INDUSTRY UPDATE: PHARMACEUTICAL DISTRIBUTORS

Initiating Coverage of Drug Distribution Channel

We have initiated coverage of the Pharmaceutical Distribution sector. At this point in time and at current equity price levels, we believe risk-rewards strongly tilt towards Market Outperform ratings on ABC, CAH, MCK, and DPLO. **Although we strongly advise ownership of all four of these companies, our top long term picks are Cardinal Health and Diplomat Pharmacy. We should note that, shorter term, we could see noticeable upside to current Street FY17 estimates for McKesson and therefore the stock is likely primed for some near term outperformance relative to its peers.**

- **Diplomat Pharmacy (DPLO, MO, $38PT).** DPLO sits at the most attractive section of the drug distribution channel: the specialty pharmacy channel. For a company to achieve 32% y/y organic revenue growth in CY15, which compared to 41% organic growth in CY14, in our view, is remarkable. Overall, DPLO delivered exceptional results for CY15. Furthermore, based on the variables within DPLO's CY16 guidance, we believe the mgmt. team has set highly achievable financial hurdles. We would be buyers of DPLO shares at these price levels given what we believe will be a "beat and raise" year for the company
- **Cardinal Health (CAH, MO, $111PT).** Without any real aid from below-the-line variables, CAH has increased the mid-point of its initial FY16 EPS guidance by 7%, and this comes at a time of extreme volatility in some generic prices. This increase has come without any assistance from the company's $700MM share repurchase authorization. All this said, our FY16 EPS estimate is $5.22 (Street: $5.28) given our cautious view on drug distribution operating margins. Continued political pressure on generic manufacturers and the likely enhanced self-regulation by these manufacturers on the pricing of their product portfolios will probably be with us through CY16.
- **McKesson (MCK, MO, $203PT).**
  Given multiple moving parts for the company going into FY17 as well as the most recent guidance fumble, the Street has clearly dinged MCK's valuation. It would appear, however, that revised expectations for FY17 appear quite "beatable." Our optimism is driven by the belief that the company can pull additional administrative cost levers above and beyond those levers disclosed on 03/18/16. Our FY17 EPS estimate is $13.87, which is $0.07 above the implied guidance range of $13.16-13.80 (Street: $13.46).
- **AmerisourceBergen (ABC, MO, $111PT).** ABC's earnings power has become increasingly insulated by a growing portfolio of non-pharmaceutical services. For CY17, the company should generate EPS growth noticeably above S&P 500 operating earnings and therefore apply a premium valuation to ABC shares when compared to the S&P 500.

Ticker	Rating	Price($)	Target($)	Upside/ Down-side
ABC	MO	88.66	111.00	25.2%
CAH	MO	84.57	111.00	31.3%
DPLO	MO	30.62	38.00	24.1%
MCK	MO	174.00	203.00	16.7%

Healthcare Research Analysts

Greg Bolan
615-467-3521
gbolan@avondalepartnersllc.com

Steven Couche
615-312-7171
scouche@avondalepartnersllc.com

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I. Portfolio Manager Work-up

"Big Three" Distributors and Diplomat Pharmacy

- AmerisourceBergen (ABC)
- Cardinal Health (CAH)
- McKesson (MCK)
- Diplomat (DPLO)

Combined Market Capitalization: $80+ billion

Average Daily Trading Volume: $180+ million

- **Price Performance:** Equities of the Big Three distributors have noticeably underperformed the S&P 500 over the past twelve months. From a bleak outlook for brand-to-generic conversions beyond CY16 to a sharp reversal in generic pricing inflation, the distributors have quickly become a precarious place to park money. Although fundamentally DPLO should be unaffected by changes in generic prices or brand-to-generic conversion cycles, public and political scrutiny of drug pricing has become indiscriminate, be it towards a mature generic or a new biologic molecule, and therefore DPLO's equity has experienced volatile relative performance to the S&P.
- **Relative Valuation:** NTM PEs for the Big Three distributors have come under significant pressure over the past twelve months, with the group now trading at a 20% discount to the S&P 500. If you couple up a fast reversal in fortune for generic pricing and a bleak outlook for generic drug introductions with a presidential election cycle, it becomes understandable why drug distributors equities have meaningfully underperformed the broader markets. All this said, on a relative growth basis, we cannot ignore the fact that most of these companies now trade at noteworthy levels relative to the S&P. Looking at CY17, consensus estimates call for S&P 500 operating EPS to grow 7.5% y/y. For ABC and CAH, consensus estimates call for 12.4% y/y growth in CY17 EPS, yet both companies trade at over 10% discount to the S&P. As for MCK, consensus estimates for CY17 EPS call for 7.4% y/y growth (in-line with S&P) and the equity trades near a 30% discount to the S&P.

Investment Positives:

I. **A Sector Insulated from Economic Vicissitudes.** We view the Drug Distributors' revenue growth as driven more by future prescription drug sales growth than economic cycles. Prescription volumes and drug prices, in our view, are insulated from economic volatility.

II. **Shareholder-Friendly Capital Deployment.** Over the past four years, ABC, CAH, and MCK have deployed significant cash flows to augment shareholder value.

III. **Attractive Valuations vs. Broader Market.** Looking at CY17, consensus estimates call for S&P 500 operating EPS to grow 7.5% y/y. For ABC and CAH, consensus estimates call for 12.4% y/y growth in CY17 EPS, yet both companies trade at over 10% discount to the S&P. As for MCK, consensus estimates for CY17 EPS call for 7.4% y/y growth (in-line with S&P) and the equity trades near a 30% discount to the S&P.

Investment Negatives:

I. **Threats to Distributors' Place in the Distribution Chain.** Biopharmaceutical manufacturers could eliminate the "class of trade" designation for wholesale vs. retail and thus offer drugs directly to large pharmacies with self-warehousing capabilities. We believe this risk to be very low probability given the ever growing move away from self-warehousing by pharmacies to full-scale use of distributors for generic drugs.

II. **Specialty Pharmacies Replacing Specialty Distributors.** With the rising mix of oral specialty drugs (i.e., oral oncolytics) as well as health plans' greater ability to track real-time specialty drug costs and utilization through pharmacy dispensaries, we believe the traditional role of specialty distributors is becoming less obvious.

III. **Brand to Generic Conversion Cycles Look Sparse and Generic Price Reversion Returning Fast and Furious.** As we show in the following exhibits, the dollars of branded drug revenues to go generic should decline significantly beyond CY16. Now with ubiquitous public and political scrutiny of generic manufacturers regarding drug pricing, prices have reverted at a fast and furious pace and, as a result, hampered y/y distributor profit growth. We believe the Big Three must deal with this reversion until at least mid-CY2017, when prices should stabilize on a y/y comparable basis.

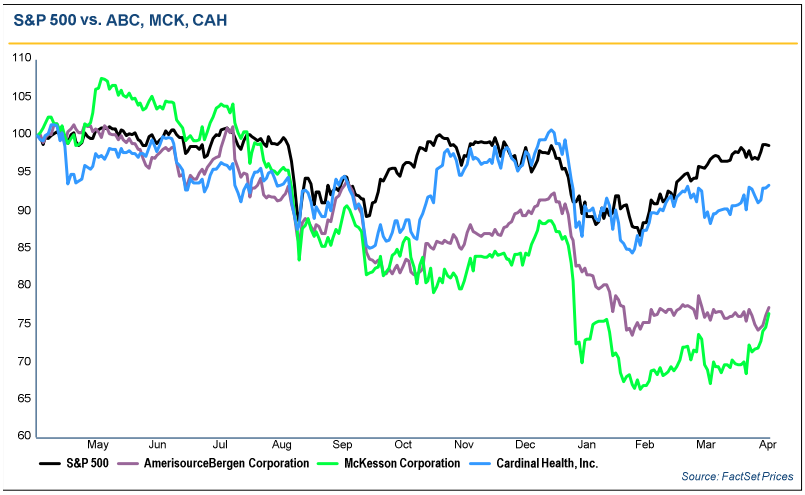
Introduction

We have initiated coverage of the Pharmaceutical Distribution sector. We are cautiously optimistic towards the core EPS growth outlook for the "Big Three" distributors into 2016. We are constructive on the core profit growth outlook for DPLO.

II. Price Performance of Drug Distributors

- **Price Performance.** Equities of the Big Three distributors have noticeably underperformed the S&P 500 over the past twelve months. From a bleak outlook for brand-to-generic conversions beyond CY16 to a sharp reversal in generic pricing inflation, the distributors have quickly become a precarious place to park money. Although fundamentally DPLO should be unaffected by changes in generic prices or brand-to-generic conversion cycles, public and political scrutiny of drug pricing has become indiscriminate, be it towards a mature generic or a new biologic molecule, and therefore DPLO's equity has experienced volatile relative performance to the S&P.

Exhibit 1: Relative Price Performance of Big Three Distributors and DPLO vs. S&P



III. Valuation Framework

Exhibit 2: Comparable Valuations for Drug Distribution Channel

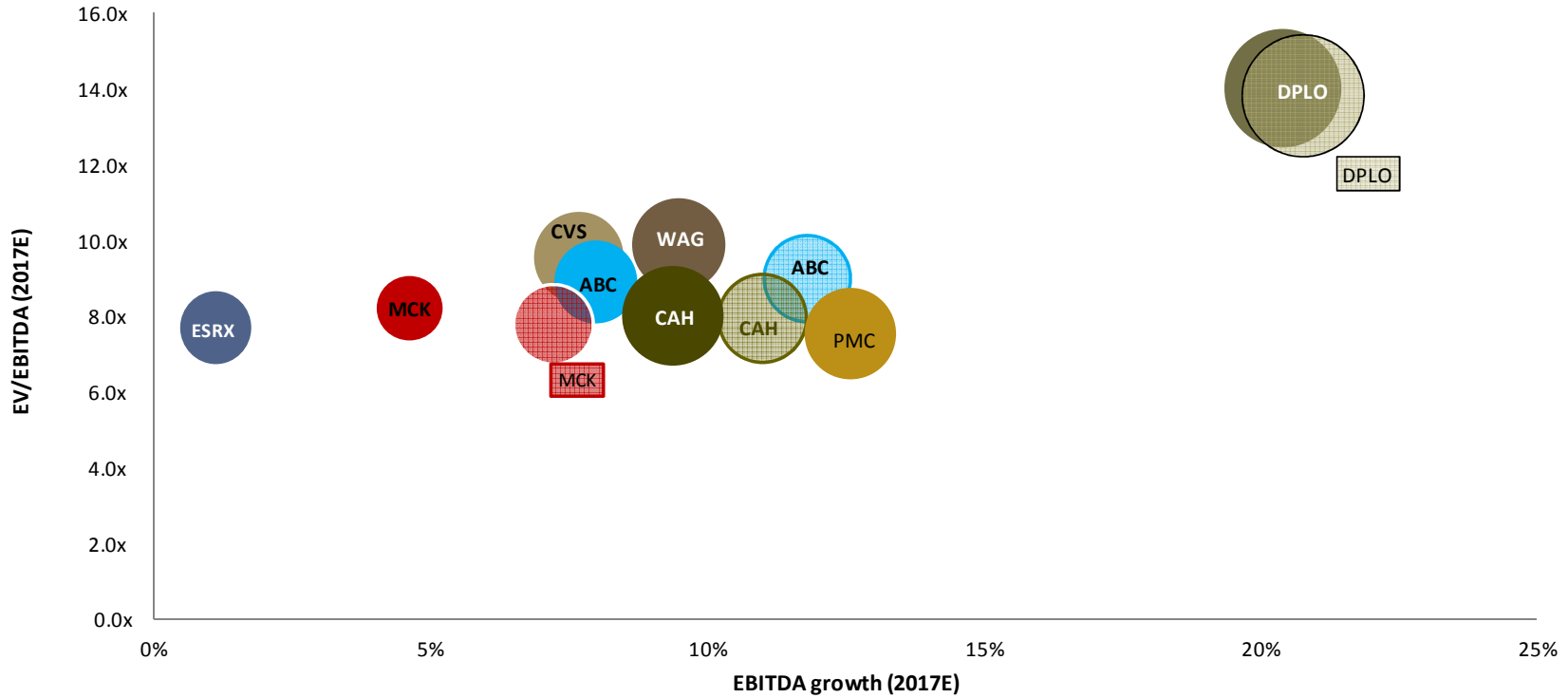
Company	Ticker	Stock Rating	Price 04/15/2016	Price Target	Market Cap (MM)	Enterprise Value (MM)	PE 2015	PE 2016E	PE 2017E	EV/EBITDA 2015	EV/EBITDA 2016E	EV/EBITDA 2017E
Pharmaceutical Distribution												
AmerisourceBergen	ABC	MO	$87.44	$111.00	$ 19,711	$ 23,235	16.9x	14.7x	13.1x	11.0x	10.0x	9.0x
Cardinal Health	CAH	MO	$84.00	$111.00	$ 27,664	$ 30,865	17.4x	14.9x	13.3x	10.4x	8.8x	7.9x
Mckesson	MCK	MO	$170.72	$203.00	$ 39,024	$ 44,336	13.9x	12.8x	12.0x	9.1x	8.6x	8.2x
Pharmacy Benefit Managers												
CVS Caremark	CVS	NR	$101.80	--	$ 111,195	$ 136,112	19.7x	17.5x	15.5x	11.6x	10.3x	9.6x
Express Scripts	ESRX	NR	$70.74	--	$ 44,764	$ 57,171	12.8x	11.5x	10.6x	8.1x	7.8x	7.7x
Chain Drugstores												
CVS Caremark	CVS	NR	$101.80	--	$ 111,195	$ 136,112	19.7x	17.5x	15.5x	11.6x	10.3x	9.6x
Rite Aid	RAD		$7.97	--	$ 8,340	$ 15,210	17.0x	32.6x	32.6x	11.0x	10.2x	9.2x
Walgreen Co.	WAG	NR	$81.55	--	$ 88,094	$ 98,500	20.0x	17.3x	15.3x	12.4x	10.8x	9.9x
Institutional Pharmacy												
Pharmerica	PMC	NR	$23.36	--	$ 713	$ 1,123	13.8x	11.6x	10.3x	8.0x	8.5x	7.5x
Specialty Pharmacy												
Diplomat Pharmacy	DPLO	MO	$29.72	$38.00	$ 1,918	$ 2,008	39.6x	33.9x	27.7x	21.1x	16.9x	14.0x

	Median	PE 2015	PE 2016E	PE 2017E	EV/EBITDA 2015	EV/EBITDA 2016E	EV/EBITDA 2017E
Drug Distributors		16.9x	14.7x	13.1x	10.4x	8.8x	8.2x
PBMs		19.7x	17.5x	15.5x	9.8x	9.0x	8.6x
Chain Drugstores		19.7x	17.5x	15.5x	11.6x	10.3x	9.6x
Inst Pharmacy		13.8x	11.6x	10.3x	8.0x	8.5x	7.5x
Spec Pharmacy		39.6x	33.9x	27.7x	21.1x	16.9x	14.0x

Source: FactSet

- **Relative Valuation of Big Three Distributors.** NTM PEs for the Big Three distributors have come under significant pressure over the past twelve months, with the group now trading at a 20% discount to the S&P 500. If you couple up a fast reversal in fortune for generic pricing and a bleak outlook for generic drug introductions with a presidential election cycle, it becomes understandable why drug distributors equities have meaningfully underperformed the broader markets. All this said, on a relative growth basis, we cannot ignore the fact that most of these companies now trade at noteworthy levels relative to the S&P. Looking at CY17, consensus estimates call for S&P 500 operating EPS to grow 7.5% y/y. For ABC and CAH, consensus estimates call for 12.4% y/y growth in CY17 EPS, yet both companies trade at over 10% discount to the S&P. As for MCK, consensus estimates for CY17 EPS call for 7.4% y/y growth (in-line with S&P) and the equity trades near a 30% discount to the S&P.

Exhibit 3: Comparable Valuations for Drug Distribution Channel *(continued)*



- Filled circles represent consensus estimates
- ○ Transparent circles represent Avondale estimates
- Size of circle represents estimated EPS growth

Source: FactSet and Avondale Partners estimates

Exhibit 4: Distributors NTM PE Relative to S&P 500

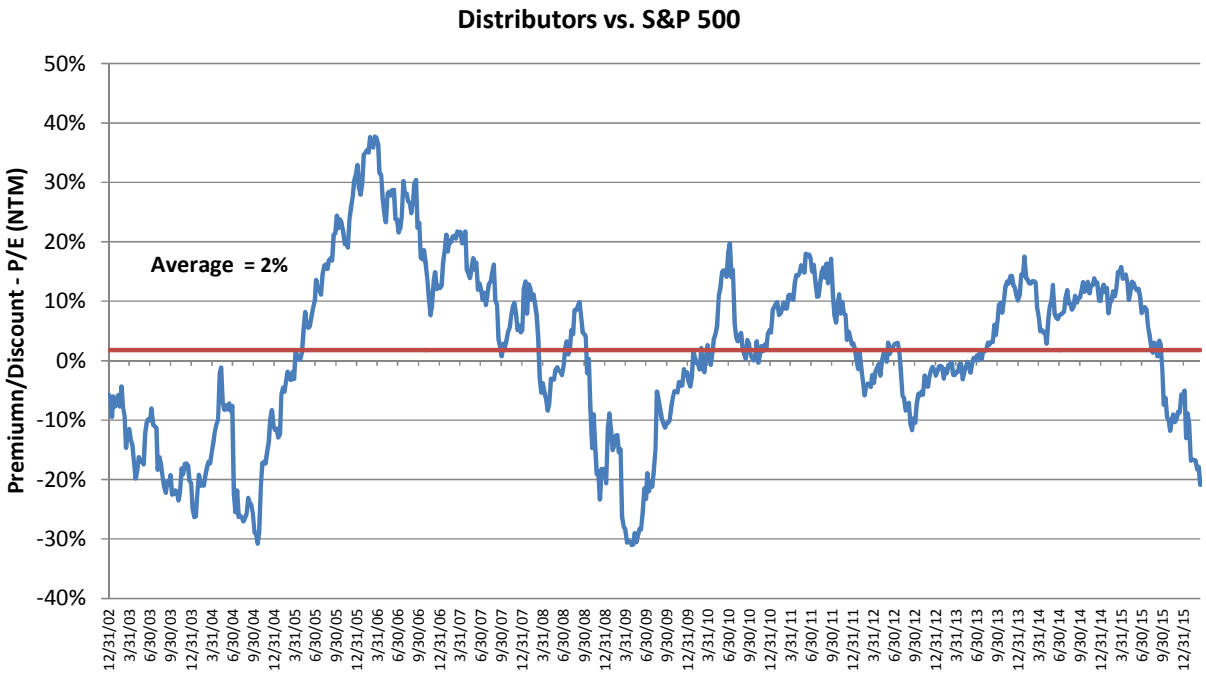
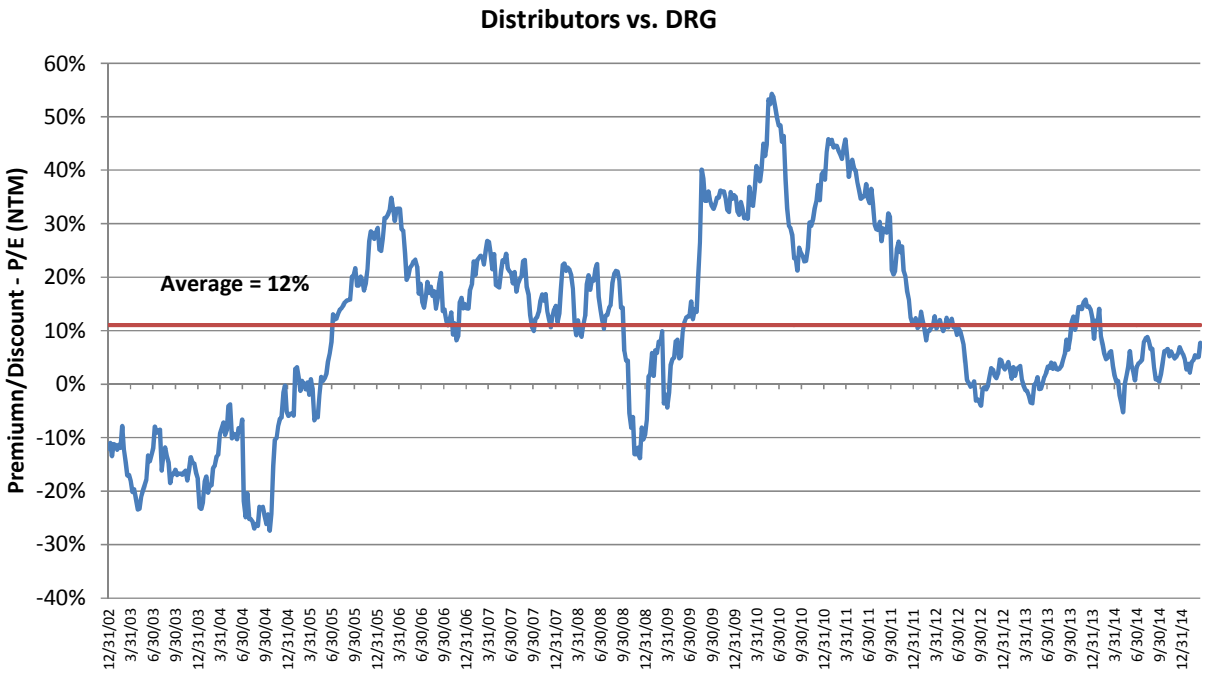
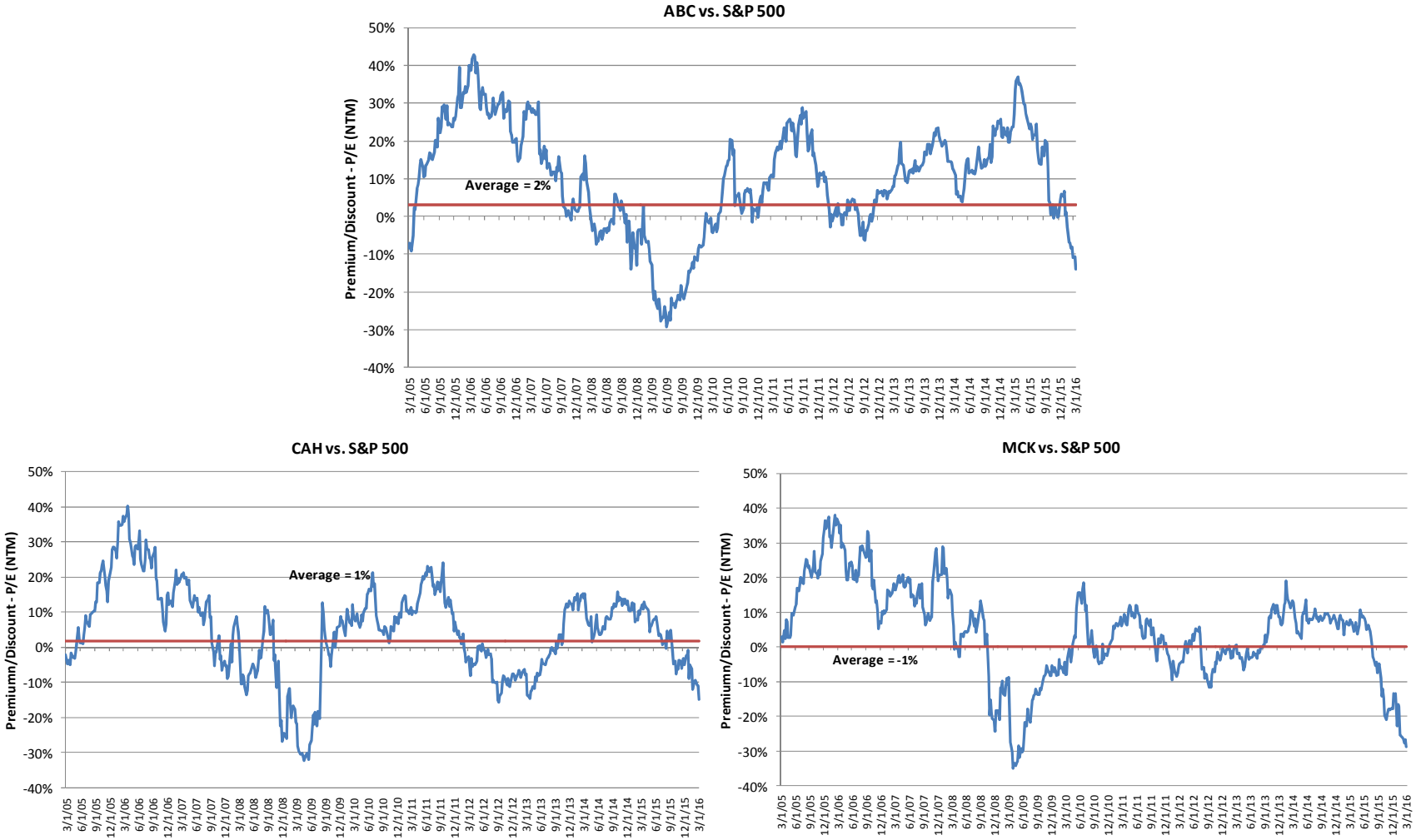


Exhibit 5: Distributors NTM PE Relative to Big Pharmaceuticals (NAR: DRG)



Sources for Exhibits 4 & 5: FactSet

Exhibit 6: Big Three by Company Relative to S&P 500 on NTM PE Basis



Source: FactSet

Investment Highlights

IV. Investment Positives

- **A Sector Insulated from Economic Vicissitudes.** We view the Drug Distributors' revenue growth as driven more by future prescription drug sales growth than economic cycles. Prescription volumes and drug prices, in our view, are insulated from economic volatility. Moreover, we several variables driving prescription spending sales growth higher over the coming years.

  As shown below, spending on prescription drugs is expected to significantly outpace U.S. GDP growth through the end of this decade and beyond. Beyond 2015, we view the primary drivers of accelerating prescription drug spending to be: 1) a decline in patent expiries on branded drugs and 2) an influx of new specialty pharmaceuticals; both of which amount to higher drug prices. As we show in Exhibit 10, generic launches are projected to slow markedly beyond 2016. Moreover, specialty pharmaceuticals are projected to grow from around 20% of current total drug spend to over 40% in 2020. With the dwindling volume of generic launches beyond CY16 coupled with a rise in specialty pharmaceuticals within the drug distribution channel, drug prices should provide a strong tailwind for drug distributor revenue growth for years to come. Specific to the Big Three distributors, we believe ABC's and MCK's dominant position within the specialty drug channel should drive superior *distribution* revenue growth for the companies relative to the industry. DPLO, in our view, should experience the largest % benefit to revenue growth given its specific focus on specialty drugs.

  As it relates to prescription drug sales, and as a corollary pharmacy sales and drug wholesaler revenues, we find virtually zero correlation with economic activity. As we illustrate below, over the past 13 years the correlation between U.S. pharmacy sales growth and U.S. retail spending growth is 0.04; the correlation between U.S. retail spending growth and U.S. drug wholesaler revenue growth is 0.13 over the same timeframe.

Exhibit 7: Projected National Expenditures on Prescription Drugs and U.S. GDP Growth

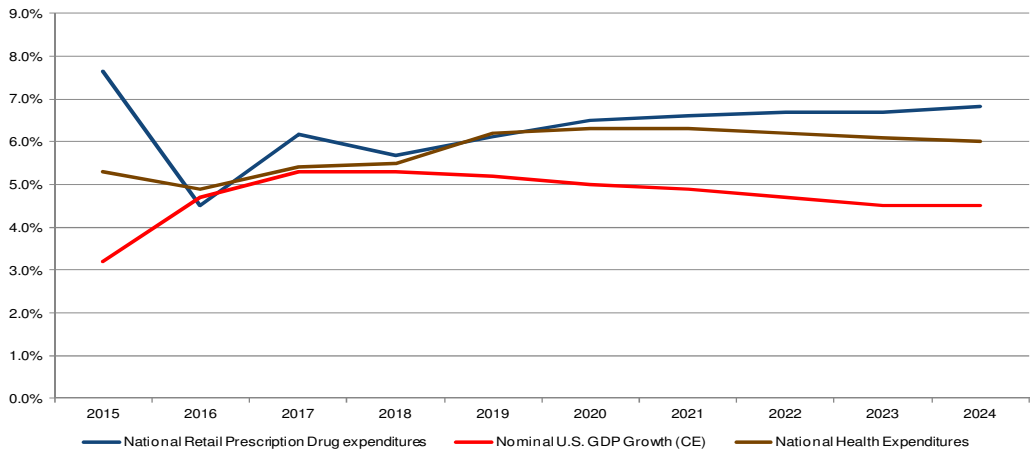
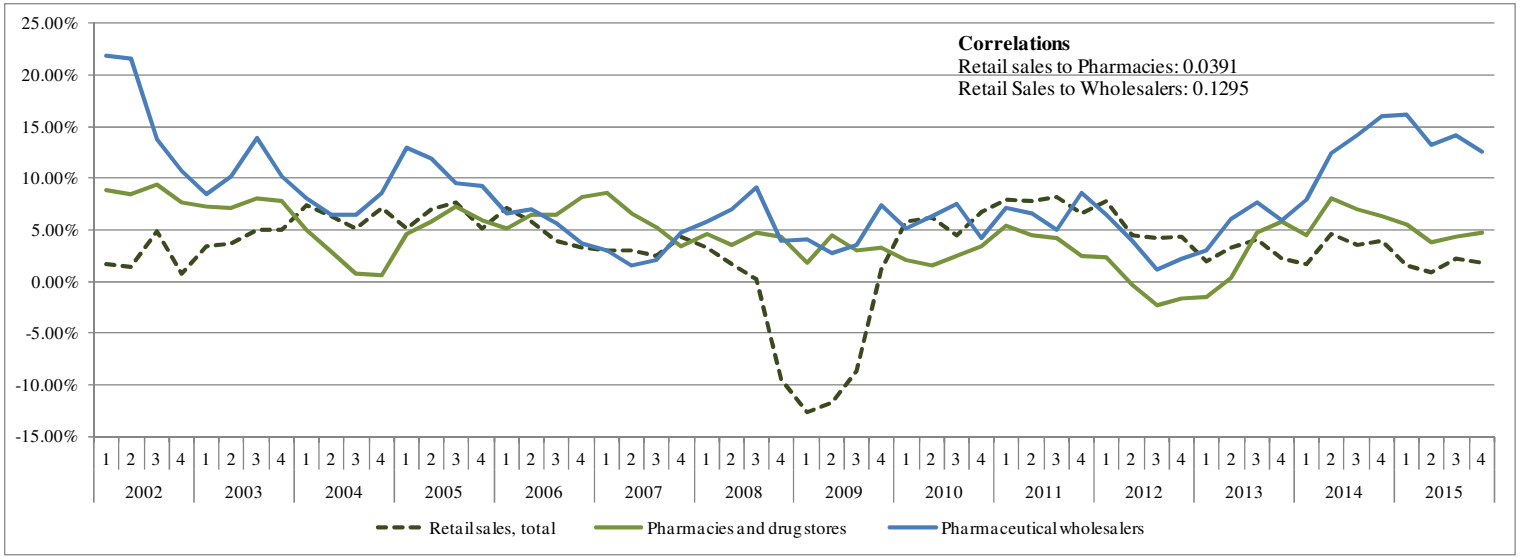


Exhibit 8: Drug Wholesaler and Pharmacy Sales - Low Correlation to the Consumer (quarterly frequency)

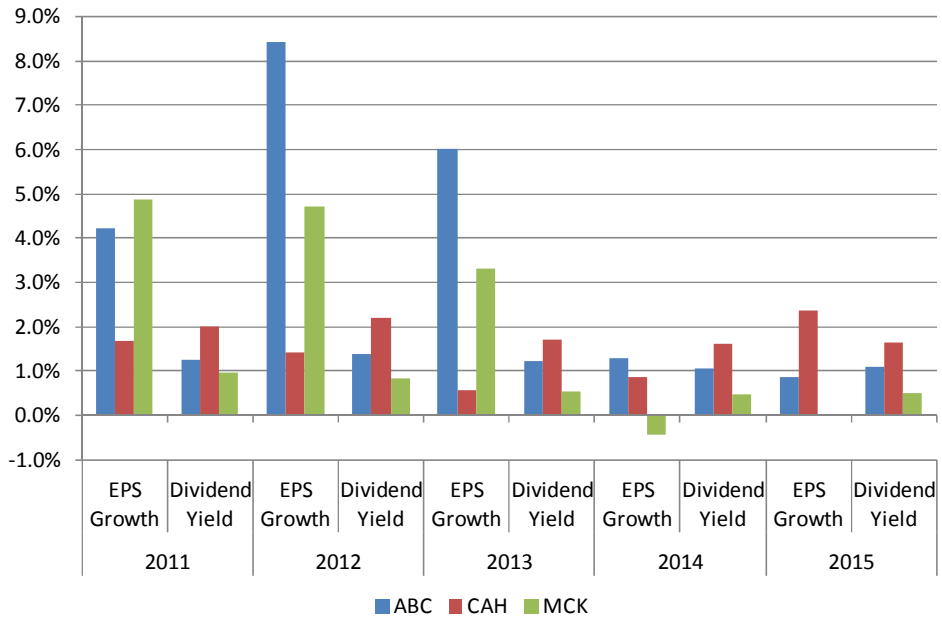


Sources for Exhibits 7 & 8: Centers for Medicare and Medicaid Services, Office of the Actuary, United States Census

- **Shareholder-Friendly Capital Deployment.** Over the past four years, ABC, CAH, and MCK have deployed significant cash flows to augment shareholder value. In the exhibit below, we track 1) y/y EPS growth due to share repurchases and 2) dividend yield.

  Based on data compiled since CY11, we find that 1) ABC had historically used buybacks as a large driver of EPS growth but this behavior has lessened in a marked way over the past several ways, 2) CAH has increasingly used share repurchases as a driver of EPS growth over the past several years, and 3) CAH has maintained a fairly consistent dividend yield despite the rise in its equity value. Relatively speaking, MCK has not used cash as a meaningful driver of EPS growth via buybacks or dividends.

Exhibit 9: Impact of Buybacks and Dividends for Big Three Distributors



Source: Company data and FactSet

- **Attractive Valuations vs. Broader Market.** As we show in Exhibit 4, shares of the Big Three distributors notably outperformed the S&P 500 in 2005 and 2008-11, which were periods in which generic launches ramped significantly. As can also be seen in Exhibit 4, NTM PEs for the Big Three have declined significantly relative to the S&P. As we show in the Investment Negatives section below, the anticipated drop-off in brand-to-generic conversion is, in our view, partially to blame for this underperformance in relative valuation. We also believe a dramatic reversion to normalcy in generic pricing has hampered upside to earnings growth and consequently a downward spiral in valuations.

  Although escalating availability of specialty drugs and higher branded drug pricing should provide a strong long-term tailwind for the Big Three distributors' sales, we believe a sustained decline in brand-to-generic conversion beyond CY16 will hamper margin expansion over years to come.

All this said, on a relative growth basis, we cannot ignore the fact that most of these companies now trade at noteworthy levels relative to the S&P. Looking at CY17, consensus estimates call for S&P 500 operating EPS to grow 7.5% y/y. For ABC and CAH, consensus estimates call for 12.4% y/y growth in CY17 EPS, yet both companies trade at over 10% discount to the S&P. As for MCK, consensus estimates for CY17 EPS call for 7.4% y/y growth (in-line with S&P) and the equity trades near a 30% discount to the S&P.

V. Investment Negatives

- **Threats to Distributors' Place in the Distribution Chain.** Biopharmaceutical manufacturers could eliminate the "class of trade" designation (discussed on p. 26) for wholesale vs. retail and thus offer drugs directly to large pharmacies with self-warehousing capabilities. Although bulk shipment or direct store delivery services offered by distributors to self-warehousing chains produce very low gross margins for the distributors, these profits do contribute nicely to distributors' cash flows, and as important, cement distributors' dominant role within the drug distribution chain. Should manufacturers offer brand drug prices at "wholesale" rates to pharmacies, thus eliminating the need for distributors by these pharmacies, we believe distributors' profitability as well as influence within the distribution channel would be jeopardized. To be clear, however, we believe this risk to be very low probability given the ever growing move away from self-warehousing by pharmacies to full-scale use of distributors for generic drugs.

- **Specialty Pharmacies Replacing Specialty Distributors.** With the rising mix of oral specialty drugs (i.e., oral oncolytics) as well as health plans' greater ability to track real-time specialty drug costs and utilization through pharmacy dispensaries, we believe the traditional role of specialty distributors is becoming less obvious. In addition, pharmacy benefit managers (PBMs) are moving to shift specialty drugs from what has traditionally been reimbursement based on an individual's medical benefit to the pharmacy benefit. Under the pharmacy benefit, patients' financial responsibility for a specialty treatment may be far lower than those covered under a medical benefit. As we discuss later in this report, the shift to specialty drug reimbursement under the pharmacy benefit should enhance the power of specialty pharmacies, largely owned by PBMs, and thereby erode the need for specialty distributors. While precarious for the Big Three, we view this trend as a tailwind for DPLO.

- **Brand to Generic Conversion Cycles Look Sparse and Generic Price Reversion Returning Fast and Furious.** As we show in the following exhibits, the dollars of branded drug revenues to go generic should decline significantly beyond CY16. We use publicly available documents to estimate 1) patent expiration dates for drugs and 2) current revenues derived from these drugs. As we illustrate, the *typical* pattern for the Big Three equity values is to outperform the S&P during heightened brand-to-generic conversion. We can see these patterns most notably in 2005 and 2008-11. From 2011-15, we would label this period as atypical in the sense that generic conversions fell off a peak level following 2012 and into 2015. Of course, from a glass half full perspective, by aggregating total branded revenues that converted to generic from 2012 to 2015 we calculate $97B. Over the previous four years (2008-11), we calculate $66B.

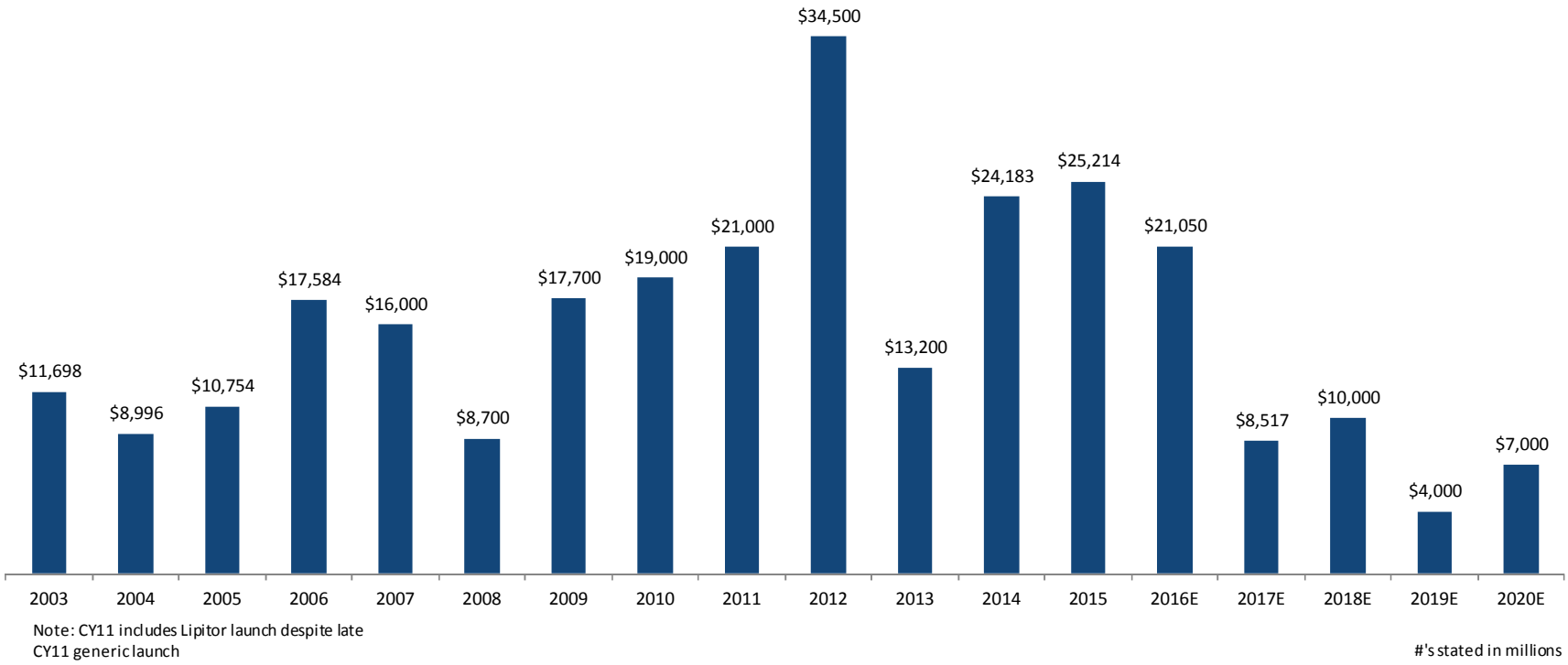
  Over the past three years, we witnessed extraordinary pricing trends for generics. For generic drugs that in some cases were decades old, prices increased for the first time in years…in certain cases, the rises in prices were well over 100%. Over this timeframe, industry observers pointed to several factors driving this extraordinary behavior in generic prices. Factors like consolidation among generic manufacturers,

shortages of raw materials necessary to make active generic pharmaceutical ingredients, to a backlog bottleneck at the FDA for approving ANDAs, were cited to have contributed to a perfect storm for generic price inflation (…or simply a lack of generic price deflation). Looking back, we do believe several of these factors mitigated to some extent traditional generic price deflation, but we believe ultimately the cause of generic price inflation was tacit collusion among manufacturers to raise prices for certain generic drugs that are deemed "life-saving." As far as whether these price increases were driven by sound fundamental reason or simply "greed," we cannot be certain. But the fact is that some generic manufacturers decided to raise pricing for baskets of generic drugs. While generic "inflation" should not exist once multiple sources of drug are on-line, as McKesson illustrates during the company's FY14 and FY15 (06/2013 – 03/2015), that is exactly what happened. In the exhibits directly following Exhibit 12, Drug Channels found that 51% of a sample of 2,376 generic drugs experienced price inflation (>0%) from July 2013 to July 2014. Based on the inherent deflationary price trends for generics, the idea that half of generic drug prices were flat to positive y/y remains completely inconceivable to us. Following myriad negative press reports and heated political debated about bad actors raising generic drug prices for no fundamental reason, self-regulation set in and generic prices are now reverting towards a traditional deflationary pattern.

Although distributors often serve as intermediaries between the manufacturers and pharmacies and therefore do not make pricing decisions, the Big Three did benefit from generic drug price inflation. The primary payment model between manufacturers and distributors revolves around fee-for-service contracts, however distributors 1) are protected by these manufacturers via truncated prices for products and 2) they are still able to benefit from price arbitrage (buy at fixed price, sell at higher prices, and retain the spread). The latter created a surge in incremental profit for the Big Three during mid-2013 through mid-2015 and managed to generate abnormal profit margins within their drug distribution businesses.

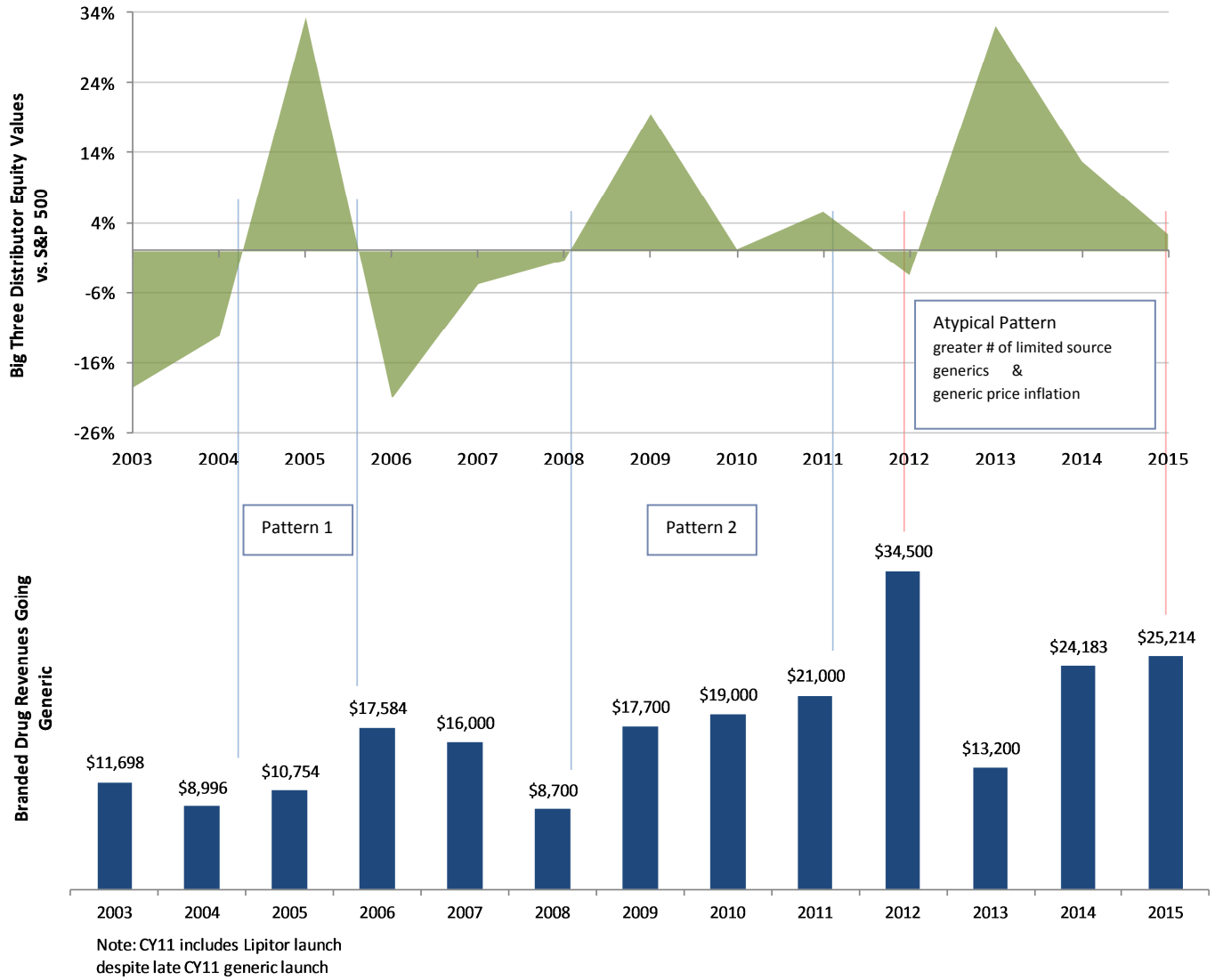
Now with ubiquitous public and political scrutiny of generic manufacturers regarding drug pricing, prices have reverted at a fast and furious pace and, as a result, hampered y/y distributor profit growth. We believe the Big Three must deal with this reversion until at least mid-CY2017, when prices should stabilize on a y/y comparable basis.

Exhibit 10: Historical and Projected Generic Launches Based on Known Branded Revenues



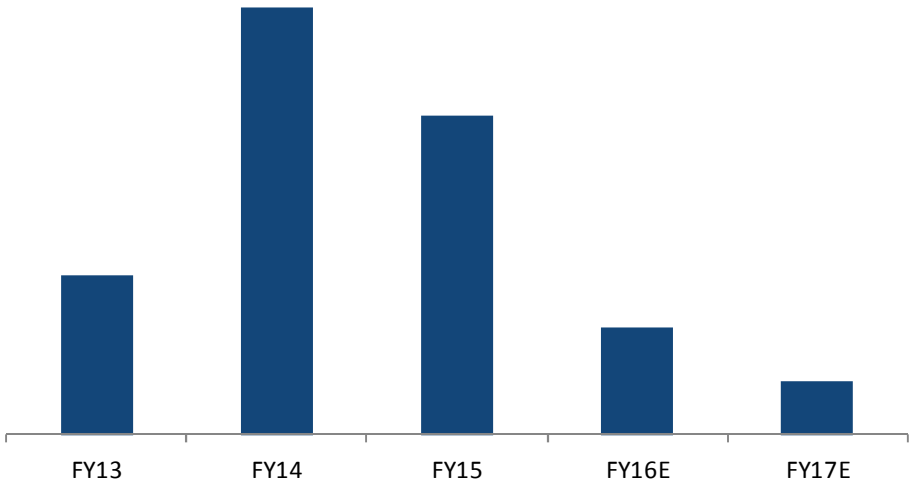
Source: McKesson 2013 Investor Day, Express Scripts Drug Trend reports, Avondale Partners estimates

Exhibit 11: Impact of Generic Waves on Big Three Distributors' Stocks



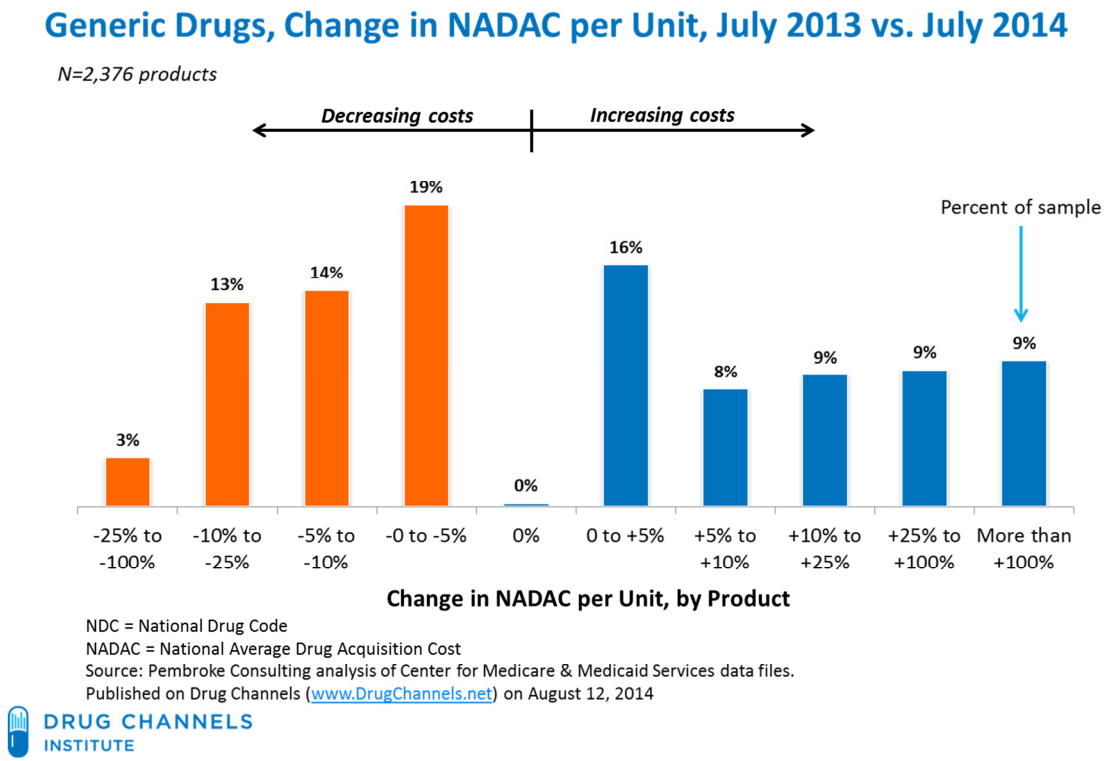
Source: FactSet, McKesson 2013 Investor Day, Express Scripts Drug Trend reports, Avondale Partners estimate

Exhibit 12: McKesson's Take on Directional Generic Price Inflation



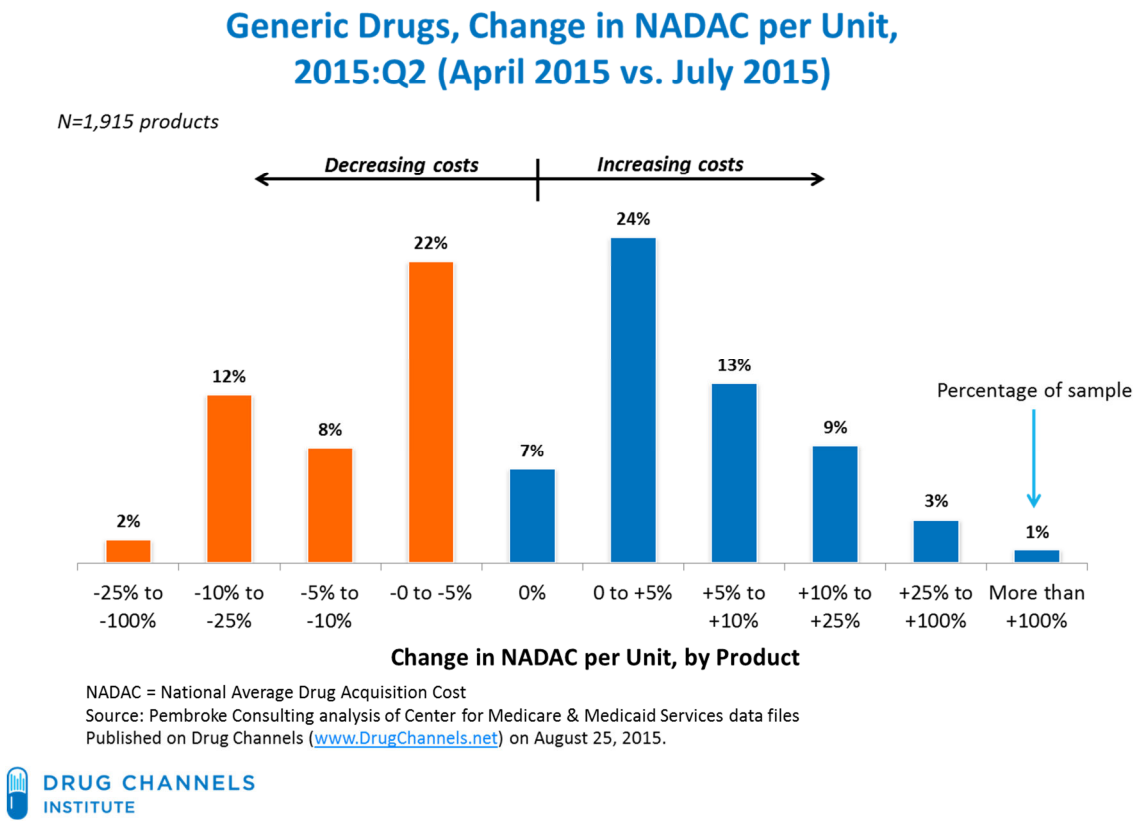
Source: McKesson 2015

Exhibit 13: Generic Price Inflation at its Height



Source: Drug Channels

Exhibit 14: Generic Pricing Reverts



Source:DrugChannels

VI. Pharmaceutical Distribution Industry Primer

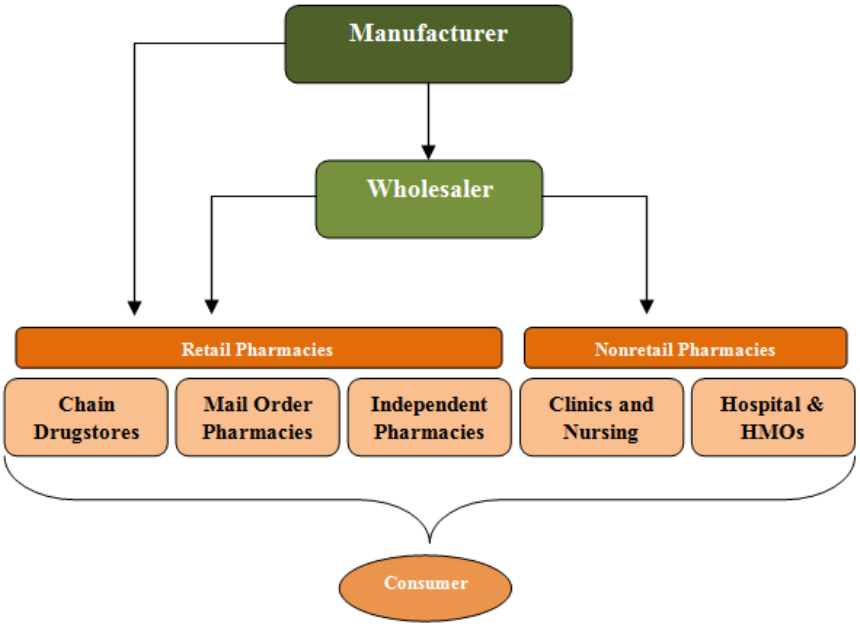
The channel through which drugs flow from manufacturers to pharmacies/providers in the U.S. is dominated by three wholesalers: AmerisourceBergen Corporation (ABC), Cardinal Health Inc. (CAH), and McKesson Corporation (MCK). Collectively, the Big Three generated over $400B in distribution revenues during CY2015, which we estimate to be 85% of total drug distribution revenues in the U.S.

Beyond the actual manufacturer, the major hubs within the drug distribution industry are full-line wholesalers and specialty distributors.

Full-Line Wholesalers

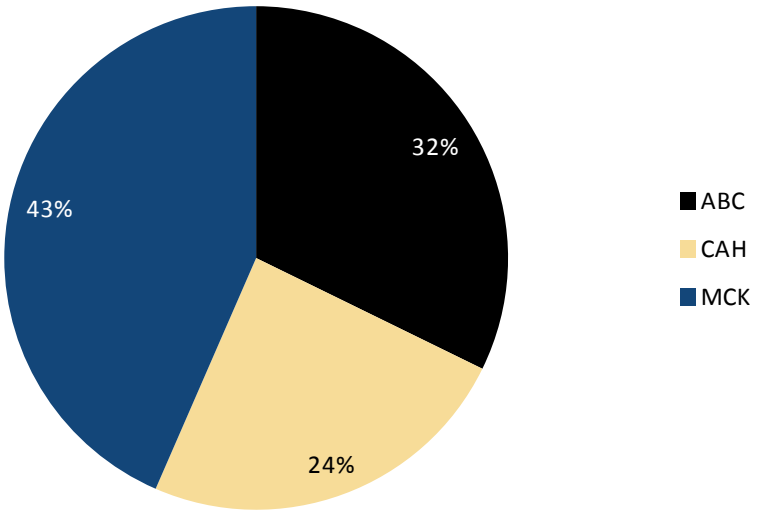
- Full-line wholesalers purchase, inventory, and sell manufacturers' products (i.e., drugs) to licensed dispensaries (i.e., pharmacies). Dispensaries can be defined as: 1) Chain Drugstores – includes chain pharmacies as well as grocery stores and mass merchants with pharmacies; 2) Hospitals and HMOs; 3) Independent Pharmacies; 4) Mail Order Pharmacies; 5) Clinics and Nursing Homes.

Exhibit 15: Distribution Channel for Full-line Wholesalers



Source: Pembroke Consulting

Exhibit 16: Drug Distribution Revenue Market Share Among Big Three Distributors



Source: Company filings

Exhibit 17: Customer Concentration for Wholesalers' Prescription Pharmaceutical Revenues

	Outlets	Dollars (MM)	Market Share
Chain and mass merchandiser with pharmacy	30,401	$108,221	35.2%
Independent pharmacy	20,835	$37,888	12.3%
Food stores with pharmacy	9,316	$21,307	6.9%
Mail service[1]	381	$52,605	17.1%
Hospitals	8,881	$31,967	10.4%
Clinics	108,439	$36,291	11.8%
Nursing homes/home health	6,102	$17,286	5.6%
Healthcare plans	1,608	$1,121	0.4%
Miscellaneous	11,086	$983	0.3%
Total	197,049	$307,670	100%

Source: HDMA Factbook, company press releases, and Avondale Partners estimates

The prescription drugs sold by distributors fall into two categories: branded and generic drugs.

Brand-name drugs: these drugs are patent protected for a finite period and the sole manufacturer (i.e., biopharmaceutical company) has the exclusive right to market and sell these drugs to licensed wholesalers and/or pharmacies.

Generic drugs: once drug patent expires, marketed and sold by *independent* manufacturers and/or *authorized* manufacturers.. These drugs are considered to yield bioequivalent efficacy within 80-125% of the brand-name counterpart. According to Express Scripts, generics represent about 84% of all dispensed prescriptions in the U.S

The route by which drugs are dispensed to patients can be classified into two channels: traditional and specialty.

Traditional channel: traditional drugs include brand-name and generic non-biologics. These drugs are typically dispensed by chain-store, independent, and/or mail-order pharmacies and are self-administered by patients. The predominant routes of *in vivo* delivery would be oral and inhalation.

Specialty channel: brand-name and generic drugs dispensed though specialty pharmacies and/or hospitals-clinics and are typically administered by a licensed healthcare provider in the inpatient as well as outpatient settings. The typical routes of *in vivo* delivery would be injection and intravenous infusion.

VII. Traditional Channel - The Role of Wholesalers and Buying Behavior by End-Markets

The traditional drug distribution channel is comprised of chain drug stores, independent pharmacies, mail order pharmacies, and food stores with pharmacies. These dispensaries represent about 70% of wholesalers' revenues, as illustrated in Exhibit 17.

The value-added services wholesalers offer to these dispensaries vary, but the common thread is wholesalers' ability to pass on lower priced drugs to these end markets. We will walk through the traditional channel and discuss how wholesalers add value through pricing, inventory management, logistics, and the like.

Retail Pharmacies

Independent Pharmacies

Nearly 15% of prescription sales in the U.S. flow through independent pharmacies. Considering that there are around 21k independent pharmacies in the U.S., the average annual revenue per pharmacy is about $2MM.

With about 92% of independent sales derived from Rx medicines, the financial viability of this end market is highly dependent on the ability to achieve adequate margins on prescription sales. Many independent pharmacies rely on *preferred* wholesalers to "pool" their purchases, thereby allowing these pharmacies to participate in discounts and/or rebates from manufacturers.

By our count, these "buying groups" represent about 14k independent pharmacies, or about 60% of total independent pharmacies in the U.S.

Exhibit 18: Pharmacy Buying Groups and Primary Wholesaler(s)

Buying Group	# of Pharmacies	Primary Wholesaler(s)
Independent Pharmacy Cooperative (IPC)	4,500+	McKesson
Independent Pharmacy Alliance	2,500	Cardinal Health-Kinray, AmerisourceBergen
American Associated Pharmacies	2,000+	Cardinal Health
EPIC Pharmacies	1,900	*not specified*
Pace Alliance	1,700	McKesson
American Pharmacy Cooperative	1,300	McKesson
Total	14,000+	

Source: Company websites, DrugStoreNews, DrugChannels

While buying groups enable independent pharmacies to use scale to leverage purchasing power, the use of Pharmacy Services Administration Organizations (PSAOs) helps these pharmacies negotiate contracts with Pharmaceutical Benefit Managers (PBMs). PBMs are third-party administrators of prescription drug plans that are responsible for processing and paying prescription drug claims, code drugs that are covered by an individual's insurance and the copayment structure, and maintain mail-order facilities to ship prescriptions to patients' homes, among other things. Around 90% of insured individuals have benefits administered through PBMs. PSAOs play a vital role for independent pharmacies, a group often lacking both the time and the necessary legal knowledge to

handle contractual negotiations with PBMs and managed care organizations. Each of the Big Three wholesalers own PSAOs: ABC – GNP Provider Network; CAH – LeaderNET; MCK – Access Health.

Individually, independent pharmacies lack the appropriate scale, bandwidth, and know-how to navigate the hurdles necessary to generate optimal profits from dispensing drugs to patients. The use of wholesalers allows these pharmacies to "plug" into an established network built specifically for the purposes of generating lower prescription drug acquisition costs and breaking down the often convoluted and time-consuming contractual negotiations with payers.

Beyond the purchasing power enabled through wholesaler networks, wholesalers offer independent pharmacies technology solutions like inventory management, medication packaging, and data analysis. In essence, wholesalers can be a one-stop shop for independent pharmacies' supply chain and in-store business needs. Because of this dependent relationship, these pharmacies represent a healthy source of profit for wholesalers.

Exhibit 19: Wholesaler Share of Independent Pharmacy Market

Company	Est Drug Sales to Independent Pharmacies (billions)		Share of Independent Pharmacy Market
Cardinal Health	$	11.2	27.9%
AmerisourceBergen	$	10.7	26.7%
McKesson	$	9.8	24.4%
Morris & Dickson	$	2.3	5.7%
HD Smith	$	2.1	5.2%
Smith Drug	$	1.4	3.5%
NC Mutual	$	0.7	1.7%
Value Drug	$	0.5	1.2%
ANDA	$	0.5	1.2%
Harvard Drug	$	0.2	0.5%
Other	$	0.7	1.7%
Total	**$**	**40.1**	100.0%

Source: Pembroke Consulting and Avondale Partners estimates

As for drug manufacturers, these companies are quite content sending bulk shipments to a handful of wholesalers for re-distribution as opposed to sending non-bulk shipments to many thousands of independent dispensaries.

Drug Chains, Mass Merchants with pharmacies, and Mail-Order Pharmacies

The economic premise for independent pharmacies to purchase drugs through wholesalers is fairly straightforward. However, when it comes to drug chains, mass merchants with pharmacies, and mail-order pharmacies, the reasoning behind the use of wholesalers appears less obvious, in our view.

Exhibit 20: Largest U.S. Pharmacies and Wholesaler Relationships

Rank	Company	Pharmacy Dispensing Route	Primary Wholesaler
1	CVS Health Corporation		
	>Retail Pharmacy1	Chain drugstore	Cardinal
	>Pharmacy Services2	Mail-order pharmacy	McKesson
	>Omnicare LT care and specialty	Institutional pharmacy	McKesson
	>Target pharmacies	Mass merchant with pharmacy	McKesson
2	Walgreens Boots Alliance	Chain drugstore	AmerisourceBergen
	>Retail Pharmacy USA	Chain drugstore	AmerisourceBergen
	>Rite Aid Corporation	Chain drugstore	McKesson (until ~03/2017)
3	Express Scripts, Inc.	Mail-order pharmacy	AmerisourceBergen
4	Walmart3	Mass merchant with pharmacy	McKesson
5	The Kroger Company	Supermarket with pharmacy	Cardinal
6	Safeway, Inc and Albertsons	Supermarket with pharmacy	McKesson
7	United Health (Optum Rx)	Mail-order pharmacy	Cardinal
8	Sears Holding Corporation[3]	Mass merchant with pharmacy	Cardinal
9	Supervalu	Supermarket with pharmacy	McKesson
	All Other Chains	various	various

1 Excludes revenues from 90-day Maintenance Choice claims filled in CVS retail pharmacies. These revenues are included in Retail Pharmacy

2 Includes Walmart and Sam's Club stores

3 Includes Sears and Kmart

Source: Drug Channels and company press releases

Historically, the largest retail pharmacies have purchased generics direct from manufacturers due to the fact that multiple sources of the drug become available over time, making the "supply side" of generics highly competitive. This purchasing behavior is changing, with the distributors garnering a larger share of generic drug purchases by retail pharmacies.

For branded drugs there is a single source, and therefore, the manufacturer gravitates to wholesalers that handle re-distribution of drugs to multiple dispensaries. This is in spite of the fact that large retail pharmacies, like Wal-Mart and Kroger, possess self-warehousing capabilities. These retailers own warehouses that are capable of receiving bulk drug shipments and distributing to individual locations. Similarly for mail-order pharmacies, PBMs manage automated facilities that fill prescriptions that are sent directly to patients' homes. These facilities are centralized and finite in number; therefore, the facilities require large shipments of drugs, which will in turn be distributed to individual patients.

The majority of wholesalers' revenues from self-warehousing chains and mail-order facilities come in the form of warehouse deliveries, which include drop shipments and dock-to-dock delivery. Drop shipments involve the direct shipment of product from the manufacturer to the customer's warehouse, yet the wholesaler handles ordering and

payment. Dock-to-dock delivery entails a wholesaler receiving bulk drug shipments which are then delivered to a customer's warehouse. These "non-stock" sales eliminate the need for wholesalers to inventory product.

So why do these retailers purchase branded drugs from wholesalers and not directly from manufacturers? Above and beyond the higher prices manufacturers would charge for additional logistical challenges and shipping costs arising from sending shipments to myriad retailers--as opposed to a handful of wholesalers--the pricing dynamics for branded drugs enable these large pharmacies to purchase branded drugs more cheaply from wholesalers than from manufacturers.

To understand the pricing dynamics for prescription drugs, we must first define payment methods along the drug distribution channel. The three primary price measures are the average manufacturer price (AMP), the wholesale acquisition cost (WAC), and the average wholesale price (AWP). Generally speaking, for branded drugs the AMP is the price paid to manufacturers, the WAC is the price paid to wholesalers, and the AWP represents the price pharmacies charge.

The AMP is the average price paid by wholesalers to the manufacturer, or by retail pharmacies that purchase directly from manufacturers (i.e. retailers with self-warehousing capabilities). The AMP reflects all price concessions and/or rebates from the manufacturers to wholesalers and to retail pharmacies, with the exception of rebates paid to PBMs and Medicaid. The WAC represents the manufacturers' "list" price for sales of branded drugs to wholesalers and retail pharmacies purchasing direct from manufacturers, which of course does not reflect rebates paid. The AWP is the published list price wholesalers charge retail and nonretail pharmacies. In reality, pharmacies will pay a discount to the AWP, and the AWP serves as the basis by which health plans will pay the pharmacy.

Biopharmaceutical manufacturers offer varying types and levels of price concessions to the published WAC for branded drugs. The level of discount to WAC varies by where the purchaser sits within different Classes of Trade (COT). As defined by DrugChannels, a COT is a group of entities that share unique service requirements, dispensing methods, patient populations, professional capabilities, or other factors. COTs include long-term care, physician, wholesaler, specialty pharmacy, or retail pharmacy. The level of discount to WAC for drugs to COTs is driven by factors like total volume of product purchased, the purchaser's ability to influence the selection of one drug from a set of therapeutically similar products, and timely payment to the manufacturer.

Interestingly, volume is not always the largest driver of discounts for a COT. According to the Congressional Budget Office, a nonretail provider, like a hospital, generally pays less for a branded drug than does a conventional retail outlet, like Wal-Mart, even though the retailer purchases more product. The reason for this is that the hospital can influence the selection of prescriptions for a large number of patients, while a Wal-Mart pharmacist must provide the drug chosen by the prescribing physician.

The wholesaler COT receives better pricing for drugs than do other COTs. Therefore, retailers with self-warehousing capabilities purchase branded drugs from wholesalers and often command a cut of the rebate wholesalers receive from manufacturers. The retailers also benefit from less logistical costs/hassle by utilizing wholesalers for direct shipment to warehouses and direct-store delivery.

VIII. Specialty Channel: Role of Wholesalers, Specialty Distributors, and Specialty Pharmacies

WHAT MAKES SPECIALTY DRUGS SO SPECIAL?

Specialty drugs are biologic drugs that are often complex in molecular structure, costly to manufacture, and require special preparation and storage. These prescription medications are purposed for patients suffering from often chronic and complex illnesses which require intensive therapies, such as cancer, multiple sclerosis, hepatitis, and rheumatoid arthritis. These therapies are typically very costly, with prices per patient exceeding $500/dose, or $6,000/ year. Additionally, specialty drugs must often be delivered to the patient by a licensed provider within a hospital, physician office, or clinic. For these reasons, specialty pharmaceuticals are often described by the 3 H's: High Complexity, High Cost, and High Touch.

The role of specialty drugs within the pharmaceutical drug industry has grown significantly in the last decade. According to the Drug Trend Report (Express Scripts), overall drug spend in the U.S. increased 13.1% in 2014, driven mostly by an increase in spending on specialty drugs. Traditional drugs increased by 6.4%, while drug spend on specialty drugs increased by 30.9%. In 2014, spending on pharmaceuticals in the U.S. reached $373.9bn, with specialty drugs now accounting for one-third of those sales. Due to multiple growth factors, specialty drug spend is projected to reach upwards of $400bn (UnitedHealth group) by 2020.

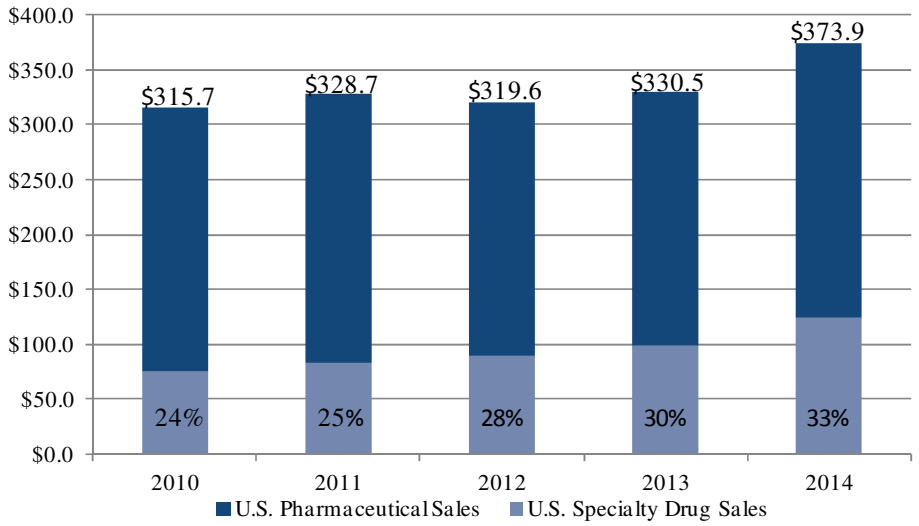
Exhibit 21: Components of Trend

		TREND		
	PMPY SPEND	UTILIZATION	UNIT COST	TOTAL
Traditional	$668.75	-0.1%	6.5%	**6.4%**
Specialty	$311.11	5.8%	25.2%	**30.9%**
TOTAL OVERALL	**$979.86**	**-0.04%**	**13.2%**	**13.1%**

January-December 2014 compared to same period in 2013

Source: Express Scripts 2014 Drug Trend Report

Exhibit 22: Pharmaceutical Drug Spend (in billions)



Source: IMS Health

Although specialty drugs only accounted for 1% of prescriptions written in 2014, they accounted for 33% of total spending on prescription drugs. The cost of these drugs is disproportionately high compared to that of traditional drugs, with an average annual cost in 2010 of $34,550 per year for just one specialty drug, compared to $2,190 for a traditional branded drug (AARP). Some of the latest drugs cost over $80,000 (ex: Solvadi) and others are over $200,000 (Cerezyme, Orkambi). In 2010, 3 of the top 10 best selling drugs by revenues were specialty drugs; this grew to 5 of the top 10 in 2013. EvaluatePharma projects that by 2020, 9 out of the top 10 best-selling drugs in the U.S. will be specialty medications.

Exhibit 23: Top 10 Drugs in the U.S., 2013A vs. 2020E

= Specialty Drug

2013A

Product	Company	Sales ($Bn)
Humira	Abbvie	5.2
Lantus	Sanofi	5
Abilify	Otsuka Holdings	4.5
Advair/ Seretide	GlaxoSmithKline	4.3
Enbrel	Amgen	4.3
Cymbalta	Eli Lilly	4
Remicade	Johnson & Johnson	3.9
Rituxan	Roche	3.6
Neulasta	Amgen	3.5
Copaxone	Teva Pharmaceuticals	3.2
Top 10 Total		**$41.5**

2020E

Product	Company	Sales ($Bn)
Humira	Abbvie	8
Revlimid	Celgene	5.6
Opdivo	Bristol-Myers Squibb	5
Tecfidera	Biogen Idec	4.8
Remicade	Johnson & Johnson	4.3
Enbrel	Amgen	4.2
Januvia/Janumet	Merck & Co	3.9
Harvoni	Gilead Sciences	3.7
Imbruvica	Pharmacyclics	3.5
Eylea	Regeneron	3.5
Top 10 Total		**$46.5**

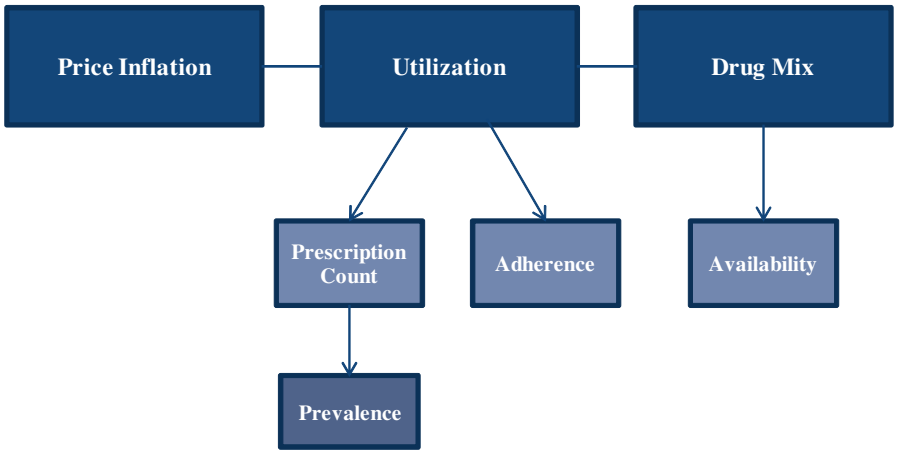
Source: EvaluatePharma

Growth Drivers of Specialty Drugs Going Forward

The pharmaceutical drug trend is driven by three main factors: cost of drugs (*price inflation*), demand for drugs (*utilization*), and type of drugs used (*drug mix*).

- **Price inflation**, or the increase in pricing for both established and newly-approved medications, is dictated by many factors, which we explore below. We view price inflation as the largest driver of specialty drug industry growth.
- **Utilization**, or the number of prescription drugs used per patient, is dictated by adherence to medication, and by prescription count.
- **Drug mix**, or the ratio of high-cost versus low-cost drugs used, is dictated by the increasing availability of specialty drugs.

Exhibit 24: Specialty Drug Spend Drivers



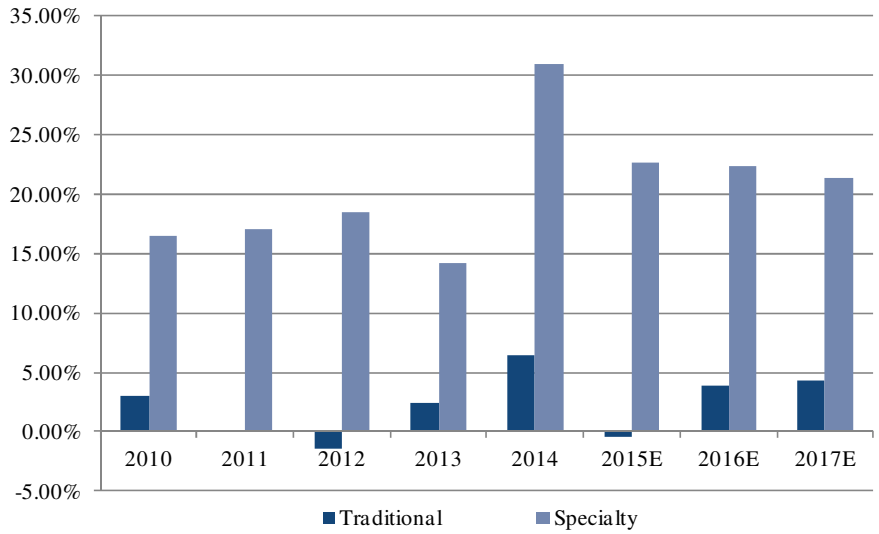
Source: Avondale Partners

1. Price Inflation

Above all else, in our view, price inflation occurs due to innovation: the greater the efficacy and/or safety profile, the more innovators can charge for their drugs.
Secondly, as is the case with any economic domination of a specific market, first-mover manufacturers with superior drug therapies can charge well above the minimum development cost.
Third, as branded drug patents near their expiration dates, many manufacturers increase branded drug prices in an effort to counteract the impending decrease in prescription volume.
Lastly, acquisitions in the pharmaceutical industry also lead to price inflation for both established and new-to-market specialty drugs. Again, the theme is economic domination,

whereby industry consolidation results in pharmaceutical manufacturers controlling a greater share of specific therapeutic areas, giving them increased pricing power.
Of course, manufacturers cite overall savings to the health system as well as positive economic impact (i.e., a less sick patient is a more productive employee), however such health economic analyses carry nebulous variables and therefore are very difficult to express in consistent mathematical terms.

Exhibit 25: Growth in Specialty Drug Cost Far Outstrips Traditional Drugs



Source: EvaluatePharma

Research by ASCO demonstrates price inflation in action: before 2000, the average cancer drug price for 1 year of therapy was less than $10,000; in 2012, 12 out of the 13 new drugs approved for cancer indications came with a price tag exceeding $100,000 per year of therapy.

We expect continued growth in specialty drug inflation over the next few years due to several factors: increasing cost of development, growth of the orphan drug market, breakthrough prices for non-orphan drugs, and lack of biosimilar competition for complex therapeutics.

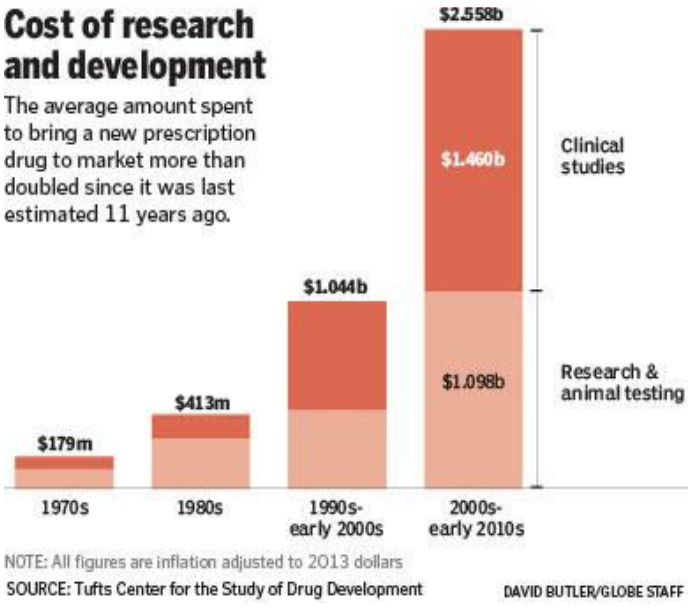
Cost of Development

In general, the cost of research and development for new molecular entities is inherently high…and rising. The latest study by Tufts Center for the Study of Drug Development suggests that it costs a pharmaceutical manufacturer $2.6bn to develop and win marketing approval for a new drug. This staggering number accounts for both the expenses associated with developing the drug, and for the time value of money.

Pharmaceutical manufacturers justify in part the prices they charge for drugs based on the research and development costs associated with developing them, as well as the cost of bringing them to market (manufacturing, distribution, etc.). We expect ever-increasing

development costs to continue driving price inflation of new molecular entities in the future. One of the primary drivers of growing development costs for specialty drugs is global patient recruitment: this is especially difficult for specialty drugs due to the limited patient base often afflicted by the disease target.

Exhibit 26: Cost of Research and Development



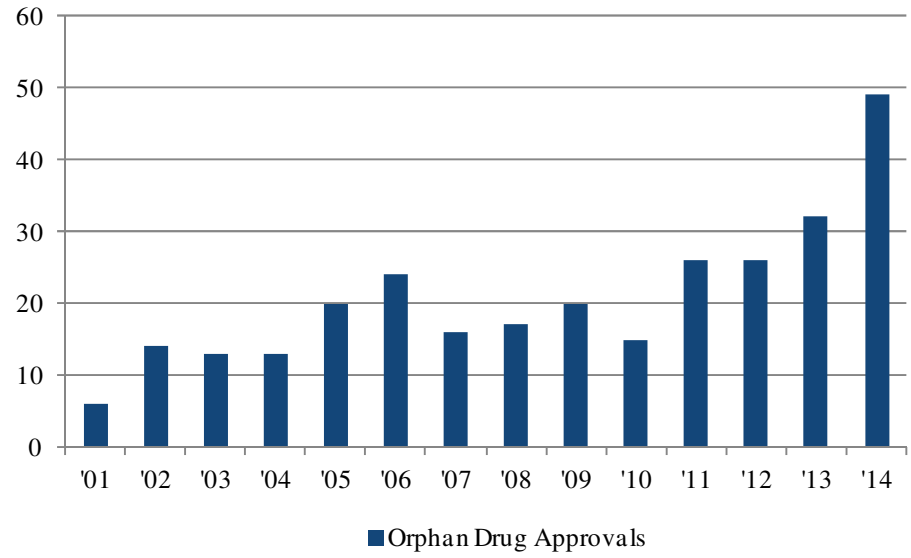
Growth of the Orphan Drug Market

Today's pipeline continues to include drugs treating common conditions, but manufacturers have been increasingly focusing R&D efforts on targeted therapies, or specialty medications that treat small patient populations with specific genetic profiles. These targeted therapies focus on rare and ultra-rare diseases, also known as orphan diseases. Orphan diseases are characterized as affecting patient populations under 200,000. Some of the diseases affect populations of less than 10,000, and at times less than 1,000 patients in the U.S.

These medications often show highly effective clinical outcomes for patients and have the potential to significantly improve the lives of those afflicted; of course, they also come with high price tags. One example is Incyte Corporation's Jafaki for the treatment of myelofibrosis, a condition affecting around 17,000 people in the US. One year's supply of the drug runs around $85-90,000 per patient, with the high cost justified by the small patient market.

While orphan drug therapies are used to treat small patient population, given the high cost of development, overall orphan development costs tend to match that of non-orphan drugs purposed for much larger patient populations.

Exhibit 27: Increase in Orphan Drug Approvals Since 2001



Source: FDA Law Blog

Breakthrough Prices for Non-Orphan Drugs

Price inflation will continue to drive growth for specialty drugs not only due to the high prices for orphan drugs--greater availability of these drugs translates to greater mix...more on this topic later--but the rising prices for non-orphan drugs as well.

The consumer price index from October 2007 to May 2014 rose 12%; during the same period, one diabetes drug quadrupled in price, and another increased by 160%, according to a Bloomberg report. While orphan diseases are classified by the FDA as diseases with patient thresholds of 200,000, some new treatments charge orphan drug-like prices, but with a much greater patient population. Gilead Sciences' Hepatitis C drug Sovaldi is one example of this, with a price tag of $84,000 for the three-month treatment and an estimated patient population of 3 million people in the United States. Breakthrough prices are further expected in another common therapy class, high blood cholesterol, with the arrival of PCSK9-inhibitors to market. This therapeutic class can lower cholesterol levels and be used in adjunct therapies. The elevated pricing for these drugs is not justified by a smaller patient market. Instead, the drug manufacturers rationalize prices due to improvement in quality of life and savings for the health care system.

Taking a look at the highly scrutinized drug Solvadi, we see rationale behind the pricing. Solvadi costs $84,000 for 12 weeks' worth of medication, with an impressive 90% cure rate by the end of treatment. Alternative treatment (earlier generation HCV drugs) could take 4x longer and cost around $144,000, all the while less effective and more toxic than Solvadi. The medication may seem expensive, but it is visibly cheaper than the costs associated with untreated Hepatitis C, such as the possible need for a liver transplant; such a cost can be upwards of half a million dollars. Due to the emergence of non-orphan therapies with "orphan-like" prices, we expect these drugs to contribute to price inflation over the coming years.

Lack of Biosimilars

Lastly, we expect specialty inflation to remain high due to a lack of biosimilars (specialty generics) in the market. According to IMS Health (Overview of the Specialty Drug Trend, 2014) the development and commercialization of biosimilars have been slow due to the fact that biosimilars often come in the form of new molecular entities. This means that the development and manufacturing costs for *complex* biosimilars, in particular, are not necessarily significantly lower than that of the branded drug. Of course, another barrier for biosimilar drugs is the lengthy patent life awarded to branded biologics. Newly-approved brand-name biologics are given a 12-year exclusivity period, which removes the economic benefits of price competition and results in increased drug prices.

In conclusion, amid the ever-increasing costs of development, high prices for specialty drugs (both orphan and non-orphan), as well as a lack of generic competition, we expect price inflation to contribute significantly to the growth in specialty drug spend in the future.

2. Utilization

Adherence to Medication

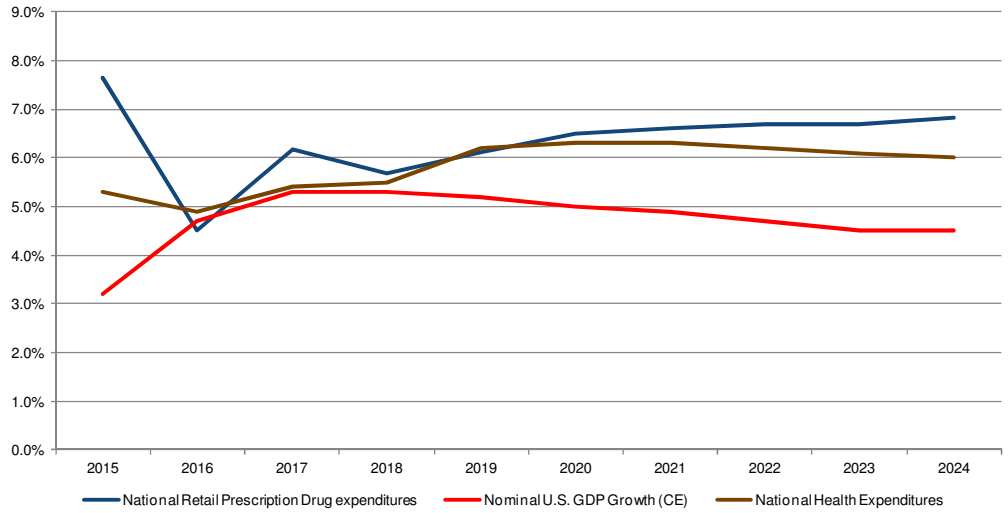
Medication adherence, or patients' compliance with taking medication exactly as directed by their provider, has become one of the main areas of focus in specialty drug spend. Since specialty drugs are defined as complex, high-touch drugs, adherence to these medications can be both expensive and inconvenient for the patient. The specialty drug industry loses billions in potential revenues each year, with non-adherence accounting for $188bn of lost revenues for the pharmaceutical industry in the U.S.

Research by CVS Health suggests that patient adherence to medication has increased with the presence of social, practical, and emotional support. For this reason, adherence programs have become an important development in the specialty pharmaceutical industry. The more specialty providers and pharmacies can ensure that patients adhere to their prescribed medications, the less revenue they stand to lose from unfilled prescriptions.

Prescription Count

Prescription count is best quantified by the percentage change in the average number of prescriptions per-member-per-month (PMPM). We believe one of the growth drivers for prescription count will be the addition of newly insured Americans to the healthcare system courtesy of the ACA.

Exhibit 28: Projected U.S. Rx Spending Growth



Source: Centers for Medicare & Medicaid and Avondale Partners estimates

As can be seen in the above exhibit, growth in prescription spending is expected to outpace that of national health expenditures and U.S. GDP through 2020.

Another growth driver for prescription count – in our view one of the most powerful drivers – is heightened prescription utilization courtesy of an aging U.S. population. As we illustrate below, a very linear relationship can be drawn between age and prescription drug use.

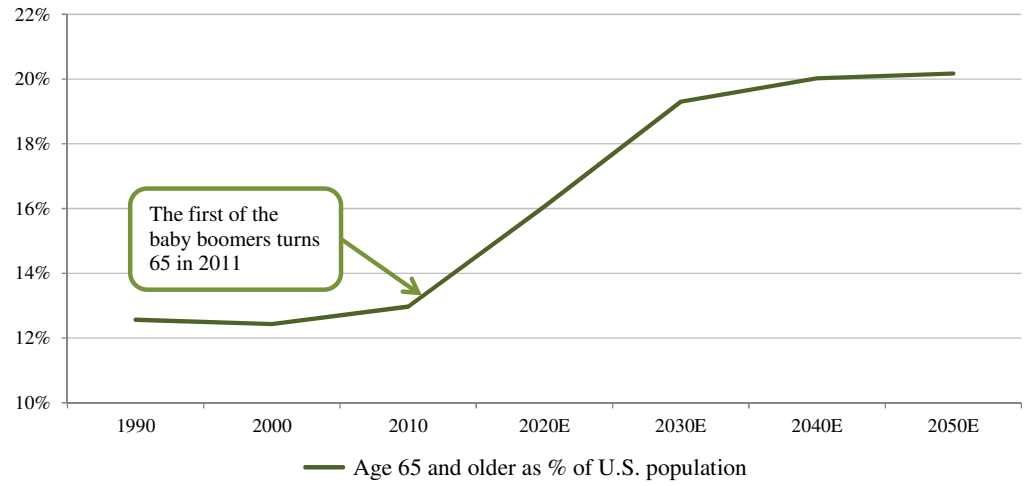
Exhibit 29: Drug Utilization by Age Demographic in U.S., 2012

Age in Yrs	2012 Population (MM's)	% w/ Rx Expense	Median Annual Expense per Person1	Share of U.S. Rx Expenditures
< 5	21.3	48%	$ 32	1%
5 to 17	53.6	43%	$ 75	6%
18 to 44	111.1	53%	$ 151	19%
45 to 64	81.5	74%	$ 533	39%
>= 65	41.2	90%	$ 1,387	35%
Total	**308.7**	**62%**	**$ 151**	**100%**

Source: Pembroke Consulting

As illustrated in Exhibit 29, 90% of individuals 65 years and older incur an annual prescription expense. Currently, the number of individuals >= 65 years old is about 13-14% of the U.S. population. By 2040, the Administration on Aging (AoA) projects that 20% of the U.S. population will be comprised of this age demographic. In absolute numbers, >= 65 year old individuals will more than double to 88MM in 2050 from around 41MM today.

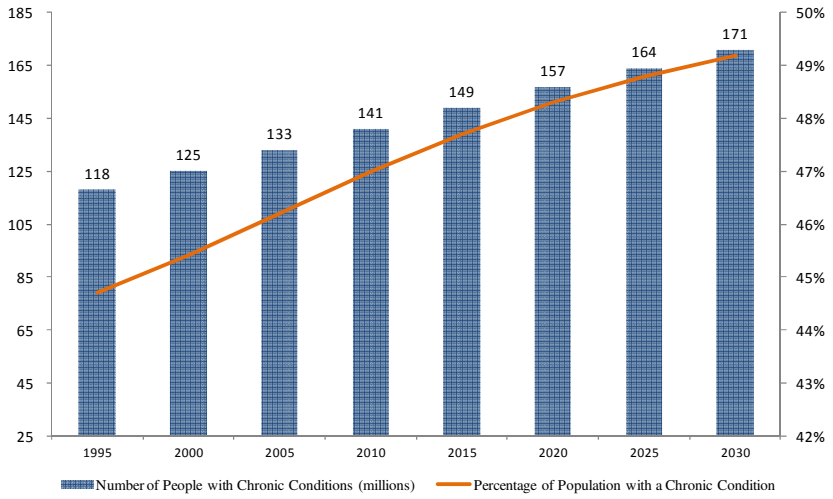
Exhibit 30: Baby Boomers on the Rise



Source: Administration on Aging

A third growth factor for prescription count is the prevalence of chronic disease. The prevalence of chronic disease has been increasing over the years and is expected to keep growing in the future.

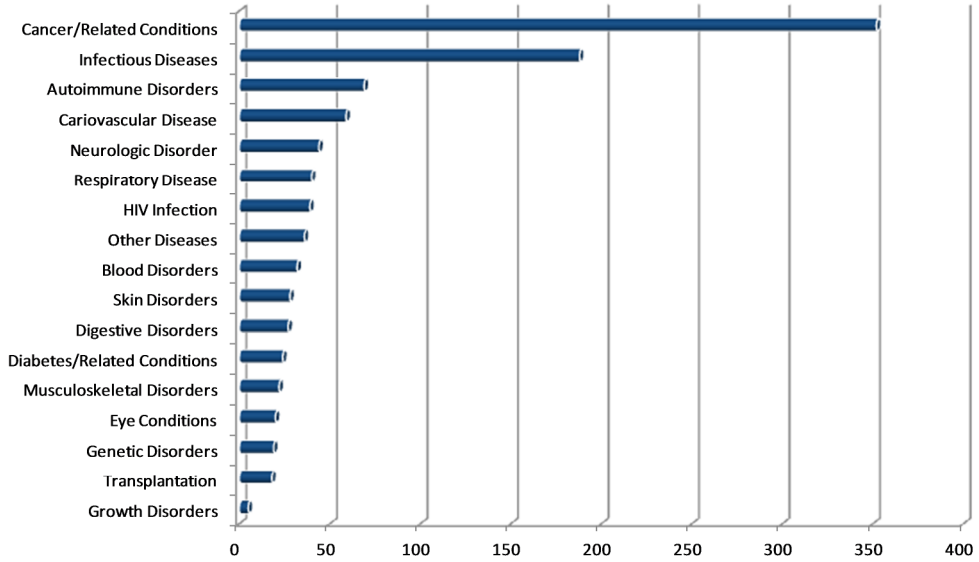
Exhibit 31: Prevalence of Chronic Conditions in the U.S.



Source: Wu, Shin-Yi, and Green, Anthony. *Projection of Chronic Illness Prevalence and Cost Inflation*

Given the increasing frequency of chronic disease, the maturation of synthetic drug development, and scientific innovation, large pharmaceutical companies are focusing greater R&D dollars on biologics. As illustrated in the exhibit below, the development of biologic compounds is resilient, with conditions like oncology and infectious diseases firmly in place as hotbeds of therapeutic activity.

Exhibit 32: The Biotech Pipelines - Therapeutics Areas of Focus



Source: PhRMA

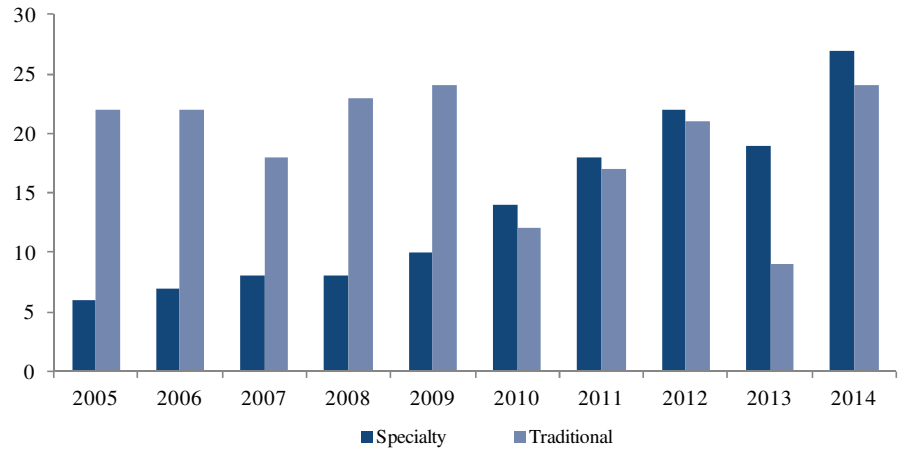
It is also important to note the correlation between chronic disease and age, with a higher prevalence of chronic disease among the older generation. The National Council on Aging estimates that about 80% of older adults have a minimum of one chronic condition, and 68% have at least two.

With an increasing prevalence of chronic disease in the U.S., we expect specialty drug utilization to rise and, in turn, accentuate growth in the specialty drug trend.

3. Drug Mix

Over the last five years, FDA approval for specialty drugs has surpassed that of traditional drugs. This increase in the availability of specialty drugs is expected to continue over the coming years, with numerous specialty drugs receiving fast-track approval from the FDA, or expedited review, due to their potential for treating serious or life-threatening diseases and satisfying unmet medical needs.

Exhibit 33: FDA Drug Approvals



Source: PWC "Behind the Numbers 2015"

According to IMS Health, specialty drugs account for 42% of the drug pipeline in late-stage development, up from 33% ten years ago. EvaluatePharma released its Top 20 most valuable R&D projects (ranked by NPV) in its World Preview 2015 Report. The report values the pipeline at $492.8bn, an 18% increase over 2014; and that's with 8 out of last year's top 20 products approved, releasing $129.2bn of value from the pipeline. Based on the recent trend of specialty drugs surpassing traditional drugs in FDA approvals, and the fact that a majority of the most valuable R&D projects are considered to be specialty, we expect drug mix to provide a forceful tailwind for specialty drug spend over the visible future.

Exhibit 34: Most Valuable R&D Projects (by NPV)

Top 20 Most Valuable R&D Projects (Ranked by Net Present Value)

Source: EvaluatePharma® 22 May 2015

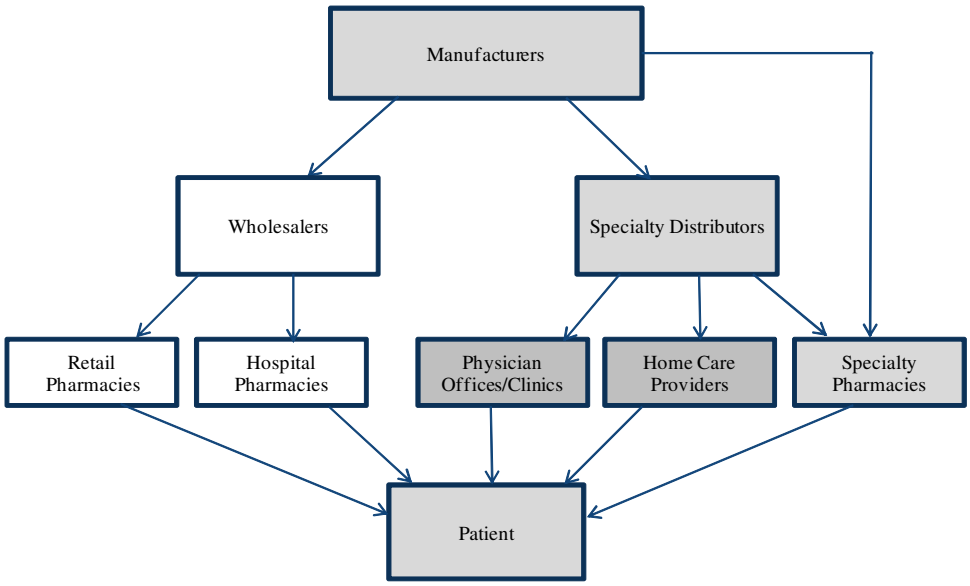
Rank	Product	Company	Phase Current	Pharmacological Class	WW Product Sales ($m) 2020		Today's NPV ($m)	
1.	GS-9857/ SOF/ GS-5816	Gilead Sciences	Phase II	Hepatitis C NS3 protease, Hepatitis C nucleoside NS5A & NS5B polymerase inhibitor	4,578	new entry	24,801	
2.	LCZ696	Novartis	Filed	Angiotensin II receptor (AT1) antagonist & neprilysin inhibitor (ARNI)	4,156		16,246	
3.	Orkambi	Vertex Pharmaceuticals	Filed	Cystic fibrosis transmembrane conductance regulator (CFTR) corrector	5,082		16,037	
4.	Tenofovir Alafenamide	Gilead Sciences	Phase III	Nucleoside reverse transcriptase inhibitor (NRTI)	3,126	new entry	10,638	
5.	MPDL3280A	Roche	Phase III	Anti-programmed death-1 ligand-1 (PD-L1) MAb	2,049		9,619	
6.	Repatha	Amgen	Filed	Anti-proprotein convertase subtilisin-like kexin type 9 (PCSK9) MAb	2,236		8,213	
7.	Obeticholic acid[2]	Intercept Pharmaceuticals	Phase III	Farnesoid X receptor (FXR) agonist	1,811		7,755	
8.	Ozanimod[2]	Receptos	Phase III	Sphingosine-1-phosphate (S1P) 1 receptor modulator	1,020	new entry	7,586	
9.	PB272[2]	Puma Biotechnology	Phase III	pan-HER inhibitor	2,956	new entry	6,742	
10.	MEDI4736	AstraZeneca	Phase III	Anti-programmed death-1 ligand-1 (PD-L1) MAb	1,201		6,545	
11.	Grazoprevir/ Elbasvir	Merck & Co	Phase III	Hepatitis C NS3/4A protease inhibitor & hepatitis C nucleoside NS5A polymerase inhibitor	3,055	new entry	5,491	
12.	Lampalizumab	Roche	Phase III	Anti-complement factor D MAb	1,099		5,391	
13.	AZD9291	AstraZeneca	Phase III	Epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor	1,196	new entry	5,376	
14.	Praluent	Sanofi	Filed	Anti-proprotein convertase subtilisin-like kexin type 9 (PCSK9) MAb	1,859		4,967	
15.	Venetoclax	AbbVie	Phase III	B-cell lymphoma 2 (Bcl-2) inhibitor	1,132	new entry	4,386	
16.	Fovista[4]	Ophthotech	Phase III	Anti-platelet derived growth factor (PDGF)-B aptamer	1,118	new entry	4,217	
17.[1]	NeoFuse[2]	Mesoblast	Phase III	Mesenchymal stem cell	-		4,056	
18.	Solanezumab	Eli Lilly	Phase III	Anti-beta-amyloid (Abeta) MAb	951	new entry	3,790	
19.	Dupilumab	Sanofi	Phase III	Anti-interleukin-4 (IL-4) & interleukin-13 (IL-13) MAb	1,141	new entry	3,790	
20.	Ixazomib Oral	Takeda	Phase III	Proteasome inhibitor	1,137	new entry	3,534	
	Top 20				40,904		159,180	
	Other				101,443		333,647	
	Total				142,347		492,827	18%
						NPV of R&D Pipeline June 2014:	418,525	

Source: EvaluatePharma World Preview 2015, Outlook to 2020

DISTRIBUTION CHANNEL FOR SPECIALTY DRUGS

The specialty distribution channel involves multiple pathways to the patient, with the channels most often traveled being specialty distributors and specialty pharmacies. The route by which patients receive specialty drugs is basically tied to the patient's insurance coverage, which is in turn driven by the type of therapy and delivery method. For office-administered drugs, like infused medications, specialty distributors typically handle transport and insurance is often covered under medical benefits. Specialty pharmacies typically handle self-administered drugs, like oral and self-injected, which are covered under a patient's pharmacy benefits. However, many wholesaler-owned and independent specialty pharmacies are now offering specialty infusion services as well. According to ESRX's 2014 Drug Trend Report, roughly 50% of all specialty drug spend is covered under medical benefits, with the remainder paid under a patient's pharmacy benefit plan.

Exhibit 35: Specialty Drug Channel

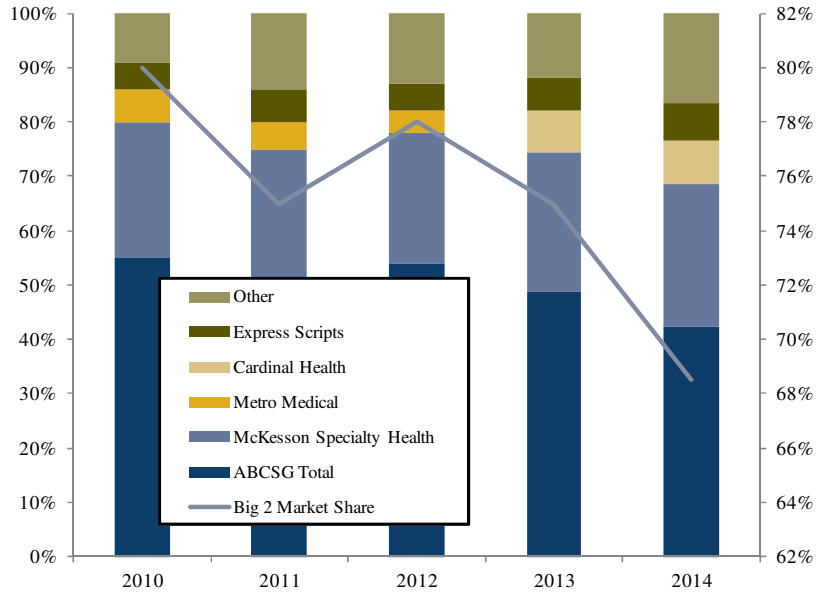


Source: Avondale Partners

Specialty Distributors

The largest specialty distributors are owned by full-line wholesalers ABC (AmerisourceBergen) and MCK (McKesson). According to Pembroke Consulting, these two companies represented about 75% of specialty distribution industry revenues in 2013 and about 69% in 2014.

Exhibit 36: Market Share for Specialty Distributors



Source: Pembroke Consulting

It is important to note that, unlike a full-line wholesaler, a specialty distributor typically forms arrangements with manufacturers to limit sales to specific customer groups. Additionally, a specialty distributor differs from a specialty pharmacy, in that it cannot dispense drugs to patients. Specialty distributors are estimated to control approximately $46bn of all U.S. specialty drugs sold in 2014, with the lion's share going to independent physician-owned clinics. Citing Center for Healthcare Supply Chain Research, from a therapeutic standpoint, roughly 33% of specialty distributors' annual sales in 2013 were derived from oncology products, while bleeding disorder and anti-inflammatory products accounted for 15.7% and 13.6%, respectively.

In recent years, the market share of the two largest specialty distributors has decreased, as illustrated above. We believe this decrease can be attributed in part to increasing competition within the specialty drug market; particularly from specialty pharmacies that also act as distributors. Payers are seeking to increase the role of specialty pharmacies in the distribution channel.

Specialty distributors benefit from the "buy-and-bill" channel, where providers (physician offices and outpatient clinics) will purchase specialty drugs from the specialty distributors, store the drugs, and dispense them to patients. Only once the drug has been administered can the provider submit a reimbursement claim to the payer. However, payers are now seeking to change the distribution of provider-administered specialty drugs, turning instead to the "white-bagging" channel and bypassing specialty distributors. White bagging is a method of delivery by which specialty medication is dispensed to the patient but shipped directly to the administering provider. The specialty pharmacy collects copayment from the patient before treatment and files for reimbursement from the payer. With the white-bagging channel, providers do not buy the drug or bill for the drug; providers are instead paid a drug administration fee.

As shown in the exhibit below, physician offices and outpatient clinics are the primary customers for specialty distributors. While specialty distributors will still generate revenues from selling to specialty pharmacies, hospitals, and home care providers, moving towards white-bagging could have a significant impact on their business.

Interestingly, and yet another example of payers circumventing the specialty distributor channel and flowing through specialty, retail, and mail pharmacies, physician offices and outpatient clinics have declined from 73% of specialty distributors revenues in 2012 to 63% in 2014.

Exhibit 37: U.S. Specialty Distributor Market Capture by Customer Group

Customer Group	Percentage of Market (Weighted Average)
Independent physician-owned/operated clinics	63%
Hospitals	20%
Hospital owned & operated clinics	10%
Specialty pharmacies	2%
Retail pharmacies	1%
Government organizations	0%
Other healthcare distributors	2%
Other	2%

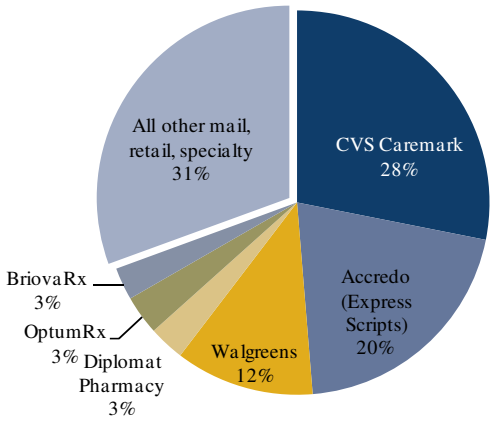
Source: 2014 Specialty Pharmaceutical Distribution: Facts, Figures and Trends, published by HDMA's Center for Healthcare Supply Chain Research.

Specialty Pharmacies

Specialty Pharmacies coordinate full service patient care for complex diseases. They specialize in storage, handling and dispensing prescription medication to patients who often require monitoring, support services, and close contact with physicians. Contrary to specialty distributors, specialty pharmacies are patient-facing, with a focus on aspects like delivery of injected and infusion specialty drugs to patients and reimbursement support.

Given the high quantity of product purchased by a limited number of specialty pharmacies, these dispensaries mostly purchase drugs directly from the manufacturer. As illustrated above, specialty pharmacies only purchase 2% of drugs from specialty distributors, while retail pharmacies purchase 1%.

Exhibit 38: Market Share for Specialty Pharmacies



Note: "Other" includes Advanced Care Scripts, Prime Therapeutics (with 2% share each), Avella, and Rightsource (with 1% each)
Note: While specialty drug distribution involves multiple channels, we are estimating for calculations that specialty distributors and pharmacies (retail, mail, and specialty) control all of the specialty drug sales

Source: Drugchannels.com

Nearly two-thirds of the specialty pharmacy market is controlled by three players: Express Scripts, CVS Caremark, and Walgreens. The specialty pharmacy subsidiaries under ESRX include Accredo Health (purchased by Medco in 2005, while ESRX bought Medco in 2012), and CuraScript Pharmacy (purchased by ESRX in 2004). CVS Caremark is a subsidiary of CVS, which was created through a merger between CVS and Caremark Rx in 2007. Specialty pharmacy subsidiaries under CVS Caremark include Coram (purchased in 2014) and Advanced Care Scripts, a subsidiary of Omnicare (purchased in 2015).

Walgreens operates the third largest specialty pharmacy after purchasing five specialty pharmacies: Cardinal Health's Specialty Scripts, Medmark Specialty Pharmacy Solutions, McKesson's specialty pharmacy, Schraft's Specialty Pharmacy, and Bioscrip Specialty Pharmacies. However, Walgreens has not made any acquisitions to expand its specialty pharmacy business since 2012's acquisition of Bioscrip Specialty Pharmacies.

In 2015, a fourth largest player emerged in the specialty pharmacy market. UnitedHealthcare, which operates the PBM OptumRx, completed its merger with the PBM Catamaran. Catamaran owns the specialty pharmacy BriovaRx and Salveo Specialty Pharmacy (acquisition completed earlier in 2015). The merger will result in OptumRx controlling 6-8% of the specialty pharmacy market, the fourth largest share.

As mentioned earlier, PBMs are attempting to convert more specialty drug treatments under the pharmacy benefit, which would shift the currently balanced mix between medical and pharmacy benefits for specialty drugs. **We reiterate our opinion that, if successful, the specialty drug channel may continue to tilt specialty spend towards pharmacies, and away from specialty distributors.**

As a reminder, "pharmacy benefits" typically cover drugs that are self-administered, either orally or by injection, while "medical benefits" cover drugs that are either injected or infused by a physician, outpatient clinic, infusion center, or home care provider

We see several factors continuing to drive the move towards pharmacy benefits:

1. Oral cancer drugs have proliferated over the last five years, with 50% of cancer drugs approved in 2014 administered orally. Oral medications are on the rise due to increased convenience for patients and specialty pharmacy support with administrative, financial, and clinical management issues for physicians and outpatient clinics.

2. Pharmacy benefits allow providers to switch to "white-bagging," rather than the "buy-and-bill" arrangement under medical benefits. Under "buy-and-bill," providers will purchase specialty drugs and administer them to patients, which thwarts a payer's ability to achieve prior authorization as well as collect data about drug utilization since the provider is billing for a drug that has already been delivered. Under a pharmacy benefit, the pharmacist can immediately adjudicate claims with a PBM and the precise dosage (i.e., prefilled syringe) can be tracked.

3. Health plans have a difficult time controlling and monitoring costs under medical versus pharmacy claims. The pharmacy benefit provides payers with greater ability to track medication use and cost, due to the specificity of the National Drug Codes (NDC) they use to make and pay claims. Compared to the claims used for medical benefit, NDC codes

provide much more precise and extensive data analysis and utilization review. While tracking the costs for medical claims is getting better, health plans continue to achieve better results with drugs covered under pharmacy benefits.

4. Patients' financial responsibility for specialty drugs appears lower under the pharmacy benefit, with the average upfront co-pay around $50 to the provider, while under the medical benefit the patient may be responsible for a percentage of the medical treatment (commonly 20%).

M&A within the Specialty Channel

Given the building pipeline of specialty therapeutic compounds and superior growth in specialty Rx pricing and utilization over traditional drugs expected through the end of this decade, we believe specialty distributors and pharmacies represent an attractive M&A opportunity.

Over the past decade, we have identified 30 specialty pharmacy and distributor transactions totaling over $40B in value. The latter number understates the actual dollar value of transactions given the lack of transaction details for certain deals. Where there are data available, we find that the median EV/EBITDA and EV/Sales for specialty pharmacy/distributor M&A transactions are 9.4x and 0.9x, respectively.

Exhibit 39: M&A for Specialty Pharmacies and Distributors

	Target	Acquirer	Deal Value (MM)	EV/EBITDA	EV/Sales
Feb-16	Biologics	McKesson		25.0x	
Aug-15	Omnicare, Inc.	CVS Health Corp.	$ 11,282.0	15.0x	1.7x
Jun-15	Burman's Apothecary LLC	Diplomat Pharmacy, Inc.	$ 83.4	4.0x	0.2x
Apr-15	BrioRx LLC	Diplomat Pharmacy, Inc.	$ 347.1		1.7x
Apr-15	Metro Medical Supply, Inc.	Cardinal Health, Inc.			
Mar-15	Catamaran Corporation	UnitedHealth Group, Inc.	$ 13,175.1	15.5x	0.6x
Jan-15	Salveo Specialty Pharmacy	Catamaran Corp.	$ 260.0		
Jan-15	Coram LLC	CVS Health Corp.	$ 2,100.0		
Jul-14	MedPro Rx, Inc.	Diplomat Pharmacy, Inc.	$ 75.8		
Aug-12	MOMS Pharmacy	AIDS Healthcare Foundation (AHF)	-	-	-
May-12	BioScript Specialty Pharmacy and Mail Order	Walgreens	$ 241.0	-	-
Apr-12	Medco Health Solutions, Inc.	Express Scripts, Inc.	$ 32,902.9	10.9x	0.5x
Jan-11	Lone Star Pharmacy	PharMerica	$ 50.0	-	-
Dec-10	US Oncology	McKesson	$ 2,200.0	8.5x	0.5x
Jul-10	Healthcare Solutions Holding	Cardinal Health	$ 667.0	-	-
Jan-10	Integrity Pharmacy Services	PharMerica	$ 41.3	10.2x	0.9x
Oct-09	Allion Healthcare	H.I.G. Capital	$ 278.0	7.0x	0.6x
Jul-08	Advanced Care Scripts	Omnicare	-	-	-
Nov-06	Access M.D.	AmerisourceBergen	$ 15.3	-	-
Mar-06	Whittier Goodrich Pharmacy	Allion Healthcare	$ 20.0	-	-
Nov-05	Pediatric Services of America/Specialty Pharmacy	Medco Health Solutions	$ 72.0	-	-
Oct-05	Priority Healthcare	Express Scripts	$ 1,229.8	-	0.7x
Aug-05	Frontier Pharmacy & Nutrition	Allion Healthcare	-	-	-
Aug-05	excelleRX	Omnicare	$ 268.8	-	-
Aug-05	RxCrossroads	Omnicare	$ 235.0	-	-
Aug-05	Accredo Health	Medco Health Solutions	$ 2,429.0	1.4x	13.5x
Jan-04	CuraScript Pharmacy	Express Scripts	$ 355.0	-	-
		Total	**$ 42,323**		
			Median	**9.4x**	**0.9x**

Source: FactSet and Company websites

IX. Revenue and Margin Dynamics of Drug Distributors

The drug distributor revenue/profit model carries two transactional sides: *buy side* and *sell side*. Distributors *buy* product from manufacturers and in turn receive service fees, prompt payment discounts, and/or rebates based on predetermined criteria; this constitutes the *buy side* of the revenue/profit model for distributors. Distributors *sell* or facilitate the sale of product to customers, which constitutes the *sell side* of the drug distribution channel.

Before we discuss the profit dynamics of buy- and sell-side transactions, we believe it important to discuss significant changes in the manufacturer-distributor relationship, which has forever altered drug distribution channel economics.

Historically, distributors would purchase more product than justified by near-term customer demand, with the primary impetus being contrived arbitrage. Distributors would purchase inventory ahead of speculated price increases and then profit from price spreads. This speculative buying clouded manufacturers' ability to track real-time patient demand for products and thus created uncertainty in manufacturers' production and inventory planning, while also causing lumpiness in certain product revenue patterns.

To more closely match drug supply with prescription demand, manufacturers and distributors created Fee-For-Service agreements (FFS) over a decade ago. These FFS agreements called for distributors to cease speculative buying in return for a recurring fee structure from manufacturers. The fees paid by manufacturers are driven by services provided by the distributors, like maintaining stable order patterns and providing more accurate forecasts of future purchases. Central to the FFS model are Inventory Management Agreements (IMA), which is an agreement between the manufacturer and distributor to control inventory levels at the distributor. A key service provided by the distributor under the FFS/IMA model is to provide transparency by sharing inventory levels.

Data transparency between distributors and manufacturers is enabled through the use of a standard data format that expresses metrics like inventory levels, quantity of product sold and product on order, and sales projections. The use of EDI 852 transaction sets is the primary method by which these data are exchanged.

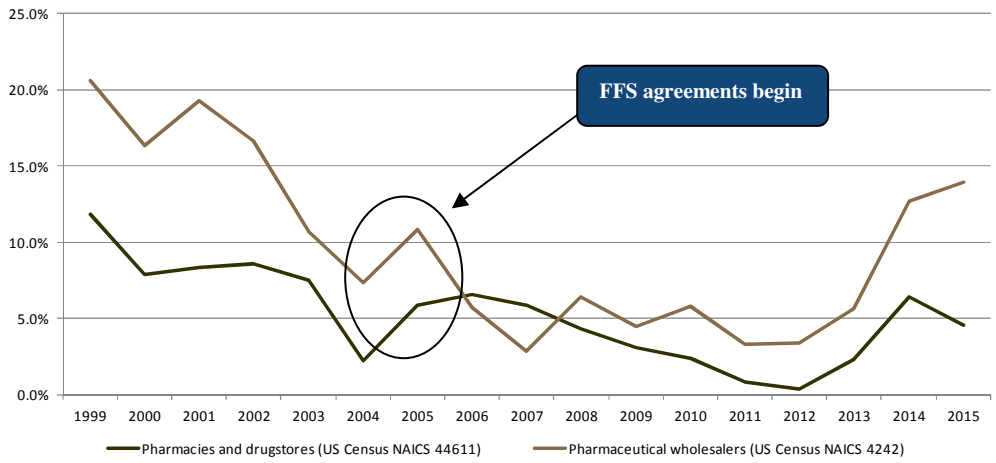
FFS agreements protect distributors from losses created by eliminating arbitraged profits from speculative buying. These agreements do allow distributors to increase inventory levels in front of price increases, but speculative buying behavior is reduced by controls on maximum inventory levels. As a case in point, distributors have achieved material benefit from purchasing generic drugs at fixed prices and selling at higher prices during the 2013-2015 timeframe.

While the aforementioned reasons certainly played a major role in instituting the FFS model, we believe a major factor sprouted from an SEC investigation of Bristol Myers for "channel stuffing," whereby BMY allegedly inflated its earnings by selling excessive amounts of pharmaceutical products to its two largest wholesalers; BMY settled with the SEC in August 2004. Nevertheless, the FFS model has had a profound impact on distribution channel economics. For example, after instituting a FFS model with wholesalers in 2003, Merck experienced a $565MM reduction in sales.

As for distributors, counter to the trend of distributor sales outpacing retail pharmacy sales during the years of speculative buying, sales growth stabilized and closely approximated underlying prescription demand by 2004 (see Exhibit 36 below).

We have started to see the distributor revenue growth once again outperform retail pharmacy sales. Our best guess for this outperformance is that the emergence of specialty drugs has created a tailwind for distributors that would not necessarily show up in *retail* pharmacy sales.

Exhibit 40: Comparison of Revenue Growth for Wholesalers and Retail Pharmacies

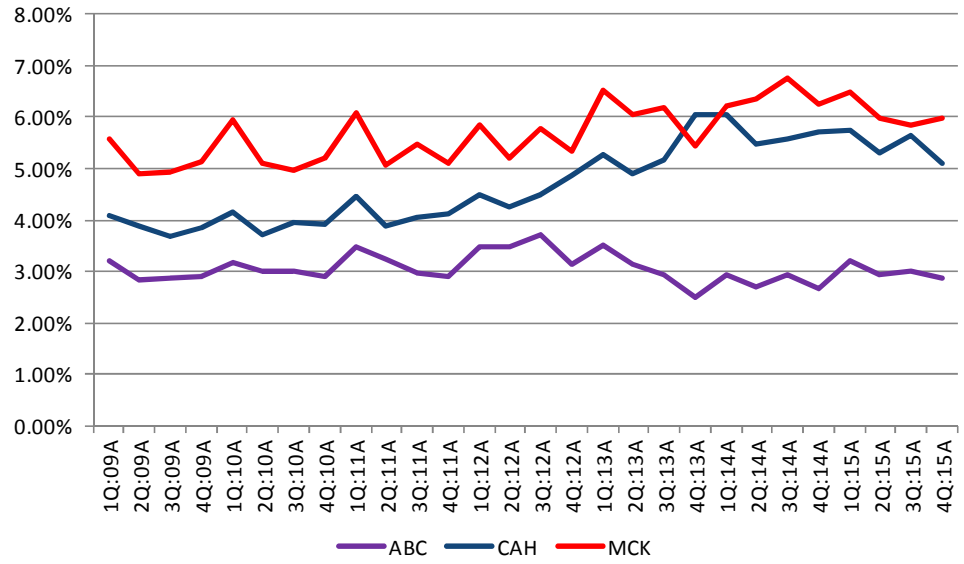


Source: U.S. Census Bureau and Avondale Partners

Total pharmaceutical wholesaler revenues as reported by the U.S. Census Bureau were over $619B in CY15, which compared to revenues for the Big Three Distributors of $415B, implying 70% share. We believe the Big Three own a far larger share of the drug distribution market relative to what is implied by the government data. Our belief is largely based on the idea that government data likely include estimates for intercompany revenues for self-warehousing chains that serve their own pharmacies.

The operating margin profile for the drug distributor industry can be characterized as anemic, but as we discuss later, the industry converts a healthy percentage of gross profit to operating profit and returns on invested capital are quite attractive.

Exhibit 41: Gross Margins for the Big Three Distributors



Source: Company reports

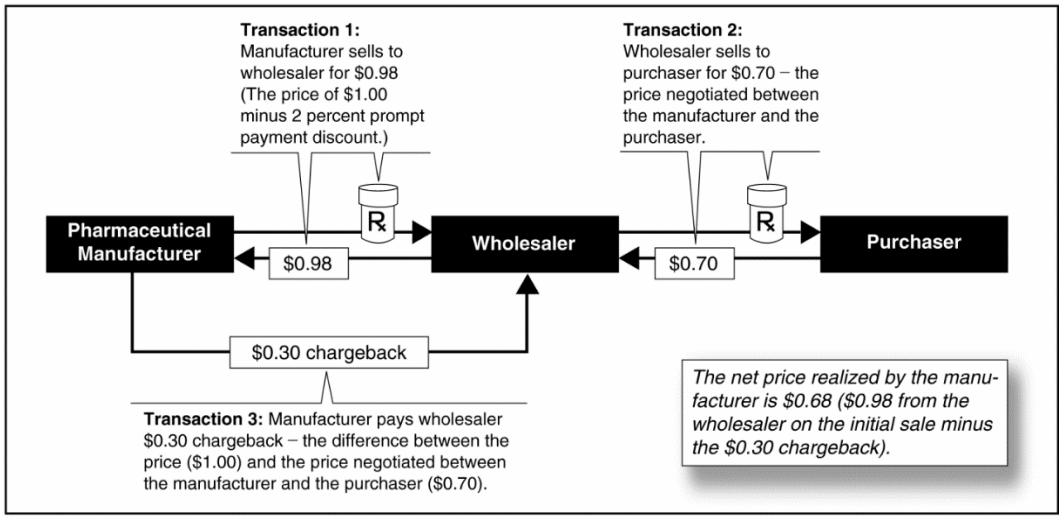
Given the competitive nature of the drug distribution industry, we believe sell-side margins are typically negative, with "non-stock" distribution sales of drugs (i.e., branded) to self-warehousing customers serving as the largest source of drag. The offsetting factors for positive consolidated gross margins are therefore buy-side margins, with the largest contributors coming from generics and traditional distribution of drugs to customers without self-warehousing capabilities.

The three primary drivers of positive distributor gross margins are 1) Fee-For-Service, 2) Prompt Payment Discounts, and 3) generic drugs.

As discussed above, FFS agreements entail fees paid by manufacturers to distributors for maintaining certain inventory levels and communicating actual sales and sales forecasts so that manufacturers can create more accurate production and inventory plans. According to Pembroke Consulting, FFS payments contribute approximately 27% to the Big Three distributors' total buy-side margins.

Prompt payment discounts are essentially monetary rewards to the distributor for payment to the manufacturer within a certain timeframe. According to HDMA, prompt payment discounts are service fees paid by manufacturers to recognize the time value of money. Moreover, these discounts compensate distributors for assuming the credit risk associated with selling a manufacturer's products. According to the U.S. Government Accountability Office (GAO), prompt discounts paid by a manufacturer are generally 2% of the purchase price to the wholesalers and others that purchase drugs directly from the manufacturer.

Exhibit 42: Schematics of Prompt Payment Discount Transactions



Source: GAO.

Citing Pembroke Consulting, prompt payment discounts account for about 36% of the Big Three distributors' buy-side margins.

The typical prompt payment terms offered by manufacturers are 30-32 days, while pharmacy customers generally pay wholesalers in about 14-16 days. So above and beyond the positive contribution to buy-side margins, prompt payment terms offered by manufacturers are long enough relative to pharmacy payments to enable a source of working capital and an associated interest income on freestanding cash for the distributors.

The remaining 36% of buy-side gross margins come from volume discounts and rebates, most of which are derived from generics manufacturers.

Unlike a branded drug with a sole manufacturer, more mature generic drugs come from multiple manufacturers, which makes competition among these suppliers far more intense than that of a sole-source drug. Wholesalers use a generic sourcing formulary program to create competition among generic manufacturers to ensure the lowest acquisition costs.

Distributors can earn higher margins on first-to-market generics than more mature generic drugs. The reasons have to do with payer reimbursement rate adjustments and the number of manufacturers from which the generic is made available.

The introduction of a generic to the public is made possible through the Abbreviated New Drug Application (ANDA) process. An innovator that is first-to-file an ANDA is granted a 180-day exclusivity period, which prevents any other manufacturer from selling the generic. In this case, a wholesaler's purchase price of the generic falls faster than the price by which they sell to dispensaries; thereby bolstering gross margin spreads.

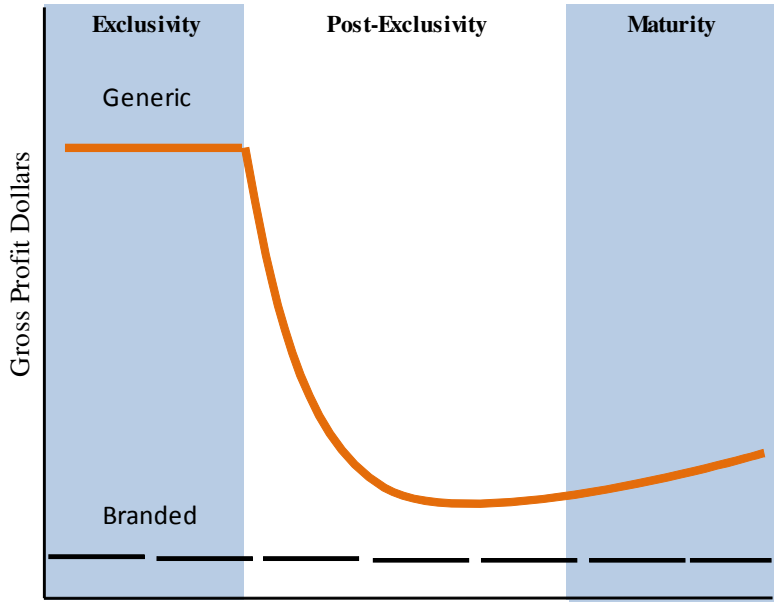
Manufacturers of the branded drug going generic may launch an *authorized generic* (AG) or grant a third party to manufacture the authorized generic to compete with the *first-filer*, which given the additional competition drives the generic price down even faster. In fact,

based on a report published by the Federal Trade Commission (FTC) in 2011, the average wholesale price (a/k/a pharmacy acquisition cost) of a typical generic drug during exclusivity is 20% less than the branded wholesale price, while the introduction of an AG drops the price to 30% less than the branded wholesale price.

Once the 180-day exclusivity period ends, multiple generics of the original branded product are introduced and by this time payers have lowered pharmacy reimbursement rates for the drug, thereby lowering what pharmacies are willing to pay. The end result is lower prices paid to wholesalers and since the cost to inventory and/or transport the generic remains the same, wholesalers' gross profit declines.

For definitional purposes, we refer to generics with one or two sources as *limited source* generics, with the window for this small number of sources typically during the 180-day exclusivity period. When >2 manufacturers exist, we refer to this as a *multi-source* generic.

Exhibit 43: Life Cycle of a Distributor's Gross Profit on a Generic and Brand Drug



Source: AmerisourceBergen Investor Day – 2012

As illustrated in Exhibit 40, the Big Three distributors' buy-side gross margins are nearly cut in half by negative sell-side margins. Due to the highly competitive nature of drug distribution, distribution services are essentially offered for free to customers.

For sole-source manufacturers, distributers offer a single channel to myriad purchasers and provide the manufacturer tight controls over pricing and inventory levels in the secondary market. For multi-source drugs, distributors can alter customer buying behavior by offering one drug over the other(s). For these reasons, both sole and multi-source manufacturers are economically incented to compensate distributors for their services.

Exhibit 40 illustrates that manufacturers pay the same fees to distributors for traditional, or direct, distribution and warehouse deliveries to dispensaries. Since the distributor is

taking legal ownership of a manufacturer's products, regardless whether to inventory and sell later or "drop ship" directly to the distributor's customer, the distributor is injecting liquidity into the drug distribution channel. We should note that sell-side margins for warehouse deliveries are lower than direct distribution given the elevated logistical challenges associated with distributing bulk product to multiple warehouses and dispensaries owned by the customer.

Exhibit 44: Estimated Buy-Side and Sell-Side Contributions to Gross Margin

Product Type:	Brand-name Drugs (traditional distribution)		Brand-name Drugs (warehouse deliveries)		Generic drugs		Total	
Percentage of Revenues:	60%		28%		12%		100%	
	bps	% of Buy-side GM	bps	% of Buy-side GM	bps	% of Buy-side GM	bps	% of Buy-side GM
Buy-side gross margin components								
Fee-For-Service*	175	44%	175	44%	0	0%	154	27%
Volume discounts, rebates, & other fees	25	6%	25	6%	1550	89%	208	37%
Prompt Payment Discount	200	50%	200	50%	200	11%	200	36%
Buy-side gross margin	400	100%	400	100%	1750	100%	562	100%
Sell-side gross margin	-240		-340		0		-239	
Total Gross Margin**	**160**		**60**		**1750**		**323**	

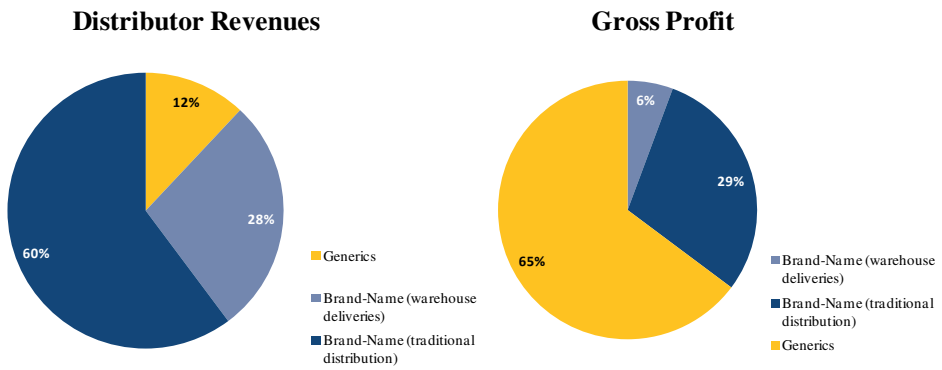
* Figure reflects weighted average of small and large manufacturers. Includes the net value of allowable inventory appreciation

** These figures represent an industry average model for the Big Three wholesalers. Any individual company's performance will be based on sales mix, client mix, and other factors

Source: Pembroke Consulting estimates

As shown in Exhibit 44, the Big Three distributors derive the majority of sales from branded drugs, although generics drive a disproportionate percentage of gross profits.

Exhibit 45: Revenue and Gross Profit Mix for Big Three Distributors

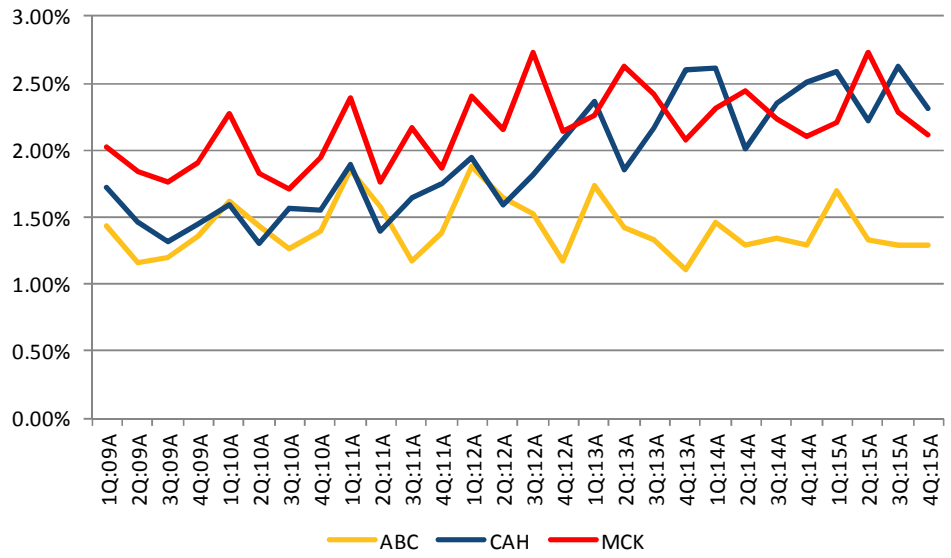


Source: Pembroke Consulting estimates

While not completely comparable due to product/services mix, operating margins for the Big Three distributors have ranged from 1% to 2.5% since 2009. At first blush, such operating margins appear anemic, but considering the fact that these three distributors

generated over $400B in distribution revenues in CY15, every 1 basis point (bps) change in operating margin equates to $40M in operating income.

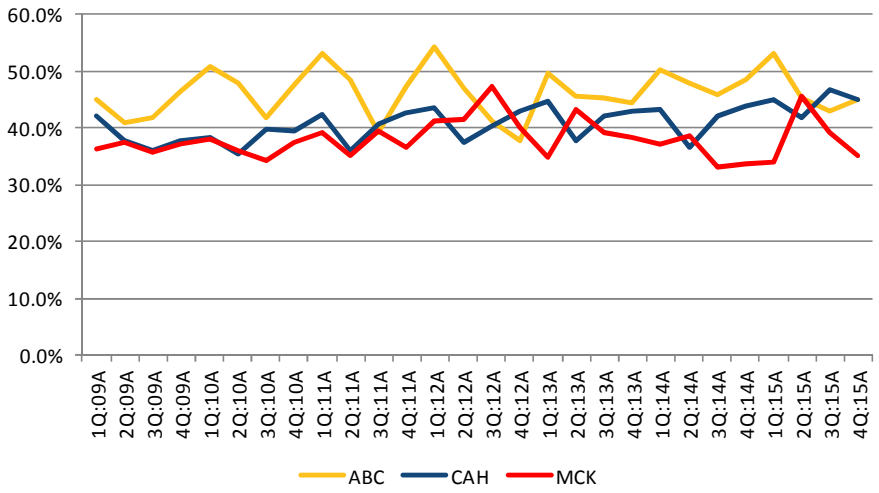
Exhibit 46: Operating Margins for Big Three Distributors



Source: Company reports

While operating margin appears anemic, the Big Three distributors have consistently converted a healthy percentage of gross profit dollars to operating profit, which speaks to tight operating expense controls employed by all three companies.

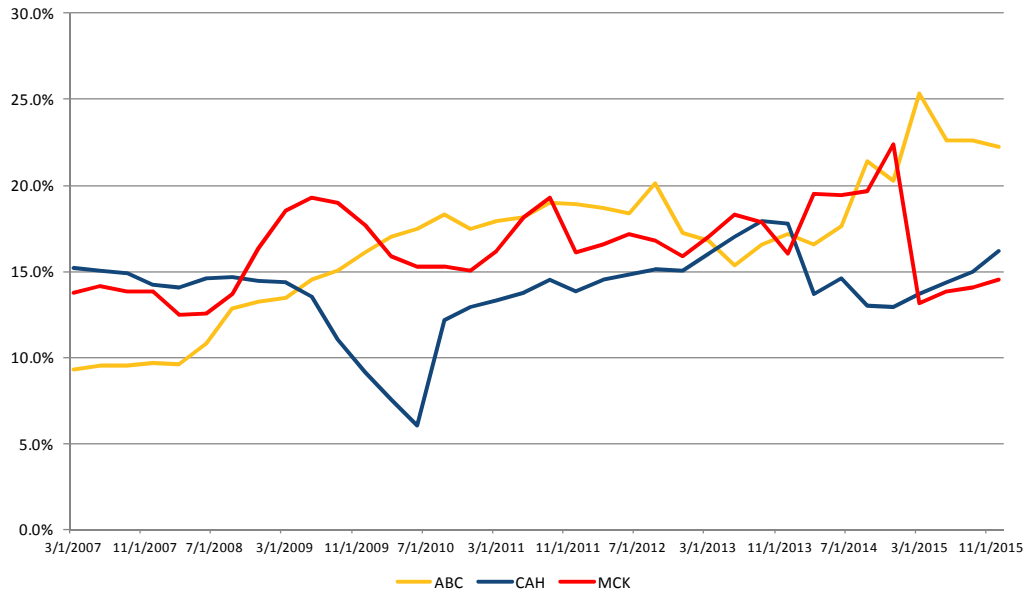
Exhibit 47: Operating Profit as a Percentage of Gross Profit



Source: Company reports

With regards to the returns earned by the Big Three distributors relative to invested capital, all three companies have shown improvement over the past eight years, with ABC clearly generating the greatest return on invested capital (ROIC). We measure ROIC as TTM after-tax EBIT divided by total debt and shareholder equity (invested capital) at the beginning of the TTM period, or [TTM EBIT – taxes]/[Invested Capital at the beginning of TTM period].

Exhibit 48: ROIC for the Big Three Distributors



Source: Company data and Avondale Partners

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MO: Expected price gains of at least 5-10% greater than the market over the next 6-18 mos.
MP: Expected price gains similar to the market over the next 6-18 mos.
MU: Expected price gains of at least 5% less than the market over the next 6-18 mos.

			Investment Banking Serv./Past 12 Mos.	
Rating	**Count**	**Percent**	**Count**	**Percent**
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HOLD [MP]	69	42.33	1	1.45
SELL [MU]	6	3.68	0	0.00

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