicates percentage of stocks by market capitalization weight in the Russell 2000 Index that are acquired for cash, on average, each year from 2011 through 2018.

Exhibit 7: Monthly Weight of Russell 2000 in Targets of Cash Mergers Completed
January 2011–December 2018



Notes: merger data are from Bloomberg LP, compiled by Dimensional. Weight indicates the sum of index weight of all cash merger targets in the Russell 2000 Index at the month-end prior to the deal completion date. The universe includes cash merger targets in Russell 2000 at the month-end prior to the deal completion and are dropped out of the index at the month following the deal completion. Select deals are noted in the graph for illustration. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. Bloomberg Barclays data provided by Bloomberg.

Investors cannot control corporate actions, but they can plan for them. A systematic equity portfolio designed to efficiently and accurately target higher expected returns can incorporate information about corporate actions, including merger activity, every day. Through process-driven yet flexible implementation, small cap stocks that are the target of a cash acquisition and are trading very closely to deal terms can be systematically sold from the portfolio in a thoughtful manner without demanding immediacy from the marketplace. Thus, an approach that systematically divests of such merger targets reduces unintentional cash-like exposure while also maintaining control of the timing of cash flows. In essence, such an approach can pursue higher expected returns while managing risks and controlling costs.

APPENDIX

Summary of Merger Counts by Region, Announced from January 2011 to December 2018

Mergers Announced from 01/01/2011 to 12/31/2018	US	Developed ex US	Emerging Markets
Number of Mergers	2,778	3,018	3,027
Number of Cash Mergers	1,778	2,041	2,439
Number of Small Cap Cash Mergers	1,033	1,859	2,267
Small Cap Cash Mergers as a Percentage of All Cash Mergers	58%	91%	93%

Small Cap Cash Mergers Announced from 01/01/2011 to 12/31/2018	Merger Count	Average Duration (days)	Deal Status	
			Completed	Terminated/ Withdrawn
US	1,033	118	85.9%	14.1%
Developed ex US	1,859	115	87.4%	12.6%
Emerging Markets	2,267	91	91.6%	8.4%

Notes: data are from Bloomberg LP, compiled by Dimensional. Small cap stocks include the bottom 10%, 12.5%, and 15% of market capitalization within the US, developed ex US, and emerging markets, respectively. Small cap securities with the lowest profitability and lowest book-to-market ratios are excluded. Average deal duration is measured in trading days and weighted by market cap at the month end prior to announcement. Bloomberg Barclays data provided by Bloomberg. Profitability is defined as operating income before depreciation and amortization minus interest expense scaled by book equity. Book-to-market ratios defined as book value divided by market capitalization.

Summary of US Small Cap Cash Merger Targets that Trade like Cash at Least Once, Announced from January 2011 to December 2018

Year Announced	Number of Mergers	Deal Status		Average Deal Duration	Average Percent of Days Trading like Cash	Average Percent Acquired
		Completed	Terminated/ Withdrawn			
2011	111	100	11	101	76.5%	97.6%
2012	138	122	16	111	75.9%	94.8%
2013	112	98	14	111	81.7%	97.0%
2014	74	63	11	141	67.0%	99.0%
2015	100	90	10	124	72.1%	98.0%
2016	107	102	5	148	77.3%	94.3%
2017	109	94	15	136	84.0%	98.0%
2018	80	76	4	109	77.3%	99.0%
Total	831	745	86	—	—	—
Average	—	—	—	124	76.8%	97.7%
As Percent of All Mergers		89.7%	10.3%	—	—	—

Notes: data are from Bloomberg LP, compiled by Dimensional. Trading like cash refers to stock price trading within +2% and –2% of deal terms. Small cap stocks include the bottom 10% of market capitalization. Small cap securities with the lowest profitability and lowest book-to-market ratios are excluded. Average deal duration and average % of days trading like cash are weighted by market cap as of the month-end prior to merger announcement. Bloomberg Barclays data provided by Bloomberg.

Summary of Developed ex US Small Cap Cash Merger Targets that Trade like Cash at Least Once, Announced from January 2011 to December 2018

Year Announced	Number of Mergers	Deal Status		Average Deal Duration	Average Percent of Days Trading like Cash	Average Percent Acquired
		Completed	Terminated/ Withdrawn			
2011	142	132	10	127	58.3%	86.2%
2012	129	113	16	167	56.5%	76.7%
2013	110	98	12	295	43.8%	90.4%
2014	127	112	15	130	51.1%	63.9%
2015	80	62	18	90	49.6%	77.0%
2016	137	121	16	162	48.4%	53.2%
2017	138	118	20	119	63.5%	79.4%
2018	130	122	8	96	48.5%	81.6%
Total	993	878	115	—	—	—
Average	—	—	—	143	52.7%	75.3%
As Percent of All Mergers		88.4%	11.6%	—	—	—

Notes: data are from Bloomberg LP, compiled by Dimensional. Trading like cash refers to stock price trading within +2% and –2% of deal terms. Small cap stocks include the bottom 12.5% of market capitalization. Small cap securities with the lowest profitability and lowest book-to-market ratios are excluded. Average deal duration and average % of days trading like cash are weighted by market cap as of the month-end prior to merger announcement. Bloomberg Barclays data provided by Bloomberg.

Summary of Emerging Markets Small Cap Cash Merger Targets that Trade like Cash at Least Once, Announced from January 2011 to December 2018

Year Announced	Number of Mergers	Deal Status		Average Deal Duration	Average Percent of Days Trading like Cash	Average Percent Acquired
		Completed	Terminated/ Withdrawn			
2011	45	42	3	200	31.6%	72.6%
2012	47	43	4	141	45.5%	61.4%
2013	58	54	4	147	44.3%	77.4%
2014	64	56	8	114	43.2%	62.6%
2015	56	47	9	195	24.2%	53.0%
2016	84	69	15	133	40.5%	51.5%
2017	67	60	7	151	36.9%	60.3%
2018	51	43	8	108	25.2%	63.5%
Total	472	414	58	—	—	—
Average	—	—	—	155	36.1%	60.3%
As Percent of All Mergers		87.7%	12.3%	—	—	—

Notes: data are from Bloomberg LP, compiled by Dimensional. Trading like cash refers to stock price trading within +2% and –2% of deal terms. Small cap stocks include the bottom 15% of market capitalization. Small cap securities with the lowest profitability and lowest book-to-market ratios are excluded. Average deal duration and average % of days trading like cash are weighted by market cap as of the month-end prior to merger announcement. Bloomberg Barclays data provided by Bloomberg.

Note on Cash Benchmarks: Cash benchmarks used throughout represent short-term rates generally available for short-term borrowing between financial institutions in a country. The cash benchmarks used include:

- Federal funds rate (US)
- Australian bank bill rate 3-month (Australia)
- ICE LIBOR for British pound 3 month (UK)
- Canada IBOR 3-month (Canada)
- German Bubill 0-3 Month total return index unhedged (Germany)
- Japanese government discount bill rate 3 month (Japan)
- ICE LIBOR for Swiss franc 3 month (Switzerland)
- Brazil interbank deposit overnight rate (Brazil)
- Shanghai interbank offered rate 1 month (China)
- Mumbai interbank offered rate 1 month (India)
- Korea interbank offered rate 1 month (Korea)

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