IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

MELISSA FERRICK, et al., Plaintiff, vs. SPOTIFY USA INC., et al., Defendants.	No. 1:16-cv-08412 (AJN)

CORRECTED

EXHIBIT B-1 TO THE DECLARATION OF JOAO DOS SANTOS IN SUPPORT OF PLAINTIFFS' MOTION FOR FINAL APPROVAL

VOLUME 3 of 7

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Spotify Hit With $150 Million Class Action Over Unpaid Royalties

12/29/2015 by Ed Christman

Vote for the AMAs Somos Una Voz Hot 100 Billboard 200 Pop R&B/Hip-Hop Chart Beat Artists

Vocal artist rights advocate David Lowery brings a massive action against the largest streaming service.

Camper Van Beethoven and Cracker frontman **David Lowery**, retaining the law firm of Michelman & Robinson, LLP, has filed a class action lawsuit seeking at least $150 million in damages against Spotify, alleging it knowingly, willingly, and unlawfully reproduces and distributes copyrighted compositions without obtaining mechanical licenses.

The lawsuit comes amidst ongoing settlement negotiations between Spotify and the National Music Publishers Assn. over the alleged use of allowing users to play music that hasn't been properly licensed, and also without making mechanical royalty payments to music publishers and songwriters. According to sources, Spotify has created a $17 million to $25 million reserve fund to pay royalties for pending and unmatched song use.

The Root Cause of Victory Records' Missing Spotify Royalties Has Been Festering for a Long Time

The lawsuit was filed on Dec. 28 in the Central District Court of California.

According to the complaint, Spotify has unlawfully distributed copyrighted music compositions to more than 75 million users, but failed to identify or locate the owners of those compositions for payment, and did not issue a notice of intent to employ a compulsory license.

"We are committed to paying songwriters and publishers every penny," says Spotify global head of communications and public policy Jonathan Prince in a statement. "Unfortunately, especially in the United States, the data necessary to confirm the appropriate rightsholders is often missing, wrong, or incomplete. When rightsholders are not immediately clear, we set aside the royalties we owe until we are able to confirm their identities. We are working closely with the National Music Publishers Association to find the best way to correctly pay the royalties we have set aside and we are investing in the resources and technical expertise to build a comprehensive publishing administration system to solve this problem for good."

The complaint states that Spotify has "publicly" admitted its failure to obtain licenses and created a reserve fund of millions of dollars for royalty payments which have been "wrongfully withheld from artists." The use of songs not lawfully licensed "creates substantial harm and injury to the copyright holders, and diminishes the integrity of the works," the complaint states.

Spotify Announces Database to Properly Manage Royalties

The songs alleged to have been illegally reproduced and/or distributed by Spotify include "Almond Grove" (copyright registration No. PAu003764032); "Get On Down the Road" (No. PAu003745342); "King of Bakersfield" (No. PAu003745341); and "Tonight I Cross the Border" (No. PAu003745338), according to the complaint.

The complaint further notes that statutory penalties allow for judgments between $750-30,000 for each infringed work, and up to $150,000 per song for willful infringement.

The complaint claims the lawsuit qualifies as a class action because there is a well-defined community of interest in the litigation and that members of the proposed class, which will exceed 100 members, can be easily identified via discovery from Spotify's database files and records. A class action is more efficient than letting the courts be burdened with individual litigation, if every member of the class could afford to pursue action (which is highly unlikely). Class actions conserve the resources of the parties and the court system and protects the rights of each member of the class.

Indie Publisher Atlas Music Signs Direct Licensing Deal With Spotify

In addition to entering an order appointing Lowery as the class representative and the plaintiff's counsel as class counsel, the complaint asks the court to enjoin Spotify from continued copyright infringement; from further violations of California Business & Professions Code § 17200; injunctive relief that requires Spotify to pay for the services of a third party auditor to identify the works reproduced and distributed by Spotify without first obtaining a mechanical license; and requires Spotify to remove all such works from its services until it obtains the proper licenses.

Lowery, who also teaches at the University of Georgia, and the class seek restitution on Spotify's unlawful proceeds, including defendants' gross profits; for compensatory damages in an amount to be ascertained at trial; statutory damages for all penalties authorized by the Copyright Act; reasonable attorneys' fees and cost; and pre- and post judgment interest on monetary awards.

***Updated, 2:23PM ET, Dec. 29:** A statement from Spotify was added to this article.*

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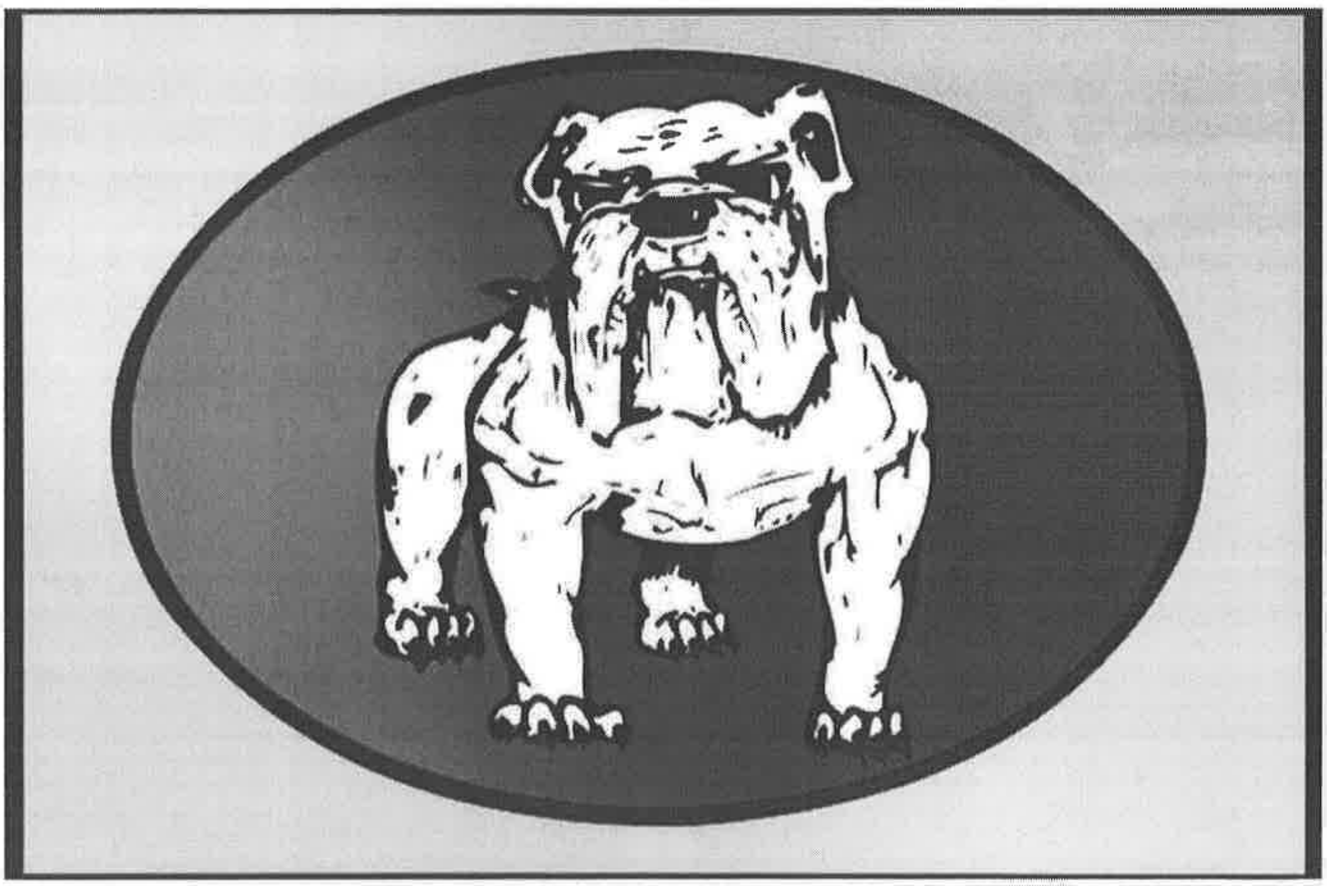
Publishers Said to Be Missing As Much as 25 Percent of Streaming Royalties

10/20/2015 by Ed Christman



By some industry estimates, as much as 25 percent of mechanical royalties due publishers and songwriters are going unpaid by streaming services due to identification difficulties.

Yesterday, Oct. 19, Spotify's U.S. service pulled down thousands of songs from Victory Records' catalog. The dispute between Spotify and Audiam/Victory came when Audiam identified 53 million streams from Another Victory which Spotify hadn't made any payments on.

The label hired Audiam -- a digital distribution and monitoring company founded in 2014 by former TuneCore CEO Jeff Price, which looks to help songwriters and publishers ensure they receive proper payments from digital services -- to monitor payments from streaming services to make sure its publishing company, Another Victory, gets paid correctly.

Audiam "created unique technology indexing and cataloging every digitally, commercially released sound recording," Price claims. "It then finds every commercially released sound recording of a particular song available in the streaming digital services." For example, Audiam identified 803 sound recordings of the Bob Dylan song "All Along The Watchtower."

Before undertaking a comprehensive audit, during the summer Audiam had provided Spotify with the results of its audits for January and June 2014 for Another Victory's catalog. Audiam also provided Spotify with back-up data and other information so that Spotify could analyze the audits, Price claims.

In addition to building technology to help match songs to master recordings Audiam, where it can, takes master recording performance royalties statements and matches them against mechanical royalty statements from the digital services, contrasting the results in order to determine which songs are not receiving payments.

Using Spotify's royalty statements on Victory Records' master recordings, and comparing those statements from 2012 through September 2015 against publishing royalty statements made to Another Victory over the same period, Audiam found that, of the 3,245 recordings that Another Victory holds a stake in, only 1,062 had received payment from Spotify. That leaves 2,183 songs in which Another Victory has a publishing stake but that did not receive mechanical royalty payments, accounting for 53 million total streams for those songs.

Billboard estimates that, at a blended mechanical rate for the ad-supported and premium services of $0.00043 per stream, the amount left unpaid comes to nearly $23,000.

Spotify tells BIllboard they are working to resolve the issue.

While some suggest that the removal of portions of Victory's catalog from Spotify was due to the streaming service becoming nervous over possible legal ramifications, others speculate that Spotify could be taking punitive action against the label by ending the flow of payments on the removed songs. Since the records Spotify removed also include those not owned by Another Victory, the removal also damages RED, Victory's distributor -- thus impacting Sony Music Entertainment, RED's parent company.

Many of the services have valuations in the hundreds of million and even billions of dollars, Victory's Brummel says, but they forget that "without the content, they are worth nothing. They need our content to get their high valuations... Yet without music, what is Spotify worth? So are they saying their users are valuable but the music is nothing?"

Making matters worse, the services "aren't doing anything to fix the hole in the dike" Brummel adds. "We are not looking to go to war with anyone. We want to be fairly; not like indentured servants."

Before Spotify pulled down Victory's music, it tried to get Another Victory to do a direct license with it. But since Victory already had a contract with Audiam that included a letter of direction to Spotify to pay Audiam for Another Victory publishing, Brummel says he couldn't consider that option.

"It sounds like Spotify fired shots across the bow," says one publisher observing the situation play out in the *Wall Street Journal*, which first reported the news. Tony Brummel, owner of Victory Records and Another Victory, "is not a guy you want to shoot at," that publisher, who also has a vested interest in the payment of mechanical royalties, adds. "This should get very entertaining."

Victory Records is one of the more successful indie labels of the past 20 years, discovering and breaking records by such bands as Taking Back Sunday, Hawthorne Heights and Atreyu, among others. And Brummel is known as a savvy, sometimes scrappy, indie label owner who is not afraid to stand up on behalf of his companies' interest.

As songwriters and publishers became increasingly aware of this issue, the National Music Publishers Assn. has initiated settlement talks with such services as Spotify, Apple and Rhapsody, in order to facilitate the payment of unpaid publishing royalties on songs streamed by the services' users. NMPA president and CEO David Israelite says he estimates that as much as 25 percent of royalty payments are not being paid to publishers, or are being distributed to the wrong entities. Many companies employ a third party -- such as such as Music Reports Inc., the Harry Fox Agency slingshot operation, Medianet and, once upon a time, RightsFlow, since ;purchased by Google for use within YouTube -- to attempt matching composition songwriters to master recordings.

Regardless, Israelite estimates a significant amount of activity, perhaps as much as 25 percent of streams, do not get properly identified. While some say that as much as $100 million in unpaid mechanical royalties is currently trapped in "black boxes" within the various interactive services, others say that the number more likely floats between $50 and $75 million. (That doesn't include YouTube, which so far is not a part of any settlement talks -- though some publishers suspect it has the same problem with this type of royalty as the other services.)

Moreover, not only are the services not paying songwriters when they are the artist, the services are having a hard time paying for cover versions, too. "I am finding that the labels are reporting more usage than the publishers to artists/songwriters," says GSO Business Management director of royalties Steven Ambers, whose company oversees the publishing catalogs of George Thorogood, Mike Campbell and Ruthless Records. GSO also serves as the business manager for some artists and songwriters, giving it access to a lot of royalty statements.

"The labels are reporting 5 million streams for a song to an artist/songwriter, while the publishers will only show 4 million streams," Ambers reports. "The publisher should always show more transactions than the master recording because of cover versions, but so far it is not happening in the streaming world."

The music publishing community only became aware of the scope of the problem this year.

"We are in discussions [with the interactive services] on how to resolve this issue, and the talks are very productive," says NMPA'S Israelite. "This is not a contentious issue. I am not alleging any bad faith on the part of the services."

He says that, while labels have to know who to pay on mechanical royalties, that information isn't readily apparent for services unless they are told by someone -- either the label or the publisher.

Jeff Price isn't buying that. He says that the services have built systems to pay the labels, not the publishers, alleging that they instead shift that responsibility to third-party companies that are overwhelmed by the influx of hundreds of billions of transactions.

"The interactive streaming music services built no infrastructure to make payments to songwriters or publishers," Price says. "The music services don't pay the songwriters or publishers [completely], and then blame the [songwriters for their non-payment. The fault is not with the music industry, the fault lays with the music services."

Some are afraid that the NMPA will use the same strategy to solve this problem as it did when it negotiated a settlement with record labels over pending and unmatched royalty payments. In that negotiation, publishers got paid by market share. However, Israelite maintains they will first try come up with a system to get the money paid out correctly, before resorting to a market share system.

COMMENTS

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INDEPENDENT LABELS CLAIMED 35% MARKET SHARE IN THE US LAST YEAR... BY OWNERSHIP

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(/REGION/US) JANUARY 3, 2017

BY TIM INGHAM (HTTPS://WWW.MUSICBUSINESSWORLDWIDE.COM/AUTHOR/TI

Last year, the Worldwide Independent Network (WIN) issued a report suggesting that independent labels claimed a 37.6% market share in 2015.

The WINTEL write-up, co-authored by respected analyst Mark Mulligan, discovered that independent labels generated $5.6 billion in revenue in the year. (http://www.musicbusinessworldwide.com/independent-labels-37-6-global-market-share-says-new-report/)

Unlike traditional market share metrics, which judge the industry on distribution power, the WIN report instead measured money generated by rights ownership.

Why that's important: a big chunk of the major labels' global market share is typically based on the revenue they accrue through their ability to distribute releases from independent label partners.

Much of this revenue, however, is subsequently paid through to the majors' independent partners.

In the case of UMG, for instance, that includes Big Machine (Taylor Swift), Concord (Iggy Pop, Paul McCartney) and Glassnote (Mumford & Sons, Childish Gambino – pictured).

WIN argues that it's the rights ownership figure, rather than the distribution figure, which is most important.

Their hypothesis just got some heavy duty back-up.

Respected US market monitor BuzzAngle has, for the first time, broken down annual market share in the US into major-owned repertoire, independently-distributed repertoire and – crucially – major-distributed repertoire.

This latter category includes the aforementioned (Glassnote, Big Machine), in addition to another huge 'independent' UMG partner – Disney. In addition, it includes sales from clients of Warner-owned ADA, Sony-owned RED and UMG-owned Caroline.

According to BuzzAngle's stats, independently-distributed labels (who are therefore independent labels by default) claimed a **13.6%** market share in 2016.

That therefore leaves a major label distribution market share of **86.4%**; a stranglehold any way you look at it.

(Unlike WIN's report, it's important to note, BuzzAngle's market share it based on *volume* figures across physical sales, streams and download – rather than on a value/revenue basis.)

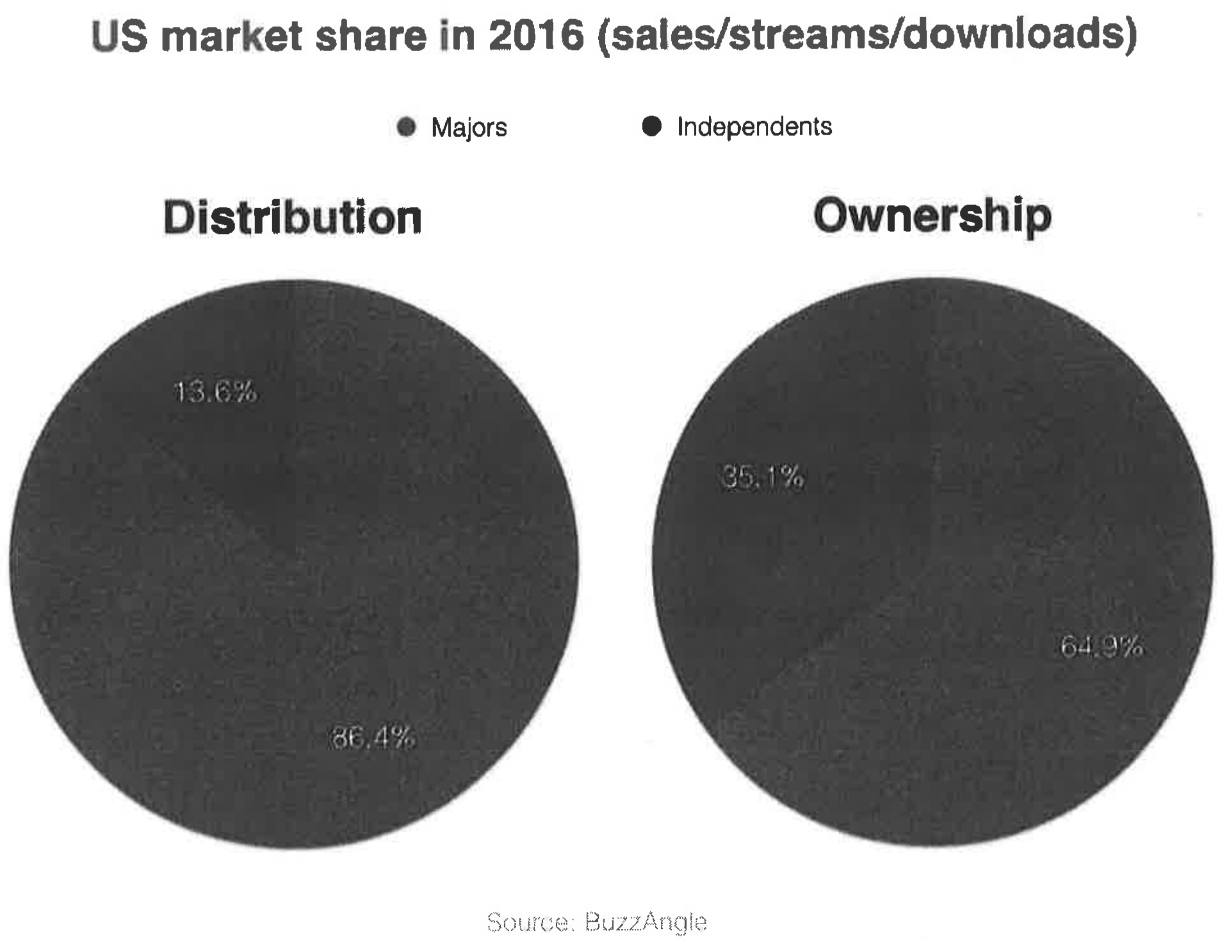
Yet things get really interesting when BuzzAngle drills down into *major-distributed* figures – the category of sales/streams attached to independent labels who then upstream their releases into major label systems.

These companies, says BuzzAngle, were responsible for **21.5%** of the US market's activity last year.

Combined, that means independent labels – both those distributed by fellow indies *and* by major labels – claimed a **35.1%** US market share of total music consumption in 2016.

Conversely, major-owned repertoire accounted for a much-smaller-than-usual 64.9% market share.

Just like the WIN report, these market share figures are rather different to those that some people (including digital services?) might expect...



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(BuzzAngle bases its market share on an 'total album project' metric to measure across formats; it equates album 'sales' in the download world as ten song sales, and in the streaming world as 1,500 plays. Although MBW is no fan of 'equivalent album' conversions, in market share terms this is a completely fair and equal yardstick for all parties.)

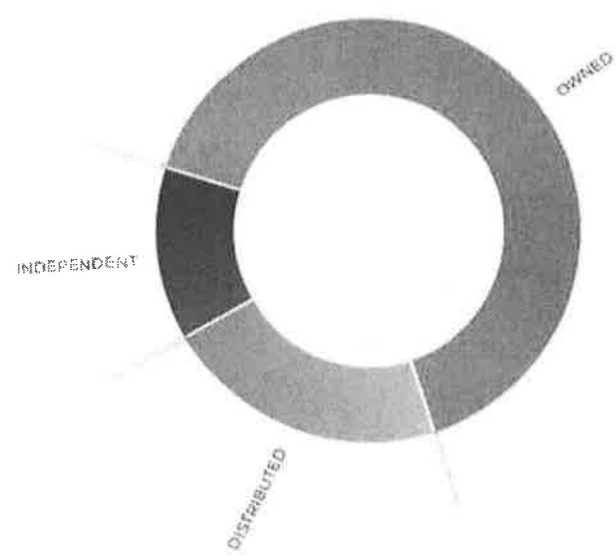
We'll have more from BuzzAngle's in-depth annual report – which you can read in full through here (http://cdn.mbw.44bytes.net/files/2017/01/BuzzAngle-Music-2016-Report.pdf) – in the coming days.

ALBUM CONSUMPTION BY LABEL TYPE

LABEL TYPE	UNITS	% OF TOTAL
OWNED	268,501,312	64.9%
DISTRIBUTED	89,037,620	21.5%
INDEPENDENT	56,389,672	13.6%

Album Consumption is calculated as follows: Total album project units = Album Sales + (Song Sales/10) + (On-Demand Audio Streams/1500)

- OWNED: Labels owned by a major distributor (e.g. Columbia, Republic, Atlantic, etc.)
- DISTRIBUTED: Independent Labels distributed by a major distributor (e.g. Disney, Glassnote, Epitaph, etc.)
- INDEPENDENT: Independent labels not distributed by a major distributor



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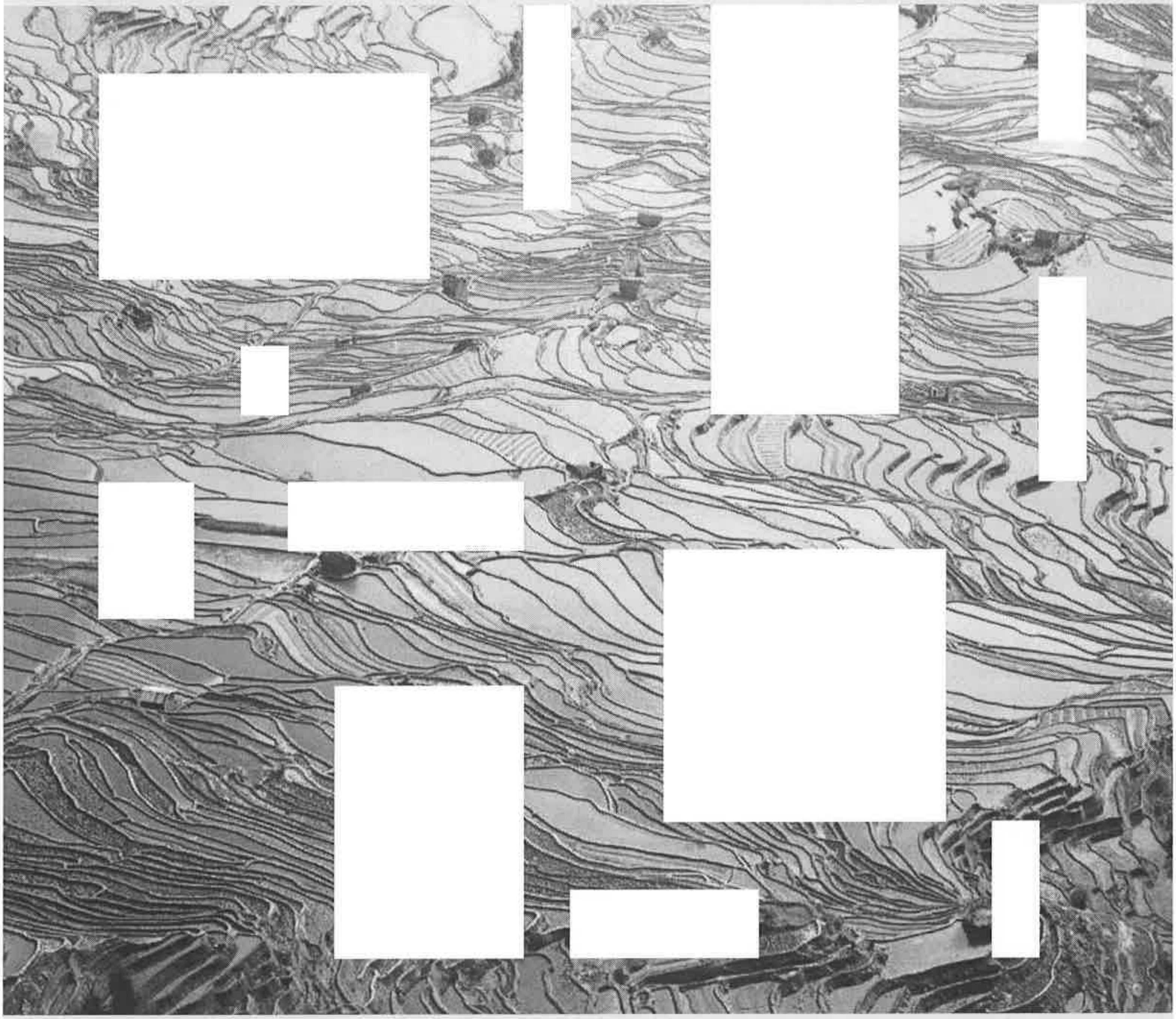


Understanding and measuring the illiquidity risk premium

Asset Research Team, March 2016

Introduction

Not every investor has the benefit of a long time horizon, but many of Willis Towers Watson's institutional investment clients do. Due to their liability structures, a significant number of pension funds, most sovereign wealth funds/endowments and some insurance companies, have the ability to 'lock up' their capital to some degree. This represents an important source of competitive advantage, with these investors able to harvest the higher returns on offer from illiquid assets.

However, even for our long-term clients, it is important to understand how much is on offer from a given asset class from time to time, and whether that is sufficient or not. After all, 'what gets measured gets managed', so if we do not have a good way of measuring illiquidity risk premia, how are we to manage and prioritise our exposure?

Over the years, the importance of illiquidity to our clients has led us to undertake significant work in this area. This paper aims to summarise this work, and is structured as follows:

- In **Section 1,** we take a step back and ask the question: how do we judge the minimum level of additional return required to encourage an investor to accept the increased uncertainty and the reduction in flexibility that illiquidity demands?
- **Section 2** then discusses our approach to determining what a particular asset class is actually offering in compensation for its illiquidity from time to time. We summarise this information in our proprietary Illiquidity Risk Premium Index.
- **Section 3** summarises the main messages and discusses the drivers and implications of what appear to be lower levels of illiquidity risk premia despite lower liquidity.

What is liquidity?

First of all, what exactly do we mean by liquidity and its opposite, illiquidity? For us, liquidity involves the presence of three factors:

i) The ability to trade in sufficient volume
ii) Without negatively impacting price
iii) All with some level of confidence

The absence of any of these factors renders an asset – to some degree – illiquid. The additional return an illiquid asset offers the investor over a liquid alternative we refer to as the illiquidity risk premium (IRP).

1. The required illiquidity risk premium

The IRP compensates the investor for tying up its capital. When an investor accepts illiquidity, it accepts an increase in the uncertainty of end outcome because it is less able to liquidate the asset should something not turn out as expected. Even if the asset can be liquidated, its illiquidity manifests in lower certainty over the price available.

Related to this is that the investor also accepts a reduction in flexibility since it cannot replace the asset with a 'better' alternative (or it is potentially more costly to do so) should that become attractive. As a consequence, illiquid assets should provide a greater level of return to compensate investors for these negative aspects.

The level of IRP an investor should demand for a given asset – or required/fair-value IRP – has three dimensions in our experience:

1. The investor's utility function: some investors will have a higher tolerance for illiquidity risk, perhaps because their time horizons are longer, because they are less likely to take advantage of the flexibility higher liquidity offers, or because the rest of their assets happen to be highly liquid and it is total portfolio liquidity with which they are concerned. These investors should be willing to accept a lower IRP than investors with a lower tolerance for illiquidity.

2. The level of illiquidity: different assets will demand that capital is locked up for different lengths of time. This time period is often not straightforward to define: some assets are completely illiquid for a given period, whereas others may at first glance be illiquid, but in practice a secondary market (of varying depth and robustness) is available. Other assets are liquid, until they are not (which often coincides with times when one would wish to sell or buy). Furthermore, pretty much anything can be sold if there is complete flexibility over price (including negative prices), therefore there is a 'pricing confidence' aspect here. The return needed should increase with the degree of this illiquidity, which is multidimensional.

3. The volatility and uncertainty of the underlying cash flows: if an illiquid asset's cash flows are more volatile, or in a broader sense less 'knowable', than an alternative, equally illiquid asset, the investor should demand a higher required return. This is because the chances of negative outcomes and hence the value of being able to liquidate that asset are higher for more volatile assets (analogous to an option prices increase with the volatility of the underlying asset). Note, because we are often working with assets that are not marked-to-market, it is not sufficient to gauge this by historical price volatility (because the volatility of the prices of illiquid assets will be depressed by the absence of trading). Therefore, we need to make a broader assessment of the volatility of underlying cash flows.

It would be useful to establish a required illiquidity 'surface' showing the necessary level of illiquidity premium along these three dimensions. However, the challenge of precisely defining any of these variables should be apparent from the definitions above. In particular, an investor's utility function is very difficult to define, being dependent on a great many idiosyncratic and qualitative factors specific to that institution and other assets it is holding in its portfolio.

However, whilst we cannot make specific estimates of required or fair-value IRPs, we can study the academic literature to determine, according to theory and empirical evidence (for example, of the trading behaviour of equities of differing levels of liquidity), what sorts of IRP investors have demanded on average. We are also able to consult our experience of investing in illiquid assets over the years, and judge what sort of IRP has typically been demanded by ourselves and our clients over time. We provide the estimate of required/fair-value IRPs, based on the 'average' investor utility function, in the table below:

Estimate of average required IRP		Asset cash flow volatility	
		Low	High
Level of illiquidity	Low	Lowest: 50-100 bps	Higher: 100-150 bps
	High	Higher: 100-150 bps	Highest: 150-250 bps +

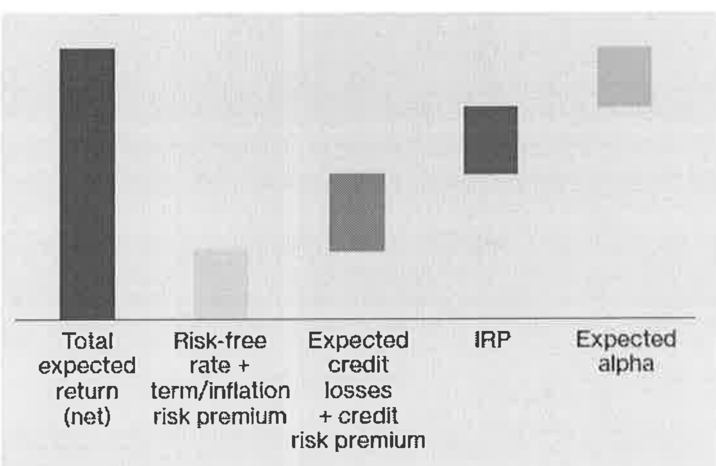
2. The expected illiquidity risk premium

Having an idea, even approximate, of the required or fair-value IRP is one thing, but how are we to identify the IRP of a given asset at a given time? In addition, how can we determine which assets provide the most attractive areas in which to "spend" whatever tolerance for illiquidity we have? Broadly speaking, we follow the straightforward process set out below:

- Establish some form of prospective yield or return: Critically this must capture, as much as possible, known uplifts to cash flows, such as those related to inflation linkage. This yield should be net of costs such as transaction costs, management costs and depreciation costs.
- Subtract an appropriate risk-free rate: This will strip out the market's estimated cash rate over the term of the asset, plus whatever bond risk premium (to compensate for inflation and interest rate uncertainty) it is currently demanding.
- Adjust for other risk premia: The focus here is on adjusting for credit risk (expected losses from defaults/ migration, plus additional credit risk premium) and, where possible, equity-like risk (such as anything that causes cash flow uncertainty, for example voids/vacancies in commercial real estate ownership).

The residual expected return we assume represents the IRP. *Figure 1* below illustrates this further.

Figure 1. **The building blocks of expected returns**



This approach is simple in principle, but complex in practice:

- It rests on a reliable estimate of expected return, which requires a significant amount of judgement. This also means it lends itself better to assets that generate more return from income than capital appreciation (that is, it works better for debt-like assets than equity-like assets).
- Expected cash rates and bond risk premia we take from bond yields, but neither expected credit losses (from defaults and downgrades) nor credit risk premia are directly available from market pricing. We use structural models of credit spread composition in public credit markets to estimate these (see Box 1 on page 6). This market-consistent measure must be adjusted for differing levels of seniority and security of the asset in question relative to a vanilla, publicly quoted corporate bond and any other important idiosyncratic factors.

[redacted]

[redacted]

- For an actively managed strategy (often required in illiquid asset classes), additional returns may be expected from net alpha. In practice, 'alpha' may be hard to isolate in an illiquid asset as it often manifests in a lower expected default rate/higher expected credit or IRP. However, given we are trying to isolate the prospective IRP, we attempt to make this distinction.
- In treating the IRP as a residual and using market prices to determine other risk premia, we may capture any mispricing of these risk premia as mispricing of the IRP, depending on how our expected return is generated. At times when the market is demanding very low (high) levels for credit/inflation/term risk premia in the prices of bonds and credit assets, this may emerge as an attractive (unattractive) IRP. Furthermore, this residual is subject to 'noise' in the sense that small relative movements in the prices of other assets may cause larger moves in the measured IRP.

Whilst it has its limitations, we believe this approach is extremely powerful as it is a) intuitive, b) fairly simple in principle and c) the only one we have! Box 1 overleaf discusses the modelling approach we use to decompose publicly listed corporate bond spreads into their component parts, in order to identify the IRP available from public credit markets. This is worth special attention as the market-consistent expected losses, credit risk premia and IRPs of publicly traded corporate debt are important under our approach to determining the appropriate risk premia to deduct from the expected returns of other assets exposed to credit risk.

Box 1 – Decomposing credit spreads

The additional yield a corporate bond provides over a risk-free (or mostly risk-free) alternative of the same maturity is known as the credit spread. This is paid to/demanded by investors in order to compensate for:

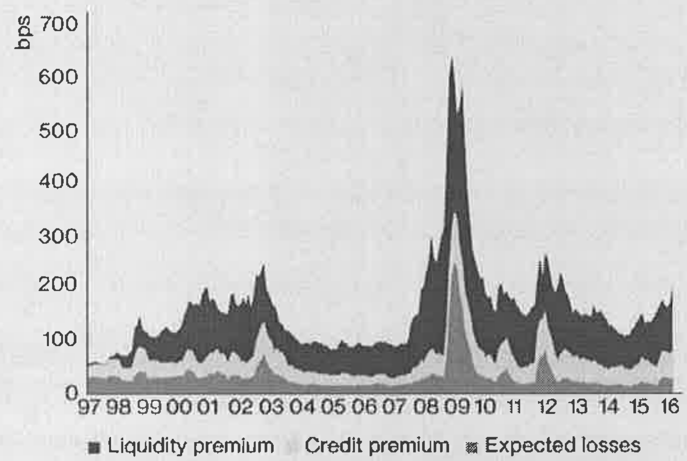
- Expected credit losses, which can arise due to defaults on the payments due on the bond, or in some cases due to a credit rating downgrade causing a permanent loss of capital on the bond (for example, a BBB-rated bond could get downgraded, forcing investment-grade investors to liquidate at a time of falling prices).
- Further risk aversion around credit risk. In addition to these expected credit losses, risk-averse investors will demand an extra premium to compensate for the uncertainty of those losses, and the left-tailed nature of credit as an asset class (lots of modest positive returns, but the potential for large negative returns).
- The lower liquidity of corporate bonds versus risk-free equivalents such as US treasuries or UK gilts – an IRP.

Structural credit models enable us to split credit spreads into these component parts by making a limited number of assumptions. Our preferred implementation of these models uses the Leland-Toft model as its foundation, which takes Merton's observation that a firm's total equity value can be modelled as a call option on the firm's assets. It follows that the firm's debt value should be the present value of the firm's assets minus the value of this option.

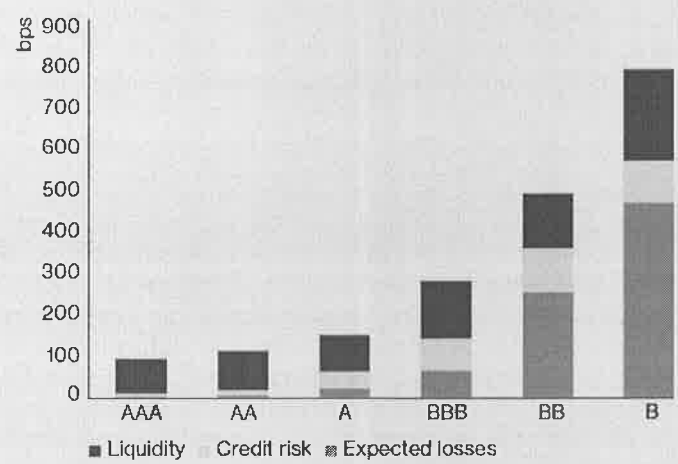
By valuing this option using the market's expectation of future volatility (taken from equity option-implied volatility), we are able to estimate – in a market-consistent manner – how much spread the market is demanding for credit losses and the additional risk aversion-related credit risk premium. Further, by valuing this option in a risk-neutral world we are able to isolate how much of this spread relates to expected credit losses alone. Finally, the residual 'unexplained' spread is the market-consistent amount of IRP from corporate bonds.

The charts below show the decomposition over time of US investment-grade corporate bond spreads over US (including non-investment-grade) bonds at the most recent date. Having a decomposition by ratings band is an important innovation that enables us to size the credit risk premia of other assets if we are able to estimate the credit quality of that asset.

US investment-grade decomposition over time



Decomposition by ratings band as at 31 January 2016



Expected IRPs in practice – European direct lending

This generic approach can be brought to life with an example. In recent years, we have been advocates of allocations to a specific European direct lending strategy. The economic conditions in the eurozone and the UK and the continued regulatory pressure being applied, particularly to the balance sheet size of highly levered European banks, have increased banks' cost of lending and created sufficient room for the well-connected investor to lend to mid-sized companies at attractive rates of return.

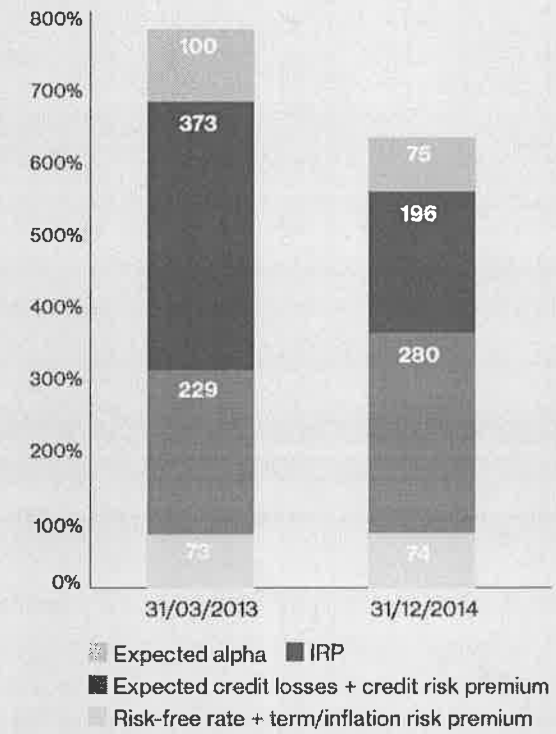
Figure 2 provides the breakdown of our forward-looking expected returns at two different points in time. The decomposition uses the same categories (and colour coding) as Figure 1.

Details behind these numbers:

- The risk-free rate is the market-discounted cash rate at the time, including risk premium, for the maturity of a typical private loan (five years) in the UK and the eurozone.
- Expected credit losses and credit risk premia are taken from our Leland-Toft models applied to European and UK credit markets, weighted by the estimated credit quality of the counterparties to any loans and adjusted lower to reflect the increased seniority of direct lending relative to unsecured corporate bonds.
- Alpha in this context is inexorably wrapped up with a lower default exposure and loss given default. Therefore, this number is our estimate of how much lower default experience will be if implemented through our preferred (and we believe skilled) manager.

Figure 2 illustrates how our changing expectations of returns from this asset class interact with changing credit risk and alpha potential, and deliver a shifting estimate of IRP on offer. The overall conclusion for European direct lending is that whilst the IRP on offer has declined significantly since initially recommending the strategy, it remained reasonable at the start of 2015.

Figure 2. **European direct lending expected return decomposition (bps)**



Source: Willis Towers Watson

[redacted]

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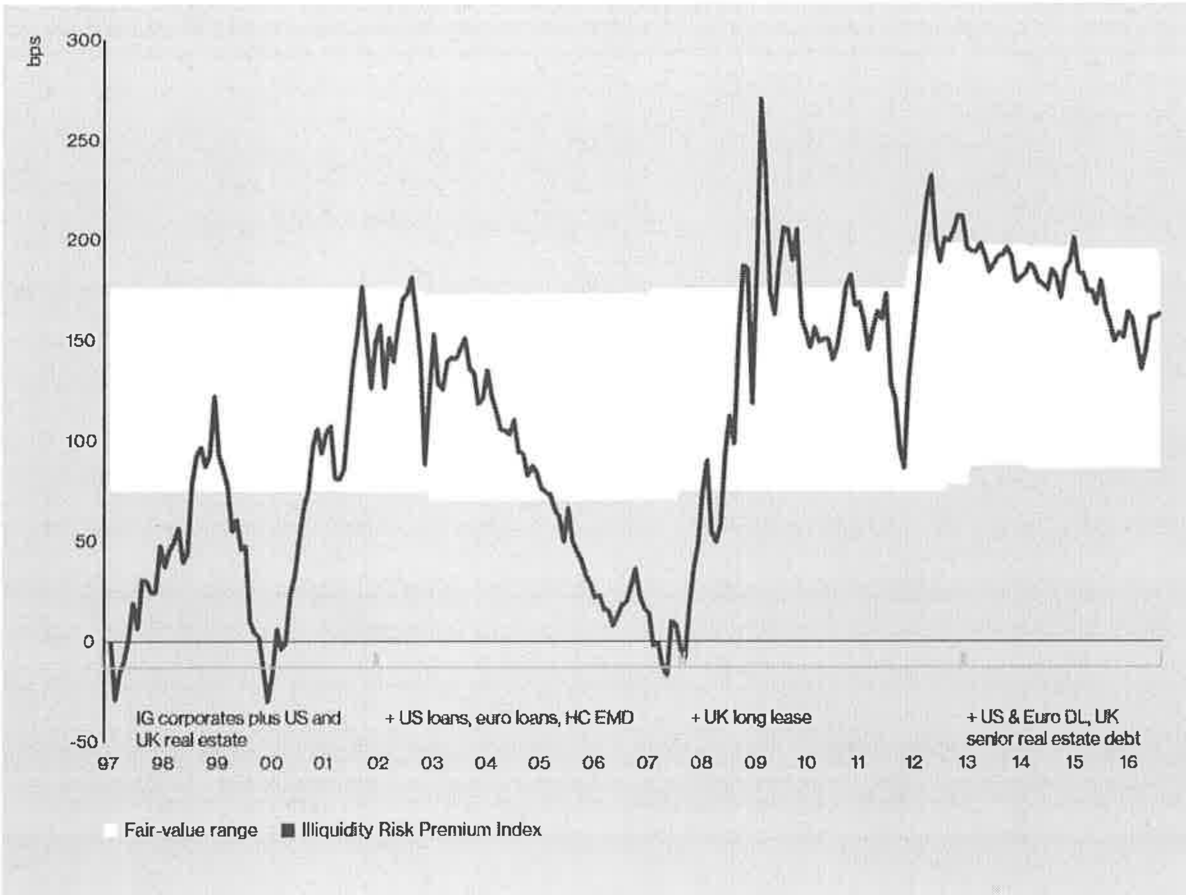
Figure 3. **The Willis Towers Watson Illiquidity Risk Premium Index**



Combining measurements of IRPs

By following this process, we are able to estimate, over time, the IRP on offer from a variety of different assets of varying liquidity. First of all, this enables us to compare IRPs across assets on a consistent basis, and make relative-value statements about the attractiveness of taking illiquidity risk across those assets. This is a useful input in portfolio construction when we are determining how to 'spend' a given illiquidity budget across the opportunity set.

It is beyond the scope of this article to cover all the assets we have implemented this for, but we have combined all these measures in our own Illiquidity Risk Premium Index, which is shown in *Figure 3* above. This takes a simple average of all the assets we have data for at a particular point in time, and plots this against the approximate fair value (based on the ranges developed in Section 1).

The Index does have a few limitations that are worth noting. The sample of assets included is restricted by data availability, therefore the fair-value level (itself uncertain) does change over time albeit not by much. In addition, our sample of assets is prone to 'positive-selection bias' in the sense that the sample of assets included is biased towards those we have conducted sufficient research on, which will tend to be those assets that appear to offer attractive risk premia a priori. Furthermore, the Index is focused on measuring the IRP on offer from the more illiquid end of the opportunity set – there are other measures of illiquidity generated from more liquid assets (TED spread, small versus mid equity bid-offers and so forth) that are not included.

With these limitations in mind, the messages emerging from this aggregation of IRPs in the assets we cover are fairly intuitive:

- Historically, there have been better and worse times to take illiquidity risk.
- The fact that there are longer periods when our measure is below fair value (illiquidity is poorly rewarded) than above may imply that:
  - Investors' average required illiquidity risk premia are too high relative to what is available.
  - We have misestimated that average.
  - Or, it may reveal that the maxim 'what gets measured gets managed' holds true: we believe our approach to assessing the IRP is fairly unique, and therefore it seems likely that the IRP was too low simply because the average investor did not appreciate it was too low.
- In the years immediately prior to the global financial crisis, illiquidity was poorly rewarded.
- In recent years, the additional returns on offer from illiquid assets have been relatively attractive and should have encouraged the long-term investor to exploit them.
- The level of this attractiveness has reduced in recent years, although this may understate the true level of IRP decline due to the sample of assets we measure (which, as mentioned above, is biased towards assets likely to offer more attractive IRPs).

As to whether illiquid assets are in aggregate providing returns that are too low, that really comes down to the investor's specific utility function, as discussed in Section 1. However, on average we would regard the general level of available illiquidity risk premia of the assets we measure to be moving into the lower end of the range of fair value.

What about private equity?

So far, we have been silent on measuring the IRP in private equity, which may seem odd given its highly illiquid nature. To some degree it is debatable whether private equity should provide an IRP. Whilst investors are required to lock up capital for many years to access private equity – which should be compensated via some level of additional expected return – there is nothing inherent to many assets held within private equity vehicles that demands they be held privately/in illiquid form. Indeed, companies are owned publicly with great ease by many investors, so the additional return from private equity is not exclusively in compensation for illiquidity.

Instead, additional expected returns are likely to compensate for a variety of factors as well as illiquidity, which are difficult to disentangle. A significant element of further expected returns is generated by the investor (or their agent) taking control, and altering the operational or financial structure of the business in some fashion. Clearly, taking control of a business and successfully realising value requires a considerable amount of skill, suggesting much of the extra return is a skill premium. Finally, in some instances, higher expected returns may reflect an inherently higher equity risk premium as a consequence of the increased operational, financial or idiosyncratic risks the investor adopts when investing in some forms of private equity. Therefore, whilst we suspect private equity does provide an IRP to some degree, it is onerous to disentangle it from the control, skill and other risk premia that drive the additional expected returns of private equity over its listed sibling.

3. The drivers of changing IRPs, and what they mean for portfolio strategy

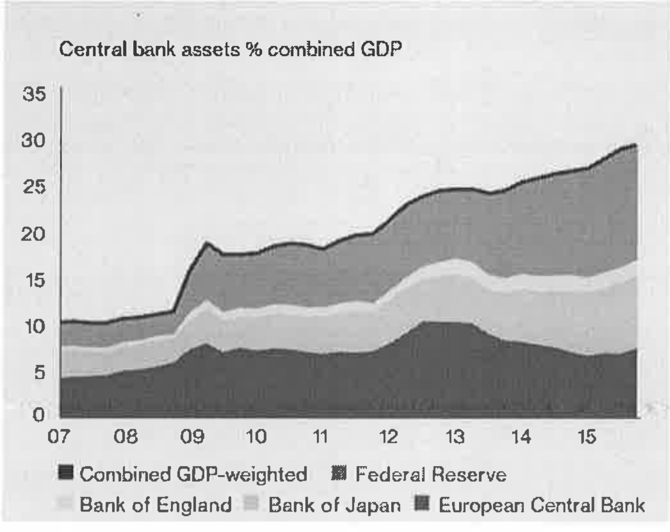
The Willis Towers Watson Illiquidity Risk Premium Index suggests illiquidity risk premia are currently at the low end of fair value. What are the top-down forces acting on IRPs that might explain this move? We make a few observations below:

- Section 1 discusses the importance of utility functions in determining the level of risk premium demanded by investors. Over time, the changing composition of the marginal investor base and/or the preferences of these investors could change the form of that utility function and alter the 'fair' level of the IRP.
- Quantitative easing (QE) and other central bank asset purchases have been a crucial driver of shifting marginal utility functions. An explicit policy objective of QE has been to push down on risk premia more generally – IRPs are one example.
- Given the predicted tightening of US policy in coming years, one might expect the pressure on the IRP to be upwards.
- However, taking a lead from bond markets, it is global liquidity conditions under the broadest measure that are most likely to be important here – a simple measure based on the projected size of key developed world central bank balance sheets is presented in *Figure 4*. This indicates that global liquidity conditions have remained easy due to the size of Japanese and eurozone asset purchases, but US dollar liquidity has been declining at the same time. The extent to which this will impact our measure of IRP is uncertain.
- Another factor relevant to expected IRPs is the changing structure of liquidity from the sell side. As we have discussed previously[1], measures of the market-making capacity of key fixed income markets have declined significantly since 2008. Whilst these measures may over state the true decline in underlying liquidity provision (for example, they exclude off-balance sheet trading via 'dark pools'), we do believe the underlying liquidity of capital markets is structurally lower.
- Combined with the rapid rise in assets invested in fixed-income securities, this may leave fixed-income markets less able to meet the demands of investor redemptions should sentiment turn.

In aggregate, the pressures on the global IRP are likely to continue to be lower for some time, reflecting the amalgamation of these forces and conditional on no downside event materialising. Investors are being encouraged to search for yield, and in a low-return world illiquidity risk is potentially an appealing means of generating additional yields. However, we believe there to be a higher chance than normal of a downside event occurring, pushing all risk premia – including IRPs – higher. This macro picture and the evidence presented in Section 2 of a declining IRP lead us to caution: pursuing a risk premium some may be ill-suited to bear, in combination with the picture of reduced structural market-making capacity in more liquid markets, risks 'ending in tears' should sentiment turn.

In part, this underlies our generally cautious outlook on risky assets because, for many risky assets, the amplitude of future price moves to the downside may be greater than normal, which is another way of saying risk-adjusted returns are lower. However, we are still of the view that for many of our clients, who are suited to taking illiquidity risk, certain assets still provide attractive risk premia on a highly selective basis. Moreover, if a negative event does occur and illiquidity risk premia do increase, these clients should stand ready to capture these attractive returns. Often this requires investment at a worrying time, but having a solid process to estimate the IRP – such as that detailed above – eases this decision.

Figure 4. **European Central Bank and Bank of Japan balance sheet expansion is driving easy global liquidity conditions**



1. For example, see: https://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2012/07/Corporate-Bond-Liquidity-Constrained-but-Active-Managers-Can-Still-Excel
Also "Credit market liquidity: changing return of market liquidity and the need for caution" (forthcoming)

Further information

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About Willis Towers Watson

Willis Towers Watson (NASDAQ: WLTW) is a leading global advisory, broking and solutions company that helps clients around the world turn risk into a path for growth. With roots dating to 1828, Willis Towers Watson has 39,000 employees in more than 120 countries. We design and deliver solutions that manage risk, optimise benefits, cultivate talent, and expand the power of capital to protect and strengthen institutions and individuals. Our unique perspective allows us to see the critical intersections between talent, assets and ideas – the dynamic formula that drives business performance. Together, we unlock potential. Learn more at willistowerswatson.com.

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Highlights For The Week Ended September 8, 2017

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What's Inside

ATVI, LGF, NFLX, P, Spotify

What's Incremental To Our View

ATVI: Destiny 2 Metacritic score at 84 vs Destiny 1 at 76; Candy Crush Saga/Soda Saga the #1/#4 top grossing U.S. mobile gaming apps. **NFLX**: Won't get future 'Star Wars' or Marvel Films, but T-Mobile deal could add 1 million domestic subs. **P**: Spotify/Hulu partner on a $5 bundle for students. **LGF.B**: 'Hitman's Bodyguard' Domestic box reached ~$65m vs our $60m target.

Activision (ATVI, Buy)

- *Destiny 2 Metacritic Score Stands At 84 Vs Destiny 1 At 76 (+).* The score is for PlayStation and can change as more Critic reviews come in (6 reviews to date vs Destiny 1 at 95). Expect Xbox score shortly.
- *Other*: 1) Candy Crush Saga and Soda Saga are #1 and #4 top grossing game apps on iPhone for August into September per App Annie (+); 2) Crash Bandicoot #4 in Australia/New Zealand; 3) ATVI unveiled its new eSports arena.

Netflix (NFLX, Hold)

- *Netflix Won't Get Future 'Star Wars,' Marvel Films (-).* DIS will retain rights to Lucas, Marvel, Pixar, Disney films for its pending OTT service set to launch 2H19 (see our note HERE).
- *Other*: 1) T-Mobile (TMUS, $62.74, Buy; Miller) deal could add 1 million domestic subs – see our note HERE (+); 2) Hulu and Spotify are partnering on a $5 bundle for students (-); 3) Facebook (FB, $170.95, Buy; Squali) could spend $1b on original video content (-); 3) Star India's Hotstar launched SVOD service in the U.S and Canada (-); 4) AMC Networks is readying Spanish OTT service (-).

Pandora (P, Buy)

- 1) Spotify and Hulu are partnering on a $5 bundle for students (-); 2) Facebook offers hundreds of millions of dollars for music rights to enable Facebook users to legally upload songs in their video posts.

Lions Gate (LGF.B, Buy)

- 1) 'The Hitman's Bodyguard' Domestic box office gross reached ~$65m vs our $60m target; 2) LGF's final film for the quarter, 'American Assassins', set to release this weekend (9/15).

SEE PAGE 5 FOR REQUIRED DISCLOSURE INFORMATION

Activision Blizzard (ATVI, Buy)

Destiny 2 Metacritic Score Stands At 84, Up From Destiny 1 At 76 (+)

(10 September 2017 – Metacritic)

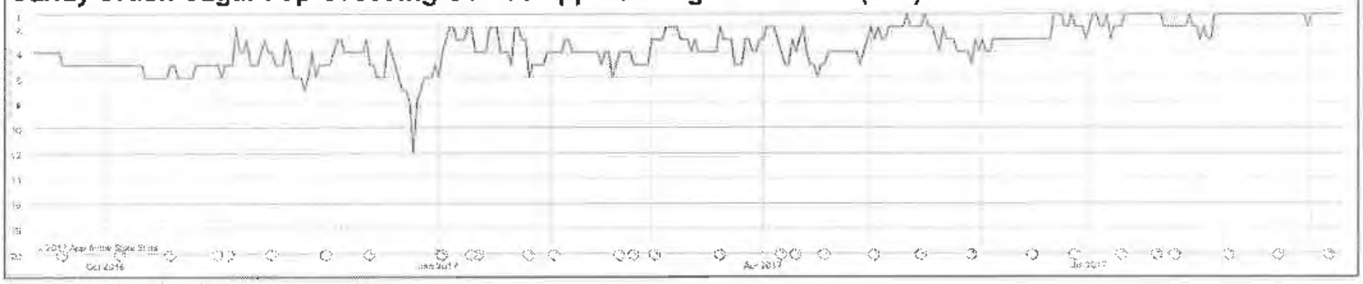
- The score is based on 6 Critic reviews to date for the PlayStation platform. The score can change as more Critic reviews come in, e.g. Destiny 1 Metacritic score of 76 was based on 95 Critic reviews for the PlayStation platform. Expect Destiny 2 Metacritic score for Xbox to register shortly (Destiny 1 Metacritic score on Xbox was 75 based on 11 Critic reviews).
- The Destiny 2 User score (based on reviews from gamers, i.e. non-professional Critics) stands at 6.0 on PlayStation vs Destiny 1 at 6.1/5.5 on PlayStation/Xbox.

Candy Crush Saga The Top Grossing Mobile Gaming App Over Last Month In The U.S. (+)

(8 September 2017 – AppAnnie)

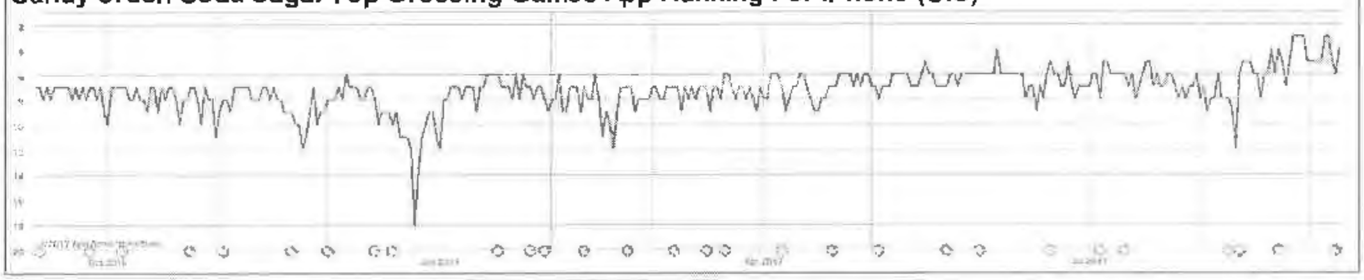
- Candy Crush Saga is #1 grossing mobile gaming app for most of August and September (see exhibit below). Candy Crush Soda Saga is at #4.

Candy Crush Saga: Top Grossing Games App Ranking For iPhone (U.S)



Source: AppAnnie;STRH

Candy Crush Soda Saga: Top Grossing Games App Ranking For iPhone (U.S)



Source: AppAnnie;STRH

Top 10 Best-Selling Physical Games For The Week Ended September 3 Revealed For Australia/New Zealand

(6 September 2017 – IGEA)

- Crash Bandicoot N. Sane Trilogy is at #4 in Australia and #2 in New Zealand. This is down from #1 position in both countries in July and August as the release ages).

Blizzard Unveils Live Event Arena

(8 September 2017 – Blizzard)

- The new facility, Blizzard Arena Los Angeles, has been built to support competitive events. This arena will open its doors the weekend of October 7–8 to host the Overwatch Contenders Season One Playoffs.

Lions Gate (LGF.A/LGF.B, Buy)

'The Hitman's Bodyguard' Domestic Box Office Gross Reaches ~$65m (+)

(10 September 2017 – ComScore)

- The movie took in ~$5m over the weekend and has now surpassed our domestic gross box office target of $60m.

'American Assassins' Set To Release This Weekend (September 15)

(10 September 2017 – Lions Gate; STRH)

- The movie, a co-production between CBS Films and LGF (distributed by LGF), is based on a 2010 novel and stars Dylan O'Brien, Michael Keaton, Taylor Kitsch, and Sanaa Lathan.

Netflix (NFLX, Hold)

Netflix Won't Get Disney 'Star Wars,' Marvel Films (-)

(7 September 2017 – Variety)

- Disney announced that it will retain rights to Lucas and Marvel films, starting with the 2019 slates, with the films to be part of the company's pending OTT service set to launch in 2H19. Recall Disney previously announced that it will not renew its pay-1 film deal with NFLX for Disney and Pixar films (see our note HERE).

T-Mobile Deal Could Add 1 Million Domestic Subs (+)

(6 September 2017 – T-Mobile)

- T-Mobile USA will bundle free Netflix with select wireless plans. We estimate this deal could provide a ~1%/~5% lift to total revenue/EBITDA – see our note HERE.

Spotify/Hulu To Offer Discounted Bundle To Students (-)

(7 September 2017 – TechCrunch)

- Will offer U.S college students both services for $4.99/month. The bundle includes access to Spotify Premium, Spotify's on-demand music service, and Hulu's "Limited Commercials" plan.

Facebook Could Spend $1b On Original Video Content (-)

(8 September 2017 – Wall Street Journal)

- The $1b figure covers potential spending through 2018. Facebook recently bid more than $600 million for the digital rights to stream cricket matches in India from 2018 to 2022.

Star India's Hotstar Launches SVOD Service In U.S and Canada (-)

(6 September 2017 – Rapid TV News)

- Star India is owned by 21st Century Fox. Hotstar offers international subscribers multi-lingual programming from Star India's channel bouquet such as Star Plus, Star Jalsha, and Asianet, Fox Star-produced Indian films, and originals. Hotstar also carries live sports, including badminton, hockey, and cricket.
- The over-the-top (OTT) service will cost US$9.99 per month in the US, and CAD 12.99 in Canada.

AMC Networks Readying Spanish OTT (-)

(7 September 2017 – Advanced Television)

- Branded *Selekt,* the new SVOD service will be integrated into the platforms of Spanish operators Telefónica, Vodafone, and Orange. It will likely be priced between €5 and €10.

Pandora Media (P, Buy)

Spotify/Hulu To Offer Discounted Bundle To Students (-)

(7 September 2017 – TechCrunch)

- Will offer U.S college students both services for $4.99/month. The bundle includes access to Spotify Premium, Spotify's on-demand music service, and Hulu's "Limited Commercials" plan.

Facebook Offers Hundreds Of Millions of Dollars For Music Rights

(5 September 2017 – Bloomberg)

- This will allow Facebook users to legally upload songs in their videos.

Companies Mentioned in This Note

Facebook, Inc. (FB, $170.95, Buy, Youssef Squali)
T-Mobile US, Inc. (TMUS, $62.74, Buy, Greg Miller)
AMC Networks Inc. Class A (AMCX, 56.61,NR)
Telefonica SA (TEF-MCE, 10.766762,NR)
Vodafone Group Plc (VOD-LON, 2.8180802,NR)
Orange SA Sponsored ADR (ORAN, 16.64,NR)
Twenty-First Century Fox, Inc. Class A (FOXA, 27.79,NR)
Walt Disney Company (DIS, 101.93,NR)
Spotify (Private, NR)
Hulu (Private, NR)

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Hold (H) – the stock's total return is expected to perform in line with the S&P 500 or relevant benchmark over the next 12-18 months (unless otherwise indicated)

Sell (S) – the stock's total return is expected to underperform the S&P 500 or relevant benchmark over the next 12-18 months (unless otherwise indicated)

Not Rated (NR) – STRH does not have an investment rating or opinion on the stock

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Legend for Rating and Price Target History Charts:
B = Buy
H = Hold
S = Sell
D = Drop Coverage
CS = Coverage Suspended
NR = Not Rated
I = Initiate Coverage
T = Transfer Coverage

<u>The prior rating system until Oct. 7, 2016:</u>

3 designations based on total returns* within a 12-month period**
: Buy – total return ≥ 15% (10% for low-Beta securities)***
: Reduce – total return ≤ negative 10% (5% for low Beta securities)
: Neutral – total return is within the bounds above
: NR – NOT RATED, STRH does not provide equity research coverage
: CS – Coverage Suspended
*Total return (price appreciation + dividends); **Price targets are within a 12-month period, unless otherwise noted; ***Low Beta defined as securities with an average Beta of 0.8 or less, using Bloomberg's 5-year average

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Coverage Universe			Investment Banking Clients Past 12 Months		
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Hold/Neutral	279	39.86%	Hold/Neutral	58	20.79%
Sell/Reduce	4	0.57%	Sell/Reduce	1	25.00%

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WELLS FARGO SECURITIES

Pandora Media, Inc.

P: Spotify Gains Continue, But Pandora Maintains Ad-Supported Hrs Lead

Market Perform/V/$10

Internet
Overweight

Company Note

- **Pandora listening hour update based on Triton Digital data.** Based on our analysis of Triton Digital's June Domestic Ranker (released today), P listener hours declined 2.7% YoY in June, comparing to an estimated 3.4% decline in May and -5.8% in April (see Exhibit 1 in body of this note). Based on P's most recent 10-Q and WFS estimates, we believe Pandora's ad-supported hours declined ~12% in June, consistent with May, though a modest improvement from April. Off-setting this decline, we believe P's subscriber based listening hours (Plus and Premium) grew 62% in June, accelerating from estimated 56% in May and 50% in April. With June's growth, we believe subscription hours now likely represent ~21% of total P listening, up from 13% in June'16.
- **Spotify momentum continues, though P maintains comfortable lead in ad-supported hrs.** Though Pandora has a broad set of competitors in the streaming music space—including Apple, Google, Amazon etc.—Triton Digital's monthly streaming audio tracker includes only Spotify among direct competitors. For June, our analysis of Triton data points to 53% y/y growth in total streamed hours for Spotify, the second straight month of accelerating growth (50% in Apr, 51% in May), and the seventh consecutive month of year/year growth above 40%. Though Spotify's public filings don't allow us to distinguish between ad-free and ad-supported hours, we applied comments made by Spotify executives to ad-supported vs. subscription hour listening trends seen with Pandora to estimate Spotify's split of ad-supported vs. subscription listening. The output suggests that though Spotify has now nearly matched Pandora in the U.S. with regard to total hours streamed, that Pandora maintains a significant—if slowly shrinking—advantage when it comes to ad-supported hours of ~75%.
- **Advertising competition heating up.** Though we believe Pandora maintains several significant advantages over Spotify as a digital advertising platform, we believe the competitive pressure is building. Ad agency contacts inform us that Spotify has increased its outreach to national radio buying groups in addition to pitching digital media planners and buyers. And while we believe Spotify has not yet elected to build out a local market salesforce, local Spotify inventory is available through an ad-network selling relationship with Triton Digital. Further strengthening Spotify's advertising hand has been the company's first-mover status in rolling out a programmatic buying platform for national audio ads, and more recently a self-serve platform for marketers, neither of which are currently offered by Pandora. Though we believe Pandora now trails Spotify in terms of these more advanced offerings, Pandora's scale and local selling infrastructure gives P a substantial advantage in addressing the relatively untapped—though slower moving in terms of digital adoption—local market. Looking ahead, we expect P's new management team to focus on improving P's ad platform in order to more significantly leverage its leading scale in ad-supported listening.

USD EPS	2016A	2017E Curr.	2017E Prior	2018E Curr.	2018E Prior
Q1 (Mar.)	($0.20)	($0.24) A	NC	NE	
Q2 (June)	(0.12)	(0.21) A	NC	NE	
Q3 (Sep.)	(0.07)	(0.06)	NC	NE	
Q4 (Dec.)	(0.13)	0.05	NC	NE	
FY	($0.51)	($0.45)	NC	$0.00	NC
CY	($0.51)	($0.45)		$0.00	
FY P/EPS	NM	NM		NM	
Rev.(MM)	$1,385	$1,483		$1,659	

Source: Company Data, Wells Fargo Securities, LLC estimates, and Reuters
NA = Not Available, NC = No Change, NE = No Estimate, NM = Not Meaningful
V = Volatile, ✎ = Company is on the Priority Stock List

Ticker	P
Price Target/Prior:	**$10/NC**
Price (08/30/2017)	**$8.08**
52-Week Range:	$6-15
Shares Outstanding: (MM)	251.0
Market Cap.: (MM)	$2,028.1
S&P 500:	2,367.34
Avg. Daily Vol.:	6,655,530
Dividend/Yield:	$0.00/0.0%
LT Debt: (MM)	$342.0
LT Debt/Total Cap.:	24.0%
ROE:	0.0%
3-5 Yr. Est. Growth Rate:	25.0%
CY 2017 Est. P/EPS-to-Growth:	NM
Last Reporting Date:	07/31/2017 After Close

NC = No Change
Source: Company Data, Wells Fargo Securities, LLC estimates, and Reuters

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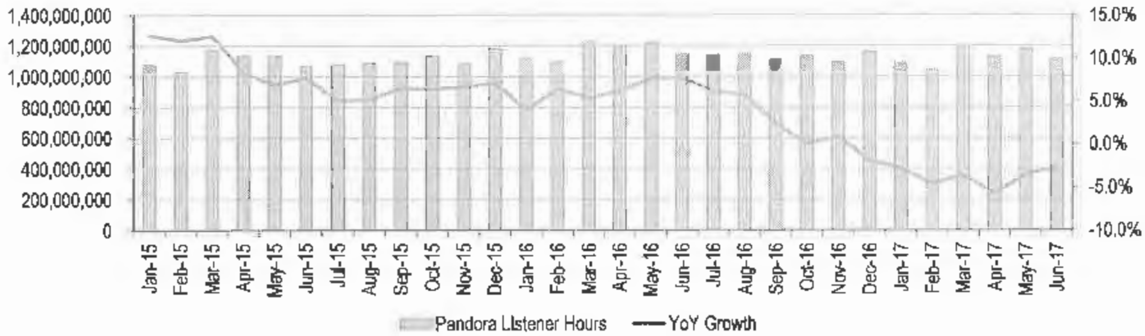
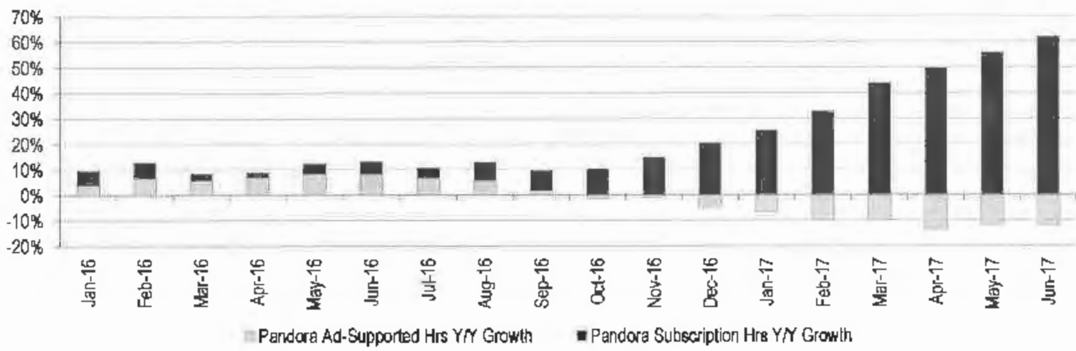
Please see page 6 for rating definitions, important disclosures and required analyst certifications. All estimates/forecasts are as of 08/30/17 unless otherwise stated. 08/30/17 19:31:58 ET

Exhibit 1. Pandora Estimated Monthly Listener Hours (6 a.m. - Midnight Daypart)



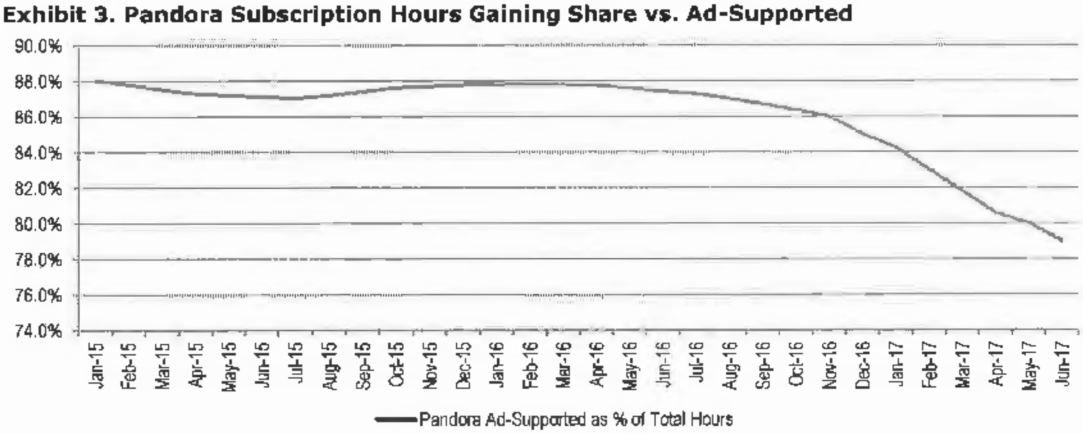
Source: TritonDigital, Wells Fargo Securities, LLC estimates

Exhibit 2. Estimated Growth of Pandora Ad-Supported and Subscription Hours



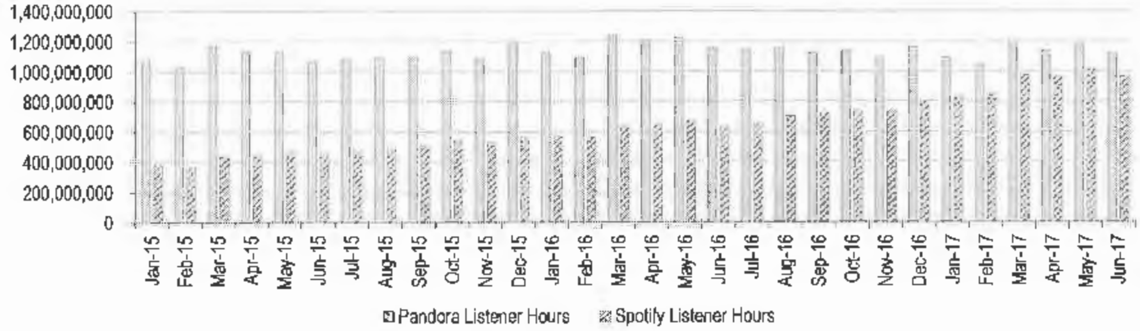
Source: Company reports, TritonDigital, Wells Fargo Securities, LLC estimates

Exhibit 3. Pandora Subscription Hours Gaining Share vs. Ad-Supported



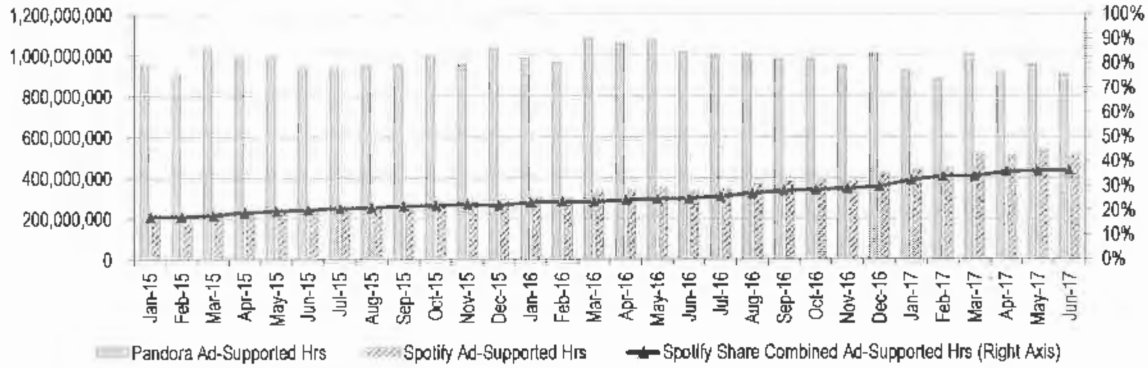
Source: Company reports, TritonDigital, Wells Fargo Securities, LLC estimates

Exhibit 4. Pandora vs. Spotify U.S. Listener Hours (6 a.m. - Midnight Daypart)



Source: TritonDigital, Wells Fargo Securities, LLC estimates

Exhibit 5. Pandora vs. Spotify: Estimated Ad—Supported Listener Hrs, Spotify Share (6 a.m. - Midnight Daypart)



Source: TritonDigital, Wells Fargo Securities, LLC estimates

Exhibit 6. Pandora Income Statement

$MM except share and per share amounts	2015A	2016A	1Q17A	2Q17A	3Q17E	4Q17E	2017E	2018E
Non-GAAP Revenue	**1,164.0**	**1,384.8**	**316.0**	**376.8**	**381.6**	**408.8**	**1,483.2**	**1,658.5**
- Subscription Return Reserve	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
= GAAP Revenue	**1,164.0**	**1,384.8**	**316.0**	**376.8**	**381.6**	**408.8**	**1,483.2**	**1,658.5**
Advertising Revenue	933.3	1,072.5	223.3	278.2	284.4	323.3	1,109.3	1,201.7
Subscription Revenue	220.6	225.8	64.9	68.9	78.6	85.4	297.8	456.8
Ticketing Revenue	10.2	86.6	27.8	29.7	18.6	0.0	76.1	0.0
Total Cost of Revenue	**691.8**	**888.6**	**230.7**	**243.0**	**234.2**	**231.1**	**939.0**	**958.4**
Cost of Revenue - Content Acquisition Costs	610.4	734.4	187.4	195.9	194.8	202.5	780.5	844.0
Cost of Revenue - Other (ex-SBC)	74.3	95.2	24.7	26.6	27.2	28.6	107.2	114.4
Cost of Revenue - Ticketing Service (ex-SBC)	7.1	59.1	18.6	20.5	12.2	0.0	51.3	0.0
Gross Profit	**472.3**	**496.2**	**85.3**	**133.9**	**147.4**	**177.7**	**544.2**	**700.1**
Total Operating Expenses	**642.3**	**815.0**	**210.1**	**401.4**	**201.8**	**190.4**	**1,003.7**	**838.6**
Product Development (ex-SBC)	60.9	110.7	31.7	31.8	28.6	26.6	118.7	107.8
Marketing and Sales (ex-SBC)	345.4	433.3	111.6	130.8	112.6	104.2	459.2	456.1
General and Administrative (ex-SBC)	124.3	132.5	37.2	44.7	28.6	26.6	137.1	132.7
Stock-Based Compensation	111.6	138.5	29.6	38.6	32.0	33.0	133.2	142.0
Restructuring and Other	0.0	0.0	0.0	155.5	0.0	0.0	155.5	0.0
GAAP Operating Income	**($170.0)**	**($318.8)**	**($124.8)**	**($267.5)**	**($54.4)**	**($12.7)**	**($459.4)**	**($138.5)**
Other Income/Expense	(1.2)	(24.4)	(7.2)	(7.3)	(7.2)	(7.3)	(29.0)	(30.0)
Pre-tax Income (Loss)	(171.2)	(343.3)	(131.9)	(274.9)	(61.6)	(20.0)	(488.4)	(168.5)
Tax Expense	1.6	0.2	(0.3)	(0.3)	(0.4)	0.0	(1.0)	0.0
Net Income – GAAP	**(169.7)**	**(343.0)**	**(132.3)**	**(275.1)**	**(62.0)**	**(20.0)**	**(489.4)**	**(168.5)**
EPS – GAAP	**($0.79)**	**($1.49)**	**($0.56)**	**($1.20)**	**($0.26)**	**($0.08)**	**($2.03)**	**($0.69)**
Non-GAAP Net Income	**$20.6**	**($117.7)**	**($57.2)**	**($50.1)**	**($15.2)**	**$13.4**	**($107.7)**	**$0.4**
Non-GAAP EPS	**$0.09**	**($0.51)**	**($0.24)**	**($0.21)**	**($0.06)**	**$0.05**	**($0.45)**	**$0.00**
Common Shares Outstanding								
Basic	213.8	230.7	237.5	241.3	242.3	243.3	241.1	244.1
Diluted	223.2	239.9	247.0	250.9	252.0	253.0	250.7	253.8
EBITDA Calculation								
GAAP Operating Income	(170.0)	(318.8)	(124.8)	(267.5)	(54.4)	(12.7)	(459.4)	(138.5)
+ Depreciation & Amortization	24.5	60.8	17.7	17.4	18.4	19.4	73.0	83.0
+ Stock Based Compensation	111.6	138.5	29.6	38.6	32.0	33.0	133.2	142.0
+ Other Adjustments	85.5	0.0	6.2	157.2	0.0	0.0	163.4	0.0
Adjusted EBITDA	**51.7**	**(119.5)**	**(71.3)**	**(54.3)**	**(4.0)**	**39.7**	**(89.9)**	**86.5**
Growth Rate								
Non-GAAP Revenue (YoY)	28.4%	19.0%	6.3%	9.9%	8.5%	4.1%	7.1%	11.8%
Adjusted EBITDA (YoY)	-11.2%	-331.4%	24.1%	116.4%	-39.7%	-230.6%	-24.8%	-196.3%
Margin Analysis								
Gross Margin	40.6%	35.8%	27.0%	35.5%	38.6%	43.5%	36.7%	42.2%
GAAP Operating Margin	-14.6%	-23.0%	-39.5%	-71.0%	-14.3%	-3.1%	-31.0%	-8.3%
Adjusted EBITDA Margin	4.4%	-8.6%	-22.6%	-14.4%	-1.0%	9.7%	-6.1%	5.2%
Costs as a % of Non-GAAP Revenue								
Cost of Revenue	59.4%	64.2%	73.0%	64.5%	61.4%	56.5%	63.3%	57.8%
Product Development	5.2%	8.0%	10.0%	8.4%	7.5%	6.5%	8.0%	6.5%
Marketing and Sales	29.7%	31.3%	35.3%	34.7%	29.5%	25.5%	31.0%	27.5%
General and Administrative	10.7%	9.6%	11.8%	11.9%	7.5%	6.5%	9.2%	8.0%
Stock Based Compensation	9.6%	10.0%	9.4%	10.2%	8.4%	8.1%	9.0%	8.6%

Source: Company reports, Wells Fargo Securities, LLC estimates

Price Target

Price Target: $10 from NC

Our price target reflects a 1.6x EV-to-Sales multiple on our 2018E revenue estimate of $1.66B. Risks include the high cost of content licensing, competition for users, and failure to meet paid subscription growth targets.

Investment Thesis

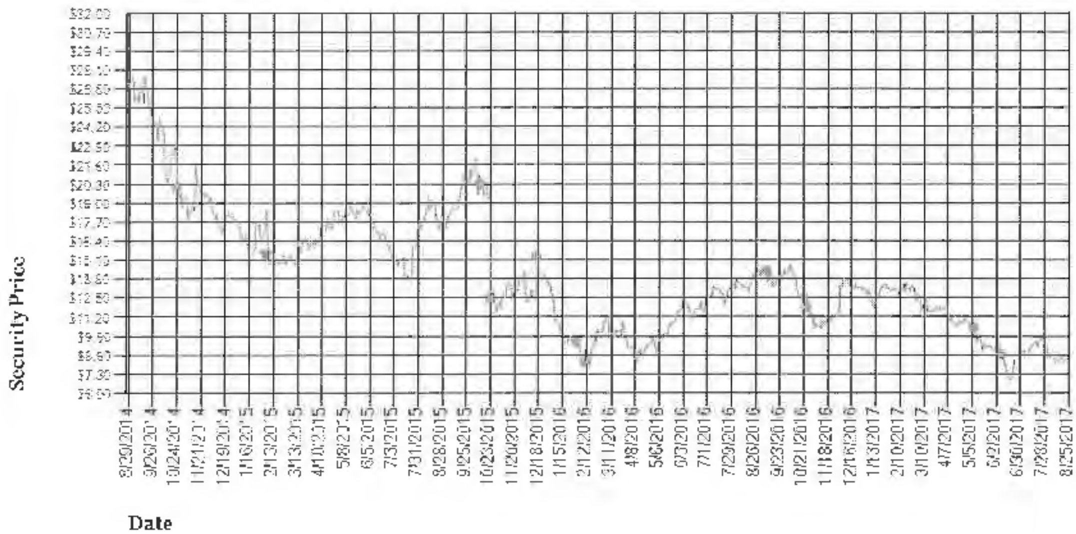
We believe the strength of Pandora's ad platform positions the company well to continue share gains vs. terrestrial audio ad competitors, and we expect P's new subscription products to see significant adoption. However our positive product view is tempered by uncertainties surrounding execution and competition.

Company Description

Pandora Media, Inc. is a market-leading provider of Internet radio services. Founded in 2000, Pandora provides its listeners with a completely personalized radio experience that promotes music discovery. Pandora offers its music to end users on an either a free, but advertising supported model, or subscription basis. The product can be easily accessed by nearly any Web-connected device including the PC, tablet, smartphone, and hundreds of consumer electronics devices such as TVs and Blu-ray players.

Required Disclosures

Pandora Media, Inc. (P) 3-yr. Price Performance



	Date	Published Price ($)	Rating Code	Price Target	Val. Rng. Low	Val. Rng. High	Close Price ($)
	8/26/2014		Stabler				
	8/26/2014	NA	1	NE	38.00	40.00	27.32
	10/24/2014	23.12	1	NE	29.00	31.00	20.00
▼	2/6/2015	18.41	2	NE	15.00	17.00	15.24
	10/12/2015	20.21	2	NE	22.00	24.00	20.21
	10/23/2015	19.19	2	NE	14.00	16.00	12.39
	12/17/2015	13.44	2	NE	15.00	17.00	15.26
	2/2/2016	9.69	2	NE	12.00	14.00	9.40
	2/12/2016	9.09	2	NE	10.00	12.00	8.00
	9/8/2016	14.63	2	NE	14.00	16.00	14.25
	10/26/2016	12.18	2	NE	12.00	14.00	11.77
	5/8/2017	10.40	2	12	12.00	14.00	10.40
	6/9/2017	8.52	2	10	12.00	14.00	8.52

Source: Wells Fargo Securities, LLC estimates and Reuters data

Symbol Key
- ▼ Rating Downgrade
- Rating Upgrade
- Price Target/Val Range Change
- ◆ Initiation, Resumption, Drop or Suspend
- ■ Analyst Change
- Split Adjustment

Rating Code Key
- 1 Outperform/Buy
- 2 Market Perform/Hold
- 3 Underperform/Sell
- SR Suspended
- NR Not Rated
- NE No Estimate

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P: Risks include the high cost of content licensing, competition for users, and failure to meet paid subscription growth targets.

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2=Market Perform: The stock appears appropriately valued, and we believe the stock's total return will be in line with the market over the next 12 months. HOLD
3=Underperform: The stock appears overvalued, and we believe the stock's total return will be below the market over the next 12 months. SELL

SECTOR RATING
O=Overweight: Industry expected to outperform the relevant broad market benchmark over the next 12 months.
M=Market Weight: Industry expected to perform in-line with the relevant broad market benchmark over the next 12 months.
U=Underweight: Industry expected to underperform the relevant broad market benchmark over the next 12 months.

VOLATILITY RATING
V = A stock is defined as volatile if the stock price has fluctuated by +/-20% or greater in at least 8 of the past 24 months or if the analyst expects significant volatility. All IPO stocks are automatically rated volatile within the first 24 months of trading.

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Industry Update

June 27, 2017

Internet: Applications and Media

Spotify Showing Momentum Ahead of Possible Listing

Spotify added 20mn paying subscribers in the last year, more than the 18mn added in the best year at Netflix (NFLX, Buy, $157.50, $195 PT), a similarly priced media service. Content costs are still very high, estimated to be 68% of revenue last year, but licensing renewals are said to be about 600bps lower (after windowing concessions made by Spotify). We see other structural pathways for continued content cost and gross margin improvement over time. Assuming reports on licensing are correct, subscriber growth continues at high rates and the model continues to scale, we illustrate a scenario of $1.7Bb of net profit by 2022. We think the stock would likely trade at 20x to 25x forward earnings, which could make it a +$35bn company in 4-years. We look forward to more disclosure as a direct listing appears to be coming later this year. **We are neither participating in the offering of Spotify nor are we initiating coverage with this report. We are not making any stock recommendations in this report.** *Reach out to your MKM rep. for a copy of the most recent financial filings (2016 annual) as well as a working subscriber model and framework for evaluating earnings potential.*

Impressive subscriber momentum

- In March, Spotify reported that it had reached 50mn paying subscribers, adding over 20mn new paid members in one year. This is a meaningful acceleration from 13mn additions in 2015 and 5mn in 2014.
- In mid-June the company disclosed that total active users reached 140mn. While there is still a wide discrepancy between free, ad-supported and paying subscribers, the conversion ratio appears to be improving materially.
- We estimate that Spotify is now converting over 70% of net new users to net paying users, up from around 55% last year, 40% in 2015 and 25% in 2014. This has been point of contention with music labels in the past, but patience appears to be paying off.

Subscription revenue is 90% of revenue, but the advertising business is also growing fast

- The U.S. is now 40% of revenue, from 30% two years ago. This implies around 19mn U.S. subs at end-2016 with about 9mn in the UK/ Sweden and 20mn elsewhere around the world.
- Implied subscriber ARPU implies a surprisingly large y/y decline. We assume this is impacted by foreign exchange and some mix shift to student plans. This could also be an even greater Q4-loaded year than we have modeled.

Still loss making

- Spotify recorded non-GAAP losses of about $520mn for 2016 on revenue of $3.2bn. Losses were about $290mn greater than in 2015 despite 52% revenue growth. Cash gross margin of 15.1% was up about 160bps.

Content costs set to improve

- Content costs have been reportedly in the 68-69% range, with 58% to labels and 10-11% to publishers. After being out of contract with all three major labels for an extended period (multiple years), Spotify renewed with Universal Music Group in April.
- Reports suggest that UMG may be worked down to around 52%, but Spotify offered a major concession on windowing. UMG artists will now be able to release new material to only paid members for up to two weeks before it becomes available to free listeners.
- We think changes in industry structure are diminishing value proposition of labels to artists and that artists should increasingly look to license directly to the major platforms. This could materially increase the compensation to artists and lower content costs to Spotify over time.
- We also think a recent acquisition of a blockchain technology company (Mediachain) could lead to meaningful improvement in gross margin. It may be possible to use blockchain technology to disintermediate third parties from reporting and payments between Spotify and rights holders. This could improve transparency and speed of payment to artists while lowering cost of revenue.

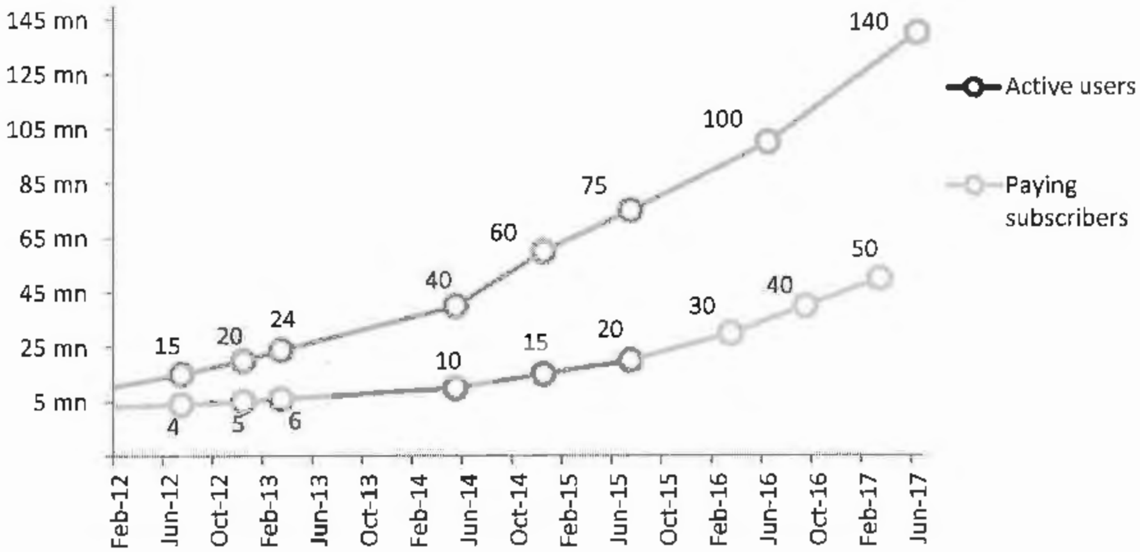
Significant earnings potential by our illustrative framework

- There have been several media reports suggesting that Spotify may forgo a formal IPO process in favor of a direct listing (supposedly on the NYSE).
- While still not profitable, this significant earnings power is why the company is reported to be having little problem raising money at $13bn valuation.

Potential direct listing late 2017

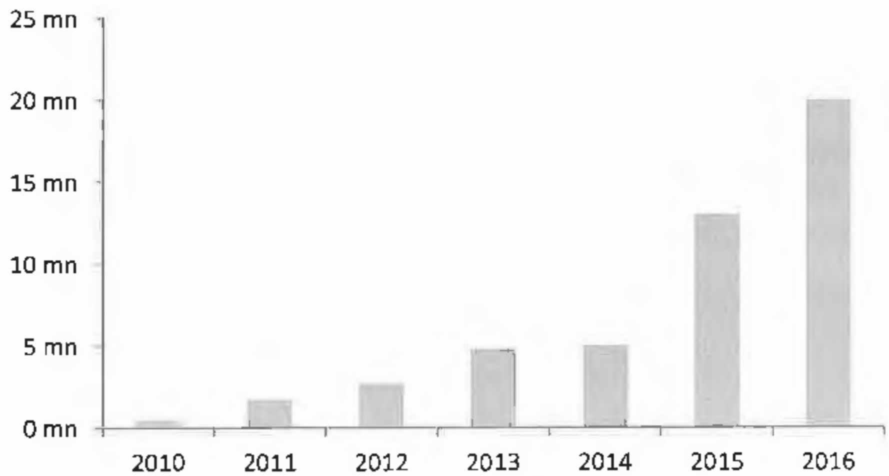
- There have been several media reports suggesting that Spotify may forgo a formal IPO process in favor of a direct listing (supposedly on the NYSE).
- Comments in early June by board member and co-founder during a radio interview in Sweden suggested the IPO is definitely not being considered, but the direct listing is were revoked by the company's official spokesperson. She also confirmed that the company has hired bankers Morgan Stanley, Goldman Sachs and Allen & Co. to advise in the process.

Spotify Reported User Milestones



Source: company reports

Acceleration in net paid additions



Source: company reports

We are neither participating in the offering of Spotify shares nor are we initiating coverage/making any stock recommendations.

Of potential comps, we're asked most often how we would compare Spotify with Netflix

Content exclusivity: The subscription video space is evolving toward content exclusivity. This makes competing services more complementary than substitutes. The music space has more limited opportunity for exclusivity (pre-releases, side-tracks/deep cuts, live performance, etc.), making the services more substitutive.

Addressable market: Many investors/observers have noted that while there is a strong precedent for subscription video, most consumers are not willing to pay for music. We disagree. The recording industry peaked at about $27bn in physical media sales in 1999, which inflation adjusted is about $40bn today. We think there is also a strong precedent for consumers paying for music, it's just that the format has changed and for the better to the consumer.

Universal appeal: We think both services have global appeal but that music may travel even better than filmed entertainment.

Content costs: The cost of music licensing is the by far the biggest swing factor on earnings power and valuation for Spotify. It has been reported that Spotify's recent licensing renewals will lower content costs from 58% to 52% so long as minimum subscriber thresholds are met. We interpret this as only the sound recording rights, not the publishing rights (another 10-12%).

end-2016	Spotify	Netflix	Pandora	SiriusXM
Paying subscribers	**48 mn**	**89 mn**	**4 mn**	**31 mn**
y/y additions	*20 mn*	*18 mn*	*0 mn*	*2 mn*
Total users	*126 mn*	*94 mn*	*81 mn*	*31 mn*
Revenue	**$3,247 mn**	**$8,288 mn**	**$1,298 mn**	**$4,725 mn**
Subscription ARPU	$6.76	$8.61	$4.71	$11.23
Ad ARPU	$0.40	$0.00	$1.19	$0.38
Content spending	2,208	5,100	734	850
Other cost of revenue	540	667	101	715
Total cost of revenue	**$2,748 mn**	**$5,767 mn**	**$836 mn**	**$1,565 mn**
Gross margin	***15%***	***30%***	***36%***	***67%***
Content spending	*68%*	*62%*	*57%*	*18%*
Other cost of revenue	*17%*	*8%*	*8%*	*15%*
Other COR per user	*$4.29*	*$7.11*	*$1.25*	*$22.82*
shares		445 mn	255 mn	4,847 mn
stock price		**$158**	**$8.46**	**$5.30**
Market cap	**$13 bn***	**$70 bn**	**$2 bn**	**$26 bn**

** media reports for current financing round/Note: Pandora (P, Neutral, $8.28, $10 FV); Sirius XM (SIRI, Not Rated)*
Source: FactSet, company reports, MKM estimates

We are neither participating in the offering of Spotify shares nor are we initiating coverage/making any stock recommendations.

Can Spotify continue to leverage content costs lower?

Many investors fall back to the adage that "content is king" without considering the changing dynamics of the music industry. It's true that music services like Spotify have no business without access to licensed music for which there is no substitute.

Spotify is already by far the largest platform and growth is accelerating. As this continues, it's becoming increasingly conceivable, in our view, that Spotify could cut out the labels and go directly to musicians, expand their economics considerably while lowering overall content costs.

In April, the company renewed with Universal Music Group (the largest major label) and with Merlin (the largest independent label (MERL.LN, Not Rated)). It has been reported that the deal with UMG will allow for content costs to improve by about 600 bps. Spotify will give UMG unprecedented access to data, but Spotify also made a major concession on windowing. Going forward, Universal artists will have the option to release new albums only on the Premium service for two weeks, withholding new material from ad-supported listeners.

The role of the music label is diminishing, but economics are not

Artists have historically relied on music labels to provide marketing and distribution of their works and on music publishing groups as toll collectors for the scattered royalty streams around the globe. However, a lot has changed in the music business. Physical media is all but dead. Radio and MTV are no longer relevant platforms for music discovery or artist promotion. Music labels spending on A&R is nothing compared to two decades ago. There are now a very small number of growth platforms for consumption, of which Spotify is the largest.

All of these trends suggest that the value-add of major labels and publishing groups to musicians is becoming increasingly marginalized. Economic relationships, however, have not changed much.

It has been reported that major label artists receive about 20% of the total streaming royalty, while the music label and publisher (often the same company) take the huge majority of the royalty. Most artists don't understand how streaming economics work, but many complain that they see so little for their participation, have very little transparency and often have lengthy waiting periods before being paid. Much of the criticism of the artist community is directed toward the services like Spotify.

A report by a Los Angeles based law firm (Manatt, Phelps & Phillips) published in 2016 suggested that *artists not signed to a major label* can expect to receive **nearly 4x the royalty** from streaming compared to a major label artist.

In late 2014, after Taylor Swift very publically pulled her catalog from streaming services like Spotify, CEO Daniel Ek disclosed in a blog post here that the works of top artists were being paid over $6mn per year. Given the massive subscriber growth, on 2017 numbers this would imply about $22.5mn to a top artist. The framework provided by Manatt, Phelps & Phillips suggests that top artists will be receiving around $4.5mn in 2017 from Spotify, while their music labels and publishers receive about $18mn. Artists should be questioning the value the traditional music industry is providing to them in the streaming world.

Through Spotify, artists can now reach over 140mn listeners. Include just three other platforms – YouTube, Apple Music and Pandora – and we think artists have the potential to reach several hundred million listeners. As these services continue to grow, the value proposition of the label will continue to diminish.

Blockchain is another interesting development

Spotify incurs significant expense from third parties (i.e., payments firm Adyen) to handle measurement and settlement of transactions between music labels and publishers.

It is believed that Spotify's recent acquisition of blockchain technology company Mediachain Labs is an effort to create a new mechanism to handle payments that could significantly reduce its costs and provide a better, more transparent system for creators and rights holders.

Blockchain is most well known as the foundation for the cryptocurrency Bitcoin. It provides a digital ledger distributed across a network of computers, providing transparency for network participants without a centralized authority. We think this could disintermediate third-party vendors, provide more transparency and speed up payments to artists. This could also remove another point from the value chain that labels and performance rights organizations provide to artists, increasing the potential for disintermediation.

Spotify: Illustration of Potential Earnings Power

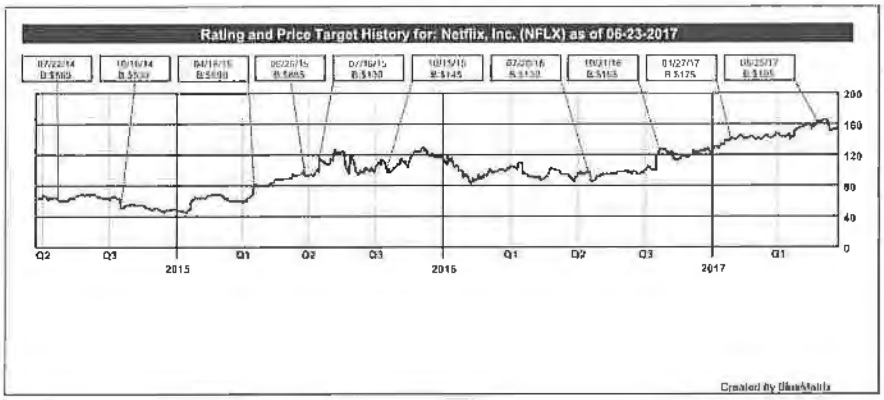
	2016	2017	2018	2019	2020	2021	2022
Total users (mn)	126	159	187	211	233	251	267
Paid subscribers (mn)	48	68	88	106	122	136	148
Subscription revenue (mn)	$2,920	$5,059	$7,390	$9,796	$12,215	$14,226	$16,100
Advertising revenue (mn)	$327	$327	$468	$597	$727	$860	$998
Total revenue	**$3,247**	**$5,386**	**$7,858**	**$10,393**	**$12,942**	**$15,086**	**$17,098**
Music licensing	68%	65%	63%	62%	61%	60%	60%
Other COGS per user	$4.29	$4.00	$3.50	$3.30	$3.20	$3.10	$3.00
gross margin	*15%*	*23%*	*29%*	*31%*	*33%*	*35%*	*35%*
Product development	***6.5%***	***6.3%***	***6.1%***	***6.0%***	***6.0%***	***6.0%***	***6.0%***
Sales and marketing	*13.9%*	*13.6%*	*13.3%*	*13.0%*	*12.5%*	*12.0%*	*11.5%*
General and admin.	*5.1%*	*4.8%*	*4.6%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*
Tax rate			*10%*	*25%*	*25%*	*25%*	*25%*
Net profit (mn)	**($329)**	**($80)**	**$330**	**$608**	**$995**	**$1,396**	**$1,707**

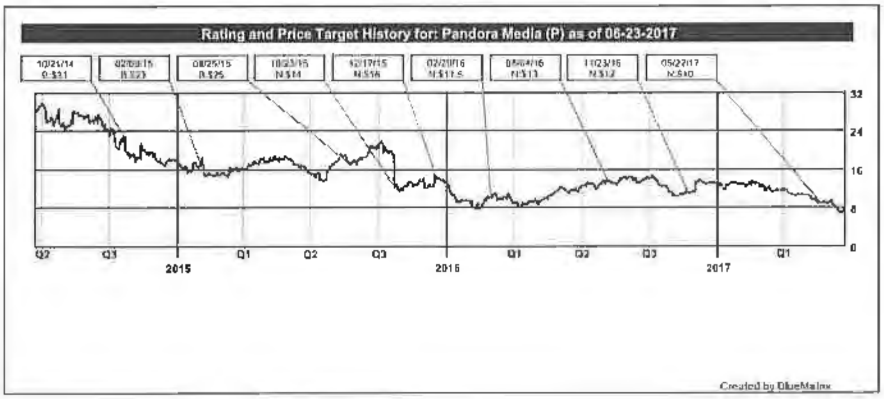
Source: company reports, MKM estimates

We are neither participating in the offering of Spotify shares nor are we initiating coverage/making any stock recommendations.

Other Public Companies Mentioned:

Company Name	Ticker	Price	Rating	PT/FV
Netflix, Inc.	NFLX	$158.02	Buy	195.00
Pandora Media	P	$8.28	Neutral	10.00





Valuation Methodology:

NFLX: Our 12-month price target of $195 per share assumes 22.5x forward EPS in 2020E, discounted at 25% per year.

P: We arrive at our fair value estimate with the assumption that media reports of LMCA floating a $15 offer and that the stock would collapse back to $9 if deal speculation were to disappear. Our $10 fair value estimate is the midpoint of these scenarios.

Risks:

NFLX: There are inherent risks that the target price for any security will not be realized, especially in emerging growth markets. In addition to general market and macroeconomic risks, for NFLX, these risks include, among other things: (1) fixed cost leverage as NFLX is making very significant bets on content and is losing large sums of money to develop international markets, (2) subscriber growth could slow while the bull case on NFLX depends on a significant amount of subscriber growth for many years, (3) international markets may not develop, (4) a hot-hand in original programming could turn cold, (5) there are many large competitors participating or looking to enter the space, (6) the long-term cost model is unknown and our earnings power analysis depends on scale in content spending and (7) lack of network neutrality or aggressive usage caps could ultimately lead to higher delivery costs for NFLX or for users which would effectively raise price to consumer with no benefit to the company.

P: There are always risks that the target price for any security will not be realized. In addition to general market and macroeconomic risks, for P, these risks include, among other things: 1) a reversal in content cost escalation; 2) P achieves a significant premium to traditional radio advertising with new interactive ad formats or otherwise; 3) the company is acquired; 4) investors continue to look through business model challenges for an extended period; 5) competitive efforts fail and rapid audience expansion resumes; 6) P's subscriber business sees mass-market adoption.

Distribution of Ratings
MKM Partners, Equity Research

	Investment Banking Serv./Past 12 Mos.

Rating	Count	Percent	Count	Percent
BUY [BUY]	77	52.74	0	0
HOLD [NEUTRAL]	67	45.89	0	0
SELL [SELL]	2	1.37	0	0

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June 22, 2017

Apple Inc.

Apple Music vs. Spotify: Can You Hear the Battle Drums?

Our view: We outline the multiple steps Apple has taken recently to grow Apple Music's share of the streaming market.

Key points:

All You Need to Know: Apple Music has been growing at a solid clip and presently has 27M subscribers vs. ~20M as of Dec. However, it still lags behind Spotify which announced ~50M paid subscribers in March (vs. 40M in Sep-16). Apple has been taking multiple steps to gain share in Music, which is central to its larger push to double Services revenue by 2020 (Refer to our Services Primer for details on services business). 1.) Apple lowered pricing for users who buy an annual subscription vs monthly. Annual subscription costs $99/year vs. $9.99/month and offers a ~17% discount. 2) Apple is seeking to reduce record labels' current 58% revenue share from streaming. Earlier, Spotify successfully lowered the record label cut to 52% from 55% by providing subscriber growth guarantees. (Source: Bloomberg) 3.) At WWDC, AAPL introduced social features similar to Spotify, adding the ability to share playlists/songs with friends and allowing users to see what their friends are listening to. 4) AAPL supplements the streaming business with free TV shows like recently released "Planet of the Apps" and "Carpool Karaoke" (release in August). In a further commitment to create original content, AAPL recently hired two top Sony Pictures executives that were behind successful shows like Breaking Bad and The Crown.

Fundamentally, we remain positive on AAPL based on: 1) iPhone 8 cycle tailwinds; 2) sustained high-teens services growth and 3) potential cash repatriation benefits. Maintaining Outperform rating and price target at $168.

Apple Music vs. Spotify: (a.) Content: Apple Music has a larger catalog and has struck more exclusive deals with artists. It is also increasingly investing in exclusive video content for the Music service. (b.) AAPL allows integration with iTunes library. (c.) Social features: Presently, only Spotify allows users to share playlists and let them see what songs their friends are playing. (d.) Music discovery and others: Apple uses curated playlists and Beats 1 radio. Spotify appears to have a slight advantage with multiple tools like Release Radar, New Music Friday, and personalized Discover Weekly playlist. (e.) Pricing is essentially the same though Spotify offers a free service with ads.

Services 101: AAPL expects Services to be the size of a F100 company by FY17 (~$28B in revenues) and double by FY20, implying ~18% CAGR. Currently in the $24B Services portfolio, we estimate the largest components are A) App Store ($8.5B, or 3.9% of total revenues), B) iTunes/Apple Music (~$5.5B, 2.5%), C) AppleCare & Services (~$4.1B, 1.9%), D) Licensing & Other including iCloud, Apple Pay and others (~$5.9B, 2.7%).

Sector: IT Hardware

Outperform

NASDAQ: AAPL; USD 145.63

Price Target USD 168.00

WHAT'S INSIDE	
☐ Rating/Risk Change	☐ Price Target Change
☐ In-Depth Report	☐ Est. Change
☐ Preview	☑ News Analysis

Scenario Analysis*

Downside Scenario	Current Price	Price Target	Upside Scenario
105.00	145.63	168.00	195.00
↓ 26%		↑ 17%	↑ 35%

*Implied Total Returns

Key Statistics

Shares O/S (MM):	5,328.0	Market Cap (MM):	775,917
Dividend:	2.28	Yield:	1.6%
BVPS:	23.78	P/BVPS:	6.12x
		Avg. Daily Volume:	29,778,684

RBC Estimates

FY Sep	2015A	2016A	2017E	2018E
EPS, Ops Diluted	9.22	8.28	8.90	9.79
P/E	15.8x	17.6x	16.4x	14.9x
Revenue	233.7	215.6	225.4	238.3

EPS, Ops Diluted	Q1	Q2	Q3	Q4
2016	3.28A	1.90A	1.42A	1.67A
2017	3.36A	2.10A	1.58E	1.87E
2018	3.48E	2.42E	1.81E	2.08E
Revenue				
2016	75.9A	50.6A	42.4A	46.9A
2017	78.4A	52.9A	44.9E	49.3E
2018	79.9E	59.3E	47.0E	52.1E

All values in USD unless otherwise noted.

Target/Upside/Downside Scenarios

Exhibit 1: Apple Inc.

Source: Bloomberg and RBC Capital Markets estimates for Upside/Downside/Target

Target price/base case

In the current environment with $250B+ in cash, we believe the stock is undervalued at these levels. From a product perspective, we believe the company can continue to gain share in both the tablet and smartphone space. In our view, the smartphone space is currently a two-horse race where Apple will be one of the winners in continuing to gain market share. Our base case of $168/share is based on ~18x FTM EPS, as we think Apple will return to y/y revenue growth in FY17.

Upside scenario

In our upside scenario of $195, we see Apple's services growing at a faster than anticipated rate and lifting company gross margins above the 40% level. In this scenario, we believe the stock deserves to be valued higher, as EPS growth expansion would likely outpace revenue growth for the company over the next several years. In this scenario, we believe many investor concerns would be quelled, causing the stock price to move well above our current price target. Our upside price reflects ~20x FY18E EPS.

Downside scenario

In our downside scenario of $105, the company begins to lose market share in both the smartphone and tablet markets. These two product lines generate the bulk of Apple's revenue and EPS. If new competitors impinge on the company's current market share, we believe the financial model would become increasingly difficult to maintain.

Investment summary

Themes. We believe AAPL's current stock price creates an attractive entry point for investors to benefit from its ability to return to revenue and EPS growth in FY17. We believe multiple catalysts remain as the company benefits from: (1) iPhone ramps; (2) Mac/iPad refresh cycle; (3) potential iTV launch or other major product lines; and (4) improvements in capital allocation policy. We believe the fundamental reality remains that AAPL's valuation is materially sub-par to what we anticipate is its long-term revenue and EPS potential.

It's the ecosystem, not just hardware. We believe AAPL's true differentiation is its unique computing ecosystem: iOS. iOS provides users with an integrated, scalable, and seamless experience across multiple devices, which we believe will be difficult for competitors to replicate in scale. Simplistically, the scale of users attracts application developers, which in turn bolsters the number of users. We believe this cycle results in a captive consumer base that transitions more data and usage via iOS on Apple devices.

Vertical integration. While the benefits of integrating and developing hardware and software simultaneously are well recognized with Apple, we believe another byproduct of this is that Apple is able to pursue a substantially larger profit pool vs. any of its peers. Simplistically, rather than just targeting the hardware layer, AAPL is able to capture incremental profits by also being the OS developer, processor manufacturer, and in some instances the retailer of the product.

Multiple levers in place. We believe AAPL has multiple levers ahead of it that should drive further revenue acceleration. Notably, we believe emerging markets penetration will remain a key and material revenue driver for the company over the next several years. Furthermore, we believe success and growth in Enterprise markets will open up a stickier and higher-margin segment. Finally, we believe new products (such as an iTV) could further expand AAPL's revenue opportunity and profit potential.

Amit Daryanani, CFA (415) 633-8659; amit.daryanani@rbccm.com

Valuation

Our price target of $168 is based on ~18x FTM EPS, which is slightly above AAPL's five-year price/FTM EPS multiple of 15x, as we think AAPL will revert to y/y revenue growth in FY17E. Our price target and implied return support an Outperform rating.

Risks to rating and price target

Risks include: unknown market acceptance of new products; new product launch delays; stronger-than-expected competitive response to iPhone; slower-than-expected international expansion; greater-than-expected iPod cannibalization; slower-than-expected Macintosh market share gains; channel conflicts or execution; and key executive or staff departures. We see Apple's valuation multiple as vulnerable should market sentiment continue to deteriorate, and it could compress further on unexpected competitive developments, execution stumbles, unexpectedly slowing growth, declining margins, PC market concerns, or a decline in overall market or technology market valuations.

Company description

Apple, founded in 1976, is a California-based designer, manufacturer, and marketer of differentiated personal computers, software, and services. Products include the Macintosh line of personal computers, Mac OS X operating system and related application software (iLife, iWork, etc.), services, and peripherals, the iPod line of portable digital media players, the iTunes online media store, iPhone Smartphone, and iPad tablet. Apple is positioned in the high-end consumer sector, has a strong global brand and fiercely loyal customer base, and is supported by its retail store network. Apple has approximately 110,000 employees.

RBC Capital Markets

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Apple Inc. (NASDAQ:AAPL)
Fiscal Year End September

Guidance	Dec-15A	Mar-16A	Jun-16A	Sept-16A	Dec-16A	Mar-17A	Jun-17E	Sept-17E	Dec-17E	Mar-18E	Jun-18E	Sept-18E	Dec-18E
Revenue ($ in Billions)	$75.5-77.5	$50-53	$41-43	$45.5-47.5	$76-78	$51.5-53.5	$43.5-45.5						
Gross Margin (%)	39-40%	39-39.5%	37.5-38%	37.5-38.0%	38-38.5%	38.0-38.5%	37.5%-38.5%						
OPEX ($ in billions)	$6.3-6.4	$6-6.1	$6-6.1	$6.05-6.15	$6.9-7.0	$6.5-6.6	$6.5-6.6						
Other ($ millions)	$400	$325	300	$350	$400	$400	$450						
Tax Rate (%)	26.2%	25.5%	25.5%	25.5%	26.0%	26.0%	25.5%						

Guidance	FY15	FY16	FY17E	FY18E	CY15	CY16	CY17E	CY18E
Revenue ($ in Billions)	–	–	–	–	–	–	–	–
Gross Margin (%)	–	–	–	–	–	–	–	–
OPEX ($ in billions)	–	–	–	–	–	–	–	–
Other ($ millions)	–	–	–	–	–	–	–	–
Tax Rate (%)	–	–	–	–	–	–	–	–

US$ MM	Dec-15A	Mar-16A	Jun-16A	Sept-16A	Dec-16A	Mar-17A	Jun-17E	Sept-17E	Dec-17E	Mar-18E	Jun-18E	Sept-18E	Dec-18E
Net Sales	75,872	50,557	42,358	46,852	78,351	52,896	44,881	49,414	79,880	59,246	46,891	52,066	81,006
Q/Q Change	47%	-33%	-16%	11%	57%	-32%	-15%	10%	62%	-26%	-21%	11%	56%
Y/Y Change	2%	-13%	-15%	-9%	3%	5%	6%	5%	2%	12%	5%	5%	1%
COGS = non-GAAP	45,449	30,636	26,252	29,039	48,175	32,305	27,826	30,428	48,653	36,237	28,693	31,741	49,009
Gross Profit	30,423	19,921	16,106	17,813	30,176	20,591	17,055	18,986	31,237	23,109	18,298	20,328	31,997
Gross Margin %	40.1%	39.4%	38.0%	38.0%	38.5%	38.9%	38.0%	38.5%	39.1%	38.9%	38.9%	39.0%	39.5%
Q/Q Change	48%	-35%	-19%	11%	69%	-32%	-17%	11%	65%	-26%	-21%	11%	57%
Y/Y Change	2%	-25%	-28%	-13%	-1%	3%	6%	7%	4%	12%	7%	7%	2%
R&D	2,404	2,511	2,560	2,570	2,871	2,776	2,826	2,766	3,555	3,323	3,054	3,114	3,868
Q/Q Change	6%	4%	2%	0%	12%	-3%	2%	-2%	28%	-7%	-8%	2%	24%
Y/Y Change	27%	31%	26%	16%	19%	11%	10%	8%	24%	20%	8%	12%	9%
% of revenue	3.2%	5.0%	5.0%	5.5%	3.7%	5.2%	6.3%	5.7%	4.5%	5.6%	6.5%	6.0%	4.6%
SG&A	3,848	3,423	3,441	3,482	3,946	3,718	3,650	3,600	4,194	3,739	3,477	3,853	4,556
Q/Q Change	4%	-11%	1%	1%	13%	-6%	-1%	-2%	17%	-11%	-7%	11%	18%
Y/Y Change	7%	-1%	-5%	-6%	3%	9%	7%	3%	6%	1%	-6%	7%	8%
% of revenue	5.1%	6.8%	8.1%	7.4%	5.0%	7.0%	8.2%	7.3%	5.3%	6.3%	7.4%	7.4%	5.6%
Total operating expenses	6,252	5,934	6,001	6,052	6,817	6,494	6,505	6,366	7,749	7,062	6,532	6,977	8,425
Q/Q Change	6%	-5%	1%	1%	13%	-5%	0%	-2%	21%	-9%	-8%	7%	21%
Y/Y Change	14%	10%	7%	2%	9%	9%	8%	6%	14%	9%	0%	9%	9%
% of revenue	8.2%	11.7%	14.2%	12.9%	8.7%	12.3%	14.5%	13.0%	9.7%	11.9%	13.9%	13.4%	10.4%
EBIT	24,171	13,987	10,105	11,761	23,359	14,097	10,547	12,600	23,488	16,047	11,767	13,350	23,573
EBIT margin	31.9%	27.7%	23.9%	25.1%	29.8%	26.7%	23.5%	25.6%	29.4%	27.0%	25.0%	25.6%	29.1%
Other Income (expense)	402	155	364	427	821	587	450	400	400	400	400	400	400
Income (loss) before Taxes	24,573	14,142	10,469	12,188	24,180	14,684	10,997	13,000	23,888	16,447	12,167	13,750	23,973
Provision for Taxes	6,212	3,626	2,673	3,174	6,289	3,655	2,804	3,380	6,211	4,276	3,163	3,575	6,233
Tax rate	25.3%	25.6%	25.5%	26.0%	26.0%	24.9%	25.5%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%
Net Income (excl. SBC)	18,686	10,841	8,850	9,364	19,147	12,246	9,293	9,970	18,002	12,496	9,353	10,525	18,065
Net Margin %	24.6%	21.4%	20.9%	20.0%	24.4%	23.2%	20.7%	20.2%	22.5%	21.1%	19.9%	20.2%	22.3%
Shares-Basic	5,558.3	5,514.4	5,443.1	5,366.2	5,298.7	5,225.6	5,165.6	5,105.8	5,045.8	4,985.8	4,925.8	4,865.8	4,805.8
Shares-Diluted	5,594.1	5,540.9	5,472.8	5,393.3	5,328.0	5,261.7	5,201.7	5,141.7	5,081.7	5,021.7	4,961.7	4,901.7	4,841.7
GAAP Basic EPS	$3.30	$1.91	$1.43	$1.69	$3.39	$2.11	$1.59	$1.88	$3.50	$2.44	$1.83	$2.09	$3.69
GAAP Diluted EPS	$3.28	$1.90	$1.42	$1.67	$3.36	$2.10	$1.58	$1.87	$3.48	$2.42	$1.81	$2.08	$3.66

US$ MM	FY15	FY16	FY17E	FY18E	CY15	CY16	CY17E	CY18E
Net Sales	233,715	215,639	225,442	238,295	234,988	218,118	226,981	239,412
Q/Q Change	-	-	-	-	-	-	-	-
Y/Y Change	28%	-8%	5%	6%	18%	-7%	4%	5%
COGS = non-GAAP	140,089	131,376	138,634	145,323	140,680	134,102	139,112	145,679
Gross Profit	93,626	84,263	86,808	92,972	94,308	84,016	87,869	93,733
Gross Margin %	40.1%	39.1%	38.5%	39.0%	40.1%	38.5%	38.7%	39.2%
Q/Q Change	-	-	-	-	-	-	-	-
Y/Y Change	33%	-10%	3%	7%	20%	-11%	5%	7%
R&D	8,067	10,045	11,261	13,057	8,575	10,512	11,945	13,390
Q/Q Change	-	-	-	-	-	-	-	-
Y/Y Change	34%	25%	12%	16%	30%	23%	14%	12%
% of revenue	3.5%	4.7%	5.0%	5.5%	3.6%	4.8%	5.3%	5.6%
SG&A	14,329	14,194	14,944	15,265	14,577	14,292	15,192	15,608
Q/Q Change	-	-	-	-	-	-	-	-
Y/Y Change	19%	-1%	5%	2%	16%	-2%	6%	3%
% of revenue	6.1%	6.6%	6.6%	6.4%	6.2%	6.6%	6.7%	6.5%
Total operating expenses	22,396	24,239	26,205	28,320	23,153	24,804	27,137	28,996
Q/Q Change	-	-	-	-	-	-	-	-
Y/Y Change	24%	8%	8%	8%	21%	7%	9%	7%
% of revenue	9.6%	11.2%	11.6%	11.9%	9.9%	11.4%	12.0%	12.1%
EBIT	71,230	60,024	60,603	64,652	71,155	59,212	60,731	64,737
EBIT margin	30.5%	27.8%	26.9%	27.1%	30.3%	27.1%	26.8%	27.0%
Other Income (expense)	1,285	1,348	2,258	1,600	1,517	1,767	1,637	1,600
Income (loss) before Taxes	72,515	61,372	62,861	66,252	72,672	60,979	62,368	66,337
Provision for Taxes	19,121	15,685	16,129	17,225	18,941	15,752	16,050	17,243
Tax rate	26.4%	25.6%	25.7%	26.0%	26.1%	25.8%	25.7%	26.0%
Net Income (excl. SBC)	55,909	47,741	50,656	52,018	55,683	48,202	49,510	51,189
Net Margin %	23.9%	22.1%	22.5%	21.8%	23.7%	22.1%	21.8%	21.4%
Shares-Basic	5,753.4	5,470.8	5,199.0	4,855.8	5,682.4	5,405.8	5,135.9	4,885.8
Shares-Diluted	5,793.1	5,500.3	5,233.3	4,881.7	5,721.2	5,433.7	5,171.7	4,931.7
GAAP Basic EPS	$9.28	$8.35	$8.99	$9.89	$9.48	$8.88	$9.06	$10.03
GAAP Diluted EPS	$9.22	$8.30	$8.90	$9.79	$9.41	$8.35	$9.02	$9.98

Source: Company Reports and RBC Capital Markets Estimates.

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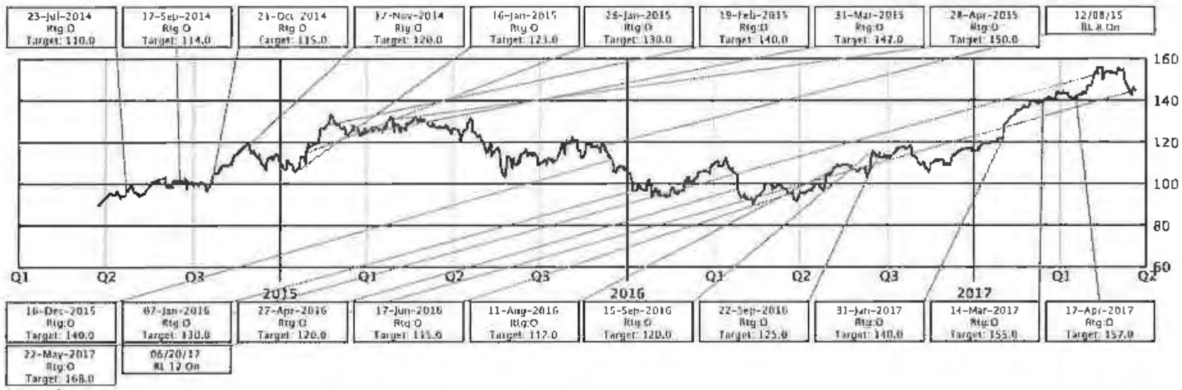
Rating and price target history for: Apple Inc. as of 21-Jun-2017 (in USD)



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Apple Inc.

Valuation

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AEGIS CAPITAL CORP

Company Update

March 3, 2017

Key Metrics

P - NASDAQ	$12.43
Pricing Date	Mar 2 2017
Price Target	$17.00
52-Week Range	$14.98 - $8.05
Shares Outstanding (mm)	255.2
Market Capitalization (mm)	$3,172.1
3-Mo Average Daily Volume	7,632,070
Book Value/Share	$3.56
Price/Book	3.5x

EPS FY: December

	2015A	Prior 2016A	Curr. 2016A	Prior 2017E	Curr. 2017E
1Q-Mar	(0.23)	--	(0.51)	--	(0.51)E
2Q-Jun	(0.08)	--	(0.33)	--	(0.31)E
3Q-Sep	(0.40)	--	(0.27)	--	(0.25)E
4Q-Dec	(0.09)	--	(0.41)	--	(0.17)E
FY	(0.79)	--	(1.52)	--	(1.20)E
P/E	NM		NM		NM

REVENUE

	2015A	Prior 2016A	Curr. 2016A	Prior 2017E	Curr. 2017E
1Q-Mar	230.8	--	297.3	--	314.9E
2Q-Jun	285.6	--	343.0	--	373.1E
3Q-Sep	311.6	--	351.9	--	444.8E
4Q-Dec	336.2	--	392.6	--	541.0E
FY	1,164.0	--	1,384.8	--	1,673.9E

Company Description:

Pandora is an Internet radio service primarily in the U.S. with an evolving service offering in New Zealand, and Australia and their associated territories. The service has over 78 million monthly active users, 100 million users every three months that listen for an average of 23 hours a month, and close to 4 million paying subscribers to its subscription ad-free service. Pandora also owns Ticketfly, a live events ticketing company, which it purchased on October 31, 2015 and is in the process of launching an on-demand music streaming subscription service. Pandora was founded in 1999 by Timothy Westergren (recently returned to Pandora as CEO), along with two co-founders: Will Glaser and Jon Kraft. It was incorporated in 2000 and is headquartered in Oakland, California. The company commenced its non-subscription, ad-supported radio service in 2005 and since then listeners have created over 9 billion stations. The Company went public on the New York Stock Exchange on June 15th, 2011 at $16 per share. Pandora was originally named Savage Beast Technologies.

Pandora Media Inc.

Rating: Buy

Spotify Sub Leap Evidence of Expanding Market For On-Demand

Investment Highlights:

Spotify @ 50M Subs. Spotify announced the crossing of 50M subscribers via Twitter (TWTR-$15.79:Sell) last night, adding 10M subscribers in five months. That compares to 20M subscribers for Apple Music at the end of 2016 - Eddy Cue, Apple's SVP of Internet Software and Services stated in Mid-February, that Apple was "well past" the 20M subscriber mark. Currently, under 100M consumers are paying for music worldwide compared to a potential market opportunity, we believe, of at least a billion. Spotify's subscriber leap is evidence, in our view, of an expanding market for paid on-demand music streaming. The market is in its infancy, rather than maturing.

Positive For Pandora. Spotify's announcement is creating headline risks for Pandora's stock this morning. However, Pandora is in a perfect position to capture subscribers from this expanding market, both from its existing subscriber base of 81M active users, and from non-Pandora users. Thus, we view this news from Spotify as as positive indicator of Pandora's ability to capture subs when it rolls out its premium on-demand product this month.

Maintain Buy & $17 Price Target. We continue to believe that an acquisition remains part of the bull case on the stock. Our price target is based on a DCF analysis using a WACC of 9.4% and a 9x implied terminal year EBITDA multiple. Pandora trades at 2.0x 2017 EV/Sales on our estimates. These multiples are at a discount to the group of Internet media stocks which trade at 3.2x 2017 EV/Sales. See Risk Factors and Valuation Methodology on page 2.

Required Disclosures

Price Target

Our price target on Pandora is $17

Valuation Methodology

Our price target is based on a DCF valuation analysis.

Risk Factors

Competition. Competition in online streaming, and on-demand streaming in particular, continues to grow. Spotify recently announced surpassing 40M subscribers, Apple Music in its short existence has 17M subscribers, Tidal is getting aggressive in the space with exclusive content, YouTube/Google Play is becoming increasingly relevant in addition to launching the YouTube Red service, and SoundCloud has 175M users globally.
Relationships With Labels. Pandora's relationships with the top music labels could sour in the future or could become less economical when contracts are up for renegotiation.
Execution Risks. High execution risks from juggling multiple investments : the existing lean-back service, the forthcoming on-demand service, international expansion, and expanding the ticketing service.

For important disclosures go to www.aegiscap.com.

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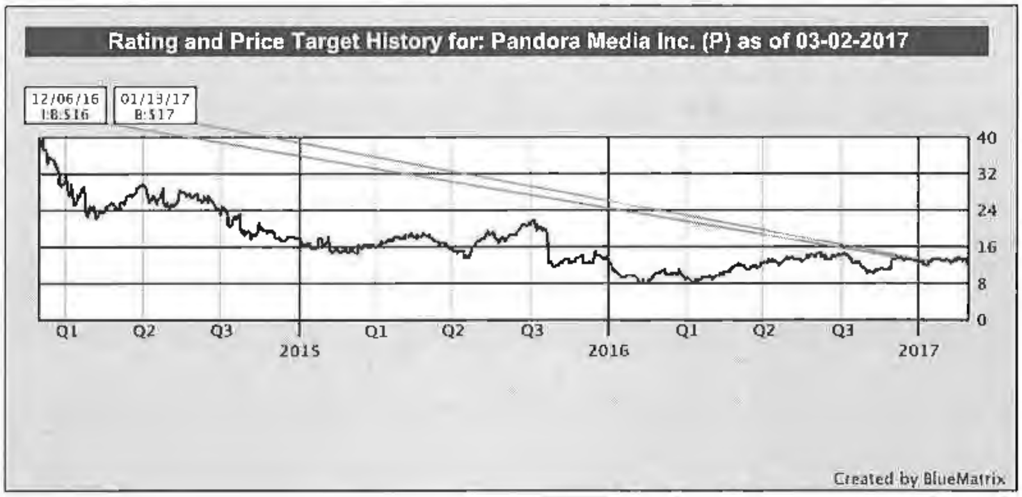

Rating	Percent	Investment Banking Services/Past 12 Mos. Percent
BUY [BUY]	**85.71**	**29.17**
HOLD [HOLD]	**13.39**	**20.00**
SELL [SELL]	**0.89**	**0.00**

Meaning of Ratings

A) A Buy rating is assigned when we do not believe the stock price adequately reflects a company's prospects over 12-18 months.

B) A Hold rating is assigned when we believe the stock price adequately reflects a company's prospects over 12-18 months.

C) A Sell rating is assigned when we believe the stock price more than adequately reflects a company's prospects over 12-18 months.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on November 13, 2017, all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via the Court's SDNY Procedures for Electronic Filing.

/s/ Steven G. Sklaver
Steven G. Sklaver