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Methodology of BofAML HY Default Rate Calculation

Bank of America Merrill Lynch

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A transparent, flexible, and timely way to track HY defaults

This publication presents a formal introduction to the methodology behind our BofAML HY bond default rate calculations. While such rates have historically been determined by the rating agencies, we decided to step into this playing field with a goal of adding more transparency, flexibility and timeliness to the process. We calculate default rates in both issuer- and face value-weighted terms. Since our calculations are based on our bond indexes, we are able to drill down to each specific cusip that goes into our default rates. Therefore, in addition to showing the total number of issuers or dollar value of bonds that defaulted, we can also perform subsequent studies, such as pre- and post default performance measurements.

Types of standard rates being calculated

The scope of our coverage is very broad – we are now tracking both issuer- and par-weighted default rates globally, both DM and EM, and regional breakdowns in each of those markets. We can also measure default experience by credit quality with LTM monthly calculations for BBs, Bs, and CCCs as well as industry sector breakouts. We have also developed a method to calculate defaults constrained by maturity, such as sub-3yr defaults. Finally, we extend this analysis to calculate defaults in distressed and non-distressed segments of the market, including some finer breakdowns, such as price bucket defaults (e.g. bonds priced 70-90pts).

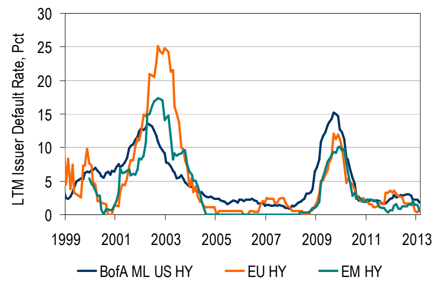
Customizable rates open new doors to understanding risk

A cusip-level dataset allows us to achieve unparalleled flexibility in terms of the type of rates being calculated, from broad market, to regions, sectors, qualities, price characteristics, etc. We are now also capable of calculating customized default rates tailored to specific portfolios or strategies. We welcome our clients' feedback on this new undertaking and requests for such customized calculations.

Things we discovered with new rates

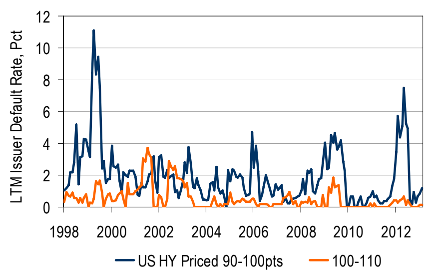
While the goal of this publication is to introduce our new default rate methodologies, there is never a bad time to learn something new about things we could not observe and measure before. For example, we discovered that distressed HY default rate consistently leads overall market's credit cycles both on the way up and on the way down. Short-duration HY defaults have only a mixed record on this scale, although it still exhibits higher sensitivity to conditions. Slightly discounted bonds – priced between 90pts and par – usually experience a credit cycle every three years or so, having seen peak defaults in 2012, 2009, 2006, and so on. Their defaults often peak at about 4-5%. When it comes to deeply discounted bonds priced at under 50pts, default rates could peak at rates as high as 70-80% (2012 saw the whole bucket going into restructuring).

Regional issuer-weighted HY default rates



Source: BofA Merrill Lynch Global Research

US HY default rates by initial price bucket



Source: BofA Merrill Lynch Global Research

Refer to important disclosures on page 8 to 12. Link to Definitions on page 7.
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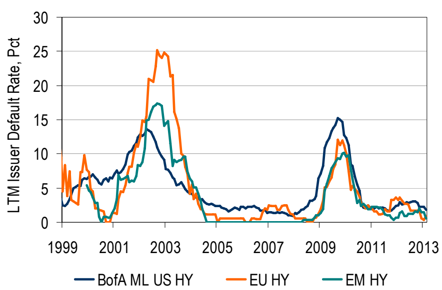
Methodology of BofAML HY Default Rate Calculation

This publication presents a formal introduction to the methodology behind our BofA Merrill Lynch HY bond default rate calculations. While such rates have historically been determined by the rating agencies, we decided to step into this playing field with a goal of adding more transparency, flexibility and timeliness to the process. We calculate default rates in both issuer- and face value-weighted terms. Since our calculations are based on our bond indexes, we are able to drill down to each specific cusip that goes into our default rates. Therefore, in addition to showing the total number of issuers or dollar value of bonds that defaulted, we can also retrieve each affected security and perform subsequent studies, such as pre- and post default performance measurements. Secondly, a cusip-level dataset allows us to achieve unparalleled flexibility in terms of the type of rates being calculated: from broad market, to regions, sectors, qualities, price characteristics, etc. Finally, we strive to report our monthly default rates promptly after month-end, and are able to track them in real time as events unfold. Figure 1 shows a historical snapshot of our broad market issuer-weight default rates in the US, Europe, and EM. Following industry practice, we are including the following types of default events in our calculations: missed payment, bankruptcy, liquidation, and distressed exchange.[1]

Figure 1: Regional HY issuer default rates

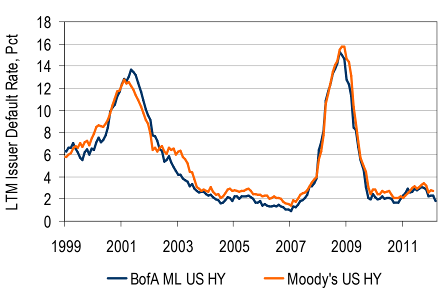


Source: BofA Merrill Lynch Global Research

The underlying universe used in all our default rate calculations consists of the full set of issuers/issues that constitute the global HY market. We combine all bonds in our HW00 (DM HY), EMHB (EM HY), and H544+HE0A (HY under 1yr to maturity) indexes, and then use appropriate subsets, tailored to the type of default rate being calculated, as the starting universe. With our rates being closely aligned to index composition, we believe they represent much cleaner benchmarks to actual portfolios maintained by most of our clients. For the full listing and selection criteria for our rates, please see the appendix at the end of this publication. Figure 2shows a side-by-side comparison of our global HY issuer default rate against that of Moody's.

Modified methodology for determining the universe size

Figure 2: BofA ML vs Moody's US issuer default rates



Source: BofA Merrill Lynch Global Research, Moody's

A commonly used methodology in calculating default rates is the standard LTM (last-twelve-month) approach, where an issuer has to be present in the market and satisfy all selection criteria (ratings, par, etc.) exactly one year prior (e.g. Dec 2012 HY defaults must be members of Dec 2011 universe). The default counts (or par amount in case of par default rates) are then summed across each LTM observation period and divided by the universe that existed at the start of that period, generating the LTM default rate for the month.

This requirement of a minimum one year presence in the HY market may make sense from the standpoint of broad market calculations, but it becomes too stringent when capturing default experiences of more fluid segments of the market, where transitions take place frequently and are considered to be a modus operandi for that market segment. Think about a distressed HY or price-bucket defined default rates, both of which we introduce later in this report, and our dissatisfaction with using the minimum one year presence requirement becomes apparent.

[1] Note: While we started tracking default rates on an ongoing basis only in the last few years, we have been able to back-calculate most of them to 1998 using historical index transitions, company filings and our on default records.

Instead, we reverse the determination process, and instead approach it from the opposite standpoint. On any given day, we determine the market as it existed at the time, for example all issuers rated CCC on Dec 31, 2011. We then count defaults that take place over subsequent twelve month as long as issuer was present in our CCC sample on the date above. In other words, it might have taken a week or 51 weeks for an issuer to default, we would still capture it in our calculation. Now, an argument could be made that broad market calculations are less susceptible to issuer transitions could thus be performed using a standard LTM method. We however believe the argument of consistency prevails here, and we thus decided to utilize this modified forward-looking universe definition approach for all our default rates, both broad and narrow, issuer- and par-weighted.

Addressing fallen angel defaults

By design, this modified universe-determination technique captures all fallen angel defaults, i.e. IG issuers that briefly transition through the HY index on their way to default. The question of whether to include such issuers in HY default rate calculations has always been a topic of discussion; one could reasonably make an argument that such issuers registered in HY and thus should be captured as HY defaults. At the same time, an opposing opinion that in certain circumstances, HY investors have sufficient evidence to believe such issuers are on an unsustainable financial path as they enter HY, and thus never truly embrace them in the short period of time they have left prior to default; WorldCom, WaMu, and Icelandic banks come as good examples of the latter forms of transitions. Were these truly HY defaults or examples of obvious “fallen knives”, i.e. rapidly deteriorating capital structures on their short way from IG to default?

Figure 3: BofA ML global HY issuer default rate components

Universe size references 1yr-prior cohort

Month	LTM Count	Universe Size	Default Rate
Jan 2012	40	1696	2.36
Feb 2012	48	1712	2.80
Mar 2012	45	1744	2.58
Apr 2012	43	1786	2.41
May 2012	46	1813	2.54
Jun 2012	46	1822	2.52
Jul 2012	42	1816	2.31
Aug 2012	44	1824	2.41
Sep 2012	44	1817	2.42
Oct 2012	42	1806	2.33
Nov 2012	37	1818	2.04
Dec 2012	33	1842	1.79
Jan 2013	31	1849	1.68
Feb 2013	26	1876	1.39

Source: BofA Merrill Lynch Global Research

Because such determinations often end up being inconclusive, involve subjective matters and leave the door open for arguments on the other side, we decided to use some sort of quantitative measurements to define such instances. Such an approach, even if not perfect by design, brings one distinct advantage to the table: it offers full transparency as to what we have would consider being a HY default emanating from a previously IG issuer. Being mindful of too many exclusions based on this rule, we decided to limit to issuers with $3bn or more in par amount of bonds at the time of transition with less than a year in HY indexes. For those fact-checkers among us, this list consists of the following eight issuers: WorldCom, CIT, ResCap, WaMu, Allied Irish Bank, Glintir Bank (Iceland), Bank of Ireland, and Finova Capital. Readers will also notice that the list is very financial-heavy, with all issuers except for WorldCom coming from that sector. This, in our opinion, only adds to the argument to have these names excluded from our HY default rate calculations.

Issuer-based default rate

To calculate issuer-based default rates, we define a unique issuer by the first 6 digits of a security’s CUSIP, a common portion of the identifier that refers to the same subsidiary under a corporate umbrella[2]. Defining issuers this way provides a more granular way to measure defaults within corporate structures, compared to ticker-level calculations. This approach allows us to account for restructurings of certain legal entities in a more precise way without making an implicit assumption that the whole capital structure was affected. This approach works consistently well for US domiciled issuers; however its performance becomes spotty for European and EM names. For these names we used CINs – an

[2] For details of CUSIP identifier construction please refer to CUSIP Global Services, managed on behalf of the American Bankers Association by S&P Capital IQ.

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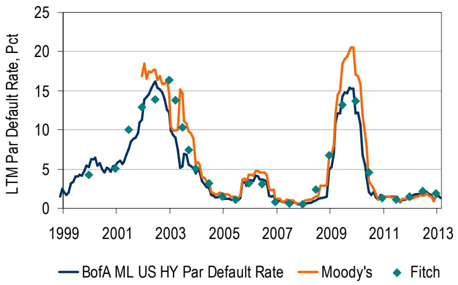
international CUSIP numbering system covering non-US securities. As a result, we use a combination of CINs and CUSIPs to derive our regional default rates.

Here is an illustration of our issuer default rate model: starting with the universe created at the beginning of March 2012, a total of 26 unique HY issuers defaulted globally in the 12-month period ending February 2013 (Figure 3). With the staring universe of 1,876 unique issuers, defined as unique 6-digit CUSIPs/CINs, the default rate comes in at 1.39% for the period ending February 2013.

Our other regional default rates include US, Europe, LatAm, EMEA, and Asia along with broad DM and EM default rates. While the methodology of calculations remains the same across default rates, the universe used changes depending on the filtering criteria used. Please refer to Figure 12 for the list of indices and criteria used in each of our default rate calculations.

Figure 4: Par-weighted default rates



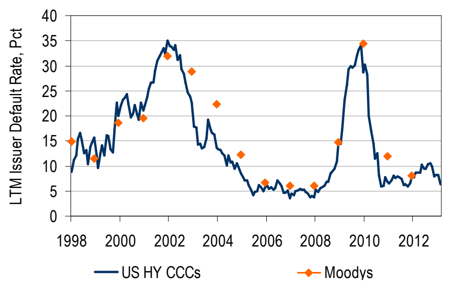
Source: BofA Merrill Lynch Global Research, Moody's, Fitch

Par-weighted default rate

Our par-default rate is calculated using the same methodology described earlier, and generates a trailing-12-month rate at the end of every month. Naturally, it is derived from the total dollar size of the universe exactly a year ago, and the defaulted dollar volume from that universe in the subsequent twelve-month period.

Our par default rate differs from that of Moody's, in two main ways: first, we exclude large fallen angel defaults, as described earlier (Moody's does no such determination). Second, we calculate our rates over straight corporate bonds with a fixed coupon schedule, excluding all convertible, preferred, floating and hybrid securities as they do not meet our index and universe inclusion criteria. Moody's, on the other hand, includes all such types of debt. The two peak differentials between Moody's and our par default rates as seen in Figure 4, happened in mid-2003 and late 2009, with Moody's overshooting our estimate in both cases. The first is due to the inclusion of WorldCom, and the second is attributable primarily to the inclusion of convertible and preferred securities issued by GM and Ford, in addition to fallen angel exclusions described earlier. Fitch's dollar default rates, also shown in Figure 4, are tracking our estimates closer as their definition also excludes convertible debt.

Figure 5: CCC issuer default rate



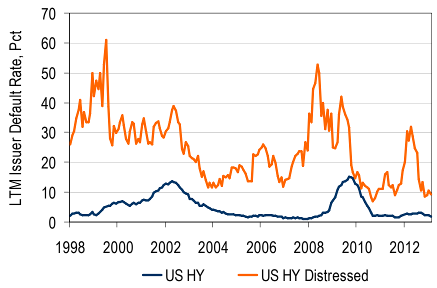
Source: BofA Merrill Lynch Global Research, Moody's

Alpha-rating and distressed default rates

Figure 5 plots a side-by side comparison of Moody's and our US CCC default rate. The two lines generally track each other very well. Our methodology, of course, allows us to determine such alpha-rating default rate for any given month, as opposed to Moody's once-a-year frequency of calculations on this level.

Figure 6 goes on to show US HY distressed default rate, defined as a cohort of names trading 1,000bp-plus formed a year ago. We also put this distressed default rate on the same chart as overall HY to help readers visualize the extent of differential in default probability once the names reaches a 1,000bp threshold.

Figure 6: Distressed HY default rate



Source: BofA Merrill Lynch Global Research

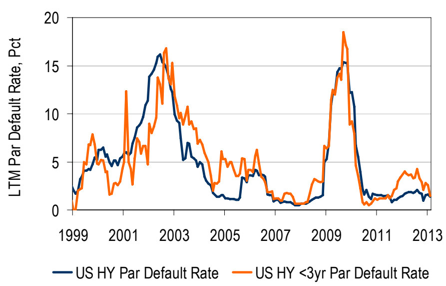
Perhaps the most interesting observation that jumps out at us in examining the distressed default rate chart is that it tends to lead broad HY defaults by a wide margin of time. For example, this rate peaked at over 60% in late 1999 and then in mid-2008, well in advance of subsequent peaks in overall HY defaults in early 2002 and late 2009. The reason for such a strong time lead, in our opinion, is that going into a new credit cycle, the distressed universe is often very small and once slower growth and restricted market access resurface, these names are often first to trip over and restructure. Notably, distressed defaults also stay at elevated levels of around 30-40pct for the duration of the credit cycle, and then they often fall first, before the broad market default rate follows suit. All in all, this highly-sensitive nature of distressed credits is a useful attribute in helping investors shape their expectations of broad market default environment going forward.

Maturity-constrained default rate

Figure 7 provides another angle on HY default environments by measuring default rate among bonds with less than three years to maturity. Note that this rate is calculated in par terms only given that most HY issuers would have bonds inside and outside of this maturity constraint. Measuring defaults in par terms here allows us to specifically relate the dollar volume of defaulted short-term HY bonds to the total volume of such bonds outstanding.

Short-duration HY default rate shows a relatively higher sensitivity to the cycle, a natural outcome, as these issuers are subject to a much greater dependency on ability to access the primary market, which of course has a tendency to shut down for riskier names at the first signs of increased risks. Thus, it is not very surprising to see short-duration default rate spiking well in advance of overall market in most historical episodes, including 2001, 2005, and 2012. Ironically, this rate failed to lead the broad market in 2008-09 experience, an outcome that in our opinion was driven by a sharp and immediate primary market shutdown for all types of issuers – with or without short-term maturities – in the aftermath of Lehman bankruptcy.

Figure 7: Short-duration HY default rate



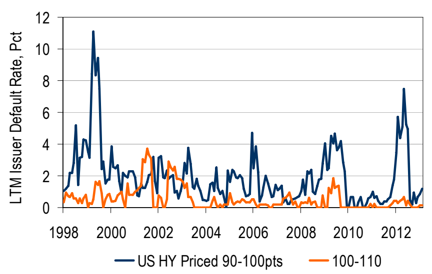
Source: BofA Merrill Lynch Global Research

Defaults by price bucket

In a similar vein to distressed defaults, we also measure the historical track record of defaults by various dollar price buckets in HY. We define buckets in 10-point increments around par levels (Figure 8), then in 20-point steps, down in deeply discounted segments above 50pts, and a single price bucket for sub-50pt bonds (Figure 9). Low sample size in sub-50pt range prevents further meaningful breakouts with that category.

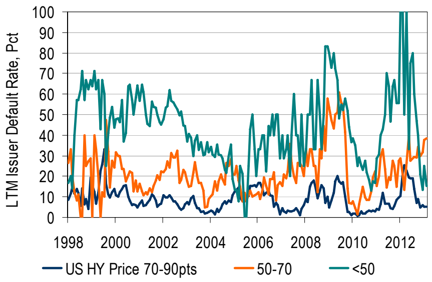
There are some very interesting observations that emerge from our initial examination of these charts. For example, bonds priced just under par, in the 90-100pt range, tend to exhibit higher cyclicality of their defaults, compared to overall market. Notice how the blue line in Figure 8 has distinct peaks in 2012 and 2006, years when the broad HY market defaults remained relatively subdued. In fact, their default rate in 1998 was higher than at any subsequent point in time.

Figure 8: Default rates by price bucket
Bonds trading around par levels



Source: BofA Merrill Lynch Global Research

Figure 9: Default rates by price bucket
Discounted bonds



Source: BofA Merrill Lynch Global Research

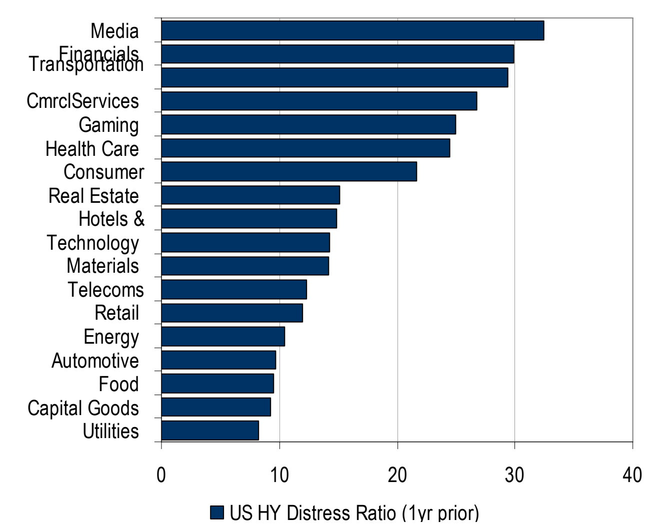
On the opposite side of price spectrum, we have deeply discounted bonds trading at under 50pts, depicted by the top line on Figure 9. This segment tends to exhibit prolonged periods of high default rates, starting well before the broad market credit cycle takes hold, and lasting until it is over. These prolonged cycles lasted for five years in 1998-2002, and four years in 2006-2009. The most intriguing part here is that once the broad market default cycle starts to subside, default rate in sub-50pt bonds drops from an average of 40-60% to an average of 15-25%. This confluence of events – between deeply discounted bond price to "low" (by relative standards) default rate – produces extremely strong performance in distressed HY as the market emerges from a credit cycle.

Sector defaults

We also produce sector default rates and look at these in conjunction with sector distress ratios (Figure 10 and Figure 11 below). Comparing today's sector default rates to a year-ago levels of distress by sector also allows us to determine how accurately the market was pricing in the credit risk going into the year. Our data shows that among top five sectors with highest defaults in the LTM period ending Feb 2013 (utilities, financials, transports, media, and consumer products) four were at the top of the distressed list in Feb 2012.

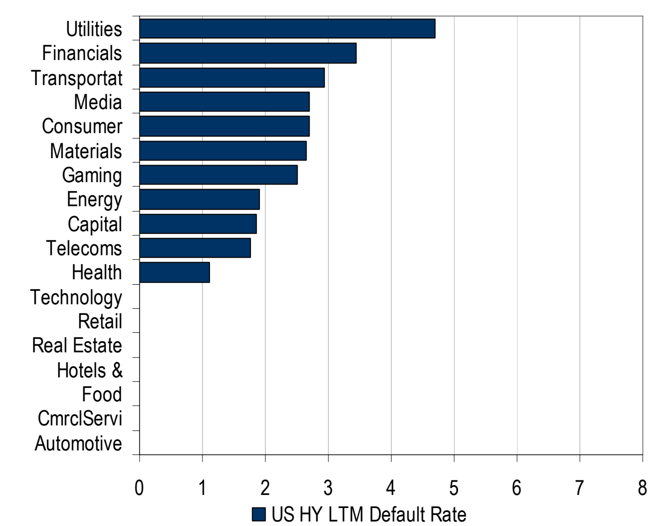
On the opposite side, distress ratios were high in commercial services whereas this sector had no defaults in the last twelve months. Utilities had the lowest distress levels going into the year and yet they experienced an elevated level of defaults. All in all, we would say the market is doing a decent job of pricing in future credit losses but it still leaves plenty of room for bottoms-up contrarian strategies.

Figure 10: Sector Distress Ratios
As of Feb 2012



Source: BofA Merrill Lynch Global Research

Figure 11: Sector LTM default rates
As of Feb 2013



Source: BofA Merrill Lynch Global Research

Following our default rates going forward

As is the case for most of our other data sets, all BofAML default rates described here will be made available on our HYDL and EMDL pages in Bloomberg, both historical series as well as on-going month-end calculations. As it follows from the description of our dataset and methodology, we are now capable of calculating customized default rates tailored to specific portfolios or strategies. We welcome our clients' feedback on this new undertaking as well as requests for such customized calculations.

Appendix

Figure 12: Selection criteria and current statistics for BofA ML default rates

	Filter Criteria				Current Statistics		
Default Rate	Indexes	Region	Credit Quality	Pricing		Universe Size (1 year prior)	Default Rate
Global	HW00, H544, HE0A, EMHB					1,876	1.39
US	HW00, H544	United States				1,090	1.83
Europe	HW00, HE0A	Developed Europe				353	0.85
DM	HW00, H544, HE0A					1,534	1.50
LatAm	EMHB	Latin America				135	1.48
EMEA	EMHB	Emerging Europe, Middle East				118	0.85
Asia	EMHB	Asia/Pacific				88	0.00
EM	EMHB					341	0.59
Sector	HW00, H544	United States					
US Par	HW00, H544	United States			$	886,994	1.32
US Par <3yrs	HW00, H544	United States			$	118,865	1.39
US Par 3 yrs+	HW00, H544	United States			$	768,128	1.31
US BB	HW00, H544	United States	BB			356	0.00
US B	HW00, H544	United States	B			533	1.13
US CCC	HW00, H544	United States	CCC			270	6.30
US Distressed	HW00, H544	United States		OAS > 1000 bps		194	9.28
US Price >=110	HW00, H544	United States		Price >=110 pts		129	0.00
US Price 90-110	HW00, H544	United States		Price >=90 pts & < 110 pts		823	0.36
US Price 70-90	HW00, H544	United States		Price >=70 pts & < 90 pts		99	5.05
US Price 50-70	HW00, H544	United States		Price >=50 pts & < 70 pts		26	38.46
US Price <50	HW00, H544	United States		Price <50 pts		13	15.38

Source: BofA Merrill Lynch Global Research

Link to Definitions

Credit

Click here for definitions of commonly used terms.

GEM Macro

Click here for definitions of commonly used terms.

Macro

Click here for definitions of commonly used terms.

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