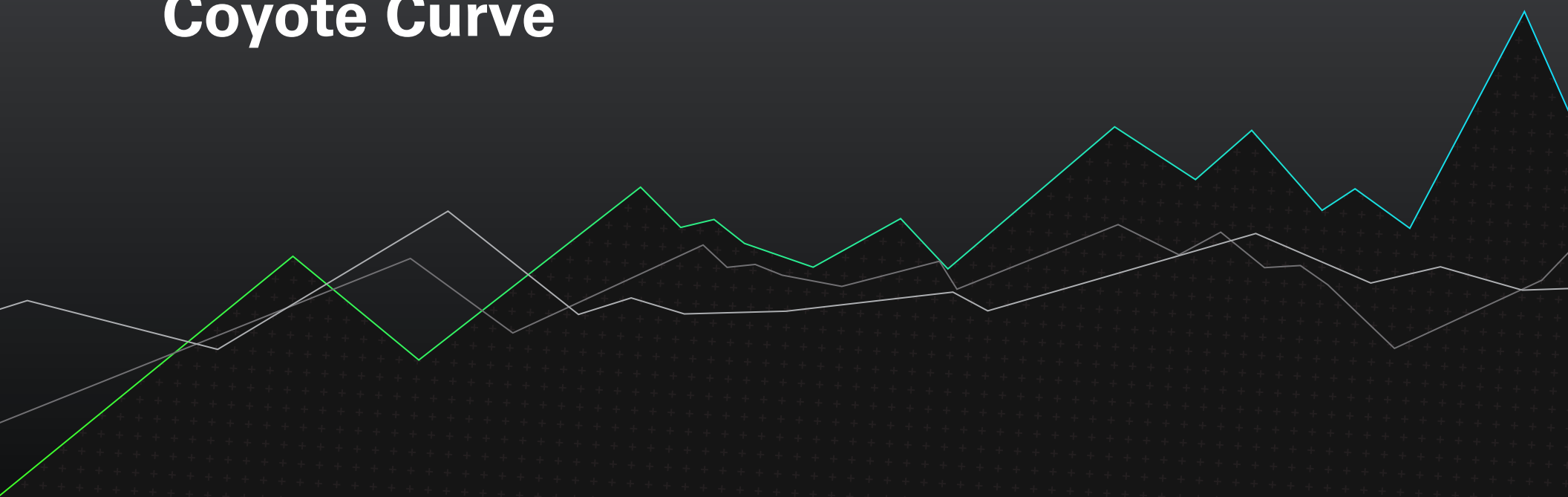


THE COYOTE CURVE PART II:

Explaining the Coyote Curve



THE VALUE OF DATA INTELLIGENCE

The U.S. truckload market's sheer size, number of participants and volatility make it difficult to collect clean supply chain data. And that's only half the battle.

Once you successfully harvest data, using it to tell a coherent story that can drive strategy is even more difficult. These twin challenges, data collection and analysis, affect almost every business in the transportation industry. A single supply chain generates a tremendous amount of information—sifting through it all can be a daunting task. Expand the scope to the full \$700B¹ U.S. truckload market, and it can seem impossible.

Yet with enough data over a long enough period of time, combined with the right industry insight, it is possible to paint a clear picture of market activity. At least that was Chief Strategy Officer Chris Pickett's hypothesis when he applied 15+ years of logistics experience and degrees in Industrial Engineering, Supply Chain, and Business Administration from Virginia Tech, MIT and Georgia Tech, respectively, to over a decade of Coyote's proprietary data. The result was the Coyote Curve.



Coyote's Unique Data Set

Expansive

We work with over 50,000 carriers to move over 10,000 loads a day, and a large portion of those carriers run relatively small fleets. That means we gather real market activity data from the most fragmented, hardest-to-measure portion of the nation's supply base which, according to the American Trucking Association, accounts for ~97% of the industry¹.

Centralized

Coyote was founded on proprietary technology powering a centralized business model. Our business units and offices are not fragmented or siloed, which helps generate clean, cohesive data from one marketplace, aggregated into a single system that gives one overarching view of the market.

Established

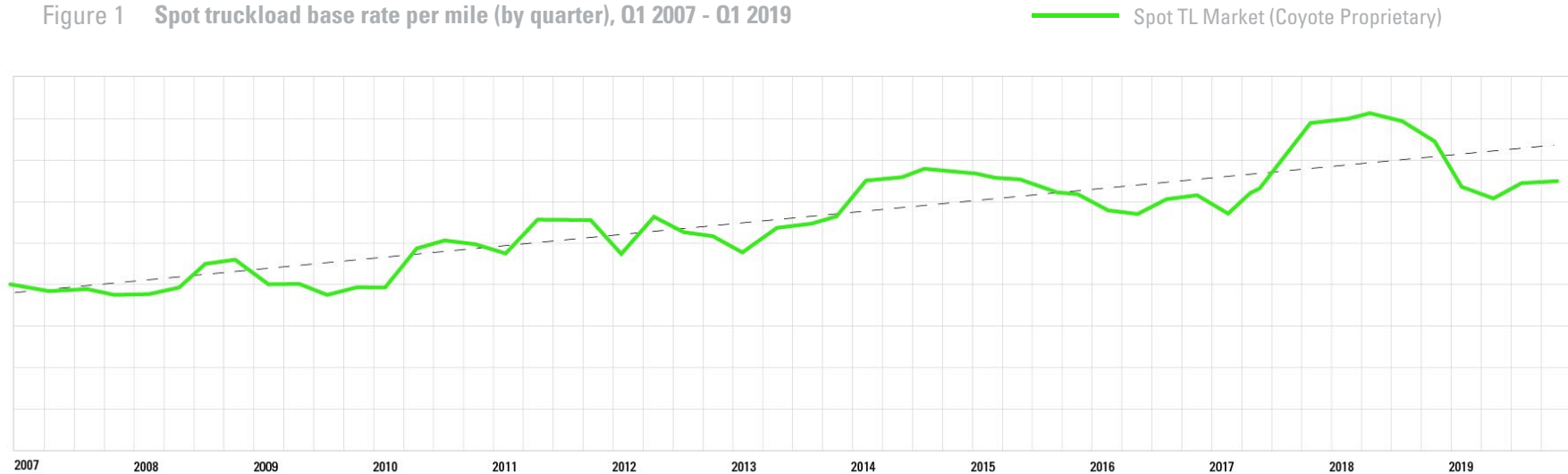
It's impossible to truly understand the underlying patterns of the U.S. truckload market without enough time and expertise. Coyote has been a leading provider of third-party logistics services for over a decade. We have experienced multiple market cycles, giving us the data diversity and intelligence needed to build and test theories.

MEASURING THE MARKET CAPACITY CYCLE

If you ask most shippers or carriers where freight rates are heading over the next year, the answer is usually 'up'. Looking at Coyote's proprietary data, we can see that the base spot market rates (net of fuel) have increased at an

annual rate of approximately 6.5% over the past ten years (with a lot of volatility along the way). But what meaningful insight can we draw from that? Not much. Raising rates 6.5% every year is not a sustainable supply chain strategy.

Figure 1 Spot truckload base rate per mile (by quarter), Q1 2007 - Q1 2019

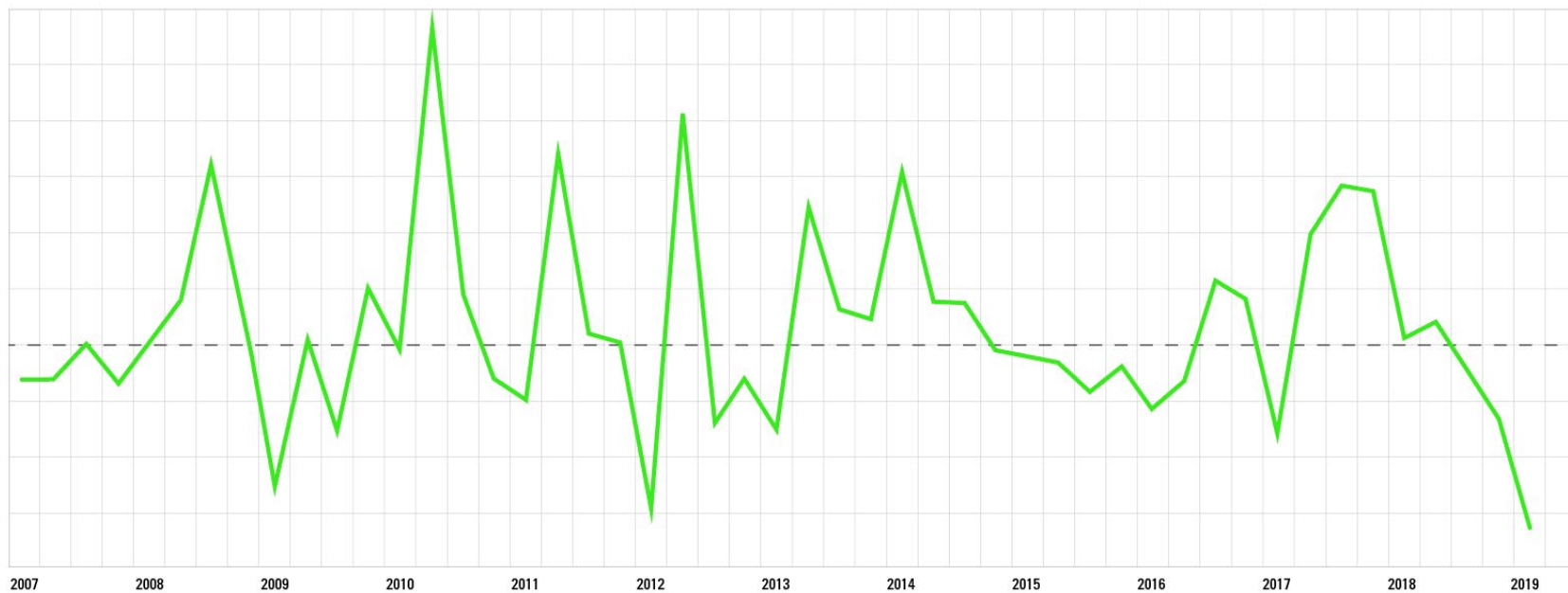


What if we measure the relative change in spot rates instead? Does taking the same data set and examining the sequential rate of change yield a more useful view of market activity?

Not really. It does debunk a few common market myths, such as, “it’s always softer in January and February” or “it’s always tighter in June and July.” As we can see, sometimes

Q1 is deflationary to Q4 as peak retail shipping dies down, but sometimes it isn’t (i.e. 2014 & 2018). Sometimes Q2 and Q3 are inflationary to Q1 due to summertime seasonal demand, and sometimes they aren’t (i.e. 2009 & 2015). While this data view also illustrates the magnitude of rate volatility from quarter-to-quarter, but beyond that, it isn’t particularly useful.

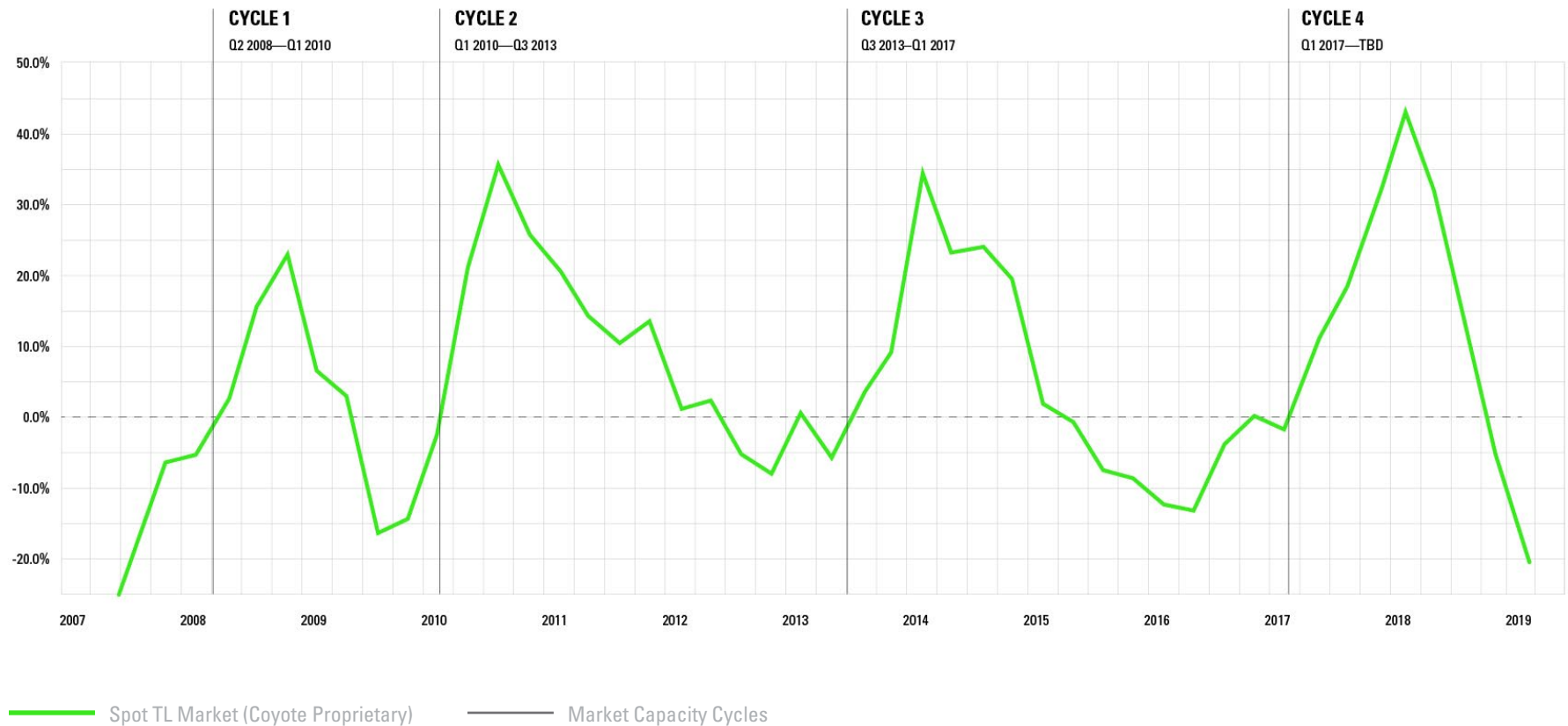
Figure 2 Spot truckload base rate per mile (sequential change by quarter), Q1 2007 - Q1 2019 — Spot TL Market (Coyote Proprietary)



What if we try to neutralize seasonality?

We took the same data set, but instead of mapping the sequential change from quarter-to-quarter, we examine the annual change, comparing each quarter to the same time frame the preceding year. Here we see a clear pattern emerge. We call it the market capacity cycle, and we measure it using the Coyote Curve.

Figure 3 Spot rate behavior through the cycle, 2007-2019 | Source: Coyote Logistics



INTERPRETING THE COYOTE CURVE

Since 2007, we've identified four distinct market capacity cycles.

One complete cycle = equilibrium (0) to peak, peak to trough, and trough back to equilibrium.

Inflationary: line is above the x-axis ($y > 0\%$)

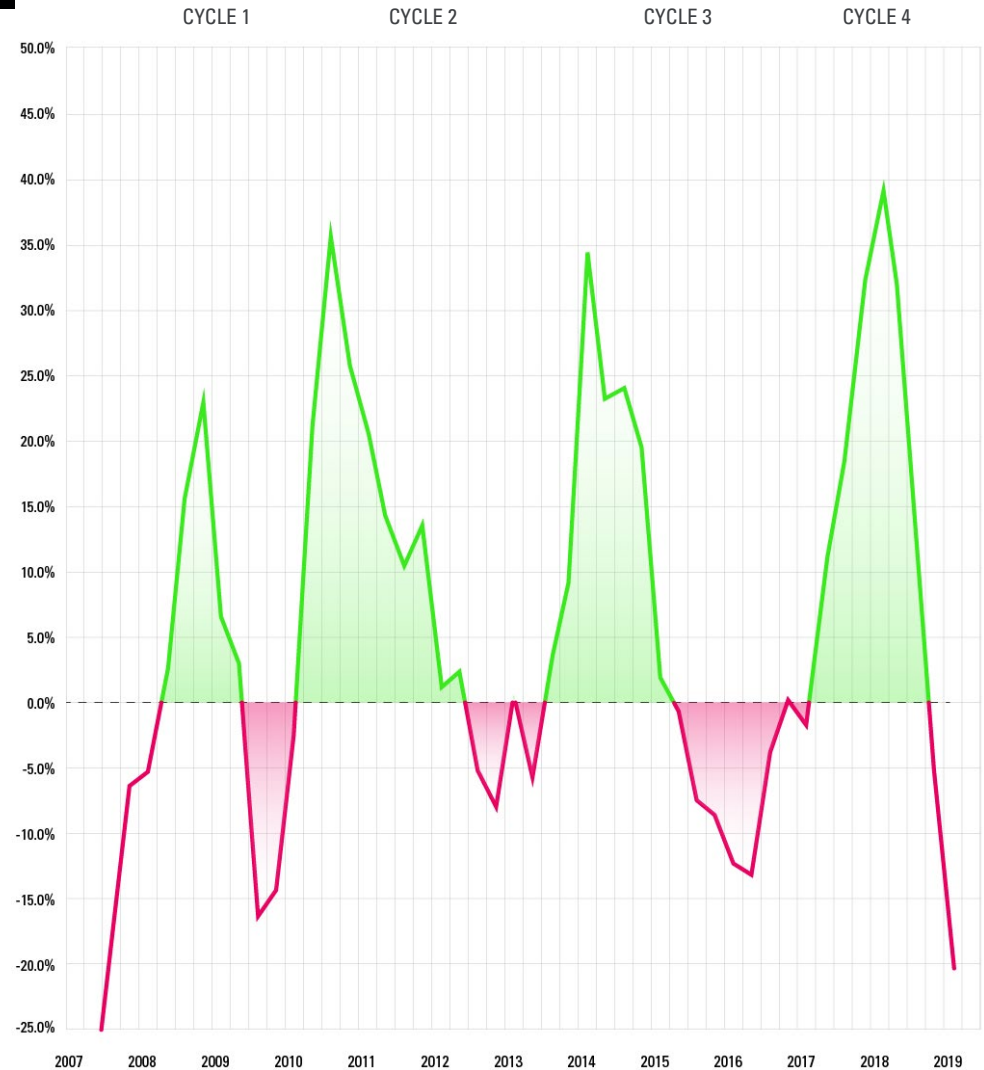
- More shipper demand relative to carrier supply
- Spot rates accelerate higher and faster relative to contract rates.
- Rates remain high enough, long enough that more capacity enters the market. Eventually, too much capacity enters for relative demand and the line peaks and begins to deflate.

Equilibrium: line is at the x-axis ($y = 0\%$)

- Carrier supply and shipper demand are balanced

Deflationary: line is below the x-axis ($y < 0\%$)

- More carrier supply relative to shipper demand
- Spot rates drop further and faster relative to contract rates.
- Rates stay low enough, long enough that capacity is forced to exit the market. Eventually, rates bottom out, and the curve begins its upward trajectory.





BUILDING CONFIDENCE IN OUR MODEL

The Coyote Curve sounds well-and-good in the context of our proprietary data, but we don't operate in a vacuum. Without cross-referencing our model against other indicators, it isn't a reliable forecasting tool.

CONTRACT VS. SPOT

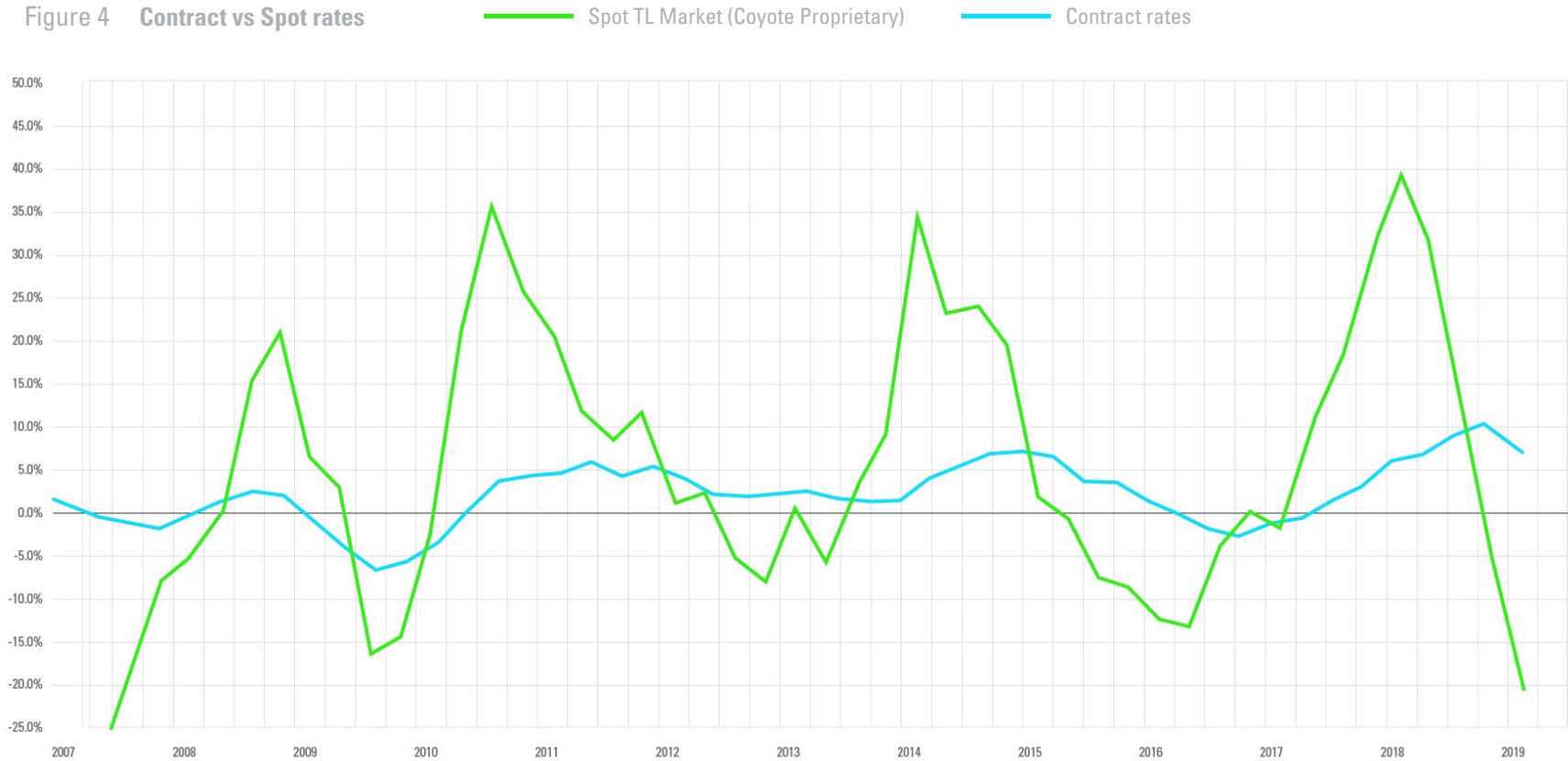
Up to this point, we've only talked about the capacity cycle in the context of spot rates, primarily because they paint the clearest picture of the current supply/demand balance. What about contract rates? After all, the annual procurement cycle is one of the three that characterize the truckload market. Let's examine the Coyote Curve up against the Cass Linehaul Index², which we will use as a proxy for contract rate performance.



Compared against our contract rate proxy, the Coyote Curve model holds up. The Cass Index takes the same general path as the Curve, though its peaks and valleys are far less pronounced (+5%-10%) versus the spot market (+35-40%). This checks out, given the comparative “stickiness” of

contract commitments. We can also observe that the Coyote Curve consistently leads the contract line in both directions, which also makes sense; current market conditions heavily influence both shippers’ and carriers’ forward-looking predictions during an annual bid exercise.

Figure 4 Contract vs Spot rates



SUPPLY & DEMAND

To continue building conviction in the Coyote Curve, we look for other indicators that can serve as proxies for supply and demand.

Demand:

We use a monthly Seasonally Adjusted TL Volume Index¹ that is published by the American Trucking Association.

Supply:

Unfortunately, there isn't a great proxy for Class 8 semi-trucks in active service, so we'll have to be resourceful. Diesel fuel tends to account for ~one third of a carrier's fleet cost and is much more volatile than the third that goes to driver wages and benefits. We use diesel price activity relative to the spot rate environment as an indicator of carriers' financial health. If fuel costs spike faster than rates (as in 2007–8), some carriers will be forced to shrink, idle or exit the industry altogether. On the other hand, if fuel prices deflate faster than rates (as in 2014–15), carriers have more financial flexibility to absorb lower market rates.



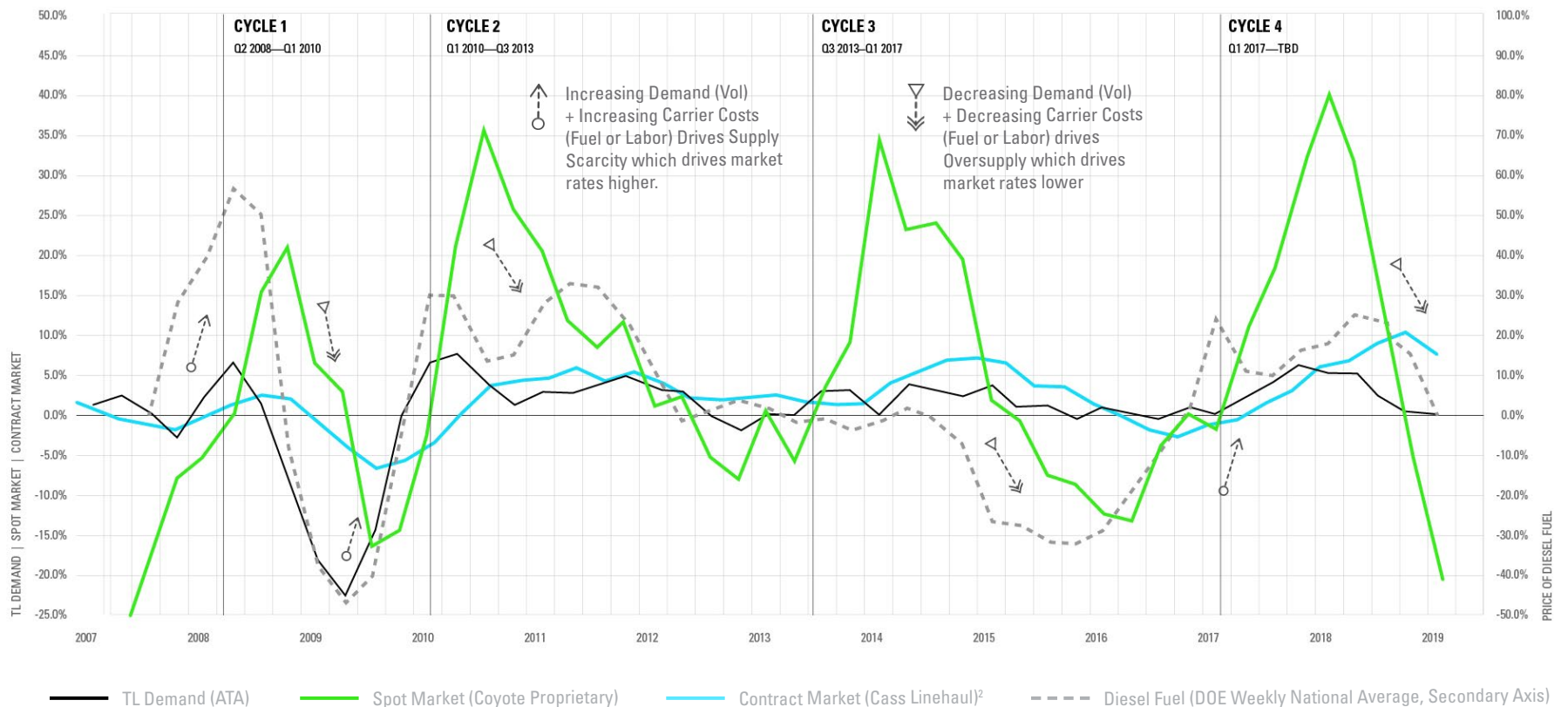
If fuel costs spike faster than rates (as in 2007–8), some carriers will be forced to shrink, idle or exit the industry altogether.



When we overlay our spot and contract rate curves with our supply and demand indicators, we can observe some coincidental behavior. When demand and fuel are accelerating simultaneously (green arrows), conditions are ripe for an inflationary TL rate environment. When both are simultaneously decreasing, conditions support a deflating rate environment. Though we make no claim of statistical causality, they are useful in signaling inflection points.

We use several other indicators to further vet our model including: Industrial Production Index from the Federal Reserve Board, U.S. Imports from the Bureau of Labor Statistics, Personal Consumption Index from the Bureau of Economic Analysis, Inventory to Sales Ratio from the Census Bureau, and NA Class 8 truck order from ACT Research.

Figure 5 TL Market Vol + Retail Diesel > TL Demand vs. TL Supply Balance > Market Pricing Dynamics



VALIDATING THE COYOTE CURVE OVER TIME

Perhaps the most important endorsement of the Coyote Curve is its performance over time.

Though many market participants felt 2016 was an extremely “soft” year, we correctly predicted that the curve would reach an inflection point and trend upwards. When back-to-back hurricanes devastated southern coastal regions in late 2017, shippers felt the capacity crunch like a lightning bolt. In reality, the market had been trending towards an inflationary environment since Q2 2016 and crossed the threshold in Q1 2017, many months before the wider industry acknowledged it.

In late 2017, we predicted the Curve would reach an inflection point and reverse direction in the next quarter. Once again, the model proved correct and began deflating in Q1 2018. With enough historical evidence to feel confident, Chris Pickett published the [initial Coyote Curve white paper](#) in May of 2018, accurately predicting the impending deflationary market at a time when most industry participants were talking about scarce capacity and higher rates.

*** Though many market participants felt 2016 was an extremely “soft” year, we correctly predicted that the curve would reach an inflection point and trend upwards.**

CONTINUED READING:

To see how our original projections held up against actual market performance and where we think the market is heading in Q2-Q4 2019, read [Part III: Q1 Market Update](#) (coming soon).

Want to learn more about the structure of the market and the three cycles that characterize it? [Read Part I: Understanding the U.S. Truckload Market](#).

References:

1. American Trucking Association, Reports, Trends, & Statistics, available at https://www.trucking.org/News_and_Information_Reports_Industry_Data.aspx (accessed March 28, 2019).
2. The Cass index is published by Cass Information Systems in conjunction with Broughton Capital, LLC. The index shows relative change in TL base rates across the \$25bn in annual freight spend that Cass manages on behalf of their customers. Our assumption is that the same high-volume shippers that outsource their freight payables to Cass are the same types of shippers with enough volume to contract a majority of their TL spend. While the Cass data includes all freight payables—both spot and contract—it's likely contract shipments represent the majority.

[Read Part III:](#) **Q2 Market Update**



[Read Part I:](#) **Understanding the US Truckload Market**

