Applied Economics Handbook

Make Better Business Decisions

EQUIPMENT LEASING & FINANCE
FOUNDATION
Your Eye on the Future

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The Foundation is the only research organization dedicated solely to the equipment finance industry.

The Foundation accomplishes its mission through development of future-focused studies and reports identifying critical issues that could impact the industry.

The Foundation research is independent, predictive and peer-reviewed by industry experts. The Foundation is funded solely through contributions. Contributions to the Foundation are tax deductible.

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Applied Economics Handbook

EXECUTIVE SUMMARY

This Handbook provides insight on how to leverage economic data and tools using applied economics to make more informed business decisions. Based on interviews with industry executives, it is clear that many equipment leasing and finance firms — particularly smaller independents — have limited in-house analytical capabilities and are relatively inexperienced with using applied economics techniques. As such, the Handbook is intended to both familiarize industry executives with the concept of applied economics and provide a series of straightforward tools, techniques, and use cases that can be adapted and customized to individual firms.

The Handbook covers economic data that originate from a variety of private and government sources and includes a data appendix with links to each source. In particular, it emphasizes data and research products that are tailored to the equipment leasing and finance industry, including several Equipment Leasing and Finance Foundation ("Foundation") reports (e.g., the annual State of the Equipment Finance Industry report, quarterly Economic Outlooks, and monthly Equipment Investment Momentum Monitors) and the Equipment Leasing and Finance Association ("ELFA") Monthly Leasing and Finance Index.

The first chapter of the Handbook provides a framework for the U.S. economy as it relates to the equipment finance industry. Chapters 2, 3, and 4 describe how applied economics is useful in a variety of real-world business settings and offer techniques for how to use economic data to inform each decision. In particular, these chapters include fictional case studies and step-by-step examples related to key decisions commonly faced by equipment industry executives. The Handbook is also interspersed with a series of real-world "success stories" that summarize how industry leaders are using economic data and analysis to make better business decisions.

Chapter 1: Economic Indicators in the United States

Chapter 1 is intended to help equipment executives understand the relationship between the equipment finance industry and the U.S. economy and focus on the economic data that matter most. The chapter provides brief summaries of several key economic indicators that are available to industry members. Indicators are divided into "Business Cycle" and "Financial Market" groupings. "Business Cycle" indicators provide insight on the current state of the U.S. economy and where it is heading next, while "Financial Market" indicators include data series related to interest rates, defaults, and the value of the U.S. dollar.

Chapter 2: Forecasting Demand

Chapter 2 applies economic data and tools to demand forecasting and summarizes two methods for forecasting business volume.

Baseline Forecasting: The first approach begins with a simple baseline forecast (e.g., the previous year's business volume), which is then modified using recent and projected trends in economic indicators and industry data, along with relevant qualitative information.

Regression Analysis: The second approach involves building a quantitative forecasting tool using a simple regression equation that establishes a clear relationship between relevant economic data and a company's

historical business volume. This model, which can also be constructed as a leading indicator, can help equipment firms develop annual demand forecasts.

Both tools are intended to supplement equipment professionals' industry acumen, gut instinct, and advice from trusted industry insiders as they develop demand forecasts.

Chapter 3: Aligning a Portfolio to Emerging Trends

Chapter 3 applies economic data and tools to portfolio management. Two techniques in particular are discussed: (1) growth attribution analysis, which helps equipment executives evaluate their portfolio against industry trends and identify potential opportunities for growth, and (2) risk mapping, which can be used to identify vulnerabilities in a company's portfolio and signal a need for greater diversification. These techniques are useful when considering whether to expand into a new sector, as well as for general portfolio management. Acknowledging that strategies differ between firms, these tools are intended to supplement other sources of information and approaches used when evaluating new or existing markets.

Chapter 4: Anticipating Shifts in Portfolio Performance

Chapter 4 provides two approaches for anticipating shifts in portfolio performance and managing risk. The first approach relies on an analysis of past portfolio performance trends to identify historical patterns in the data. With an understanding of past cycles, equipment executives can use recent data to estimate the industry's current position in the cycle and predict future trends in portfolio performance. The second approach establishes the relationships between two forces — economic conditions and the risk tolerance of borrowers and lenders — and portfolio performance. Leading indicators of these two key drivers can help signal turning points in portfolio performance and, as such, are useful tools for business leaders looking to proactively manage risk.

INTRODUCTION

Why Do Economic Data Matter?

In 2003, the renowned author Michael Lewis released "Moneyball," which detailed the Oakland Athletics' ("A's") use of advanced baseball statistics to build highly competitive teams in the late 1990s and early 2000s. Realizing their cash-strapped team was at a significant disadvantage compared to its rivals, team executives wanted to find a competitive edge by using data to identify players whose value was underestimated or unappreciated by other major league teams. To do so, the team used a variety of statistical techniques (described collectively as "sabermetrics") to identify player attributes that were most associated with winning baseball games. Based on their findings, the A's targeted players who excelled at those attributes, especially those who appeared to be undervalued when assessed using traditional metrics (e.g., batting average, runs batted in). This strategy proved to be quite successful, as the A's were among the best teams in baseball in the early- and mid-2000s despite having a significantly lower payroll than most other top teams. The Boston Red Sox had even more success with the Moneyball strategy, winning the 2004 and 2007 World Series in part due to their use of sabermetrics. Today, nearly every franchise employs a team of data analysts and incorporates sabermetric techniques when making roster decisions.

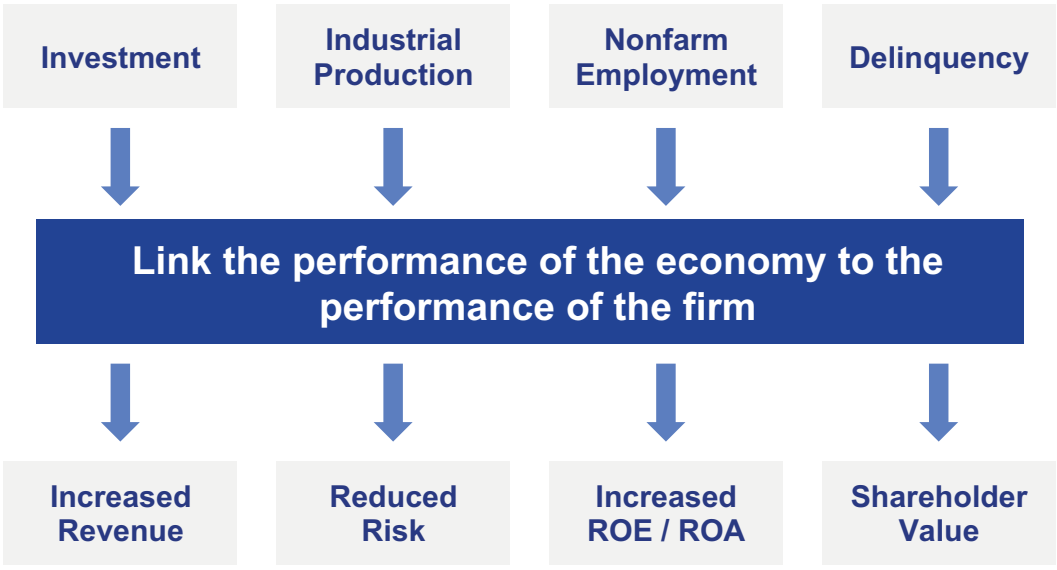
For the equipment leasing and finance industry, the Moneyball analogy is constructive. Just as baseball executives use applied statistical techniques to identify top prospects and avoid overpaying for "big names" whose production is likely to slip, equipment executives can leverage available economic data to help identify equipment verticals that are primed for growth and reduce their footprint in sectors that are likely to experience a downturn in the near future. In short, applied economics (i.e., the application of economic theory and econometrics to a specific, real-world setting) can provide the same kind of value to the equipment leasing and finance industry as sabermetrics provides to professional baseball.

However, at a time when industry members are looking for new ways to anticipate market trends and improve firm performance, not all firms have the resources and in-house expertise to analyze economic data — while others may feel unsure where to begin. Moreover, the abundance of information about the economy can be paralyzing, and business leaders may find it difficult to wade through the noise and identify the data signals that truly matter.

This Handbook is intended to help equipment leasing and finance companies "bridge the gap" between economic information and informed business decisions. Specifically, the Handbook contains information on which economic data series matter most and how they can be used — either on their own or through a custom-built tool — to inform strategic business decisions.

It is important to note, however, that while applied economics is highly useful, it does not guarantee success (any more than using sabermetrics to build a baseball roster guarantees a World Series championship). Instead, applied economics is best viewed as a complement to a firm's existing sources of information and strategies used in business planning — in much the same way that baseball teams use sabermetrics in conjunction with information gathered through traditional in-person player scouting. Some firms may find the information and tools provided in this Handbook useful, while others may have more a more sophisticated analytical framework already in place. Regardless, given the close relationship between industry performance and the U.S. economy, all firms stand to benefit from an increased understanding of how to interpret economic signals, predict where markets are headed, and incorporate this information into strategic business decisions.

Figure 1. Conceptual Graphic of Applied Economics



CHAPTER 1
Equipment Leasing and the U.S. Economy
Why Do Economic Data Matter?

I. INTRODUCTION: LEASING AND THE U.S. ECONOMY

The U.S. economy is the largest in the world and in a constant state of flux. At any given time, certain sectors rise while others suffer due to falling demand and/or increasing costs. Media outlets (e.g., print, television, radio, and online resources) flood the offices of equipment finance executives with economic news and data — and often, these myriad sources contradict one another. Making sense of this "data deluge" and getting to the core of what it all means for the equipment leasing industry is challenging, but those who solve this riddle are likely to find themselves with a significant competitive advantage.

Equipment leasing falls under the investment sector of the U.S. economy. Business investment is a bellwether for the broader U.S. economy, with the investment cycle essentially matching the long-term business cycle (i.e., the cyclical ups and downs experienced by the economy as a whole). Increased equipment and software investment strongly suggests an expanded market for equipment leasing and new business opportunities for industry members, as more than half of such investments are leased or financed (totaling over $1 trillion per year). Gross Domestic Product ("GDP") reports, released quarterly by the U.S. Bureau of Economic Analysis, are the primary source of information on equipment investment and provide a good starting point for understanding overall demand in the economy and the business cycle.

II. TWO KINDS OF ECONOMIC INDICATORS

While the amount of economic data currently available is overwhelming, a small subset of indicators can produce a clearer picture of both the current and near-future economic environment. The indicators outlined in this chapter fall into two general categories:

- **Business cycle indicators** reflect the level of demand in an economy (or, put another way, whether the economy is growing or in recession). Some offer a snapshot of current conditions (both overall and in specific sectors), while others can be used to project what might be in store in the near future.
- **Financial market indicators** include variables that are directly relevant to leasing executives (e.g., interest rates and delinquencies) and those indirectly related to the business cycle and market growth (e.g., the exchange value of the dollar or stock prices). Even more so than with business cycle indicators, financial markets provide a "firehose" of continuous information that can be overwhelming. As such, it is important for equipment finance professionals to focus on what matters most.

One of the Handbook's central purposes is to help equipment industry professionals learn to use business cycle and financial market indicators to improve their business planning and bottom line. To this end, this chapter attempts to separate the "wheat from the chaff" by providing summaries of over a dozen economic data series that are highly relevant to the equipment leasing and finance industry. Additional information pertaining to each variable is included in Appendix A (including where and how to freely access the data on the internet).

III. BUSINESS CYCLES

Business cycle indicators measure where the U.S. economy is relative to trend. Understanding whether the economy is in the early phases of recovery or approaching full capacity has important implications for investment and, by extension, the market for equipment leasing and finance. This is because the equipment industry generally mirrors business cycle trends, but its peaks and valleys are more pronounced. For example, during the 2008–09 recession, GDP declined by roughly 2.8 percent in 2009, while equipment investment declined nearly 23 percent. On the flip side, GDP grew by 2.5 percent in 2010, but equipment investment increased by nearly 16 percent. In addition, monitoring business cycle indicators provides perspective on financial conditions, including interest rate movements and borrowers' ability to remain current on their loans and leases. In later chapters, the Handbook will link some of the indicators below to specific equipment verticals.

3.1 GDP

Published quarterly, GDP is the broadest gauge of demand in the domestic economy. Technically, GDP is the sum of spending by federal, state, and local governments, private consumers, and businesses for investment purposes. Exports are also included in GDP, while imports are subtracted as these goods are not produced by the U.S. economy. Typically, an economy is considered to be in recession when GDP falls for two consecutive quarters.[1] Following a recession, an economy enters a recovery phase that typically lasts for several years.

What to watch: A reasonable rate of GDP growth in the coming years is likely to be 2.5 – 3.0%. This indicates that the economy is growing at a sustainable pace, and growth rates at this level should facilitate healthy demand for equipment without putting excessive upward pressure on interest rates due to inflation concerns. GDP is one of the indicators used by financial markets and policy makers. As the economy approaches full capacity, the Federal Reserve Bank ("Fed") may raise borrowing costs to hold inflation pressures in check.

3.2 Business Investment

As described above, business investment is the subcomponent of GDP that incorporates equipment leasing. An important characteristic is that investment, especially construction, tends to drop sharply at the start of recessions and also tends to "lead" during economic recoveries. For this reason, construction investment is often considered an early indicator of economic fortune.

What to watch: Investment is disaggregated into several categories, including the 12 equipment verticals that comprise the Foundation's U.S. Equipment & Software Investment Momentum Monitors. The equipment categories provide a direct measure of leasing market potential and, when combined with the Foundation's measure of the propensity to finance, can help determine a baseline for new business volume for equipment leasing companies. However, equipment investment data tend to be quite volatile, with large changes on a quarter to quarter basis (particularly at the sector level). For many sectors (e.g., aircraft investment), it is useful to look at a two or three quarter average as a gauge of market direction rather than the latest data point.

3.3 Industrial Production

Industrial production ("IP") is an index that measures the volume of production in manufacturing, mining, and utilities by both small and large businesses. The index is based on data collected from companies across these sectors, but by excluding the service sector, IP covers a relatively small part of the U.S. economy. Nevertheless, economists view IP as a good predictor of GDP because it gauges the health of the "goods-producing" sector of the economy and is published on a more-frequent monthly basis.

What to watch: Changes in industrial production generally occur a few months before changes in GDP. It is more important for leasing executives in verticals that produce tangible outputs (e.g., manufacturing equipment) than verticals that cater more to the service sector (e.g., computer equipment and software).

3.4 Capacity Utilization

Capacity utilization ("CU") measures slack or spare capacity in mining, manufacturing, and utilities — the same industries covered by IP. The concept is to gauge how much these sectors can produce with the current capital stock under normal operations. For the aggregate index, 80% is considered a "neutral" reading, while levels below 80% point to slack in the economy and levels above 80% suggest that current demand exceeds capacity. Benchmarks for specific sectors may differ from this 80% figure, and economists usually compare current levels to the 15-year moving average when assessing sector-specific CU.

What to watch: CU is a leading indicator of investment spending (see Figure 2). As CU approaches 80%, companies will be increasingly likely to purchase, lease, or finance new equipment in order to meet the increased demand (and depending on the industry, they may also increase hiring). Economists also look at CU for signals of possible changes in interest rates. High and sustained CU levels can also point to an economy that is overheating, which increases pressure on the Fed to raise interest rates in an attempt to quell inflationary risk. Financial markets also watch CU, and may charge a higher premium over a short term benchmark to guard against inflation.

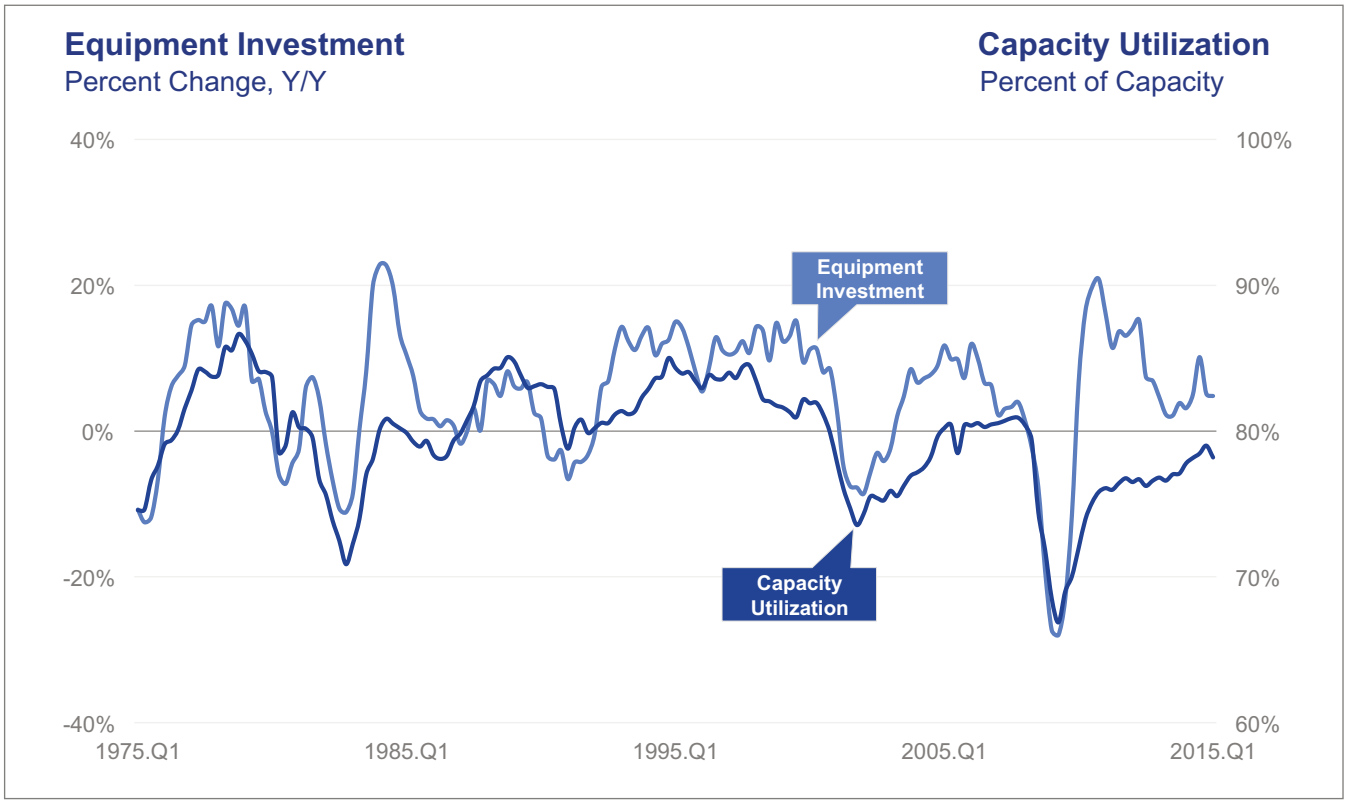
3.5 Employment

Nonfarm payroll employment measures the number of people employed by private companies, state and local government, and the federal government. Its coverage is broader than IP or CU because it includes the government and service sectors, and it is therefore considered to be a more representative measure of economic performance. Released monthly by the U.S. Bureau of Labor Statistics, the "jobs report" also includes data on hours worked, earnings, changes to the overall labor force, and the unemployment rate.

What to watch: Steady gains in employment, especially at the beginning of an economic upturn, can confirm a sustainable recovery. Employers often wait to hire until they are confident that the economy has turned a corner. There is no universal target for job gains in a month, as an "acceptable" rate of payroll growth is largely dependent on the number of jobs lost during the previous recession. However, most economists believe that payroll growth should, at a minimum, keep up with or exceed population growth and average at least 100,000 – 150,000 jobs per month during periods of growth. Other data contained in the employment report is also useful in predicting the economy. For example, a rise in the average number of hours worked often precede new hiring because it indicates employers are asking more of their employees and may need to hire additional workers in the near future. In addition, in a healthy economy

with 4 – 5% unemployment, wages will tend to increase because there are fewer "unattached" workers, causing employers to raise wages in order to better compete for available labor.

Figure 2. Equipment Investment & Capacity Utilization



Source: Macrobond Financial

3.6 Durable Goods Orders

Durable goods orders are based on a survey sample of large companies and provide information on future production of industrial goods (i.e., products that have been ordered, but have not yet been made). In this sense, this variable is a solid leading indicator for equipment demand.

What to watch: At the aggregate level, economists often look at orders excluding transportation equipment and defense to remove the impact of big-ticket items that can vary significantly from month to month. The data is broken down by sector, allowing equipment companies to focus on the area that is most relevant to their business line.

3.7 Building Permits

Building permits are another leading indicator of the business cycle. In most areas of the country, a building permit is required before construction activity (including housing) can begin. Historically, the housing sector has played an important part in business cycle peaks and troughs, in part because of its sensitivity

to interest rates. The key exception was the recovery from the 2008-09 recession, which began with the financial crisis and the housing market collapse. While housing has recovered to some extent, it remains well below pre-recession levels nearly 7 years after the recession ended.

What to watch: A pickup in housing starts typically means that a recovery is underway or will commence shortly. Signals for an upswing can be confirmed by a pickup in the Michigan Consumer Sentiment Index and a subsequent rise in construction.

3.8 Business Roundtable CEO Economic Outlook Survey

The Business Roundtable is a trade organization comprised of the CEOs of over 200 large U.S. companies. Each quarter, it surveys its members on their expectations for company sales, investment spending, and employment over the following six months. Survey results are reported as an index normalized to 50, with a range of -50 to 150. In addition to the overall index, the survey reports sub-indexes for sales, investment, and employment. The survey also asks the CEOs to provide the rate at which they expect GDP to grow for the current year.

What to watch: The survey is a proven leading indicator of business investment in equipment and software and, as such, can be useful for projecting future demand in the equipment finance industry. In particular, the sub-index for capital expenditures is particularly useful as a broad measure of future demand for equipment among large businesses. Readings above 50 indicate economic expansion, while readings below 50 indicate contraction (i.e., recession).

3.9 Consumer Confidence

Measures of consumer confidence, including the Conference Board's Consumer Confidence Index and the University of Michigan's Consumer Sentiment Index, show how consumers perceive economic conditions and can signal future shifts in consumer spending. While indirectly related to equipment finance, changes in consumer spending can influence business decisions to ramp up or scale back investment in equipment and software — which, in turn, affects equipment leasing and financing activity. Further, measures of consumer confidence can help predict trends in overall economic growth, as consumer spending accounts for roughly two-thirds of total economic activity.

What to watch: A sustained pick-up in consumer confidence generally signals that consumers are preparing to increase their spending. However, month-to-month fluctuations should be interpreted with some caution, as longer-term trends over the course of several months send clearer signals on the direction of consumer spending. Comparing recent data to a historical benchmark can also provide value (e.g., assess recent values against the pre-recession peak).

3.10 Consumer Prices

The consumer price index ("CPI"), published by the Bureau of Labor Statistics, consists of monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services. As a measure of inflation, CPI reflects the business cycle and has implications for interest rates (see Figure 3). For this reason, CPI is closely monitored by the Fed.

What to watch: As inflation nears 2%, the Fed typically begins to tighten monetary policy by increasing the federal funds target rate. Conversely, inflation rates at or below 1% typically lead to more accommodating monetary policies (i.e., lower interest rates). However, the Fed may take into account some one-time factors such as energy or food price swings, which can have a temporary effect on inflation. During times of price volatility, economists often prefer to assess price inflation excluding food and energy.

IV. FINANCIAL MARKET INDICATORS

Some financial market indicators are directly relevant to the leasing industry, while others are best used as a means of confirming the signals that are coming from macroeconomic business cycle indicators.

4.1 Interest Rates

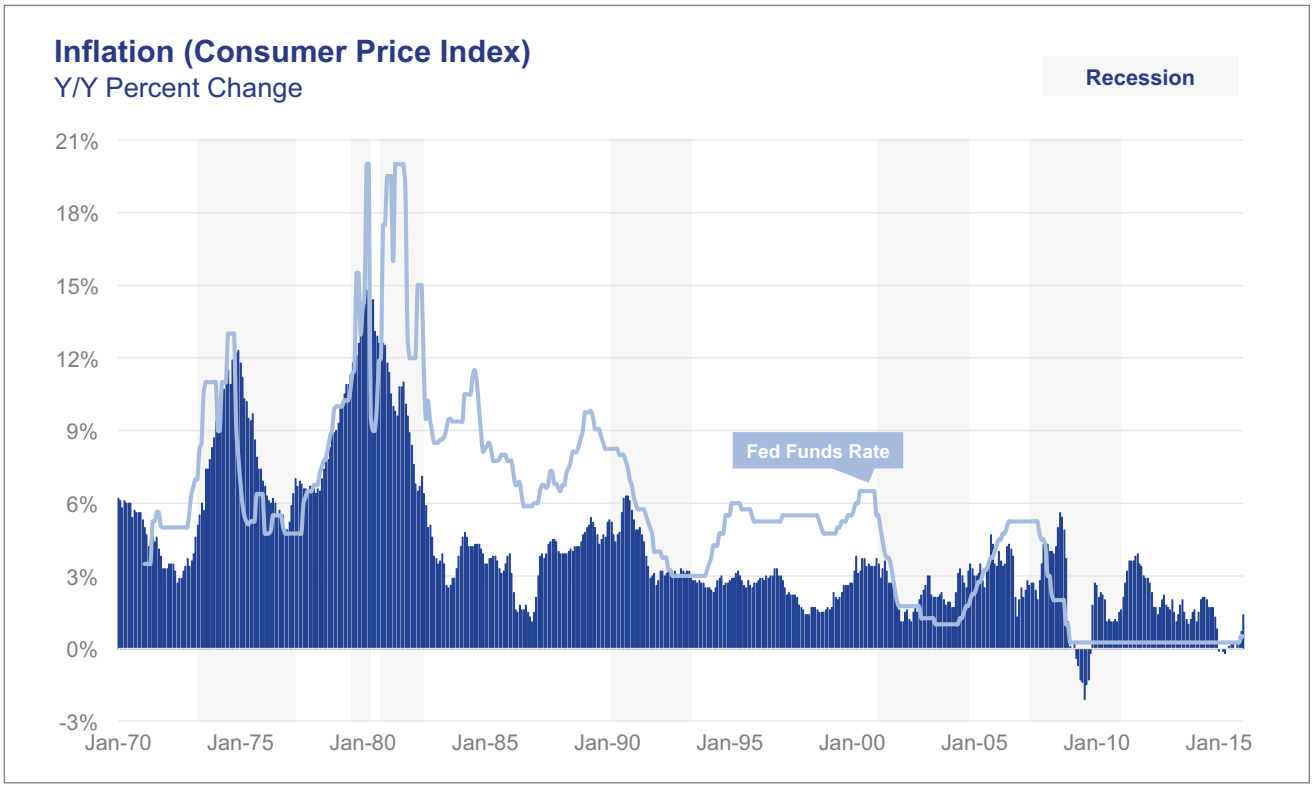
Historically, the Federal Reserve has controlled very short-term interest rates, while market forces have determined longer rates. These borrowing costs are, of course, key drivers in equipment investment and leasing. The mechanism used by the Fed to control short-term interest rates is the federal funds target rate. This is the Fed's primary monetary policy instrument, and while it is only available to large commercial banks, it is the economy's benchmark rate against which other interest rates are set. This rate was zero during the depths of the 2008-09 recession and remained there until late 2015.

What to watch: Typically, rising interest rates help to relieve inflationary pressures, but they can also dampen demand for equipment investment and slow economic growth. However, in the zero interest rate policy environment of recent years, the equipment finance industry has become extremely competitive, with many new firms competing for new business. In this environment, rising interest rates may help to relieve some of these competitive pressures and enable equipment lessors and financers to build in additional margin in their deals, even if the demand for new investment falls somewhat. As such, rising interest rates (or falling rates) are not unequivocally "good" or "bad" for the industry, provided the movement in rates is reasonably smooth and predictable.

4.2 Portfolio Performance

The percentage of a firm's portfolio in good standing has a clear and direct impact on the firm's profitability. The Fed and the Federal Deposit Insurance Corporation ("FDIC") each publish data on net charge-offs in commercial loans and leasing, and overall trends revealed through these reports can provide valuable market intelligence for the equipment finance industry. The Fed and FDIC also publish data on delinquent loans of various durations, which are strong leading indicators of charge-offs given that bad loans are first classified as past due.

Figure 3. Consumer Price Index & Fed Funds Rate



Source: Macrobond Financial

Industry research can also reveal important trends in portfolio performance. The Foundation's annual State of the Equipment Finance Industry report ("SEFI") includes an annual reporting of portfolio performance as measured by delinquencies, charge-offs, and non-accruals for specific equipment verticals and firm type (i.e., banks, captives, and independents). The Equipment Leasing and Finance Association's Monthly Leasing and Finance Index ("MLFI-25") tracks the volume of commercial equipment financed in the United States and reports monthly data on the aging of receivables and average charge-offs as a percentage of net receivables. (For more information on portfolio performance data, see Chapter 4.)

What to watch: When portfolio performance is near record levels (as it has been in recent years), some firms will be more willing to take on additional risk to generate new business — which will tend to degrade portfolio performance over time. The opposite is also true; poor portfolio performance sends a market signal to equipment lessors to tighten their standards in order to avoid incurring additional delinquencies and charge-offs. Both the FDIC and MLFI-25 data can provide an early warning that change is on the horizon, enabling leasing and finance firms to adjust accordingly.

4.3 The Dollar

The exchange value of the dollar has direct implications for the competitiveness of U.S. businesses. While a strong dollar demonstrates that other countries are confident in the U.S. economy and see it as a good place to invest, it also tends to slow growth by hurting exporter profitability and providing an incentive for importers to sell additional goods in the United States. The opposite is true when the dollar is weak.

What to watch: Many economists watch index values of the dollar published by the Fed and other stakeholders to facilitate comparisons of the dollar's strength relative to foreign currencies. It is also useful to monitor specific exchange rates, such as the Canadian dollar or the euro. In 2015 and 2016 the dollar has been quite strong, which most economists attribute to the relative buoyancy of the U.S. economy compared to other developed economies.

4.4 Commodity Prices

Commodity prices influence economic and investment growth, both directly through commodity producers and also indirectly through commodity consumers (including households and firms that rely on commodities as key inputs). Commodity prices also impact inflation and, as such, are relevant to Fed interest rate policy. For example, a spike in gas prices would affect CPI directly through gasoline's share of the average consumer's basket of goods and services, as well as indirectly via price increases of related goods or services (e.g., higher airline fares).

What to watch: For energy, key data series include the West Texas Intermediate ("WTI") crude oil spot price (the benchmark for U.S. oil prices) and the Henry Hub natural gas spot price (the benchmark for U.S. natural gas prices). For agricultural products, the U.S. Department of Agriculture ("USDA") regularly publishes data on crop, dairy, and livestock prices. As noted, shifts in commodity prices impact sectors of the economy differently. A drop in oil prices benefits consumers (who save on fuel expenses) as well as energy-intensive industries, such as air or truck transportation. On the other hand, low oil prices hurt energy production firms, and firms in related industries often suffer from spillover effects. In response, energy extraction firms are likely to cut back on investment in response to a low price environment, while firms that rely on commodities as key production inputs may take advantage of lower prices by ramping up investment.

4.5 The Stock Market

In theory, U.S. stock prices reflect expected future profits of U.S. companies. In this sense, a rising stock market could signal the need for additional equipment investment, and may also boost consumer confidence and spending. However, the stock market ebbs and flows based on myriad factors that may or may not reflect the performance of the economy. For this reason, stock prices should generally only be used to confirm signals offered by other indicators.

CHAPTER 2
Forecasting Demand Using Economic Data
How Can I Develop More Accurate Growth Projections?

I. INTRODUCTION

For any company, a reliable demand forecast is essential to planning for the year ahead. If the forecast is too low, the company risks lacking sufficient capacity to capitalize on new business opportunities. If the forecast is too high, the company may find itself with higher costs than its revenue intake can justify. In short, an accurate demand forecast is the starting point for most strategic decisions.

Applied economics can play an important role in developing more accurate, data-driven, and defensible forecasts. Using economic data, companies can develop dependable frameworks for making strategic decisions, both currently and in future years. By anticipating the likely short- and medium-term direction of the industry, business executives can gain a competitive advantage over their peers through strategic decisions that are more informed, less reactive, and ultimately more profitable.

However, using applied economics to develop demand forecasts is difficult. Identifying and processing information from countless economic sources, accounting for continually shifting economic and industry dynamics, and synthesizing everything into a single projection are significant challenges. Even when done well, data-driven forecasts are not guaranteed to yield an accurate picture of the future. Acknowledging this difficulty, we view applied economics as a tool that equipment professionals can use to supplement their industry acumen, gut instinct, and advice received from trusted industry insiders.

This chapter offers two methods for forecasting business volume. Both methods start with and rely on a simple baseline (i.e., the previous year's volume) and use economic data to modify this baseline. Further modifications can and often should be made based on information from non-economic sources.

(1) **Economic Data as Forecasting Guide:** The first approach is simple: establish a baseline forecast equal to last year's "known" business demand, and then use recent and, where possible, projected near-term trends in economic and industry data to modify this baseline accordingly. This forecast can also be adjusted based on company-specific information (e.g., level of portfolio exposure to declining or rising equipment verticals), access to insider knowledge about the firm's targeted market, and other relevant qualitative information.

(2) **Building a Forecasting Tool:** The second approach involves building a simple quantitative forecasting tool. Starting with the same baseline of last year's business demand, the forecast model uses regression analysis to establish clear relationships between relevant economic data series and the company's historical business volume. This econometric model can provide valuable insights into how a company's performance ebbs and flows with the overall economy. Moreover, by incorporating lagged economic variables, a model can be produced with near-term leading qualities that are highly useful for developing annual demand forecasts.

II. SIMPLE BASELINE FORECASTING USING ECONOMIC DATA

As discussed in the previous chapter, performance in the equipment finance industry is closely tied to the overall economy. Economic indicators offer insight into the industry and, when appropriately applied, can help guide projections for the industry. Macroeconomic data such as GDP and nonfarm employment growth can provide context for broad economic conditions, while more granular data (e.g., business investment, commodity prices) offer information more tailored to equipment finance or specific equipment verticals. Many of these relevant data series are included in Foundation research, with some forecasted out for several quarters or years.

Below we outline a "layered" approach to forecasting. Starting broadly, business leaders can use key data series to guide their forecasting process. They can then modify their company projections as they narrow in on more granular data.

2.1 Step-by-Step Example: Creating a Demand Forecast

For example, a fictional independent equipment lessor (A-1 Construction Finance Company) focuses on construction equipment leases. Its sales growth has averaged 8 percent per year over the last five years, yet growth slipped to 5 percent in 2015, yielding $65 million in annual business volume. Looking ahead to 2016, A-1 Construction wants to set a realistic sales goal for the year. One potential approach to forecasting business volume is presented below.

2.1.1 Set a Baseline

Like many other forecasters, A-1 Construction starts with a baseline for its 2016 sales projections. A sensible starting point for its 2016 forecast is its 2015 business volume growth of 5 percent. Starting with $65 million of business volume in 2015, this growth would result in roughly $68.3 million of business volume in 2016.

2.1.2 Modify with Economic Data

Five percent growth may or may not be a good forecast for 2016, depending on emerging economic and industry trends. By comparing its 2016 forecast against relevant data series, A-1 Construction can benchmark its projected growth against other forecasts and adjust accordingly. As noted by one interviewee, at a minimum, this method can be used to help encourage company executives to justify any deviations of their forecast from other trends. Further, this "layered" process can also help business leaders better understand and anticipate coming shifts in the U.S. economy or equipment finance industry.

As a broad indicator of overall economic activity, GDP growth is a reliable measure of economic conditions. For this reason, consideration of recent GDP growth data and consensus forecasts is a good first step in modifying company demand projections. Using the Foundation's 2016 U.S. Economic Outlook, A-1 Construction could assume that U.S. economic growth will be similar to 2015 (see Reference 1). Other sources (e.g., Wall Street Journal, Bloomberg, Wells Fargo) publish their own economic forecasts, and The Economist magazine publishes a helpful "consensus" forecast — any of which could be used to adjust

U.S. Bank Equipment Finance: A "Layered" Approach to Forecasting Demand

Many equipment finance executives use economic or industry forecasts as a "reality check" for their internal company forecasts. For example, executives at U.S. Bank use a "layered" approach for incorporating economic data in business growth forecasts, similar to the approach discussed in this chapter. First, U.S. Bank uses macroeconomic data and forecasts (e.g., GDP) as a framework for overall growth. By understanding the economic environment in which the company operates, executives can set realistic annual growth expectations. Next, equipment investment and financing data (e.g., new business volume data from the Association's MLFI-25 survey) offer a more complete picture of relevant trends, while sector-specific data (e.g., the Foundation-Keybridge U.S. Equipment & Software Investment Momentum Monitor) help U.S. Bank tailor its forecasts based on its main areas of business. These data help company leaders set expectations for each major business channel, which are then aggregated into an overall growth forecast.

While executives at U.S. Bank acknowledge that no one piece of information can provide the right answer — and that fitting information from multiple sources together can be an intimidating task — this simple "layered" approach helps ground U.S. Bank forecasts in economic reality.

a company's baseline demand growth projection. In this case, most forecasters agree with the Foundation's view that 2016 GDP growth is likely to be similar to 2015 growth, so company executives may see little reason for demand to shift significantly this year due to a different overall economic trajectory.[2]

Reference 1. 2016 Annual U.S. Economic Outlook: Projections for Key Economic Indicators

Projections for Key Economic Indicators

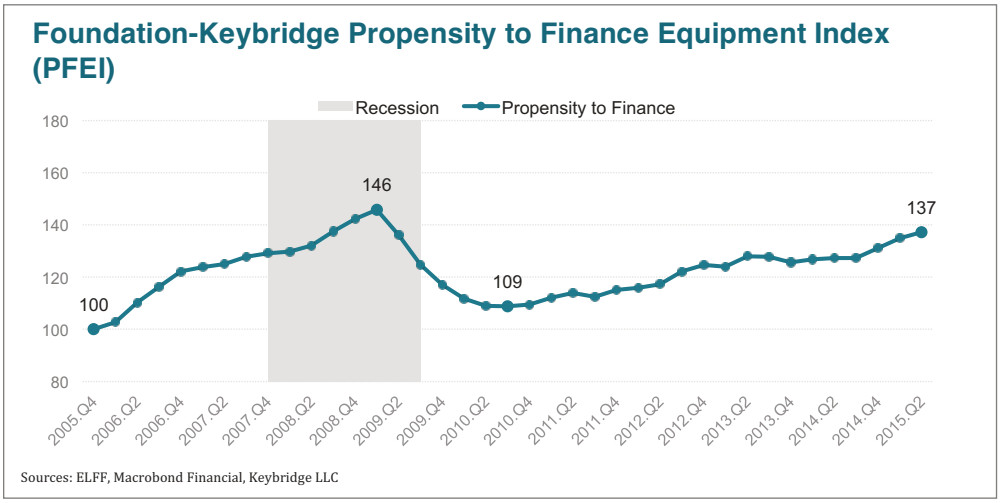
Indicator	2014	2015e	2016 Quarterly Estimates				2016 e
			Q1e	Q2e	Q3e	Q4e	
Real GDP (SAAR %)	2.4%	2.6%	2.6%	2.9%	2.8%	2.9%	2.8%
Real Investment in Equipment & Software (SAAR %)	6.0%	4.2%	3.8%	4.2%	4.6%	4.0%	4.4%
Inflation (year -on-year %)	1.6%	0.1%	1.4%	1.9%	2.1%	2.2%	2.0%
Federal Funds Target Rate (lower bound, end of period)	0.00%	0.25%	0.50%	0.75%	1.00%	1.25%	1.25%
10-year Treasury Rate (end of period)	2.2%	2.3%	2.5%	2.7%	2.9%	3.1%	3.1%
Total Payroll Growth (in thousands)	+3,116	+2,538	+575	+610	+585	+580	+2,350

Note: SAAR% refers to the annualized rate of change in seasonally adjusted data from one quarter to the next, which is the Bureau of Economic Analysis' standard method for reporting growth in the national accounts data.

After getting a broad picture of the economic outlook, equipment lessors can turn to more specific sources for information on equipment investment and financing activity. For example:

- Economic and industry reports published by the Foundation can be helpful in determining how economic trends will affect the equipment leasing and finance industry. For example, both the annual SEFI and quarterly Economic Outlooks offer forward-looking analysis of the equipment industry, while the monthly MLFI-25 survey provides up-to-date data on leasing activity. Accounting for ongoing headwinds and positive trends, the Foundation's 2016 Economic Outlook estimated that equipment and software investment will grow at a moderate 4.4% rate in 2016, little changed from 3.8% growth in 2015.
- Due to an elevated "propensity to finance," the Foundation's annual SEFI report anticipates continued positive equipment leasing in 2016 (see Reference 2). However, the SEFI also acknowledges the potential for somewhat slower industry growth due to normal business cycle cyclicality. Specifically, the report describes the equipment finance industry as entering "a new phase of solid but slower growth" and suggests that equipment and software investment may slow relative to the overall economy in the years ahead.
- Finally, the December 2015 MLFI-25 release reported that 2015 cumulative new business volume was up only 0.4% from 2014 levels, while the Foundation's Monthly Confidence Index was down nearly 12 points from its four-year high in March 2015.

Reference 2. 2015 SEFI: Foundation-Keybridge Propensity to Finance Equipment Index



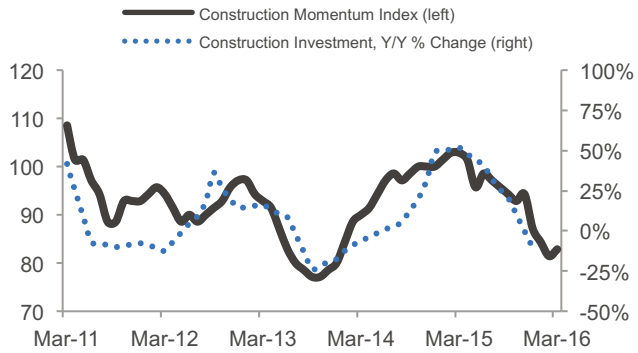
After assessing these macroeconomic and industry-specific indicators, A-1 Construction may consider bumping down their demand projections — or, at a minimum, refrain from anticipating faster growth in 2016.

Given the uniqueness of most equipment finance firms, an individual company's outlook is likely to differ from the outlook for the overall equipment finance industry. This is particularly true for small independents, which often face substantially different growth opportunities and risks. For this reason, granular data that cover specific equipment verticals may yield insights that are useful for developing a reliable business demand forecast.

A-1 Construction, for example, would be wise to consider leading indicators for construction activity as it plans for the year ahead. A good source for this information is the Foundation-Keybridge U.S. Equipment & Software Investment Momentum Monitor for Construction Machinery. Comprised of leading indicators for construction and housing activity, the Momentum Monitor is designed to signal turning points in the investment cycle without giving false readings of shifts in momentum. Published in the 2016 Annual Economic Outlook, the December update pointed to slower, but still solid, growth in construction machinery investment over the next six months (see Reference 3).

Reference 3. Foundation-Keybridge Equipment & Software Investment Momentum Monitor – December 2015

Construction Machinery:
Investment in Construction Machinery declined at a 26.0% annual rate in Q4 2015, the third straight contraction, and is now down 10.5% year-over-year (a two-year low). The Construction Momentum Index rose from 81.4 (revised) in February to 82.9 in March, its first increase in four months. While Housing Starts dropped 3.8% in January, Private Non-Residential Construction Spending rebounded 1.0% and Real Personal Consumption Expenditures rose 0.4%. Overall, the Index continues to suggest slower (and potentially negative) investment growth over the next three to six months.



Other housing and construction data also indicated positive momentum going into 2016. The National Association of Home Builders ("NAHB") Housing Market Index, a leading gauge of builder sentiment, climbed to a 10-year high in late 2015, indicating positive home building conditions (see Figure 4). Additionally, private residential housing starts (published monthly by the Census Bureau) — a key leading indicator of construction activity — accelerated over the second half of 2015.

In response to this construction-specific data, A-1 Construction may anticipate continued positive growth over the next year. While reacting to these slightly conflicting construction data points is not clear-cut, company executives might feel confident maintaining its 2016 demand forecast at 5 percent growth — or even bumping it up to 6 or 7 percent.

As discussed above, this second step centers on interpreting economic data in the context of the equipment finance industry or a specific sector. However, smaller independents are likely to interpret economic and industry forecasts differently than large banks — a key point made by multiple industry interviewees. To paraphrase one interviewee, large firms operate differently than small ones, and therefore have different data needs. For instance, projections of 1.5% annual GDP growth may lead a large, established bank to bump down its forecast for the year ahead, while robust double-digit growth in new business volume could still be feasible for a young independent firm — particularly if the company focuses on only a few niche equipment verticals with high growth potential.

Figure 4. NAHB Housing Market Index

Source: Macrobond Financial

2.1.3 Adjust Based on Qualitative Insights

A purely data-driven approach to forecasting investment demand may overlook key considerations that, while difficult to quantify, are likely to affect company performance. As such, industry executives should look to refine the forecasts that arise from economic data using qualitative information, industry expertise and "gut instinct," and insights from industry experts. For example, if the CEO of A-1 Construction learns that a key client is relocating to the other side of the country, he or she may expect a temporary decline in demand. Alternatively, business leaders may instinctively feel that their company's growth prospects differ significantly from the overall industry outlook, and adjust their demand forecast accordingly.

Once a demand forecast is developed, it can and, in most cases, should be adjusted throughout the year based on new quantitative and qualitative information. For instance, A-1 Construction may wish to downgrade its forecast in March based on recent drops in builder confidence (as seen in the NAHB Housing Market Index), two consecutive declines in housing starts, and further weakening on the Construction Machinery Momentum Monitor. On the other hand, it may increase its forecast after reading about the current low inventory of homes for sale in the regions in which they operate (which encourages new construction) and hearing a similar story from a trusted source in the construction business.

III. BUILDING A FORECASTING TOOL USING REGRESSION ANALYSIS

As discussed above, by benchmarking company projections against relevant economic and industry forecasts and data, business leaders can ground their projections in economic reality. Other quantitative tools offer a more rigorous statistical approach to incorporating economic data into company forecasts. Some finance firms, particularly large banks and captives, may already have in-house analytics departments that provide advanced research and analysis on industry trends. While many smaller firms may lack access to this type of sophisticated analysis, they can still build simple, easy-to-use quantitative tools to incorporate data into their forecasting decisions. One such tool is a simple regression analysis that quantifies the relationship between recent economic data and future business volume, which executives can use to build a short-term forecasting tool.

3.1 What Is Regression Analysis?

Basic regression analysis (also referred to as econometrics) is a well-established statistical tool that can reveal important relationships between data series. A regression is a statistical relationship between a "dependent" variable and one or more "independent" variables. By quantifying these relationships, business leaders can forecast outcomes and better plan for the future. Although advanced statistical software programs are often used by academic researchers working with large data sets, common software programs such as Microsoft Excel can handle most statistical tasks that would be of interest to equipment finance professionals. While it is difficult to show causality through the use of regression analysis (i.e., a particular variable or set of variables *causes* higher or lower demand in equipment investment, rather than

Farm Credit Leasing Services: Using Economic Data to Target New Business

In addition to Foundation research and publicly available data, some equipment lessors subscribe to private data services to gain more granular information on vertical-specific trends. For example, Farm Credit Leasing Services relies on leasing and sales data from Equipment Data Associates ("EDA") to better understand its competition and identify potential new customers in the agricultural equipment business. EDA provides detailed sales and financing data for many asset types and geographical regions, allowing users to target new business and tailor its sales strategy by region.

Using data from EDA and other private vendors, firms can better understand regional and vertical-specific variation in leasing opportunities and target the areas and verticals that have the best potential for growth. For example, if Farm Credit Leasing Services sees evidence of significant leasing activity in a given region, its sales representatives can target farmers in that region as potential customers and hope to grow its market share. Conversely, if equipment end-users are purchasing in cash, sales representatives may choose a different marketing strategy in order to increase the propensity to lease.

In short, Farm Credit Leasing Services relies on data from EDA in order to increase its knowledge of its competition, project future trends in leasing activity and portfolio performance, and target new business opportunities more effectively.

merely being associated with demand changes), regressions can be quite useful in determining whether the historical relationship among variables is meaningful, happenstance, or driven by other factors.

To create a customized forecasting tool, equipment finance executives can perform regression analysis using their company's historical business volume as the "dependent" variable and various key indicators identified in this Handbook as potential "independent" variables. As an example, Keybridge built a simple regression model to forecast MLFI-25 New Business Volume two quarters in the future.[3]

3.2 Step-by-Step Example: Forecasting MLFI-25 New Business Volume

3.2.1 Select Independent Variables

Since equipment leasing is a subcomponent of business investment, we used Equipment and Software Investment as an independent variable for our model. We then considered several other data series as independent variables, including Capacity Utilization, NFIB Small Business Optimism, New Orders of Durable Goods, and Industrial Production (all converted to quarterly frequency for the analysis). After trying various combinations and transformations of these indicators in our model, we determined that Capacity Utilization is a solid indicator of new business volume.[4]

3.2.2 Adjust for Seasonality

Another component of our model was adjusting for seasonality in New Business Volume. Both Capacity Utilization and Equipment and Software Investment are published as seasonally-adjusted data, so no further changes were needed for these variables. However, New Business Volume data is not seasonally adjusted and shows significant seasonality (e.g., new business volume typically spikes at the end of the year before falling sharply in Q1). To account for these seasonal differences, we created a set of "dummy" variables with values of either 0 or 1 to indicate the current quarter (e.g., in Q2 2016, Q1 = 0; Q2 = 1; Q3 = 0; and Q4 = 0). These "dummy" variables were then incorporated into our regression model.[5]

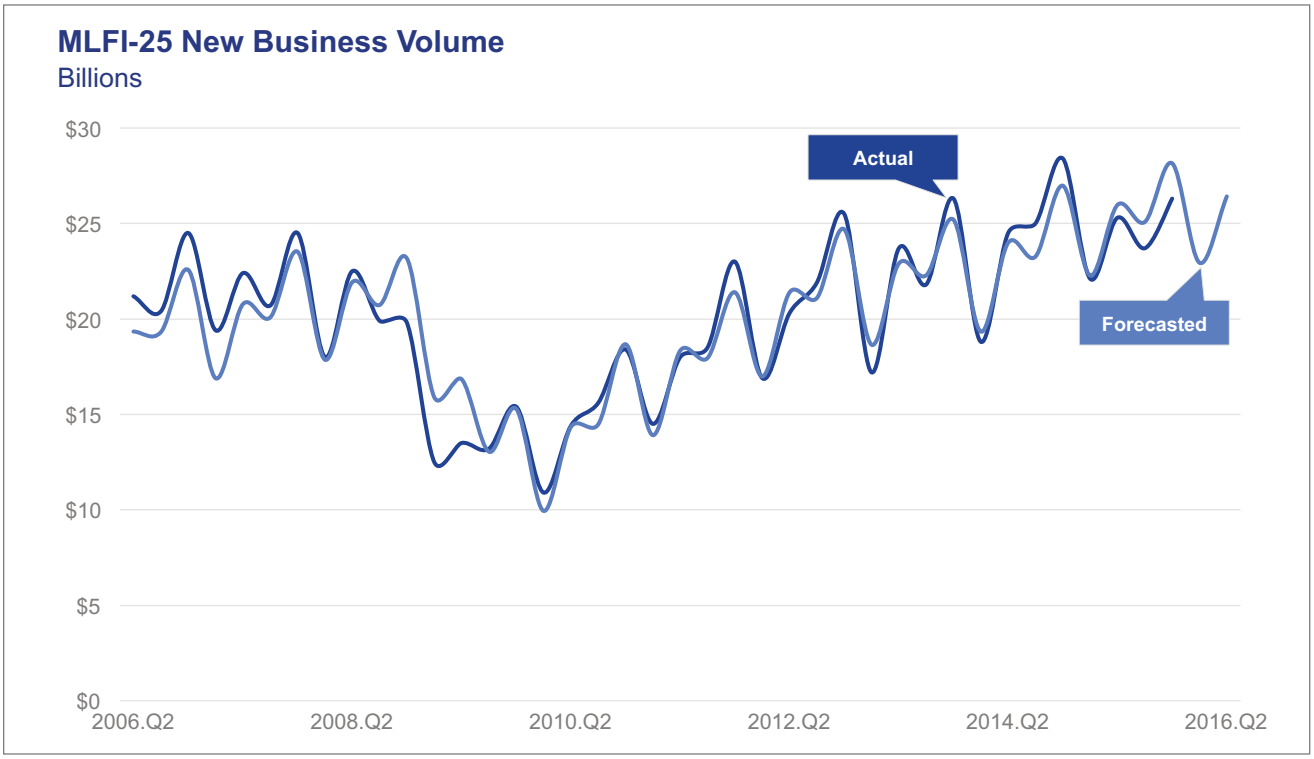
3.2.3 Test for Leading Relationships.

To build a forecasting tool, we needed our key independent variables (Capacity Utilization and Equipment and Software Investment) to predict future New Business Volume rather than current levels. Therefore, we "lagged" our key independent variables by two quarters in the regression model. In other words, the model uses *current* values of Equipment and Software Investment and Capacity Utilization to predict *future* New Business Volume (specifically, two quarters later).

Using this lagged approach, our simple tool forecasts $22.9 billion New Business Volume in the first quarter of 2016 (up 3% year-on-year) and $26.4 billion New Business Volume in the second quarter (up 2% year-on-year). (Figure 5.) In addition to statistically significant relationships between the independent variables and new business volume, our model had an R-squared value of 0.874 — meaning that our forecast tool explained roughly 87% of the variance in actual New Business Volume. These results demonstrate that our tool provides a reliable forecast of MLFI-25 New Business Volume.[6]

This example shows that a simple regression model, using a handful of independent variables likely to be relevant for most industry members, can reveal future trends in equipment finance and help executives better plan for the quarter or year ahead.[7] Firms may use this forecasting tool as a supplement to the approach discussed earlier in this chapter (i.e., compare the results of the forecasting model to their baseline forecast or to other relevant economic and industry forecasts). Our model forecasts MLFI-25 New Business Volume, and in this way it tracks industry-wide trends. However, equipment lessors can tailor forecasting models to their company, as discussed in the case study at the end of this chapter.

Figure 5. MLFI-25 New Business Volume: Actual & Forecasted Values



Source: ELFA; Keybridge

IV. CONCLUSION

This chapter describes how to interpret economic information in light of your firm and its unique characteristics. Economic data are useful inputs into demand forecasts, but there is no "one size fits all" solution to projecting future demand. Economic shifts impact firms of different sizes and industries in different ways, and an equipment lessor's unique portfolio composition will largely determine its performance in the near term. At a minimum, however, forecasts driven by economic and industry data trends can be used as a reality check against your own company's internal projections. Taken further, more robust statistical tools such as simple regression analysis can potentially create additional value in guiding demand forecasts. Regardless of the specific technique your company prefers, however, we agree wholeheartedly with one industry executive who stated that "a structured approach to forecasting," whether simple or advanced, is beneficial to any business.

Case Study: Building a Forecasting Tool

The model described above helps forecast trends in industry-wide new business volume (as shown by MLFI-25 data), yet equipment finance firms can use a similar approach to build a forecasting tool tailored to their business. This section walks through a case study for a fictional equipment finance firm.

Overview & Context: Ag Finance is an independent equipment lessor specializing in leases of agricultural machinery. Founded in 2000, Ag Finance enjoyed solid growth over the last decade, as commodity prices soared and the U.S. agricultural industry experienced record profits. However, since 2012, the company's new business volume growth has slowed somewhat as crop prices dropped and farmers have cut back on new investments. Facing an industry slowdown after several years of robust growth, senior management at Ag Finance is less certain about how to plan for the year ahead. While company leadership remains confident in their industry expertise and their ability to adapt to new industry dynamics, they are looking to supplement their industry knowledge with a more analytical-based approach to business decision making.

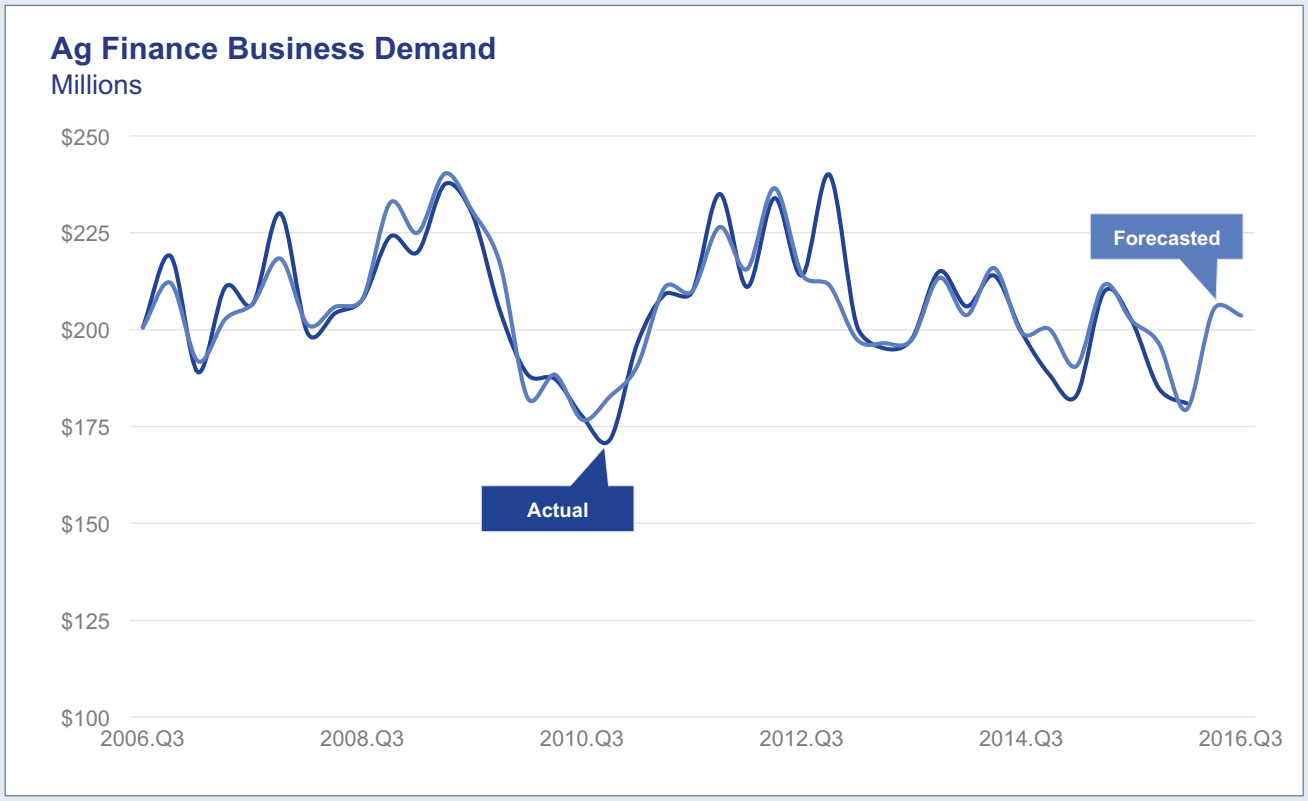
Goal: Given this higher degree of uncertainty surrounding the future of the agriculture industry, the senior manager wants to develop a simple tool to help forecast business demand several quarters into the future.

Approach: Ag Finance considered a variety of economic and agricultural data series as "independent" variables for its forecasting tool. Business investment in agricultural machinery, published quarterly by BEA, was an obvious choice, along with the Foundation's monthly Momentum Monitor for Agricultural Machinery Investment. In addition, Ag Finance looked at other publicly-available data series to gain insight into near-term shifts in the agriculture industry. These included major crop prices, such as corn prices (published monthly by the U.S. Department of Agriculture), and shipments of agricultural machinery (published monthly by the Census Bureau). Lastly, Ag Finance also included the Propensity to Finance Equipment Index ("PFEI") as a potential "independent" variable in its model.

Along with the "independent" indicators discussed above, Ag Finance also incorporated quarterly "dummy" variables in their model to account for seasonality in its business volume. To build its forecast model, Ag Finance performed regression analysis using historical company demand as its "dependent" variable and the quarterly "dummy" variables and lagged industry indicators as "independent" variables. After testing different combinations of "independent" variables and removing the ones that weren't statistical significant (i.e., those that failed to show a meaningful relationship with business volume), Ag Finance created a simple forecasting model.

Solution: The final model uses the Agricultural Machinery Momentum Monitor and quarterly "dummy" variables to forecast business demand two quarters into the future. Using the model in early 2016, Ag Finance predicts that business demand will dip in the first quarter of the year before rising slightly in the second quarter (see Figure 6). Overall, the model points to some stabilization in demand for Ag Finance leases, as the agriculture industry adjusts to a period of slower growth.

Figure 6: Demand Forecasting Tool: Actual & Forecasted Business Volume



Source: Keybridge

CHAPTER 3
Aligning a Portfolio to Emerging Market Trends
Am I Invested in the Right Equipment Verticals?

I. INTRODUCTION

Expanding into a new sector is a major decision for any equipment finance company, and one that demands extensive research and foresight. Equipment leasing executives must evaluate the economic, regulatory, and competitive forces influencing a sector, as well as predict how well their company would fit into the market and perform against its competitors. To make a choice that aligns with both the current and future economic environment and their company's long-term strategic goals, executives must identify and interpret a wide variety of quantitative and qualitative information. Using applied economics techniques to analyze economic and industry data can provide a fuller picture of the market and, ultimately, lead to more informed business decisions.

For many equipment lessors, the decision to expand into a new sector happens fairly infrequently. But even if the time is not right for a company to branch out to new verticals, diversification is an important part of any business investment strategy, and shifts in both economic and industry trends matter. As one interviewee stated, companies are regularly presented with opportunities to go "deeper" into a vertical in which the company has already established a position, as well as "wider" into new sectors. Either way, economic data can be used in conjunction with company data, information from trusted experts, and natural business acumen to produce more informed and more supportable decisions regarding whether to invest in a new vertical.

This chapter discusses economic tools for portfolio management decisions, both big and small. Acknowledging that strategies differ between firms (e.g., some firms want to ensure a reasonable rate of return while minimizing risk, while others are more willing to seek out high-growth sectors), this chapter provides a broad framework for portfolio management and offers two specific applications:

(1) **Growth Attribution Analysis** allows business leaders to critically analyze their portfolio in light of current and future growth trends. Based on this analysis, executives can identify growth drags and anticipate new opportunities for growth.

(2) **Risk Mapping** provides industry executives with a tool for estimating the severity and likelihood of portfolio risk. To the extent that vulnerabilities are identified, they can be mitigated through resource reallocation and/or portfolio diversification.

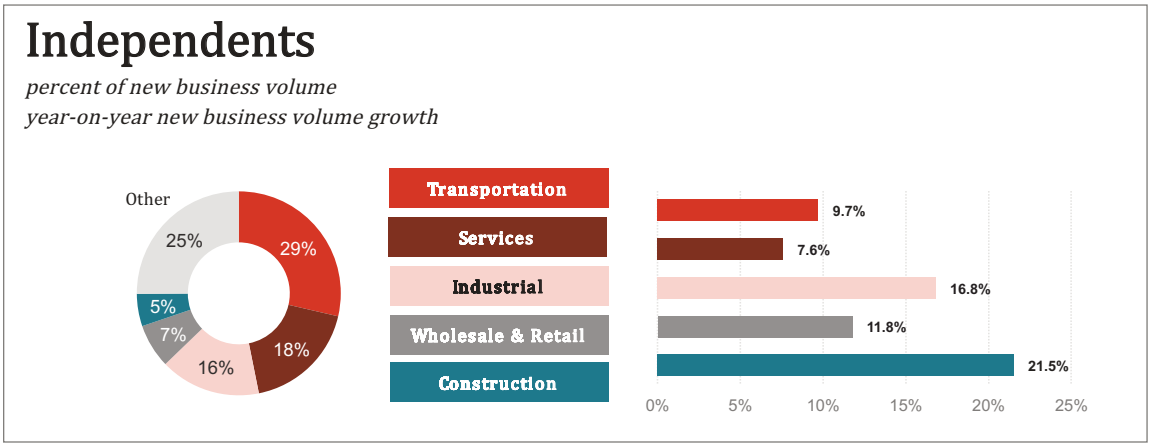
II. USING GROWTH ATTRIBUTION ANALYSIS TO ALIGN YOUR PORTFOLIO WITH INDUSTRY TRENDS

Every equipment finance executive faces the challenge of aligning their company's portfolio with economic and industry trends. In doing so, industry executives can identify both existing vulnerabilities in their portfolios and potential opportunities for new business. This section borrows from the 2015 State of the Equipment Finance Industry ("SEFI") report, which includes a section in which the distribution of new

business volume in a given sector is assessed.[8] This technique, known as growth attribution analysis, helps explain the drivers behind broader growth trends. For example, in 2014, Independents' heavy emphasis on Transportation — one of the fastest-growing equipment verticals — boosted their overall growth in new business volume (Reference 4). While the analysis included in the SEFI is inherently backward-looking due to its reliance on the previous year's data, a similar approach could help industry members improve their future planning efforts.[9]

Further, growth attribution analysis can signal the need for an organization to diversify its portfolio. In conversations with industry experts, several stressed the importance of diversification as a means of insulating their firms against sector-specific downturns. To the extent feasible, spreading investment positions across several equipment verticals can mitigate the negative implications of an investment decline.[10]

Reference 4. 2015 SEFI: Growth Attribution by Equipment Type



2.1 Step-by-Step Example: Growth Attribution Analysis

ABC Equipment Finance is a fictional independent equipment finance firm that plays in four main sectors: Oil Extraction, Trucking, Industrial Equipment, and Software. At the end of each year, executives at ABC Equipment Finance assess the company's portfolio and consider potential new markets. Recently, the firm has considered an expansion into medical equipment leasing and wants to assess whether this shift would be likely to benefit the company. In late 2015, ABC Equipment Finance uses growth attribution analysis to evaluate its current portfolio and gauge medical equipment as a potential new vertical.

2.1.1 Calculate Portfolio Distribution by Equipment Sector

Before turning to other data, business leaders first must understand their company's current portfolio allocation. Assume ABC Equipment Finance's portfolio is as follows:

- Oil Extraction Machinery = **40%**
- Trucks = **27%**
- Industrial Equipment = **18%**
- Software = **15%**

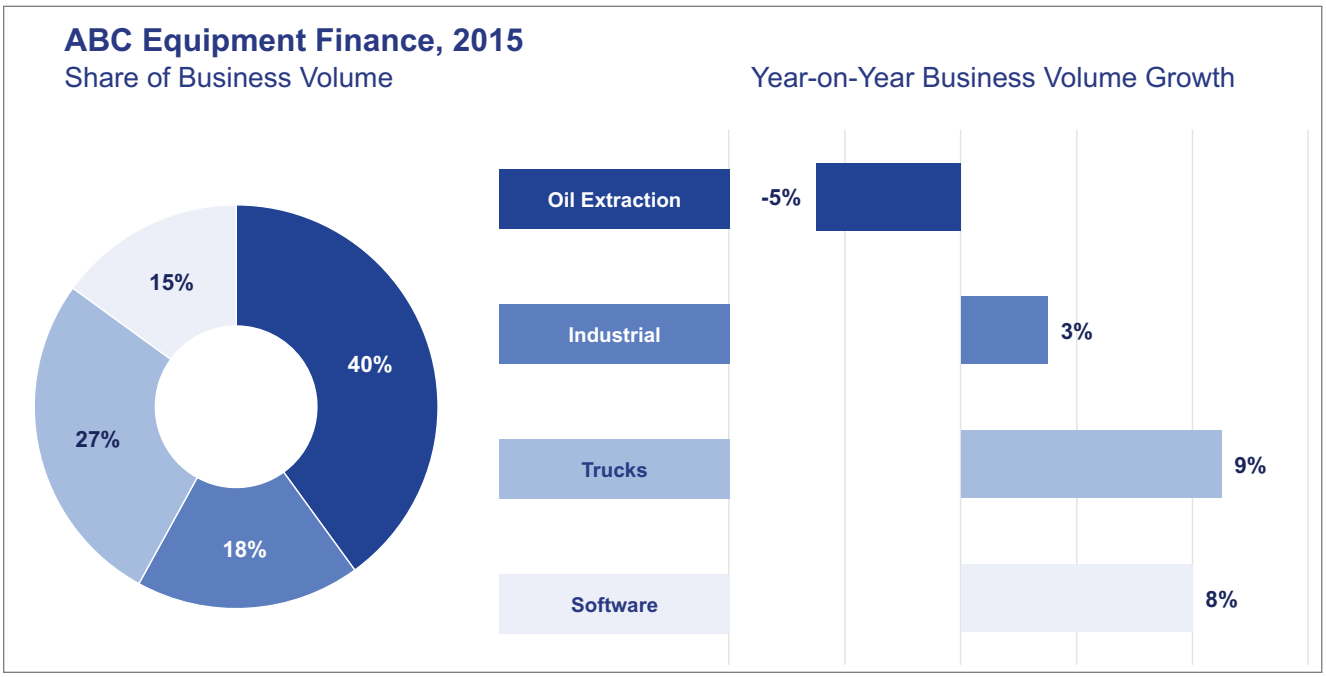
2.1.2 Analyze Past Growth

With their company's portfolio composition in mind, ABC Equipment could assess recent investment growth within each vertical and for the industry as a whole. This step is the central component of the SEFI's growth attribution analysis: break down the role each sector plays in overall business growth for a group of equipment lessors (e.g., banks, captives, or independents).

When analyzing past growth trends, business leaders can use internal revenue data, business investment data from BEA, or industry-wide new business volume data from industry publications, such as the SEFI (or a combination of the three). Internal data provides insight into which sectors are driving company growth, while investment and industry data reveal broader dynamics which affect all equipment finance firms. By evaluating its portfolio in light of both company growth and industry growth, an equipment lessor can distinguish between trends that were unique to their company and those experienced more universally throughout the industry.

- **Internal Data:** In 2015, ABC Equipment Finance estimates that its business volume grew 2.2% — a deceleration from recent years. A breakdown of company data shows that the firm's dependence on oil extraction equipment held back overall growth in 2015, as company business in the oil extraction sector contracted 5 percent from the previous year. Meanwhile, industrial equipment business volume grew by a modest 3 percent, while truck and software financing business expanded at a 9 percent and 8 percent clip, respectively (Figure 7). Clearly, ABC Equipment's 2015 growth would have benefited from a larger weight in the fast-growing software and truck sectors and a drawback in oil equipment leases.
- **Business Investment:** Equipment and software investment data tell a similar story for 2015. Total equipment and software investment growth slowed from 6 percent in 2014 to less than 4 percent in 2015, mirroring ABC Equipment Finance's growth deceleration. Software and industrial equipment investment grew 6.1 percent and 4.7 percent, respectively, both above their historical averages. Investment in trucks rose 12.2 percent in 2015, roughly equal to its 15-year average of 11.8 percent. Mining and oilfield equipment investment, however, plummeted nearly 40 percent in 2015, well below its 8.1 percent average growth rate. Lastly, investment in medical equipment grew 6.6 percent in 2015, roughly in line with its historical average.
- **Equipment Financing Activity:** ABC Equipment Finance could perform a similar analysis using new business volume data from the 2015 SEFI (by equipment type or end-user), yet these data are based on 2014 trends and are thus somewhat outdated. While data from the previous year could provide value by revealing longer-term trends, this chapter omits the older SEFI data from the growth attribution analysis.

Figure 7: 2015 Growth Attribution: ABC Equipment Finance



Source: Keybridge

2.1.3 Use Economic Data to Predict Future Growth

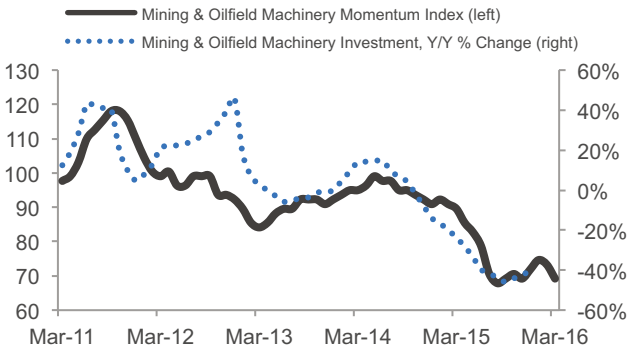
While useful in establishing baseline expectations, historical data do not tell the whole story. A sector which slowed during the prior year and hurt company performance could reverse course and drive growth in the months and years ahead, and vice versa. Therefore, equipment finance executives should assess the future trajectory of each sector using the best available information as they consider changes to their portfolio.

After evaluating its current portfolio in light of 2015 growth trends, executives at ABC Equipment Finance can use forward-looking data to assess its portfolio against likely future trends in equipment investment activity. Relevant data series could include publicly available leading indicators, sector-specific lending indices from private sources such as PayNet, and investment projections from the Foundation's Economic Outlooks and Equipment Investment Momentum Monitors. In this example, the company leadership identifies recent trends in Momentum Monitor data and compares current values to their historical averages.

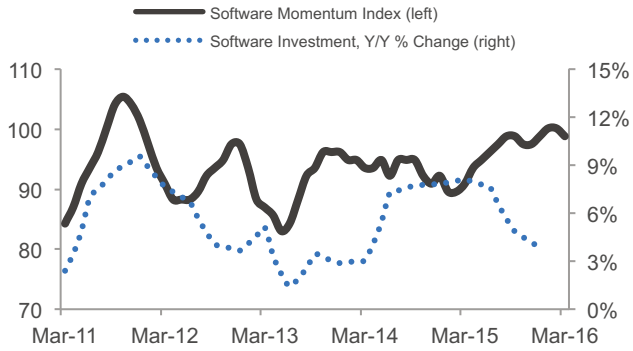
- The December 2015 Momentum Monitor for Mining & Oilfield Machinery Equipment Investment hovered near a 10-year low and indicated continued weak investment over the first few months of 2016 (Reference 5). Meanwhile, despite solid growth in 2015, the Other Industrial Equipment Momentum Monitor ended the year significantly below its 10-year median and signaled a strong potential for slower growth in the near term. At the same time, the Trucking Equipment Momentum Monitor pointed to a likely continuation of moderate investment growth, while the Software Momentum Monitor — after rising consistently over several months — indicated a solid potential for faster investment growth.

Reference 5. December 2015 Equipment Investment Momentum Monitor: Select Verticals & Comparison to 10-Year Historical Average

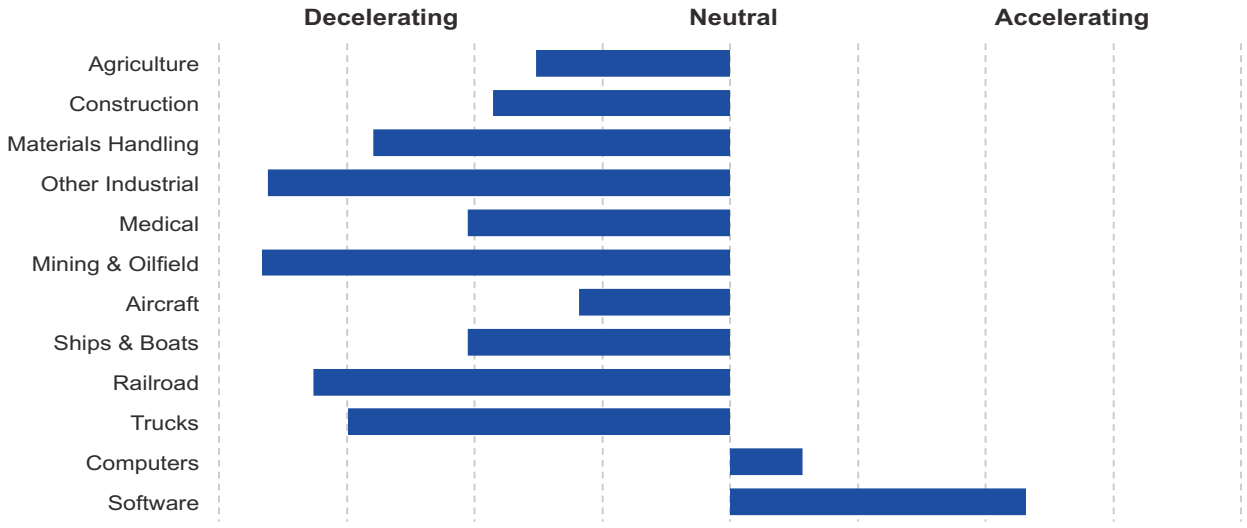
Mining & Oilfield Machinery:
Investment in Mining & Oilfield Machinery contracted at a 32.3% annual rate in Q4 2015 (the sixth straight decline) and remains down 40.6% year-over-year. The Mining & Oilfield Machinery Momentum Index fell from 73.3 (revised) in February to 69.2 in March. Mining Employment dipped 1.5% in January (the 16th straight monthly decline), and Shipments of Oil & Gas Field Machinery fell nearly 6%. Meanwhile, Natural Gas Industrial Production rebounded more than 16%. Overall, the Index points to continued weakness in mining & oilfield machinery investment over the next three to six months.



Software:
Investment in Software expanded at a 1.6% annual rate in Q4 2015, and is up 3.9% year-over-year. The Software Momentum Index eased from 100.1 (revised) in February to 98.8 in March, but remains elevated relative to historical norms. The ISM Non-Manufacturing Employment Index fell to a two-year low in February, while Exports of Travel Services dipped 0.6% (its third straight decline). Overall, the Index points to solid growth in software investment over the next three to six months.



Equipment Vertical Momentum Relative to 10-Year Historical Average



- Company executives could also evaluate medical equipment using Momentum Monitor data. The Momentum Monitor for medical equipment rose modestly over the last few months of 2015 and stood at an elevated level relative to historical readings. Both of these trends suggested continued solid growth in medical equipment investment in early 2016.

Other sector data also help predict future trends in economic and investment activity.

- For example, by the end of 2015, the U.S. oil rig count and crude oil prices had dropped to their lowest levels since the 2008–09 recession, and domestic crude oil production had largely plateaued. Coupled with historical investment data and the Momentum Monitor, these data suggest that oil equipment will continue to be a drag on investment and financing growth for most of 2016.
- Similarly, the Institute for Supply Management's ("ISM") Manufacturing Index indicated contraction in the industrial sector in late 2015 after declining for six consecutive months. Further, ISM's sub-index for Manufacturing New Orders reported a decrease in new orders of manufactured goods, suggesting continued weakness in manufacturing over the near term. Mirroring the Momentum Monitor, the data point to a slowdown in industrial equipment investment in early 2016.

2.1.4 Supplement Findings with Qualitative Information

Equipment lessors may also use other research or qualitative information to supplement or adjust their findings.[11] In the same way that an executive might modify his demand forecast based on a newspaper article or insight from a sector expert, these sources may reveal likely future trends missing from industry data. For instance, executives at ABC Equipment Finance might learn that transportation companies have increased their demand for used trucks and are seeking out new leasing agreements in light of low gasoline prices. This information, paired with continued low oil prices, could indicate that truck transportation will be a source of positive growth in 2016.

2.1.5 Consider Company Goals, Strengths, & Weaknesses

For a major expansion to be successful, more than just the economics need to be right. This key point was repeated in our conversations with industry players. As stressed by one interviewee, business leaders need to be "thoughtful and disciplined" in order to make a decision that is right for their respective firms — which typically involves assessing the firm's advantages and disadvantages relative to the competition. Another interviewee shared that personnel was the "driving force" behind decisions to do business in new areas. In other words, without having access to appropriate industry expertise, many firms would be better served by not expanding to a new market, even if they believe that market's growth prospects are attractive.

Moreover, our interviews with industry leaders revealed that many equipment lessors have no interest in chasing the "hot" market. Consciously moving away from the crowd, they look for under-represented markets to gain an advantage over the competition. These statements show that business leaders respond to industry trends in different ways, and a winning strategy for some firms is to look for opportunities to invest in markets that haven't yet blossomed, but may be on the verge of doing so.

Finally, the risks and benefits of expanding to a new equipment vertical differ between firms. A small firm may choose to expand to a relatively narrow market because company executives believe a niche market can provide ample room for growth even if the overall market size is unattractive to larger firms (indeed, niche markets are often attractive for this very reason). On the other hand, a large bank may expand to a saturated, competitive market in hopes of capturing market share from its competitors, particularly if these low-margin investments are generally associated with little risk.

In short, applied economics is intended to augment, not replace, firms' existing growth strategies. Just as advanced statistics haven't eliminated the need for traditional scouting in major league baseball, the tools in this chapter can supplement other tactics used by equipment lessors when evaluating new markets.

2.1.6 Adjust Portfolio Distribution

Based on their analysis, business executives may choose to adjust their portfolio to better align their business to industry trends. With a fuller knowledge of how individual sectors are likely to impact future growth, equipment finance executives can make more informed choices concerning new business. For the most part, these changes are likely to be minor and limited to new deals. However, executives may also use this analysis to inform the decision to expand to a new sector.

ABC Equipment Finance, for example, could choose to pursue new deals for software and truck leases in 2016. At the end of 2015, both sectors were poised to increase their demand for investment and financing, presenting solid new business options for the company. Conversely, ABC Equipment Finance may avoid new business in the oil industry. The growth attribution analysis indicates that demand for oilfield

GSG Financial: Using Sector Data to Identify Growth Opportunities

The 2008–09 financial crisis and resulting credit crunch led some equipment finance companies to increase the role of applied economics in their portfolio management practices. For example, GSG Financial relies more heavily on economic data to supplement other information when deciding whether to expand into a new equipment vertical. Following the recession, GSG increased its efforts to include economic data in its portfolio allocation decisions. Company executives were looking to stay a step ahead of the competition by identifying a vertical that was showing signs of bottoming out and primed for a rebound, which the company believed would lead to higher yields and new business volume.

GSG first evaluated the business cycles of several equipment verticals, using the Foundation-Keybridge Momentum Monitors and other industry data (e.g., U.S. housing starts). After identifying several potential verticals that had appeared to have recently bottomed out, GSG then assessed the future prospects for each and determine which areas appeared to be on the verge of recovery and were also aligned with the company's overall growth strategy. Specifically, company leaders used the Foundation's monthly Momentum Monitor publication, industry reports, and other related economic data to supplement insights from vendors and industry experts. This combination of quantitative and qualitative data helped GSG predict which verticals were likely to stagnate further and which were likely to rebound. For instance, GSG saw evidence of a long-term shift in printing and publishing that pointed to continued weak investment for the foreseeable future, yet potential for stronger growth in other verticals (e.g., diversified industrial).

After assessing its capabilities for expanding into the diversified industrial equipment vertical, GSG decided that it was a good fit for the company. While economic data was only one component behind GSG's decision, the company's analysis of business cycles helped guide its strategic thinking and provided a sound, data-driven justification for its resource reallocation.

equipment financing is likely to wane further in 2016, suggesting that the company may not be successful in pursuing new business in this area. Moreover, some traditional energy extraction companies may struggle to make payments on time (or at all) in the near future if oil prices remain low, which increases the risk associated with new oil equipment leases. Finally, the firm may decide to pursue new business in medical equipment leases in light of the sector's positive outlook.

III. USING RISK MAPPING TO IDENTIFY & ADDRESS VULNERABILITIES

In recent years, our conversations with industry players, along with Survey of Equipment Finance Activity ("SEFA") data, have highlighted the risk aversion of the equipment finance industry following the 2008–09 financial crisis. Relatedly, for some equipment lessors, the financial crisis underscored the need to systematically evaluate industry risk. Given these trends, some executives may be more interested in mitigating risk than expanding into fast-growth equipment sectors. The simple risk mapping exercise discussed below is a clear-cut method for identifying key vulnerabilities within a portfolio and can help executives better prepare for likely risks.

Similar to growth attribution analysis discussed above, risk mapping allows equipment finance executives to systematically assess vulnerabilities within their company's portfolio and compare risks. Risk maps provide a visual summary of the probability and severity of risks and are a straightforward, useful decision-making tool.

At the simplest level, each potential risk outcome is categorized using a simple "high/low" scale for both likelihood and severity. Then, each outcome is placed in the appropriate cell on the risk map. This mapping process facilitates an easy comparison of risks as business leaders can focus their attention on avoiding risks that are associated with higher severity and likelihood scores, while paying less attention to risks expected to be less likely and severe.

Below is a step-by-step example of risk mapping for a fictional company, Sodor Financial Group. While the simplest risk map is a two-by-two matrix, this example uses a slightly more detailed three-by-three map.

3.1 Step-by-Step Example: Risk Mapping

The majority of Sodor Financial Group's business comes from three equipment verticals (Railroad, Aircraft, and Computers), although the company is also establishing footholds in a few new markets. While Sodor Financial has grown at a solid rate over the last year, company leaders are concerned about economic pessimism seen in the news, along with recent declines in business and equipment finance industry confidence. As a result, the firm is looking to identify any emerging risks in the equipment finance industry, particularly within Sodor's three core verticals.

3.1.1 Identify Concentrations in Portfolio to Assess Risk Severity

The first step of risk mapping is assessing the company's vulnerability to shifts in the industry. Like growth attribution, this analysis begins with the company's portfolio distribution. To create a risk map, it is helpful to establish simple rules by which to interpret portfolio data. For example, Sodor Financial may create the following rules:

- **Low Concentration**: Sectors which account for less than 10 percent of their business;
- **Medium Concentration**: Sectors with 10-20 percent of business; and
- **High Concentration**: Sectors which comprise over 20 percent of the company's business.

These groupings can correspond directly to the severity of a downturn in each sector. A firm with a portfolio that is highly concentrated in one sector will experience severe losses during a sector downturn. The same is true for firms holding portfolios that appear to be diversified, but are actually highly concentrated in a set of correlated sectors (e.g., oil and railroad equipment); if one sector begins to struggle, related sectors are likely to follow suit.

For instance, assume Sodor Financial Group's portfolio is as follows:

- Railroad = **40%**
- Computers = **29%**
- Aircraft = **14%**
- Other = **17%**

Sodor Financial's positions in Railroad Equipment and Computer Equipment would each be considered "high severity," while Aircraft Equipment would be "medium severity" and investments in other verticals would be classified as "low severity."

While portfolio concentration certainly plays a large role here, other factors may also influence the relative severity of a sector slowdown for a given equipment leasing firm. One interviewee suggested that smaller equipment lessors are more susceptible to short-term changes in equipment demand, while larger firms are more equipped to ride out these demand ripples with minimal damage. As a result, the rules for estimating sector concentrations are likely to vary between firms.

3.1.2 Assess Likelihood of Sector Downturn

Next, industry leaders can use Momentum Monitors, sector-specific portfolio performance (both internal and external), and other industry data to evaluate the likelihood of a downturn in their main areas of business. Sodor Financial could assess recent trends in its three core sectors to evaluate the probability of a near-term downturn.

In the same way that we established "severity" (i.e., portfolio concentration) rules in the previous step, this step relies on simple rules for evaluating the likelihood of a downturn in each sector. Sodor Financial might base its rules on information from the Momentum Monitor:

- If a Momentum Monitor is below its ten-year average and its recent trend suggests slower or weak growth, then the likelihood of a near-term downturn in that equipment sector would be high.

- If a Momentum Monitor sits above its ten-year average and points to stronger or solid investment growth in the next six months, the chances of a near-term sector slowdown would be low.
- If a Momentum Monitor shows mixed or neutral signals (e.g., slightly below its ten-year average, but exhibiting positive momentum in recent months), the likelihood of a downturn in that sector would be moderate.

Using the March 2016 Momentum Monitors, Sodor Financial should expect a downturn in both Railroad and Aircraft equipment investment within the next six months. Investment in Computers, meanwhile, appears poised to strengthen in the near term, resulting in a "low" likelihood of a downturn in the next six months.

In addition to the Momentum Monitors, other data sources may also be useful in evaluating sector risks. Business leaders could analyze sector-specific portfolio performance data from private data sources, such as PayNet's Small Business Delinquency Index ("SBDI") and Small Business Default Index ("SBDFI"), to determine both industry-wide and sector-specific portfolio performance for the country as a whole and for individual states. Several interviewees said they look at equipment cycles and predict future movements based on the current point in the cycle. One industry executive also mentioned contract length as an indicator of risk in a given sector. Longer contracts signal greater confidence and less risk, while shorter contracts tend to signal more uncertainty and a higher likelihood of delinquency and default.

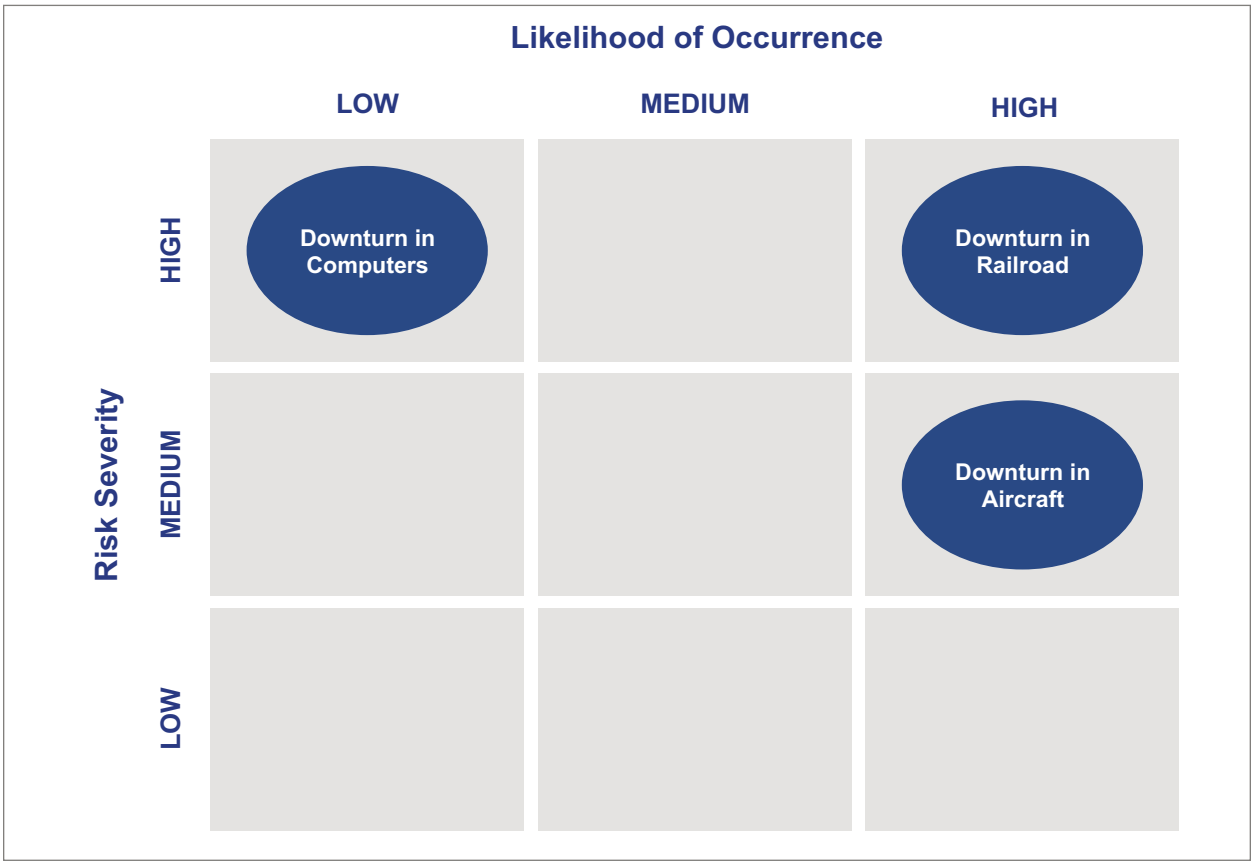
3.1.3 Combine Severity & Likelihood to Compare Risks

After establishing the "severity" and "likelihood" of a downturn for each of its main sectors, Sodor Financial can then combine its findings in a simple 3 x 3 risk map, as shown in Figure 8. By plotting each risk outcome on the map, executives at Sodor Financial can both visualize how they compare and have additional support for portfolio allocation decisions. To provide additional value, equipment leasing and finance companies could consider a more detailed risk map in which risks are categorized with greater granularity (e.g., using a 5 x 5 matrix).

3.1.4 Adjust Portfolio

The leadership at Sodor Financial can then use the risk map to modify the company's portfolio and guide new business. Like many firms, Sodor Financial is interested in mitigating high severity / high likelihood risks. Adjusting the composition of its portfolio is one way of accomplishing this goal. In the same way that ABC Equipment Finance used growth attribution analysis to drive business development, Sodor Financial may require a higher profit margin in order to accept the increased risk inherent to new leases of railroad equipment, while also shifting business development resources towards computer equipment and other verticals.

Figure 8. Sodor Financial: Risk Map for Main Sectors of Business



Source: Keybridge

IV. CONCLUSION

This chapter describes how to apply economic data and tools to portfolio management. Growth attribution helps business leaders evaluate their company portfolios in the context of recent and future trends. The risk mapping tool is designed to help equipment finance executives better prepare for the next downturn and avoid unnecessary risk. Combined, the two tools in this chapter underscore two points repeated in the industry interviews:

- The importance of making disciplined, structured portfolio management decisions; and
- The benefits of diversification in terms of reducing portfolio risk.

Once again, the data analysis discussed in this chapter is intended to supplement, not replace, other sources of information used in decisions regarding portfolio management. Quantitative tools, such as growth attribution or risk mapping, may reveal opportunities or risks absent from other sources, yet qualitative information can of course provide insights missing from industry and economic data.

Key Equipment Finance: Performing a "Stress Test" to Prepare for Industry Downturn

In order to minimize damage from industry downturns, Key Equipment Finance ("KEF") uses economic data and research to assess vulnerabilities in its portfolio. As part of this effort, KEF recently merged in-house research with Foundation data to assess the impact of a downturn in the oil industry, and "stress-tested" its portfolio against such potential risk. The Foundation-Keybridge Momentum Monitors were an important source of timely information, as they highlighted the future path for not only the mining and oilfield equipment industries, but also for related sectors such as railroad transportation.

Learnings provided by the Momentum Monitors also validated KEF's in-house analysis based on more detailed internal information. For instance, internal analysis allowed them to include customers from correlating sectors, based on North American Industry Classification System ("NAICS") code descriptors, in their portfolio analysis. Additionally, KEF's internal reports measured the impact of declining oil prices at various threshold levels, and also estimated reasonable timelines for price stabilization. By combining this information with the Foundation data, KEF concluded that the oil industry was facing a major downturn, which was likely to result in substantial damage to the rail transportation sector as well. These findings led KEF to assess its current portfolio to determine whether the company's concentration of assets in the mining, rail transportation, and related industries presented intolerable risk.

By performing a simple stress test, KEF was able to quantify the potential impact the downturn would impose on the company's bottom line. Executives first estimated the change in default rates caused by a downturn by subtracting current default rates from default rates realized during the last decline. Combined with its current business volume in these verticals (mining, rail transportation and related industries), KEF then developed several scenarios based on various degrees of decline, which in turn provided a range of potential losses the company would suffer as a result of the anticipated decline in the oil industry.

KEF's stress test illustrates how firms of all sizes can easily perform valuable analyses to evaluate portfolio vulnerabilities and determine the potential impact on their overall financial performance. While KEF undoubtedly has access to more sophisticated tools (both quantitative and analytic), a "back-of-the-envelope" estimate is not only possible, but also practical. Combining company data with well-reasoned industry and economic trends enables organizations to anticipate market fluctuations and make more informed decisions to limit their portfolios' risk exposure.

CHAPTER 4
Anticipating Shifts in Portfolio Performance
Am I Overexposed to Non-Payment Risk?

I. INTRODUCTION

As in any business, successful equipment leasing and finance firms are able to manage risk effectively. In recent years, industry competition has intensified and profit margins for many firms have narrowed significantly. As a result, achieving company targets for annual new business volume can become more challenging and require firms to find new customers, develop new products and services, and, in some cases, loosen credit standards.

Given that industry-wide delinquency rates and charge-offs are currently near all-time lows, portfolio performance is perhaps not a pressing concern for some firms. However, as interest rates normalize and the business cycle continues to mature, it will likely become increasingly important for company decision makers to anticipate broad shifts in the performance of their loan and/or lease portfolios and, potentially, adjust their risk tolerance when evaluating individual deals.

This chapter discusses two straightforward tools industry members can use to anticipate shifts in portfolio performance:

(1) **The Portfolio Performance Cycle:** Like business investment, portfolio performance tends to move in cycles. Economic growth generally strengthens portfolio performance and encourages lenders to loosen credit standards. Conversely, riskier borrowing and a slowdown in economic activity leave borrowers less able to repay their debts — resulting in higher delinquencies and defaults. By identifying historical patterns in portfolio performance and determining the industry's position in the current performance cycle, equipment executives can better plan for future shifts.

(2) **Leading Indicators:** Portfolio performance is largely driven by two broad forces: economic conditions and the risk tolerance of lenders and borrowers. These indicators (which often move in tandem) can signal coming shifts in portfolio performance. As such, understanding how these forces are related to one another and to portfolio performance can help equipment leasing and finance firms project likely changes to their internal delinquency and charge-off rates.

II. UNDERSTANDING THE PORTFOLIO PERFORMANCE CYCLE

The importance of understanding industry cycles is a theme repeated throughout this Handbook, and the same is true for portfolio performance cycles. The core of this approach is a simple analysis of the historical trends of key portfolio performance indicators, followed by an assessment of the current cycle. After estimating the current point in the cycle, business leaders can predict where portfolio performance is likely to head next.

2.1 Portfolio Performance: Key Data Series

Delinquencies and defaults are two primary indicators of portfolio performance and can be used to track historical cycles. Below are several useful sources for delinquency and default data (additional information is contained in Appendix A):

- **FDIC:** In its "Quarterly Banking Profile," the Federal Deposit Insurance Corporation publishes data for several portfolio performance indicators, including 30- and 90-day delinquencies, nonaccrual loans and leases, and net charge-offs. Aggregates of all FDIC-insured banks, these data series are available for several loan types and reflect broad trends in portfolio performance.
- **Federal Reserve:** On a quarterly basis, the Federal Reserve publishes delinquency and charge-off rates for loans and leases. These data series are reported for a variety of loan types (e.g., real estate, consumer, agricultural) and provide an overview of credit conditions in the U.S. economy.[12]
- **MLFI-25:** ELFA publishes two indicators of portfolio performance in its MLFI-25 report.[13] Specifically, the "Aging of Receivables over 30 Days" and "Average Losses (Charge-Offs)" data series are good barometers of current portfolio health in the industry.
- **SEFI:** The Foundation's annual SEFI report provides granular data on portfolio performance in equipment leasing and finance. These data, which are collected from ELFA's annual Survey of Equipment Finance Activity ("SEFA"), include 30-day, 60-day, and 90-day delinquencies, non-accruals, and charge-offs for the overall industry and by business model and end-user industry.[14]
- **Private Data Services:** Several private data vendors track trends in portfolio performance. Notable examples include PayNet's Small Business Delinquency Index ("SBDI") and Small Business Default Index ("SBDFI"), which signal rising or diminishing risk of delinquency and default in small business lending. PayNet also maintains a granular database of lease and loan information at the county and industry level, allowing its clients to better evaluate the risk of potential customers in a given sector or region.
- **Internal Data:** Equipment finance firms can analyze their own portfolio performance to identify historical patterns and predict future shifts in their business.

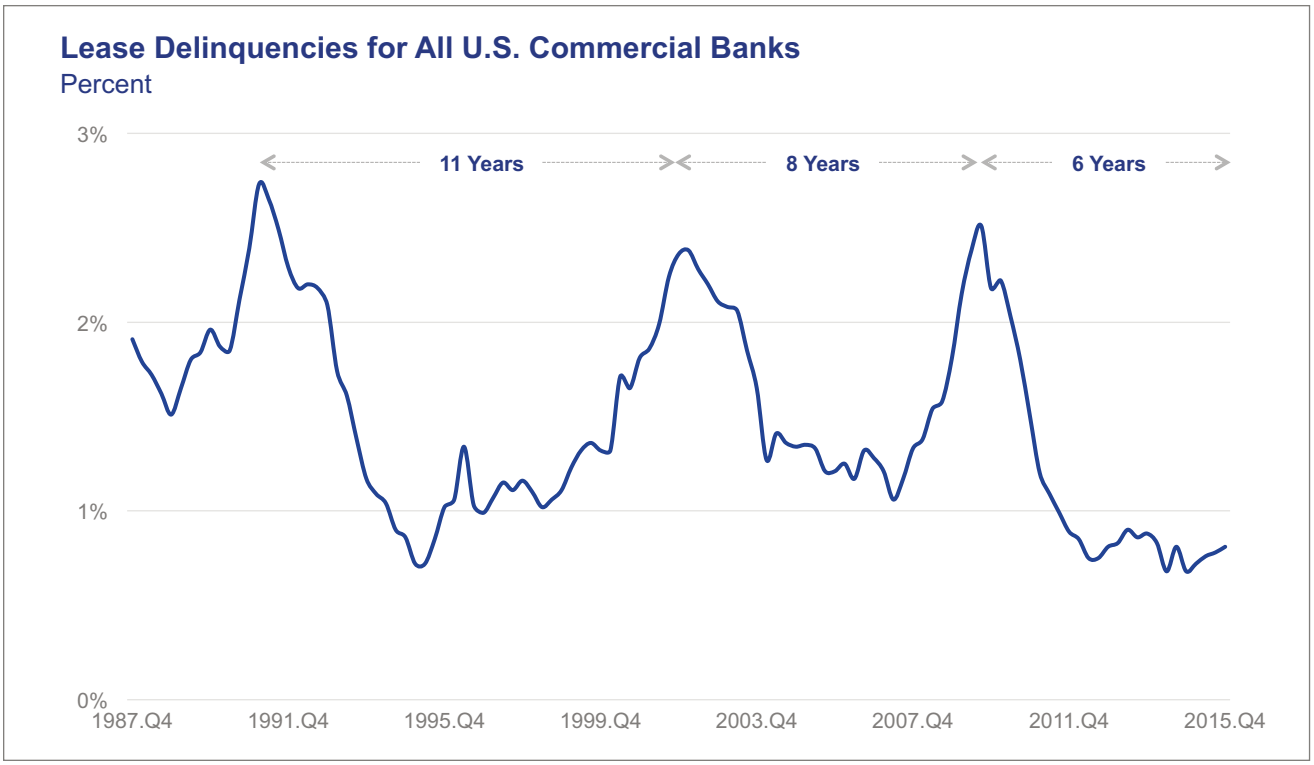
2.2 Trend Analysis: Step-by-Step Example

After identifying and gathering relevant data from the sources above, industry decision makers can analyze historical patterns in portfolio performance, compare them to recent trends, and predict future movements.

2.1.1 Establish Historical Cycles

To understand the portfolio performance cycle, it is important to first visualize historical data in order to assess past cycles. In most cases, a simple line graph is sufficient for identifying cycle peaks and troughs and for gauging the average cycle length. As illustrated in Figure 9, a look at lease delinquencies for all U.S. commercial banks (published quarterly by the Federal Reserve), for example, shows that lease portfolio performance cycles typically last 8 – 11 years (i.e., the next peak occurs roughly a decade after the previous one).

Figure 9. Lease Delinquency Rate, All U.S. Commercial Banks



Source: Macrobond Financial

2.2.2 Estimate Point in Current Cycle

After analyzing historical patterns, the next step is estimating where the cycle currently stands. To do so, equipment finance executives may want to evaluate recent data in the context of both historical levels and the current cycle.

Graphical analysis offers a quick look at where portfolio performance stands relative to past observations. For a more sophisticated analysis, business leaders can compare the current level to its historical average (e.g., how much higher / lower is the current observation compared to its 20-year median).

Similarly, a simple graphical or quantitative analysis helps gauge where the cycle currently stands. For this step, equipment finance executives might ask several questions, including:

- How long has it been since the last peak or trough?
- How much has the indicator fallen (risen) since the last peak (trough)?
- Compared to the equivalent point in the previous cycle, is the indicator higher or lower?

To continue the example from the prior step, using lease delinquencies for all U.S. banks:

- A quick look at the data shows that delinquencies are near all-time lows. A simple quantitative analysis confirms this finding; at just 0.8 percent in Q4 2015, lease delinquencies were nearly 50 percent below their 20-year historical average.
- Six years after the last peak and roughly a year after their late-2014 low, lease delinquencies ticked up slightly in Q4 2015. However, as noted above, delinquencies remain well below previous cycle troughs.

2.2.3 Predict Future Trends in Portfolio Performance

After obtaining a better understanding of both historical patterns and current portfolio performance, equipment lessors are in a better position to predict future trends. While some portfolio performance cycles are longer than others, establishing cyclical patterns can help business leaders distinguish between a temporary shift and a major turning point. For example, because lease delinquencies tend to follow decade-long cycles, and because delinquencies have recently risen from record lows, it is expected that delinquencies will continue to gradually increase in 2016, and a near-certainty that they will trend upward in the years ahead.

Of course, executives in the equipment finance industry are likely to also incorporate other information when analyzing the strength of their portfolio in addition to the performance cycle. For instance, one industry interviewee uses information on contract length as an indicator of credit risk. A shift towards longer contracts signals rising confidence (and improvements in customers' ability to pay) in a given sector, while shorter contracts convey a larger degree of uncertainty and the potential for higher delinquencies and defaults. Paired with recent trends in lease delinquencies, a shift towards shorter lease contracts would support our prediction of a gradual normalization of portfolio performance over the next year.

III. USING LEADING INDICATORS TO PREDICT TRENDS IN PORTFOLIO PERFORMANCE

The portfolio performance cycle, while a clear and useful tool, relies on historical data and is thus inherently backward-looking. To anticipate coming shifts in portfolio performance — particularly changes that deviate from historical norms — business leaders can incorporate forward-looking leading indicators in their analysis. As discussed throughout this Handbook, leading indicators help reveal major shifts in the economy or a specific industry. The leading indicators listed below reflect trends in the two main forces influencing portfolio performance: economic conditions, and borrowing / lending behavior.

(1) **Economic Conditions:** By analyzing key economic and sector-specific leading indicators, equipment finance executives can better anticipate shifts in the economy and, therefore, changes in their customers' ability to make timely payments.

(2) **Credit Behavior:** Borrowing and lending trends can act as leading indicators of portfolio performance. This simple logic has been echoed by many industry players in recent years: risky behavior by businesses and/or equipment lessors usually results in higher delinquencies and losses, while stringent standards result in healthier portfolios.

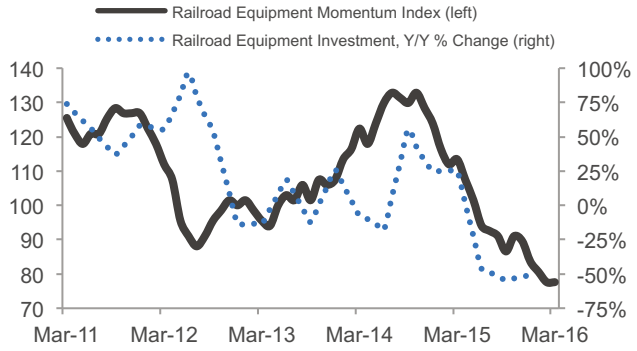
3.1 Leading Indicators: Economic Conditions

Below we list several leading indicators of economic conditions that are relevant to projecting future portfolio performance.

- **Foundation-Keybridge Momentum Monitors:** While the Momentum Monitors are designed to track trends in equipment and software investment, they also offer insight into the health of specific sectors. For instance, as shown in Reference 6, the sharp and prolonged decline in the Railroad Equipment Momentum Index suggests weak investment in railroad equipment — and indicates that customers may struggle to make payments on railroad equipment leases.

Reference 6. March 2016 Foundation-Keybridge Equipment Investment Momentum Monitor: Railroad

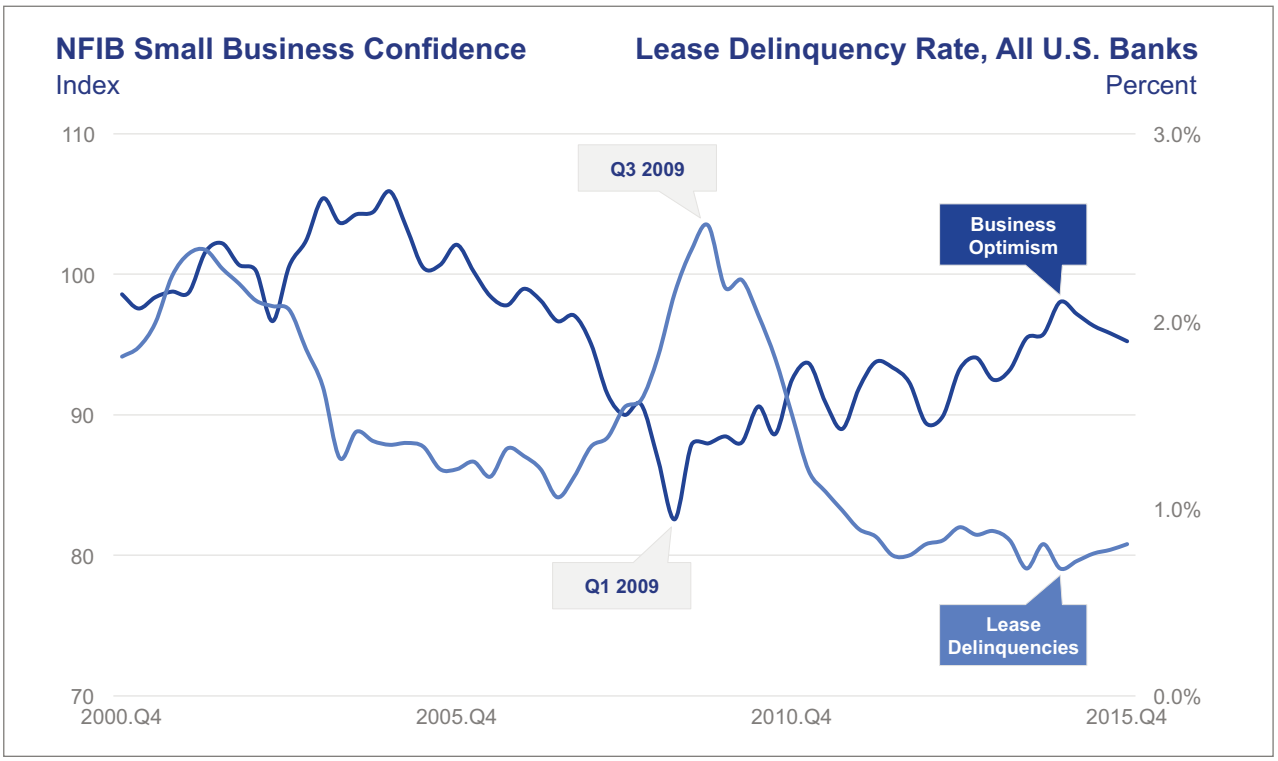
Railroad Equipment:
Investment in Railroad Equipment fell at a 10.9% annual rate in Q4 2015, and remains down 50.8% year-over-year, the third consecutive decline. The Railroad Equipment Momentum Index held steady at 77.6 (revised) from February to March, maintaining a six-year low. The ISM Manufacturing Employment Index increased 2.6 points in February, yet Nonfarm Employment Growth slowed to 151,000 in January. Overall, the Index's recent movement and low position suggests continued weakness in railroad equipment investment over the next three to six months.



- **Sector-Specific Indicators**: As discussed in previous chapters, sector-specific indicators also signal market changes that are likely to influence future portfolio performance. For example, housing starts and permits both peaked in 2005 then plummeted in 2007 and 2008, signaling the housing collapse well before construction investment began to decline.

- **Business Confidence:** Indicators of business confidence can also reflect shifts in economic conditions and businesses' ability to pay their debts. Business confidence typically has an inverse relationship with delinquencies and defaults (put another way, a positive relationship with portfolio performance); when conditions worsen and businesses lose confidence, they are also more likely to be delinquent on their payments. As one example, the National Federation of Independent Business ("NFIB") Small Business Optimism Index plummeted to an all-time low in early 2009, two quarters before the lease delinquency rate peaked in Q3 2009 (see Figure 10). In this case, businesses signaled a major shift before it had fully appeared in portfolio performance data.

Figure 10. NFIB Small Business Optimism & Lease Delinquency Rate



Source: Macrobond Financial

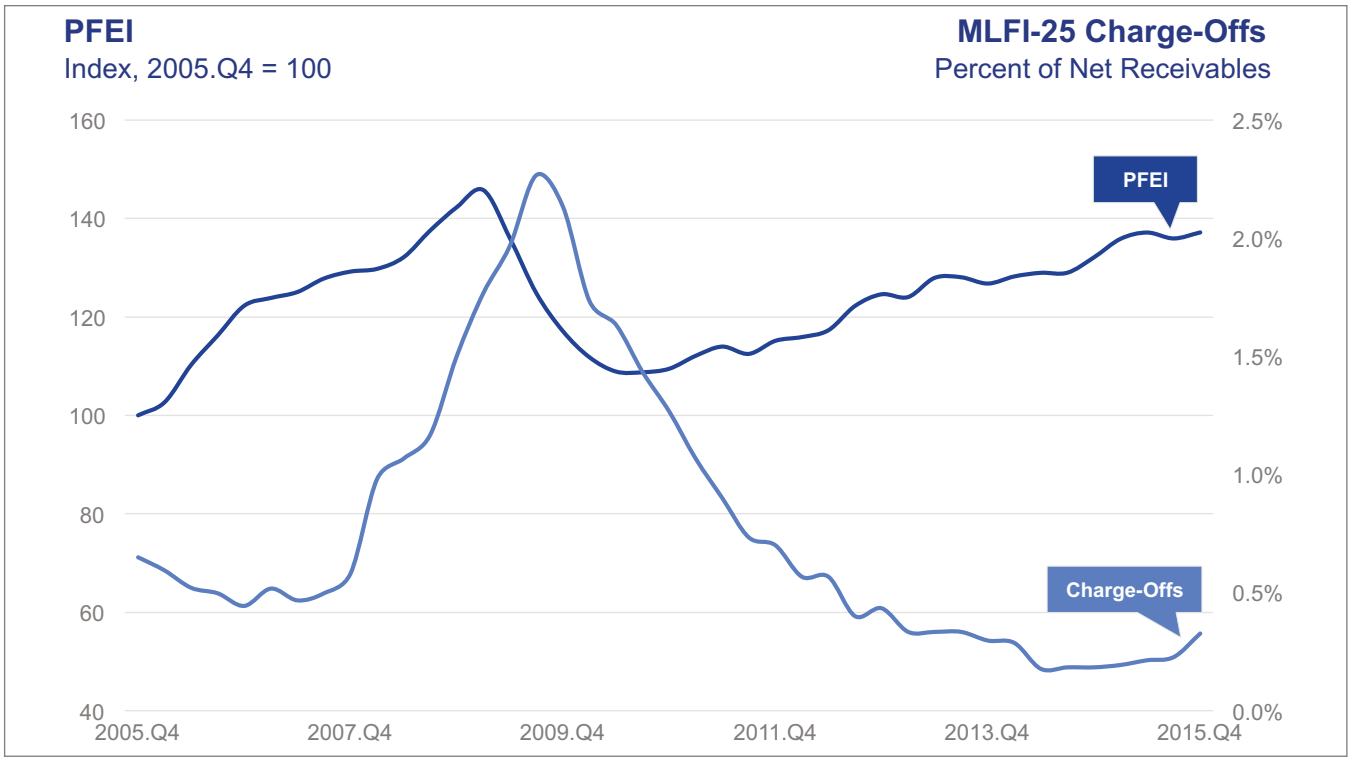
3.2 Leading Indicators: Credit Market Behavior

Just as shifts in economic conditions often portend a shift in portfolio performance, changes in lending and borrowing behavior generally foreshadow changes in delinquencies and defaults. While qualitative information (e.g., insights from customers, vendors) is likely to play a role here, several data series also reveal trends in credit behavior, specifically the level of risk-taking in the equipment finance industry.

- **Foundation-Keybridge Propensity to Finance Equipment Index:** The Propensity to Finance Equipment Index ("PFEI") gauges businesses' preference to finance equipment investment relative to purchasing in cash. As such, the PFEI reflects businesses' willingness to take on debt and can act as a proxy indicator of their current tolerance for risk. The PFEI peaked in early 2009, as companies took on increasingly more debt to finance their capital expenditures. Charge-offs on equipment leases and loans, as reported in the MLFI-25, lagged the PFEI by several quarters, climbing to a new high at the end of 2009 (see Figure 11).

- **Credit Standards:** Credit standards reflect lenders' willingness to take on risk, which generally has an inverse relationship with future portfolio performance. The MLFI-25 tracks the monthly credit approval rate for its 25 respondents, providing a snapshot of credit standards in equipment finance. For a broader view, the Federal Reserve's Senior Loan Office Survey provides quarterly data on the credit standards of major U.S. banks. Survey respondents report whether they have recently eased, tightened, or held unchanged credit standards for several loan types, including commercial and industrial ("C&I") loans and real estate loans.

Figure 11. Foundation-Keybridge PFEI & MLFI-25 Charge-Offs



ELFA; Keybridge

- **Delinquency Rates:** While delinquency rates reflect current conditions in portfolio performance, they also signal future trends in defaults — when delinquencies rise, defaults generally follow. Delinquency data from the Federal Reserve and FDIC help predict broad shifts in default rates, while 30-day delinquencies from the MLFI-25 report indicate the future path of equipment lease and loan charge-offs. Finally, equipment executives can use PayNet's small business delinquency indices ("SBDI") for a deeper dive into sector or regional portfolio performance trends (although these data series require a subscription).

Combined with the portfolio performance cycle discussed in the prior section, leading indicators help signal turning points in portfolio performance. By tracking two key drivers of portfolio performance — economic conditions and credit market behavior — equipment lessors can identify shifts before they appear in delinquency or default data.

IV. CONCLUSION

This chapter describes two straightforward tools for predicting future portfolio performance: the portfolio performance cycle, and leading indicators for the economy and credit markets. Both rely on simple trend analysis, which decision makers can use to understand historical patterns, identify key turning points, and anticipate future trends.

Equipment finance firms respond differently to shifts in portfolio performance, based on their business model and growth strategy. Based on discussions with industry leaders and data included in the annual

SEFI report, it is generally accurate that most Banks tend to emphasize credit quality and portfolio performance more than most Captives and Independents, who are typically more risk-tolerant than Banks in order to increase new business volume. However, regardless of their level of risk aversion, equipment lessors can use the data and tools described in this chapter to increase their understanding of the portfolio performance cycle and use this knowledge to predict and prepare for future performance shifts in their own portfolios.

Wintrust Commercial Finance: Making Smart Credit Approval Decisions with Sector Data

Like many industry members, Wintrust Commercial Finance incorporates economic data into its credit approval decisions when assessing the relative strengths of multiple deals in the same vertical. Recently, Wintrust was presented with two possible deals to lease rail tank cars. The first option was a "pass through" deal with a company seeking to transport petroleum products on behalf of its clients, while the second came from a company looking to transport refined petroleum products for its own use. While the equipment type was the same and the quality of each potential deal appeared similar on the surface, an assessment of oil industry data revealed key differences in potential risks.

As part of its risk assessment process, Wintrust used publicly available data from the Energy Information Administration ("EIA"), along with more qualitative information from news articles and industry publications such as the Foundation- Keybridge Momentum Monitors, to analyze the U.S. oil industry. Based on this information, Wintrust saw that domestic oil production was increasing, oil prices were plummeting and expected to stay low for several years, and crude oil inventories were sitting at multi-year highs. This combination of industry trends pointed to a sharp decline in demand for transportation of petroleum products — and a corresponding supply glut of rail tank cars. Wintrust expected that if demand for rail tank cars fell, it would negatively affect a "pass through" transportation firm more than a company that intended to use the cars to transport its own petroleum products. By analyzing relevant industry data and projections, Wintrust was better able to assess the risk of competing deals and make a more informed decision regarding which deal to finance.

Case Study: Anticipating Shifts in Portfolio Performance

Overview & Context: Founded in 1998, 18Wheel Leasing Services is a midsize independent equipment lessor specializing in commercial truck leases. Like many other equipment finance firms, 18Wheel has experienced record portfolio performance over the past three years, in part due to a conscious tightening of credit standards following the 2008–09 financial crisis.

More recently, company executives have considered easing their credit standards in order to drive new business. Some company decision makers see looser standards as a way to drive new business volume in a highly competitive marketplace, particularly because the company cannot compete against larger competitors (particularly banks) on price alone. Others are more skeptical due to lingering uncertainties surrounding the economy and the business investment cycle, and are thus hesitant to loosen standards.

To clarify this issue and guide their decision making, the leadership at 18Wheel Leasing Services decides to evaluate the outlook for portfolio performance using economic and industry data.

Goal: To help build consensus on the company's credit standards strategy, the CEO of 18Wheel Leasing Services wants company analysts to create a data-driven outlook for industry portfolio performance over the next year.

Figure 12. MLFI-25 Charge-Off Rate

Source: ELFA

Approach: 18Wheel Leasing Services first analyzes default data to understand historical patterns in portfolio performance. Starting broadly, analysts look at historical charge-off data from the MLFI-25 to review recent trends in industry portfolio performance. They note that:

- Charge-offs were historically low from 2005 – 2007 before rising sharply to an all-time high in September 2009 (Figure 12).

- Since the 2009 peak, charge-offs declined steadily, falling to a new low in late 2014.

- Charge-offs have ticked up recently, but slipped in January 2016.

18Wheel analysts then turn to internal default data to see if their company's portfolio performance has mirrored industry trends. Like MLFI-25 charge-offs, the company's default rates spiked in 2009 before falling rapidly over the next three years. Also matching industry trends, company defaults have lingered near all-time lows over the past two years. While defaults have risen slightly in recent months, analysts do not see evidence of a major shift in the company's portfolio performance.

To supplement its analysis of historical patterns in portfolio performance, 18Wheel Leasing Services assesses recent trends in its core trucking business. Analysts incorporate several leading indicators of trucking activity into this part of the analysis.

- The Foundation-Keybridge Momentum Monitor for Trucks fell sharply in early 2016, suggesting potential for a slowdown in truck investment over the next six months. However, truck investment remains up nearly 13 percent from a year prior, so analysts do not expect a major downturn in the trucking industry in the coming months.

- Other indicators of trucking activity also put the sector on solid footing. The Transportation Services Index, which measures the movement of freight and passengers, rose modestly in 2015 (although growth has slowed relative to recent years). Further, March diesel fuel prices were down nearly 30 percent from a year prior, which 18Wheel believes could lead to a short-term increase in trucking and transportation investment in the near term.

Solution: To predict future movements in delinquencies and defaults, 18Wheel Leasing analyzes portfolio performance cycles alongside trucking sector data.

- After recently hitting record lows, equipment finance charge-offs appear to have bottomed out and begun to gradually rise. 18Wheel Leasing Service's default rate continues to hover near all-time lows and is likely experiencing a cycle trough.

- Despite a potential investment slowdown in the years ahead, recent data suggest that the trucking sector remains healthy and is unlikely to experience a major decline in 2016.

Due to a low default rate and positive trucking momentum, 18Wheel Leasing Services analysts predict that company portfolio performance will remain at healthy levels in 2016. However, given historical patterns, 18Wheel Leasing's portfolio performance is unlikely to strengthen further. Despite the positive outlook for trucking sector investment, analysts expect that company delinquencies and defaults may increase slightly by the end of 2016.

CONCLUSION

Equipment leasing and finance plays a crucial role in the U.S. economy, providing businesses with the equipment and software they need to operate and expand. Economic trends can have a major influence on the relative performance of the equipment finance industry, as shifts in economic conditions encourage businesses to pare back or ramp up their capital spending.

Given these close ties between the broader economy and equipment leasing and financing, applied economics offers a competitive advantage to equipment lessors looking to anticipate trends in their industry. A nearly inexhaustible supply of economic data and research is readily available, yet sifting through even a small percentage of this information can be time-consuming and overwhelming. Instead, tailored tools — based on key data series and straightforward analytics — can help equipment executives use economics in their business decisions.

This Handbook establishes links between the overall economy and the equipment leasing and finance industry, and lists key economic indicators relevant to business decision making. Further, the Handbook provides tools for several core business decisions, including forecasting demand, managing your portfolio, and assessing your firm's risk tolerance. In short, this document offers an analytical toolkit which equipment executives can incorporate into existing strategies and sources of industry information.

Successful business leaders know that no one source provides the full answer — instead, they take advantage of new information as it becomes available and adapt their firm's strategy accordingly. As stated by one industry executive, business leaders who use the tools at their disposal, including economic data and analysis, tend to "work less, work smarter, and do more successful business."

APPENDIX A
Key Sources of Economic Data
Business Cycle & Financial Market Indicators (1of 3)

Indicator	Source		Frequency	Units	Significance
	Latest Release	Historical Data			
Real Gross Domestic Product ("GDP") Growth	BEA	FRED	Quarterly	Percent Growth	Broadest gauge of demand in the national economy
Real Equipment & Software Investment Growth[1]	BEA	BEA	Quarterly	Percent Growth	Subcomponent of GDP that incorporates equipment leasing; early warning indicator for recessions
Industrial Production ("IP")	Federal Reserve	FRED	Monthly	Index	Measures volume of production in manufacturing, mining, and utilities; early predictor for GDP
Capacity Utilization ("CU")	Federal Reserve	FRED	Monthly	Percent	Measures slack or spare capacity in mining, manufacturing, and utilities
Nonfarm Payroll Employment Growth[2]	BLS	FRED	Monthly	Number of Jobs	Captures private and public employment
New Orders of Durable Goods	Census Bureau	FRED	Monthly	$$	Provides information on future production of industrial goods
Housing Permits	Census Bureau	FRED	Monthly	Number of Permits	Measures likely new construction; leading indicator in the business cycle
Business Roundtable CEO Economic Outlook Survey	BRT	BRT	Quarterly	Index	Asks leading U.S. companies about expected investment spending

[1] Table 5.3.6: Real Private Fixed Investment by Type, Chained Dollars. Sum of "Equipment" investment and "Software" investment.

[2] Under "Units," select "Change, Thousands of Persons."

APPENDIX A
Key Sources of Economic Data
Business Cycle & Financial Market Indicators (2 of 3)

Indicator	Source		Frequency	Units	Significance
	Latest Release	Historical Data			
Consumer Confidence	Conference Board	–	Monthly	Index	Signals future shifts in consumer spending
Consumer Sentiment	University of Michigan	University of Michigan	Monthly	Index	Signals future shifts in consumer spending
Consumer Price Index ("CPI")[3]	BLS	FRED	Monthly	Index	Part of Federal Reserve's mandate; trigger for interest rate changes
Fed Funds Target Rate (Lower Bound)	Federal Reserve	FRED	Daily	Percent	Reflects cost of borrowing, which drives equipment investment and leasing; determined by the Federal Reserve
U.S. Dollar Index (Real Trade Weighted)	Federal Reserve	FRED	Daily	Index	Measures the exchange value of the dollar; directly affects competition and therefore investment
S&P 500 Price Index	S&P	FRED	Daily	Index	Market indicator of economy's health and expected profits
National Federation of Independent Business ("NFIB") Small Business Optimism Index	NFIB	NFIB	Monthly	Index	Gauge of small business optimism on economic conditions
Lease Delinquency Rate	Federal Reserve	FRED	Quarterly	Percent	Provides an overview of credit conditions in the U.S. economy
Loan Delinquency Rate	Federal Reserve	FRED	Quarterly	Percent	Provides an overview of credit conditions in the U.S. economy

[3]Under "Units," select "Percent Change from Year Ago."

APPENDIX A
Key Sources of Economic Data
Business Cycle & Financial Market Indicators (3 of 3)

Indicator	Source		Frequency	Units	Significance
	Latest Release	Historical Data			
Quarterly Banking Profile	FDIC	FDIC	Quarterly	–	Provides the a comprehensive summary of financial performance for all FDIC-insured institutions
Federal Reserve Senior Loan Officer Survey	Federal Reserve	Federal Reserve	Quarterly	–	Survey of up to 80 large domestic banks and 24 U.S. branches and agencies of foreign banks
West Texas Intermediate ("WTI") Crude Oil Spot Price	EIA	EIA	Daily	$$ per barrel	Measures price of oil in Cushing, Oklahoma; leading indicator for oil sector investment
Henry Hub Natural Gas Spot Price	EIA	EIA	Daily	$$ per mil BTU	Measures price of natural gas at the Henry Hub in Louisiana
Domestic Crop Prices	USDA	–	Monthly	–	Measures price of corn, wheat, and other crops; leading indicator of agricultural industry investment
Domestic Livestock Prices	USDA	USDA	Monthly	–	Measures price of cattle, hog, and other livestock; leading indicator of agricultural industry investment

APPENDIX A
Key Sources of Economic Data
Equipment Leasing & Finance Indicators (1of 1)

Indicator	Source		Frequency	Units	Significance
	Latest Release	Historical Data			
New Business Volume	ELFA	ELFA	Monthly	$$	Measures monthly commercial equipment lease and loan activity as reported by participating equipment finance companies
Aging of Receivables Over 30 Days	ELFA	ELFA	Monthly	Percent	A barometer of portfolio health in the equipment leasing and finance industry; indicators of future charge-offs
Average Losses (Charge-Offs)	ELFA	ELFA	Monthly	Percent	A barometer of portfolio health in the equipment leasing and finance industry
Foundation-Keybridge Propensity to Finance Equipment Index ("PFEI")	SEFI	–	Quarterly	Index	Gauges businesses' preference to finance equipment investment relative to purchasing in cash
Monthly Confidence Index for the Equipment Finance Industry ("MCI-EFI")	ELFF	ELFF	Monthly	Index	A qualitative assessment of both the prevailing business conditions in the equipment finance industry and expectations for the future
Foundation-Keybridge Equipment Investment Momentum Monitor	ELFF	ELFF	Monthly	Index	Signals turning points in the investment cycle without giving false readings of shifts in momentum; covers 12 equipment and software verticals
PayNet Small Business Delinquency Index ("SBDI")	PayNet	PayNet	Monthly	Index	Signals rising or diminishing risk of delinquency in small business borrowing
PayNet Small Business Lending Index ("SBLI")	PayNet	PayNet	Monthly	Index	Early signal of future economic growth, demand for capital, and business fixed investment
PayNet Small Business Default Index ("SBDFI")	PayNet	–	Monthly	Index	Robust indicator of small business financial stress and insolvency
Credit Approval Rate	ELFA	ELFA	Monthly	Percent	A barometer of credit standards in the equipment leasing and finance industry

APPENDIX A
Key Sources of Economic Data
Sector-Specific Indicators (1of 1)

Indicator	Source		Frequency	Units	Significance
	Latest Release	Historical Data			
U.S. Crude Oil Production	EIA	EIA	Monthly	Barrels per day	Reflects economic activity in the U.S. oil sector
West Texas Intermediate ("WTI") Crude Oil Spot Price	EIA	EIA	Daily	$$ per barrel	Leading indicator for oil sector investment; measures price of oil in Cushing, Oklahoma
U.S. Oil Rig Count	Baker Hughes	Baker Hughes	Weekly	Number of Rigs	Number of drilling rigs actively exploring for or developing oil or natural gas in the U.S. and Canada
Diesel Fuel Prices	EIA	EIA	Weekly	$$ per of Rigs	Indicates spot price of diesel; diesel is a major transportation fuel, demand generally follows economic trends
Private Residential Housing Starts	Census Bureau	FRED	Monthly	Number of Starts	Reflects the number of new housing units started; reported at a seasonally adjusted annual rate
National Association of Home Builders ("NAHB") Housing Market Index ("HMI")	NAHB	NAHB	Monthly	Index	Based on a monthly survey of NAHB members; designed to take the pulse of the single-family housing market
Corn Price	USDA	USDA	Quarterly	$$ per bushel	Based on Feed Grains data; reflects changes in corn prices received by farmers on a quarterly basis
Shipments of Agricultural Machinery	Census Bureau	FRED	Monthly	$$	Based on Manufacturers' Shipments, Inventories, and Orders Survey; reflects value of shipments
Institute for Supply Management ("ISM") Manufacturing Index	ISM	FRED	Monthly	Index	Measures the health of the manufacturing sector; based on survey of U.S. purchasing / supply executives
Transportation Services Index	DOT	FRED	Monthly	Index	Combines data on freight traffic and passenger travel to measure movement of freight and passengers

APPENDIX B
Acknowledgements

This research was guided by dedicated industry volunteers who gave their time and expertise by providing comments and suggestions throughout the development of the report. Specifically, Vince Belcastro, Scott Thacker, Tom Ware, and Chris Yungstrom. Their participation is appreciated greatly, and their expertise and insights provided valuable information concerning the critical issues facing the equipment finance industry. Additionally, we would like to extend special recognition to those individuals who donated their time to be interviewed for this Handbook.

- **Mr. Andrew Bender,** CEO, GSG Financial LLC
- **Mr. Tony Cracchiolo,** President & CEO, U.S. Bank Equipment Finance
- **Mr. Connie Eimers,** President & COO, Vision Financial Group Inc.
- **Mr. Dave Fate,** President & CEO, Stonebriar Commercial Finance LLC
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APPENDIX C
About Keybridge

Keybridge is a boutique economic and public policy consulting firm. Keybridge provides technical analysis and strategic advice to a diverse clientele that includes leading non-profit organizations, global financial institutions, multinational corporations, premier trade associations, and federal government agencies. Our principals serve as economists, policy experts, and strategic advisers on issues that reside at the forefront of public policy economics.

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ENDNOTES

[1]In the United States, the National Bureau of Economic Research ("NBER") defines recessions as "a period between a peak and a trough" in economic growth. "During a recession, a significant decline in economic activity spreads across the economy and can last from a few months to more than a year." NBER does not have a fixed definition of economic activity, but considers various factors including: GDP, economy-wide employment, income, sales, and industrial production.

[2] According to the Foundation's 2016 Equipment Leasing & Finance U.S. Economic Outlook, 2016 GDP is projected at 2.8%, up slightly from 2.4% in 2015.

[3] A similar approach was used in a recent Journal article. See Blake Reuter's article entitled "Equipment Finance Market Forecasting," published in the Journal of Equipment Lease Financing in 2015 (Volume 33, No. 3. Fall 2015).

[4] We tested the statistical relationships between the potential independent variables and our dependent variable, new business volume. Specifically, we included all of our potential independent variables in the initial model. To determine if each independent variable had a meaningful relationship with new business volume, we assessed its "p-value" in the regression output. Independent variables with p-values less than 0.05 were interpreted as statistically significant, indicating that these data series help reveal meaningful trends in new business volume.

[5] We included only three dummy variables in our regression model instead of four to prevent "perfect collinearity" between these data series. The fourth quarter's dummy variable is embedded in the model's intercept coefficient.

[6] Regression analysis reveals correlation — not causation — between independent and dependent variables, so regression results must be interpreted with some caution. In addition to being closely correlated with the dependent variable, an independent variable should also make logical sense in order to be included in a forecast model.

[7] Business executives may want to update, or "re-baseline" the regression model once a year, to account for changes in the relationships between the dependent variable and its independent indicators.

[8] For the full growth attribution analysis, refer to pages 25–27 of the 2015 SEFI report.

[9] For a more detailed attribution analysis, refer to pages 30–31 of the 2015 SEFI report. This analysis compares each business model (i.e., Banks, Captives, and Independents) portfolio distribution to the overall industry to evaluate which sectors each business model "over-weights" or "under-weights." This analysis is then combined with new business volume growth data by sector to evaluate sector growth relative to overall industry growth.

[10] The opposite is also true; an overly diverse portfolio can limit the benefits that could be reaped from a particularly "hot" market. However, based on information collected through interviews with industry leaders, many firms would willingly sacrifice some amount of new business volume growth in exchange for reduced volatility.

[11] Similarly, the long-term trends discussed in the SEFI report may offer additional insights into future growth opportunities and risks. For example, see pages 59–63 of the 2015 SEFI report.

[12] Federal Reserve loan and lease delinquency data are also reported in the "Quarterly Data Table" at the back of the Foundation's Economic Outlooks, published quarterly. For example, refer to page 13 of the Foundation's 2016 Annual U.S. Economic Outlook.

[13] The MLFI-25 is a barometer of the trends in U.S. capital equipment investment. Five components are included in the survey: new business volume (originations), aging of receivables, charge-offs, credit approval ratios, (approved vs. submitted) and headcount for the equipment finance business. The MLFI-25 measures monthly commercial equipment lease and loan activity as reported by participating ELFA member equipment finance companies representing a cross section of the equipment finance sector, including small ticket, middle-market, large ticket, bank, captive and independent leasing and finance companies. Based on hard survey data, the responses mirror the economic activity of the broader equipment finance sector and current business conditions nationally.

[14] For more information, refer to pages 41–46 of the 2015 SEFI report.

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Industry Future Council Report – Based on the deliberations of the Foundation's Industry Future Council of leading industry lessors, analysts, and service providers on current issues, trends and future industry outlook, the IFC Report is a guidebook for providers and arrangers of equipment finance as they undertake their own strategic planning efforts.

State of the Equipment Finance Industry Report – The SEFI provides a unique look at trends in the equipment finance industry over the past year, identifies key drivers for future growth, and explores emerging opportunities and risks that could shape the industry over the next 3-5 years.

Monthly Confidence Index for the Equipment Finance Industry – Designed to collect leadership data, the MCI reports a qualitative assessment of both the prevailing business conditions and expectations for the future as reported by key executives from the $1 trillion equipment finance sector.

Journal of Equipment Lease Financing – The only scholarly periodical dedicated to equipment leasing and finance, the Journal is published quarterly and spotlights research, case studies, trends and practical information through in-depth articles. Author guidelines are available online at *www.leasefoundation.org/research/jelf/*

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