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Bank Asset/Liability Management

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Difficulties Ahead for Your 2013 Budget?

As your strategic planning and budgeting process starts to take shape, there could very well be a dangerous intersection of operating income and expenses throughout the banking industry. You may be faced with continued margin compression and lower net interest income (NII). The low rate environment will cause investment and loan cash flows to reprice lower with limited ability to meaningfully reduce deposit rates. Reviewing the past several years, in general terms, you can see that your 2013 budget will be more difficult to achieve than your 2012 budget, which was tougher than your 2011 budget.

With the Federal Reserve expected to hold short-term rates at current levels until mid-2015, banks must look beyond the 2013 budget and figure out what happens to net interest income if interest rates remain at current levels, or even go lower, until at least that point. Most banks, assuming a flat or no growth balance sheet, are projecting NII to decline each successive year in their asset/liability model simulations in the current rate scenario.

All of this begs the question, "*At what point does net interest income fall below operating expenses?*" Or said another way, when do roads converge with core business operations failing to cover overhead costs, leaving fee income and loan quality as the primary driver of profitability? Throughout the planning process this year, it will be critically important for your bank to understand how decisions made today will affect capital, loan growth, liquidity/funding, investments, interest rate risk, operations, and branch networks over the next several years.

The following discussions concentrate on some key issues that banks and their A/L managers will be faced with as they review their projections beyond 2013.

Capital. With the three federal banking agencies releasing a

In This Issue:

Notice of Proposed Rulemaking (NPR) regarding the definition of regulatory capital, i.e., Basel III, banks would be wise to understand their capital position *today* and their capital position as it is written *under the new proposed rules*. Without going into great detail, it is important to understand the new minimum capital requirements along with the new common equity Tier 1 to total risk weighted assets ratio. Within the numerator, all *Available For Sale* (AFS) investment securities gains and losses will now flow through regulatory capital and not *Accumulated Other Comprehensive Income* (AOCI) as it is today. In addition, some banks will have to deduct *Mortgage Servicing Assets* (MSA) and other certain *Deferred Tax Assets* (DTA). Within the denominator, Basel III would revise risk weights for residential mortgages based on *Loan To Values* (LTV) and increase risk weights for development and construction loans, as well as past due loans. While this is by no means a complete listing of the changes, the bottom line is that there will be a lot of moving parts as it relates to the bank's product offerings.

Loan Growth. How much *net* loan growth is the bank going to need to cover the NII shortfalls for the next three to five years? When backing into the *net* number needed, it is important to note that, given the current competition for good quality loans, an incremental spread that is currently 50 to 100 basis points lower than your current margin is a starting point for your discussions. In addition to the Basel III requirements, some other key questions as related to achieving the loan growth needed are:

- *Price* — Have you made concession(s) on rate to get the deal(s)? If so, how much?
- *Term or Structure* — Are you lengthening the maturity dates, waiving prepayment penalties and other covenants to make the deal work?
- *Credit Standards* — Are you writing to lower credit standards?
- *Other Risk Metrics* — Are there any other risk metrics that you are relaxing?

Liquidity/Funding. Banks are currently flush with cash, so funding loan growth seems be the last concern. However, since the financial crisis, banks have seen a larger amount of *parked* deposits, mostly in non-maturity accounts, within their balance sheets. The real challenge is trying to figure out who is a core depositor and who is just biding their time until they can find a better offer. In addition to the core deposit question, you will also need to stress test your liquidity position using many different scenarios and variables in order to highlight potential weakness within your current liquidity position. Core deposit studies and forward-looking liquidity stress testing have quickly evolved from *nice to have* to *have to have* strategic documents.

Investments. With margin pressures increasing, banks may look to their investment portfolios to help make up the shortfall. In this case, some key questions to better understand the changes within the investment portfolio are:

- Has or will the weighted average life and duration of the portfolio become longer?
- With Basel III, any gains or losses from the AFS portfolio will now flow through regulatory capital. What is the potential impact if/when rates increase 300bps or more?
- Has the credit exposure of the portfolio increased, buying non-agency securities or increasing concentration of municipal securities?
- Is the bank moving into new asset classes that the bank has not purchased before?
- Are any other investment risk metrics being relaxed?

As your strategic planning and budgeting process starts to take shape, there could very well be a dangerous intersection of operating income and expenses throughout the banking industry.

Interest Rate Risk. Given the low-rate environment, bankers continue to see borrowers wanting long-term fixed-rate loans while depositors seek short-term products waiting for rates to rise before locking into longer-term CDs, all resulting in additional interest rate risk. Darling Consulting Group currently runs six different interest rate scenarios, five different shock scenarios, and four different stress test scenarios to capture the total interest rate risk position. If you are not — you should be. In addition, your what-if analyses should not only include traditional interest rate risk tools (i.e., extension, pre-investment, leverage, etc.), but also less traditional, and more and more commonly applied, off-balance sheet tools such as caps, swaps, collars, etc.

Operations/Branch Networks. You should consider reviewing the last five years to determine the number of transactions that have been taking place within each of your branches. With direct deposit, ACH, the Internet, remote deposit capture, and mobile banking, it would not be surprising to see the numbers of transactions at the branch level reduced by 20 to 40 percent. This leads to the question, *"Have the variable costs associated with branches dropped 20 to 40 percent as well?"* If not, now would be a good time to review how changes in the branch delivery system, such as personnel, hours of operations and locations, can help reduce those variable costs.

Summary. It is no longer business as usual. It is now more important than ever to understand the underlying issues that are driving your bank's balance sheet and operating expenses, given the current and expected rate environment. Looking ahead three to five years, the last thing you want to find yourself asking is, "*What just happened to our business model*?" Asking questions now and researching a little deeper into the details will pay current and future dividends.

— Patrick Ward, Managing Director
Darling Consulting Group

A New Approach to the Valuation of Mortgages and Mortgage Servicing Rights

On October 18, Kamakura Corporation announced a new *reduced form* approach to the valuation of mortgages and mortgage servicing rights. This new approach dramatically increases the simplicity, transparency and accuracy of the valuation of these important security types. As recently as December 31, 2009, for example, Bank of America reported that mortgage servicing rights (MSR) were carried on its balance sheet at a value of more than $19 billion dollars. Improving the accuracy of the valuation of mortgages and MSR is critical both from a hedging point of view and from the point of view of financial accounting integrity. This article explains the new Kamakura approach.

Background on the New Approach to Mortgage and MSR Valuation. The *conventional wisdom* in valuing mortgage servicing rights and mortgages has been unchanged for a long time. For many institutions, their valuation had the following characteristics:

- Valuation was based on a spread to the Libor-swap curve, usually a linear spread benchmarked on just two points on the yield curve.
- Inputs to the valuation were usually not disclosed to investors.
- A prepayment model was selected.
- A default model was occasionally, but not always, selected.
- A limited Monte Carlo simulation was done.
- The resulting valuations were often inconsistent with observable market pricing for new mortgages, for mortgage-backed securities, and for the rare transactions in MSRs themselves.
- The resulting valuations were opaque, with minimal disclosure and a high degree of model risk.
- Because of model risk, hedging accuracy was low.

A simpler, more transparent and more accurate approach to valuing mortgages has these characteristics:

- There is no use of the Libor market, where manipulation has been rampant since 2005
- There is no use of interest rate swap yields, which have been below U.S. Treasury yields at a 30 year maturity for more than two years.
- All inputs to the valuation process are freely available and completely transparent.
- All elements of the calculation are fully disclosed.
- The valuation is fully consistent with the modern *reduced form* approach to valuation of derivatives.
- Ideally, the valuation would not need to make use of Monte Carlo simulation. Instead, a single *spreadsheet* valuation formulation would result.

The new approach to valuation proposed by Kamakura achieves all of these objectives.

Introducing the Kamakura Approach to Valuation of Mortgages and MSRs. Using the reduced form approach, there is no use of Libor or interest rate swap yields. The inputs to the process are fully disclosed and freely available. All inputs are taken either from the Federal Reserve's H15 statistical release or the Federal Home Loan Mortgage Corporation's Primary Mortgage Market Survey® (FHLMC PMMS). All elements of the calculation are fully disclosed in references made available to requesters. The valuation methodology is fully consistent with the reduced form approach to *risk neutral* and *no arbitrage* valuation that was pioneered by Black and Scholes in their 1973 options model. The resulting formula is both *spreadsheet friendly* and compatible with state-of-the-art enterprise risk management systems.

The key insight of the new approach is very simple to state but very powerful. Is it correct to say that the value of a promise to pay $1 by a mortgage borrower at time T equals the price of a zero coupon bond P(T) times $1, or do we have to analyze the rest of the mortgage simultaneously to value the promise to pay $1? Jarrow (2004) shows that we can indeed value the promise to pay $1 independent of the rest of the mortgage under a number of different assumptions about default, all of which are highly accurate assumptions for mortgage analysis. Because of this insight, we can extract zero coupon bond prices for each mortgage payment date using advanced yield curve smoothing techniques. We can then value any series of cash flows C(1), C(2),...C(N) by multiplying the cash flows by the relevant zero coupon bond price:

$$Value = \sum_{i=1}^{N} P(i)C(i)$$

These zero coupon bond prices reflect the *risk neutral* value of the mortgage borrower's promise to pay $1 at time T, including the probability that the mortgage borrower may not pay because he defaults or prepays the mortgage prior to the payment date T. The zero coupon bond prices that can be derived include the market's *implied* probabilities of default and prepayment. These implied default and prepayment assumptions are conceptually similar to the common use of implied volatility in the Black-Scholes options model.

The remainder of this article shows the derivation of the mortgage valuation yield curve for October 18, 2012, and its use to value both new mortgages and all the key elements of mortgage servicing rights valuation.

Exhibit 1

Observation Date	10/18/2012
US Treasury Nominal Yield Inputs	
Standard H15 Maturitie:	Percent
1 month	0.12
3 months	0.10
6 months	0.15
1 year	0.18
2 years	0.29
3 years	0.41
5 years	0.79
7 years	1.26
10 years	1.86
20 years	2.63
30 years	3.02

Deriving the Mortgage Valuation Yield Curve. Step 1 in deriving the mortgage valuation yield curve is to secure the constant maturity Treasury rates from the Federal Reserve's H15 statistical release (see Exhibit 1 for those rates).

Step 2 is to take the current pricing on new fixed rate mortgages from the FHLMC PMMS. Those rates for October 18 are shown on the FHLMC website (see Exhibit 2).

Step 3 is to use the maximum smoothness forward rate approach to smooth the U.S. Treasury yield curve so that it perfectly matches all of the yields on the Federal Reserve's H15 statistical release.

Step 4 is to use the same smoothing approach to derive the smoothest possible forward credit spread for mortgage valuation such that the mark to market value of a new fixed rate mortgage exactly equals par value less points paid at origination for both the 15 year and 30 year maturities shown by FHLMC above. That results in the zero coupon U.S. Treasury yields and zero coupon mortgage valuation yields shown in Exhibit 3 for October 18, 2012. Associated with each zero coupon yield on the mortgage curve is a zero coupon bond price for the same maturity.

The monthly payment for new 15 and 30 year

Exhibit 2

Compilation of Weekly Survey Data for 2012

2012 Weekly Mortgage Rates Data [XLS]

October 18, 2012

Regional Breakdown	30-Yr FRM	15-Yr FRM	5/1-Yr ARM	1-Yr ARM
Average Rates	3.37 %	2.66 %	2.75 %	2.60 %
Fees & Points	0.7	0.6	0.6	0.4
Margin	N/A	N/A	2.74	2.77

mortgages was set so that the borrower could use the mortgage proceeds to pay the upfront points and have a net amount of $100,000 left over. We derived the mortgage yield curve so that the present value of the monthly payments ($678.39 for 15 years and $444.91 for 30 years) equals $100,000. We can confirm easily that

$$100000 = \sum_{i=1}^{180} P(i)678.39$$

$$100000 = \sum_{i=1}^{360} P(i)444.91$$

We know what the cash flow schedule for interest and principal is on both mortgages. We can value *interest only* and *principal only* portions of the mortgage because our zero coupon bond prices have embedded the risk that the payments will not be received due to default or prepayment. The values we get are shown in Exhibit 4; of course the sum of interest and principal has to equal the value of the whole loan, $100,000.

Valuing Each Element of Mortgage Servicing Rights. Once we know the value of the *interest only* and *principal only* components of each mortgage, it is very easy to value the key elements of mortgage servicing rights. If the net servicing fees on a loan have

Exhibit 3

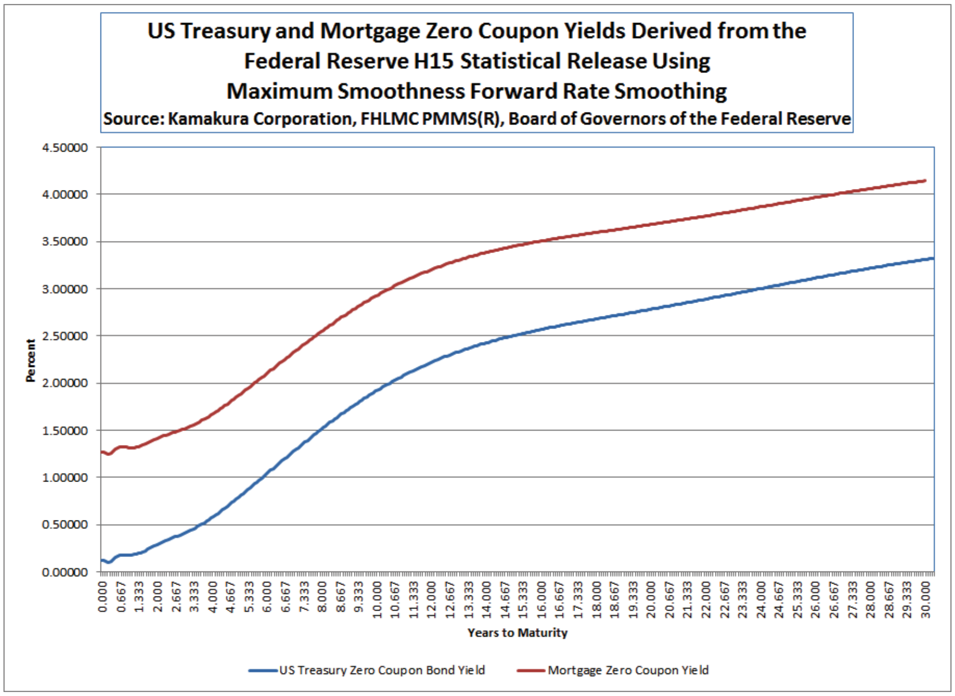

Exhibit 4

		Valuation Analysis	
Valuation of		**15 Year Fixed Rate Mortgage**	**30 Year Fixed Rate Mortgage**
Interest only		19,080	43,477
Principal only		80,920	56,523
All Cash Flow		100,000	100,000
Nominal Principal		100,600	100,700
Valuation as Percent of Principal			
Interest only		18.97%	43.17%
Principal only		80.44%	56.13%
All Cash Flow		99.40%	99.31%

Exhibit 5

Dollar Components of Mortgage Servicing	Dollar Amounts		Percent of Principal	
Annual Net Servicing Fee in Basis Points	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage
5	358.64	283.08	0.36%	0.28%
10	717.29	566.17	0.71%	0.56%
15	1,075.93	849.25	1.07%	0.84%
20	1,434.58	1,132.34	1.43%	1.12%
25	1,793.22	1,415.42	1.78%	1.41%
30	2,151.87	1,698.51	2.14%	1.69%
35	2,510.51	1,981.59	2.50%	1.97%
40	2,869.16	2,264.67	2.85%	2.25%
45	3,227.80	2,547.76	3.21%	2.53%
50	3,586.44	2,830.84	3.57%	2.81%

an annual rate of 0.25%, the value of this servicing fee income is simply 0.25%/3.37% times the *interest only* value of the 30 year fixed rate loan. The coupon rate on the loan is, of course, 3.37%. The value of net servicing fees at various servicing fee levels is shown in Exhibit 5.

The net dollar cost to service a mortgage is usually modeled as a constant dollar amount (inflation indexing would be more accurate). If we assume a constant $2 per month ($24 per year), the present value of the net dollar cost of service is simply $2.00/$444.91 times the present value of the total cash flow on the $30 year mortgage, as shown in Exhibit 6.

Exhibit 6

Dollar Components of Mortgage Servicing		Dollar Amounts		Percent of Principal	
Net Constant Dollar Cost to Service Per Month	Per Year	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage
0.50	6	73.70	112.38	0.07%	0.11%
1.00	12	147.41	224.76	0.15%	0.22%
1.50	18	221.11	337.15	0.22%	0.33%
2.00	24	294.81	449.53	0.29%	0.45%
2.50	30	368.52	561.91	0.37%	0.56%
3.00	36	442.22	674.29	0.44%	0.67%
4.00	48	589.63	899.06	0.59%	0.89%

Exhibit 7

Dollar Components of Mortgage Servicing	Dollar Amounts		Percent of Principal	
Float on Principal and Interest (Percent of Month)	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage	15 Year Fixed Rate Mortgage	30 Year Fixed Rate Mortgage
25%	45.53	57.09	0.05%	0.06%
50%	91.05	114.19	0.09%	0.11%
75%	136.58	171.28	0.14%	0.17%
100%	182.11	228.37	0.18%	0.23%

What about the *float* on the mortgage payment itself, on taxes and insurance, and on cash flows related to prepayment or default? In each case, the process is simple. We assume the amount of money subject to float is the full 30 year monthly mortgage payment of $444.91 and the length of the float period is one full month. By replication, we can value the float earnings. We assume the float amount is invested in U.S. Treasuries and we know those forward rates, since we have the full Treasury yield curve. We then calculate the dollar interest earnings and their timing. We discount those dollar earnings with the mortgage valuation yield curve zero coupon bond prices, not the U.S. Treasury zero coupon prices. This is because only the mortgage valuation yield curve zero coupon bond prices correctly reflect the fact that the float earnings will not occur if the mortgage is prepaid or defaults. The value of float for various holding periods is summarized in Exhibit 7.

In a similar way, the other elements of cash flows associated with mortgage servicing rights can be valued and summed together to get total MSR value. The valuation process is exceptionally straightforward and could be summarized succinctly in a table in a quarterly or annual report.

Hedging of mortgages and MSRs is also straightforward for any number of risk factors driving the U.S. Treasury and mortgage valuation yield curves, since value is linked to the movements in both curves.

Conclusion. The valuation of mortgages and mortgage servicing has long been regarded as a *black box* calculation shrouded in mystery and hidden from the investing public. There is no reason not to make such calculations totally transparent, because the reduced form approach to modeling both mortgages and mortgage servicing rights is both completely transparent and more accurate than the black boxes of conventional wisdom.

— Donald R. van Deventer
Kamakura Corporation

Strategic Succession Planning: Mitigate the Risk of an Employee Gap

There is no second *First Place*. Once the baton is dropped in the leadership race…your bank is at risk. Strategic succession planning is a critical step to serve the purpose of leadership continuity and mitigate unnecessary risk. If you, or any person in a critical role, unexpectedly departs or is unable to perform at expected levels, and *step-in* or *drop-in* internal candidates are not readily available assets, your stockholders are not being served. If so, risk is not effectively mitigated. This is not a gray area; it is very black and white and needs more attention in financial organizations.

This article discusses the depth and source of expertise, leadership presence, adaptive communication skills, and the need for mentors as current advanced middle-career and legacy subject matter experts leave the field. Long-time high-performing professionals are reaching their advanced middle or legacy career stages. As they decide to use their gifts and talents in new ways, financial institutions will experience a depletion of their most important asset--the human resource.

Skills and Experience: More than Book Knowledge. Skill development requires multiple areas of expertise including asset/liability management, risk to capital, profitability, funds transfer pricing, investment and credit portfolio knowledge, and relevant understanding of regulatory and compliance issues. Asset/liability and balance sheet management professionals develop an intimate knowledge of the organization that is unique to their role and how they communicate and influence the organization. Positioned properly, they have the challenge of blending analytical expertise, market, and institutional knowledge with interpersonal communication throughout diverse areas and functions of the organization.

The diverse array of required knowledge is not merely learned through education such as earning a Master's degree, reading a book, or watching a PowerPoint presentation. The learning, however, starts in school, and continues through ongoing reading and continual exposure to learning events. Foundational expertise of this nature needs to be embodied in the professional so it is readily available as needed to respond appropriately to external markets while at the same time holding a larger vision to position the bank for safety and soundness regardless of external changes.

This embodied expertise comes only through a strong commitment to learn, practice and apply, relearn, practice, and take into effective action and decision making. Depth of learning and knowing how to make informed decisions requires the experience of the real world in diverse situations and with a multitude of challenges. As legacy high performers start to transition in their careers, a void of expertise will develop in the industry. The most critical pending missing ingredient is leadership expertise and presence.

Personal Leadership Skills. Experience observing numerous asset/liability executive searches, designing leadership development programs for financial organizations, and publishing many technical articles results in one important assessment: *the most important skill of a financial executive is leadership presence*. As an executive, you may have all the right answers, analyze data and produce the right recommendations, and still not be effective. How you *present* the information, the style of *communication* you use, and the *believability* of your message are critical to the organization.

Our industry is replete with very smart people who do good work with outstanding results, as well as with highly intelligent professionals who become disenchanted when they are not *heard* at work and their recommendations go unheeded. Eventually, after dissatisfaction and frustration, these professionals change employers and the cycle repeats wherein their recommendations are not appreciated. Again, the cycle repeats and they change employers. The dissatisfaction and frustration may become chronic or, alternatively and preferably, they become aware that a fundamental shift needs to happen. The difference is how the individuals show up and presence themselves in sticky conversations, deploying resources and influencing others in the organization.

Our industry is replete with very smart people who do good work with outstanding results, as well as with highly intelligent professionals who become disenchanted when they are not* heard *at work and their recommendations go unheeded.

Schools and organizations miss providing development opportunities for the *soft skill* side of the asset/liability management professional. The critical missing ingredient is leadership presence. How you are seen by others is really what it is all about…your presence.

As an example, you spend hours preparing a presentation for an ALCO meeting on product and service pricing and expected market volatility. After your presentation of data, information, and recommendations, you leave the meeting feeling frustrated and discouraged, and this is not the first time. A disconnect exists between what or how you present and your expected outcome. Once you shift leadership *presence* and *style* to be more generative, the chronic dissatisfaction and frustration shift to engaged action and commitment.

So what does leadership presence have to do with strategic succession planning and ensuring the baton is not dropped? If you are in your advanced middle or legacy career, you are obligated to support leadership continuity. Alternatively, those in early and mid-career are required to ask for support in developing their own leadership presence. Both of you need to be proactive: the one passing the baton over the next 5-10 years and the second one who receives the baton.

Mentoring with Intellectual Capital and Leadership Presence. Organizations that demonstrate a proactive commitment to advanced learning for employees are more creative, innovative, and effective in managing change and crises. School helps us learn the basics; organizations need to harness that learning into practical application and, in doing so, create knowledge.

A major shift is happening right now with *Baby Boomers* moving toward retirement, thereby creating a gap of millions of jobs. Some might say this gap in availability of people is not an issue in today's economy. The wise ones, however, take a strategic view in planning for tomorrow and the not-too-distant future, assessing talent needs and bench strength. Some organizations are requiring employee development to be integral to the performance and responsibility of executives, for continual development of bench strength at each level of the organization.

Each sitting executive possesses intellectual capital that needs to be shared. A long-time successful chief financial officer who shares an embodied base of knowledge with junior and senior analysts is creating a lasting legacy and supporting organization sustainability.

Listed below are some questions you can ask the emerging and young professionals in your finance and treasury functions. The answers will help shape how you mentor and support their future success:

- What are the opportunities for emerging leaders in defining and shaping their careers?
- What are the leadership challenges emerging leaders face in defining and shaping their careers?
- What are the distinct learning styles of emerging leaders?
- What are the leadership development needs you have encountered as an emerging leader?

Get Started. The time to start is now; don't wait until a critical position is vacated. Start these conversations *now* over a brown-bag lunch or Friday afternoon coffee. You will be seen as a more effective leader because you share your knowledge with others and create more value on the human resource side of your balance sheet.

— Deedee Myers, CEO
DDJ Myers Advancing Leadership Institute

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