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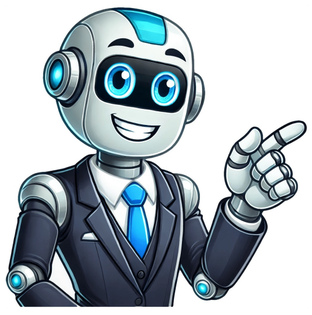

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The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. In investment banking, profit and loss attribution (also called PnL attribution, PnL explained, or P&L explain) is an income statement with commentary that attributes or explains the daily fluctuation in the value of a portfolio of trades to the root causes of the changes. The report is produced by product control; and is used by traders – especially desks dealing in derivatives (swaps and options) and interest rate products.In my daily work within the bank, an important task is to conduct profit and loss analysis on the fair value of various financial assets. Based on my interests, I analyzed the principles behind it.The main purpose of PnL attribution is to decompose the profit and loss over a period of time according to different risk factors. For time intervals [t,t+Δt], the total profit and loss is the value at the termination point minus the value at the starting point, i.ePnLt,Δt=Vt+Δt−VtIn the above equation, for newly added transactions in time interval [t,t+Δt], they need to be deducted from the fair value at time t+Δt. For transactions that have been terminated in time interval [t,t+Δt], they need to be deducted from the fair value at time t.For the profit and loss of financial instruments held continuously within time interval [t,t+Δt], attribution analysis can be conducted in the following manner. The risk factors that affect fair value are:Rt=(Rt(1),Rt(2),...,Rt(n))Due to the fact that value is determined by maturity and risk factors, soVt=V(t,Rt)=V(t,Rt(1),Rt(2),...,Rt(n))PnL Attribution is to attribute the profit and loss to term change and risk change. So we define the Term Change PnL (PnLt,Δt(0)) to reflect the impact of time, and the Risk Factor PnL (PnLt,Δt(i),i=1,2,...,n) to reflect the impact of risk, including price, interest rate, volatility, exchange rate, etc.PnLt,Δt(0)=V(t+Δt,Rt)−V(t,Rt)The first risk factor PnL is:PnLt,Δt(1)=V(t+Δt,Rt+Δt(1),Rt(2),...,Rt(n))−V(t+Δt,Rt(1),Rt(2),...,Rt(n))Its meaning is the PnL caused by the change of the first risk factor, while the values of the second to nth risk factors remain unchanged.The second risk factor PnL is:PnLt,Δt(2)=V(t+Δt,Rt+Δt(1),Rt+Δt(2),...,Rt(n))−V(t+Δt,Rt+Δt(1),Rt(2),...,Rt(n))Its meaning is the PnL caused by the change of the second risk factor, with the values of the third to nth risk factors remaining unchanged.PnLt,Δt(i)=V(t+Δt,Rt+Δt(1),...,Rt+Δt(i),...,Rt(n))−V(t+Δt,Rt+Δt(1),...,Rt(i),...,Rt(n))Its meaning is the PnL caused by changes in the i−th risk factor, with the values of the i+1st to nth risk factors remaining unchanged.According to the above definition, it is not difficult to see that PnL can be decomposed as follows:PnLt,Δt=∑i=0PnLt,Δt(i)In practice, the above equation is generally approximate, and there may be some errors on both sides of the equation, which is called unexplained profit and loss (unexplained PnL). Therefore, the above equation can be modified as:PnLt,Δt=∑i=0PnLt,Δt(i)+unexplainedPnLFor newly added transactions within time interval [t, t+Δt], separate processing is required due to the different transaction time points of different transactions. For terminated transactions, as they do not enter the total fair value at the end of the period, only the corresponding value needs to be deducted from the initial fair value.PCA for Risk FactorWe also conducted principal component analysis (PCA) on the risk factors in the process of PnL attribution, such as the term structure of interest rates. Here, SHIBOR is used as an example to introduce the analysis process.The Shanghai Interbank Offered Rate (or SHIBOR) is a daily reference rate based on the interest rates at which banks offer to lend unsecured funds to other banks in the Shanghai wholesale (or "interbank") money market. There are eight SHIBOR rates, with maturities ranging from overnight to a year. They are calculated from rates quoted by 18 banks, eliminating the four highest and the four lowest rates, and then averaging the remaining 10. SHIBOR is an important indicator reflecting the level of interest rates in the Chinese interbank market and is also widely used to price various financial products. In our daily fair value calculations, many assets are linked to SHIBOR.We select SHIBOR overnight, one week, two weeks, one month, three months, six months, nine months, and one year as variables, with a total of eight interest rate indicators named ON, 1W, 2W, 1M, 3M, 6M, 9M, and 1Y, respectively. We collected the daily data for the past ten years and averaged them monthly to obtain 125 sets of data.The first step is to perform ADF test on the time series of each period. ADF (Augmented Dickey Fuller) test is a commonly used unit root test method used to test for the presence of unit roots (Non-Stationary) in time series data. In time series analysis in finance, economics, and other fields, the ADF test is widely used to determine whether a variable has stationarity. Its original assumption was the existence of unit roots, which means that the time series is non-stationary. If the calculation results of the ADF test reject the null hypothesis, that is, at a given level of significance, the time series can be considered stationary. Our purpose in using ADF test is to eliminate the influence of trends by performing differencing operations on time series.TermON1W2W1M3M6M9M1YOriginal SHIBOR-4.178-1.796-3.657-3.088-2.174-1.86-1.86-1.811FD SHIBOR-8.542-9.148-5.794-5.285-5.716-4.658-4.45-4.388with 1% critical value: -3.486; 5% critical value: -2.886The statistical t-value of ADF test is used to measure the stationarity of variables. Generally speaking, if the value of t is less than the critical value, the null hypothesis can be rejected, that is, there exists a unit root, indicating non stationarity; If the value of t is greater than the critical value, accept the null hypothesis that there is no unit root, indicating stationarity. According to Table 2, not all original series data are stationary.The use of first differencing can reduce the degree of correlation between interest rate time series data with different terms and the autocorrelation of interest rate difference with different terms, which is more conducive to revealing the causes of changes in the term structure of interest rates. The t values for the unit root test of each interest rate term series after first differencing are shown in the second row of Table 2, all of which are stationary sequences.TermLevel factorSlope factorCurvature factorON0.338-0.3540.5591W0.356-0.3570.1512W0.386-0.304-0.0741M0.405-0.222-0.2723M0.4180.138-0.6426M0.320.423-0.0159M0.2940.4490.2651Y0.2860.4530.321We use the PCA method to analyze the factors affecting the term structure of SHIBOR, and reflect the results with changes in three characteristic elements. We selected the first difference of SHIBOR (FD SHIBOR) for principal component analysis, and the analysis results are shown in Table 3. Among them, feature element 1 has roughly the same direction and intensity of impact on interest rates for each period, showing horizontal changes (level factor); The impact direction and effect of feature element 2 on long-term and short-term interest rates are different, and the impact gradually increases with the increase of term, resulting in a skewed change (slope factor) in the term structure curve of interest rates; Feature element 3 has a negative effect on medium-term interest rates and a positive impact on short-term and long-term interest rates, reflected in the curve change (curvature factor) in the term structure of interest rates. Therefore, the first three main characteristic factors that affect the term structure of interest rates are level,slope, and curvature factors. The variance contribution rates of the first three main factors are 57.32%, 35.95%, and 3.09%, respectively. The cumulative contribution rates of the three factors can explain 96.35% of the overall changes in the interest rate curve. It can be seen that these three factors can basically explain most of the changing characteristics of the interest rate curve. Enter the world of trading metrics with PnL—Profit and Loss. This guide delves into the essence of PnL, its significance in assessing trading performance, and how it serves as a crucial measure for traders navigating the financial markets.PnL, or Profit and Loss, is a term used in trading to measure the financial gain or loss. These gains or losses are from buying and selling assets. It plays a vital role in evaluating the performance of traders and investors in the financial markets. PnL can be calculated using various methods such as FIFO (First-in, First-out), LIFO (Last-in, First-out), and YTD (Year-to-date). PnL is the measurement of financial gain or loss in trading. It evaluates the performance of traders and investors in the financial markets. PnL can be calculated using methods such as FIFO, LIFO, and YTD. Realized PnL represents profits or losses from closed positions. Unrealized PnL reflects profits or losses from open positions.Profit and Loss (PnL) stands as a pivotal financial metric, providing traders with a snapshot of their financial performance. At its core, PnL captures the daily fluctuations in the value of trading positions. Here we'll discuss the nuances of PnL, its significance, and the various ways traders employ it to gauge their success.Understanding PnL is crucial for developing effective trading strategies and assessing the success of financial investments. It involves the calculation of realized PnL and unrealized PnL. The PnL calculated here reflect the profits or losses from closed and open positions, respectively.PnL, often abbreviated as P&L, represents the daily change in the value of trading positions. This figure is calculated by subtracting the value of positions from the previous day from their current value. Traders may use different variations such as 'PnL,' 'PNL,' or 'P&L,' but the essence remains the same – evaluating profit or loss.The fundamental formula for PnL is elegantly simple: PnL equals the value today minus the value yesterday. Mathematically expressed as PnL = Value today – Value yesterday, this equation encapsulates the essence of tracking gains or losses within the trading landscape.Breaking down the formula, "Value today" represents the current worth of a trader's portfolio or positions, while "Value yesterday" signifies the value of the same positions on the previous day. The subtraction of these values encapsulates the net change in the financial standing of the trader.Let's consider a practical example to illustrate the application of the essential formula. Assume a trader has positions worth £100 on a given day. The next day, these positions appreciate to £105. Applying the PnL formula:PnL=£105−£100=£5PnL=£105−£100=£5In this scenario, the PnL for the day is £5, indicating a profit.Conversely, if the positions were worth £111 yesterday and decreased to £105 today, the PnL calculation would be:PnL=£105−£111=−£6PnL=£105−£111=−£6Here, the negative PnL of -£6 denotes a loss for the day.The simplicity of the PnL formula belies its significance. It serves as a quick and effective tool for traders to assess their daily financial performance. Positive values denote profitable trades, while negative values indicate losses. This real-time insight enables traders to make informed decisions and adjust their strategies based on the financial outcomes.The essential formula for PnL is not a standalone mathematical expression; it is seamlessly integrated into the daily practices of traders. Continuous monitoring of PnL based on this formula empowers traders to adapt swiftly to market dynamics, optimize strategies, and navigate the ever-changing landscape of trading.The formula for PnL is the linchpin of effective trading analysis. Its straightforward nature belies its power in distilling complex financial changes into a digestible metric. Armed with the ability to apply this formula, traders gain a valuable tool for assessing their performance and making strategic decisions in the dynamic world of trading. Stay tuned for deeper insights into the broader landscape of PnL categories and their implications.Averaging positions is a nuanced strategy employed by traders to enhance profitability and manage risk in a dynamic market. This technique involves adding to existing positions at more favorable prices, effectively adjusting the average cost of the asset. The goal is to reduce the breakeven point, making it easier for traders to achieve overall profitability.Consider a trader who initially purchases 1 BTC at £50,000. However, the market takes an unexpected downturn, and the asset's value drops to £40,000, resulting in a £10,000 loss on the initial investment. Instead of accepting the loss, the trader decides to average down by acquiring an additional 1 BTC at the lower price of £40,000.To calculate the new average price after averaging down, the trader combines the initial purchase with the additional acquisition and divides by the total quantity of assets. In this case, the average price becomes (£50,000 + £40,000) / 2 = £45,000.Suppose the market experiences a rebound, and the BTC price climbs back to £50,000. With the reduced average price of £45,000, the trader is now in a profitable position. If the trader decides to sell half of their position (0.5 BTC) at the current market price of £50,000, the realized profit would be (£50,000 * 0.5) – (£45,000 * 0.5) = £2,500.While averaging positions can be a lucrative strategy, it's crucial to approach it with caution. Market conditions are unpredictable, and blindly averaging down without a thorough understanding of the asset and market trends can amplify losses. Traders must carefully assess the risk-reward ratio and adhere to risk management principles.Averaging positions is a strategic manoeuvre that, when executed judiciously, can turn a losing position into a profitable one. It demands a thorough understanding of the market, risk tolerance, and a disciplined approach to risk management. By intelligently adjusting average prices, traders position themselves to capitalize on market recoveries and optimize their overall portfolio performance. As with any trading strategy, knowledge and prudent decision-making are key to success.PnL trading is a fundamental concept in the financial market that measures the profit or loss generated from investment positions. It serves as a crucial metric for evaluating the performance of both traders and investors. PnL calculations take into account various factors, including the market value of assets, entry and exit prices, as well as fees or commissions incurred during trading.When diving into the basics of PnL, it is essential to familiarize oneself with key terms that play a significant role in its understanding. These terms include Mark-to-Market (MTM), which refers to the process of valuing assets at their current market prices. Future value, realized PnL, and unrealized PnL are also essential concepts to grasp.PnL Trading Meaning: PnL trading refers to the measurement of profit or loss resulting from trading activities in the financial market. PnL Trading Definition: PnL trading is the calculation and evaluation of the financial gain or loss derived from investment positions or trading activities. PnL in Finance: PnL, in the context of finance, represents the net profit or loss that arises from trading positions or investments. PnL Trading Strategy: PnL trading strategies are methodologies or approaches employed by traders to maximize profits or minimize losses in their trading activities. PnL Trading Techniques: PnL trading techniques refer to specific methods or tactics adopted by traders to effectively manage their positions and optimize their PnL results.Traders have various methods at their disposal when calculating PnL in different trading scenarios. These methods include First-In, First-Out (FIFO), which assumes that the oldest inventory is sold first, and Last-In, First-Out (LIFO), which assumes that the most recent inventory is sold first. Additionally, weighted average cost can be utilized to calculate PnL.Assessing open and closed positions, Year-to-Date (YTD) performance, and transaction-based calculations can provide valuable insights into trading strategies and overall profitability. By understanding the basics of PnL and employing effective trading strategies, traders can enhance their decision-making and improve their financial results.Realized PnL and unrealized PnL are essential components when evaluating the profitability and risk of trading activities. Firstly, realized PnL refers to the profit or loss generated from closed positions, taking into account the executed price of the orders. It is calculated by subtracting the exit price from the entry price of a trade.On the other hand, unrealized PnL represents the profit or loss currently held in open positions that have not yet been closed. It is determined by the difference between the current market value and the entry price of the assets. Both realized PnL and unrealized PnL serve as crucial metrics for understanding trading strategies, managing risk, and assessing overall financial performance.Analyzing PnL ratios, PnL percentages, and Year-to-Date (YTD) calculations can provide further insights into the effectiveness of trading techniques. It helps traders and investors make informed decisions and refine their pnl strategies in trading. Additionally, pnl analysis in trading allows for better pnl management, giving traders the ability to adapt and optimize their pnl strategies to maximize pnl performance.By understanding the importance of PnL in trading, traders can gain a comprehensive view of their pnl management in trading and make informed decisions. It allows for a better understanding of pnl importance in trading and assists in evaluating the success of pnl strategies in trading. Overall, realizing and monitoring PnL is crucial for achieving success in the dynamic world of trading.PnL, or Profit and Loss, is a term used in trading to measure the financial gain or loss from buying and selling assets.PnL can be calculated using various methods such as FIFO (First-in, First-out), LIFO (Last-in, First-out), and YTD (Year-to-date).Understanding PnL is crucial for developing effective trading strategies and assessing the success of financial investments.Realized PnL refers to the profit or loss generated from closed positions.Unrealized PnL represents the profit or loss currently held in open positions that have not yet been closed.Realized PnL is calculated based on the difference between the entry price and exit price of a trade.Unrealized PnL is determined by the difference between the current market value and the entry price of the assets.Both realized and unrealized PnL play significant roles in assessing trading strategies, risk management, and overall financial performance. Robert J. Williams, a finance graduate from the London School of Economics, dove into finance clubs during her studies, honing her skills in portfolio management and risk analysis. With a career spanning prestigious firms like Barclays and HSBC, she's become an authority in asset allocation and investment strategy, known for her insightful reports. Understanding what PNL (Profit and Loss) stands for is crucial for grasping financial reporting. This blog post explains the term, its components like profit and loss, and how it reflects a company's financial health through key indicators and revenue-expense overview. Profit and Loss Profit and Loss (PNL) is like the financial health report of a company. Imagine your business as a small village that needs to balance its income from trades and services against its spending on food, shelter, and other necessities. Just as you'd check if your village has enough resources left after all expenses are paid, PNL gives businesses an overview of their financial performance over a specific period. What Does Profit and Loss Include? PNL, or the Income Statement as it's sometimes called, captures every income and expense item in a business for a specified time frame. Think of it like balancing your personal checkbook, but on a much larger scale. It covers: Revenue: This is all the money coming into the company from selling goods or services. Cost of Goods Sold (COGS): These are the direct costs associated with producing the products sold by the business. Gross Profit: Calculated by subtracting COGS from revenue, gross profit tells you how much money your sales generate after accounting for production costs. A Closer Look at Expenses Expenses, on the other hand, represent all the costs incurred in running the business. This includes: Operating Expenses (OPEX): These are ongoing costs such as rent, utilities, and salaries. Non-operating Expenses: These might include interest expenses or losses from selling off assets. Key Takeaways PNL helps businesses understand their financial performance by showing whether they made a profit or incurred a loss over the given period. By breaking down revenue and expenses, it provides insights into what's working well and where improvements can be made. Essentially, PNL acts as the compass for navigating your business's finances, ensuring you know exactly where you stand in terms of profitability. This structure should help provide a clear and engaging overview of Profit and Loss within the context of financial reporting terms. Company Performance Indicators When it comes to understanding a company's financial health, one cannot simply look at its bottom line—there are several key performance indicators (KPIs) that provide a more comprehensive view. What exactly do these KPIs tell us? Think of them like the vital signs on your dashboard during a road trip: they give you real-time insights into how smoothly things are running. Revenue and Expenses Overview In any financial report, the revenue and expenses sections form the backbone of understanding where a company stands financially. Let's break this down using a simple analogy: imagine your business as a car. Your revenue is like the fuel—how much energy you have to power forward. Conversely, your expenses are akin to the friction—you need them to move, but too much can slow you down. Revenue Revenue, or income, represents all the money that comes in from sales and other sources. For a company, it's like measuring how much water flows through a river. A steady stream is good; an increase might indicate growth opportunities, while a decrease could signal potential issues. However, simply looking at revenue isn't enough—context matters. Is this year's revenue higher or lower than last year's? What about compared to industry averages? Expenses Expenses encompass all the costs associated with running your business. These include raw materials, salaries, rent, and utilities. In our car analogy, expenses are like the tires and fuel—the necessary components that keep you moving but can also be significant drains if not managed properly. Operating Costs: These cover day-to-day operations like utilities, office supplies, and employee wages. Cost of Goods Sold (COGS): This is a specific subset of operating costs that directly relates to the production or purchase of goods sold by a company. It's akin to the cost of purchasing fuel for your car. Together, these figures give you a clear picture of how efficiently a business is converting its resources into income. By analyzing revenue and expenses in tandem, stakeholders can make informed decisions about the financial health and strategic direction of the company. Welcome to the PnL Explained Professionals Home Page! Main Page by Topic A. PnL Explained B. CTRM Software C. Statistics Last Updated May 2025 Our Mission a) Educate the world about PnL explained reporting (a.k.a. PnL Explain/PnL Attribution/P&L Explained/P&L Attribution/Profit and Loss Explained) b) Provide a forum for PnL Explained Professionals to share information and help them meet their professional goals. c) Provide credentials to professionals to help demonstrate that they have reached a minimum level of proficiency in PnL explained reporting. Our Motto Res Non Ipsa Loquitur PnL Explained Profit and/or Loss (PnL) Explained also called P&L Attribution is a type of report commonly used by traders, especially derivatives (swaps and options) traders, that attributes or explains the daily fluctuation in the value of a portfolio of trades to the root causes of the changes. PnL is usually defined as value today minus value from prior day. PnL Explained is defined at a high level as or in more detail: For more, see PnL Explained FAQ and PnL Explained Glossary And also see MTM Explained and Greeks Explained This website last updated May 2025 PnL, which stands for Profit and Loss, is more formally known as the Income Statement. This key financial document is essential for understanding the overall health of a business, providing insights into revenue, expenses, and profit over a specific period.PNL vs Cashflow It differs significantly from the cash flow statement, which focuses on the actual cash inflows and outflows, rather than just the profitability metrics.The Dema approach to profitAt Dema, we take a unique approach to profitability analysis by breaking down our profit metrics into three distinct layers: NGP1, NGP2, and NGP3. This layered approach allows for a more granular view of profitability. NGP1 might represent the most basic level of profitability, such as gross profit, while NGP2 and NGP3 could provide deeper insights, such as adjusted gross profit or net profit after returns and marketing costs respectively.How the DEMA factor helps Having access to these profit layers in near real-time provides a significant advantage. It enables you to pinpoint exactly which aspects of your business are contributing positively to profitability and which areas may require attention or improvement. For instance, if NGP1 shows strong performance but NGP2 and NGP3 reveal issues, you can investigate further to determine whether the problem lies in operational inefficiencies, increased costs, or other factors.Why the granular data helpsThis detailed visibility into profit at multiple layers facilitates data-driven decision-making, allowing you to make more informed choices about where to allocate resources, which strategies to pursue, and how to optimize your business operations for better financial outcomes. By leveraging these insights, you can enhance your business's overall performance and drive sustainable growth. Income statement with commentary This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources: "PnL explained" – news · newspapers · books · scholar · JSTOR (December 2020) (Learn how and when to remove this message) In investment banking, PnL explained (also called P&L explain, P&L attribution or profit and loss explained) is an income statement with commentary that attributes or explains the daily fluctuation in the value of a portfolio of trades to the root causes of the changes. P&L is the day-over-day change in the value of a portfolio of trades typically calculated using the following formula: PnL = Value today − Value from Prior Day A PnL explained report will usually contain one row per trade or group of trades and will have at a minimum these columns: Column 1: PnL – This is the PnL as calculated outside of the PnL Explained report Column 2: PnL explained – This is the sum of the explanatory columns Column 3: PnL unexplained – This is calculated as PnL minus PnL explained (i.e., column 1 minus column 2) Column 4: Impact of time – This is the PnL due to the change in time. Column 5: Impact of prices – This is the change in the value of a portfolio due to changes in commodity or equity/stock prices Column 6: Impact of interest rates – This is the PnL due to changes in interest rates Column 7: Impact of volatility – This is the PnL due to changes in volatilities. Volatilities are used to value option (finance) (i.e., calls and puts) Column 8: Impact of new trades – PnL from trades done on the current day Column 9: Impact of cancellation / amendment – PnL from trades cancelled or changed on the current day There are two methodologies for calculating Pnl Explained, the 'sensitivities' method and the 'revaluation' method. [1] The sensitivities method [2] involves first calculating option sensitivities known as the Greeks because of the common practice of representing the sensitivities using Greek letters. For example, the delta of an option is the value an option changes due to a $1 move in the underlying commodity or equity/stock. See Risk factor (finance) § Financial risks for the market. To calculate 'impact of prices' the formula is: Impact of prices = option delta × price move; so if the price moves $100 and the option's delta is 0.05% then the 'impact of prices' is $0.05. To generalize, then, for example to yield curves: Impact of prices = position sensitivity × move in the variable in question This method calculates the value of a trade based on the current and the prior day's prices. The formula for price impact using the revaluation method is Impact of prices = (trade value using today's prices) − (trade value using prior day's prices) for some small-value assets such as "loose tools".[3] Depreciation = value at the beginning of the year (opening balance) + purchases in the year − value at the end of the year (closing balance) PnL unexplained is a critical metric that regulators and product control within a bank alike pay attention to. Any residual P&L left unexplained (PnL unexplained) would be expected to be small if (1) the identified risk factors are indeed sufficient to materially explain the expected value change of the position and, if (2) the models used to calculate sensitivities to these risk factors are correct. PnL unexplained is thus a metric that, when large, may highlight instances where the risk factors classified for a risky position are incomplete, or the models used for sensitivities calculations are incorrect or inconsistent.[4] See model risk and, again, Financial risk management § Banking. PnL Explained Professionals Information and examples from PnL Explained Professionals Association's home page Pantz, Julien 2013 PnL prediction under extreme scenarios ^ See generally, Roy E. DeMeo (N.D.) Quantitative Risk Management: VaR and Others ^ For an overview, see Liuren Wu (N.D.) P&L Attribution and Risk Management, Baruch College ^ "Loose Tools | Accounting Details". ^ "Why P&L Attribution? Or judging weathermen..." Acuity Derivatives. Retrieved 10 September 2012. Retrieved from " Profit and Loss (PnL or P&L) is a critical financial metric used to determine the net profit or loss of an individual or company over a specific period. It shows how much net profit an entity has generated over a time period or in a certain number of transactions. Understanding PnL is essential for investors, traders, and business owners. In the world of trading, PnL refers to the profit or loss a trader has incurred from their trades. It is calculated based on the difference between the asset's entry and exit prices, minus any fees paid for the trade. PnL can be divided into two categories: Realized PnL and Unrealized PnL. Let's explore each of these in more detail. Realized PnL Realized PnL is the profit or loss generated from a completed or closed trade. It is essential for evaluating the effectiveness of a trading strategy and required in tax calculations, as realized profits are subject to capital gains tax, while realized losses can offset capital gains and reduce the tax liability. Realized PnL Displayed on Bluefin Exchange Account History Page Calculation Without taking commissions or gas fees into account for simplicity, realized PnL is calculated as: Long Trade = Size Closed × (Exit Price − Entry Price)Short Trade = Size Closed × (Entry Price − Exit Price) Example Long Trade A trader buys/longs an asset at a price of $10 and closes the trade at $15. The realized PnL would be $5 (or $5 realized profit). 1 x ($15 - $10) = $5 However, if the price dropped to $7 & the trader closed the trade, the PnL would be -$3 (or $3 realized loss). 1 x ($7 - $10) = -$3 Example Short Trade In contrast, if a user sells/shorts an asset at a price of $10 and closes the trade at $15. The realized PnL would be -$5 (or $5 realized loss). 1 x ($10 - $15) = -$5 However, if the price dropped to $7 & the trader closed the trade, the PnL would be $3 (or $3 realized profit). 1 x ($10 - $7) = $3 Unrealized PnL Unrealized PnL is the profit or loss generated from an open position or trade that has yet to be closed. It represents the difference between an asset's current market value (Index price) and purchase (entry) price. Unrealized PnL is also known as "paper profit or loss" because the position has not yet closed. If the trader decides to close the trade at the current market price, the unrealized PnL becomes realized PnL. Unrealized PnL Displayed on Bluefin Exchange Open Positions Calculation Without taking commissions or gas fees into account for simplicity, unrealized PnL is calculated as: Long Trade = Position Size × (Index Price − Entry Price)Short Trade = Position Size × (Entry Price − Index Price) What is PnL Percentage? PnL Percentage refers to the profit and loss relative to the initial money 'at-risk', which is another way to measure the relative gain or loss on an investment or trading position. PnL percentage is most used to analyze and compare the performance of trading strategies. To calculate the PnL Percentage, you need: The initial investment value, or Starting Value and the Final Value of the investment. The formula to calculate PnL Percentage is as follows: PnL Percentage = (Final Value/ Starting Value - 1) * 100% The formula yields PnL relative compared to your initial investment. A positive percentage means a profit was made, while a negative percentage indicates a loss. Example A trader buys/longs an asset at an entry price of $10 and closes that trade when the price of the asset is $15. The PnL percentage will be 50%. ($15/$10 - 1) * 100% = 50% What is PnL Ratio The PnL Ratio is also a measure of a trader's performance that takes into account the size of their profits and losses relative to their trading capital. It is calculated by dividing the total profits by the total losses. The formula to calculate PnL Ratio is as follows: PnL Ratio = Total Profits / Total Losses A PnL Ratio greater than 1 indicates that the trader has made more profit than loss, while a PnL Ratio less than 1 indicates that the trader has made more loss than profit. Example If a trader has made $10,000 in profits and $5,000 in losses, the PnL Ratio would be: PnL Ratio = $10,000 / $5,000PnL Ratio = 2 This indicates that the trader has made twice as much profit as loss, which is a good sign. In conclusion, PnL is an essential metric for traders, investors, and business owners to evaluate their trading strategy, financial performance, and tax liability. By understanding the different ways of calculating and evaluating PnL, such as PnL Percentage, and PnL Ratio, individuals and companies can make informed decisions about their financial strategies and performance. About Bluefin Bluefin is an orderbook-based derivatives exchange using the most innovative decentralized infrastructure to support first-time users and professional traders. Please view our terms of use and privacy policy before accessing the platform. Main Page for Subject Area PnL Explained CTRM Software Statistics PnL Explained - FAQ Question 1) What is MTM? Answer 1) MTM is short for Mark-to-Market and in the context of trading means the value of something, i.e., a trade. This concept is also called 'Present Value'. See below and see that the general formula for trading PnL can be expressed as: PnL = MTM today – MTM Prior Day. Click here for more information about MTM Question 2) What is PnL? Answer 2) PnL stands for Profit and Loss. The 'and' usually gets written as a 'n' or 'N' or '&' (as in 'PnL', 'PNL' or 'P&L'). PnL is the way traders refer to the daily change to the value of their trading positions. The general formula for PnL is PnL = Value today minus value yesterday. So if you are a trader and your positions were worth $100 yesterday and today they are worth $105, then your PnL for the day was $5. It is a profit of 5. So if you are a trader and your positions were worth $111 yesterday and today they are worth $105, then your PnL for the day was -$6 and it was a loss. The value of something is also known as the Mark-to-Market (MTM) which is defined in this FAQ as the present value of all current (meaning today) and expected future cash flows (or physical flows for physically settling deals). It is common practice to add back in any cash flow from the prior day when computing PnL, otherwise PnL would be misrepresented by the amount of the cash that is paid/received. Note that 'deal' and 'trade' are used interchangeably and mean the same thing in this FAQ. Example On March 23 a trader does a trade that means his firm will receive 2 cash payments, one for $50 on March 25 and one for $100 on March 27. This table shows the MTM, current day's payments and PnL... all assuming values are non-discounted, meaning that interest rates are zero or not counted. Undiscounted MTM (current and future cash flows) PnL (MTM today -MTM prior + prior day's cash flows) Current Day Cash Flows (payments/ receipts) March 22 $0 $0 March 23 $150 $150 March 24 $150 $0 March 25 $150 $0 $50 March 26 $100 $0 March 27 $100 $0 $100 March 28 $0 $0 The important point the above table shows is that after the first day, the PnL is zero because making payments (or receiving cash) doesn't change the trading PnL. If we add in the effects of discounting / present value / time value of money / interest rates. The concept of present value (PV) and future value (FV) is that a dollar today is worth more than a dollar in the future. That is because you can put less than a dollar in the bank today and earn interest on it and have $1 in the back in the future. The ratio of PV to FV is called the discount factor (DF) and you have these formulas: DF = PV / FV or PV = DF * FV e.g., if you have $100 and put is in the back for a year and have $102 in one year then your present value is $100, your future value is $102 and your discount factor is 0.980392157. Note that discount factors are always between 0.00 and 1.00. Undiscounted MTM (current and future cash flows) PnL (MTM today -MTM prior + prior day's cash flows) Current Day Cash Flows (payments/ receipts) March 22 $0.00 $0.00 March 23 $149.50 $149.50 March 24 $149.60 $0.10 March 25 $149.72 $0.12 $50 March 26 $99.83 $0.11 March 27 $100.00 $0.17 $100 March 28 $0.00 $0.00 Note that the PnL from March 24 to March 25 is $0.12 and that comes from the change in the discount factors which can come from two sources: a) The fact that there is one day fewer to the ultimate payment and b) changes to interest rates. In other words, both interest rates and time (time to payment date) play a role in determining the discount factor used to future payments and present value them. Question 3) What is PnL Explained? Answer 3) PnL Explained is the practice of attributing the changes in the daily value (i.e., PnL) into categories. It is sometimes called 'PnL Attribution' which means the same thing (or P&L Explained or P&L Attribution or Profit and Loss Explained / Profit and Loss Attribution). Sometimes the categories are called 'buckets' so the act of attributing PnL into categories is sometimes called 'bucketing'. The categories/buckets typically appear as columns in a PnL Explained report. There are three sources of PnL in the above example. The PnL comes from new trades, changes in time, and changes to interest rates. The sources/categories/buckets of PnL changes are often labeled something like 'Change in MTM value due to changes in time' or, more commonly, 'Impact of Time'. The below table takes the above example and buckets the PnL into the three sources applicable for this example. Note that the numbers are just examples... the breakdown between Impact of Time and Impact of Interest Rates is just for this example and not something you could calculate with just the information given so far. Sample PnL Explained Reports over several days. PnL (MTM today -MTM prior + prior day's cash flows) Impact of New Trades Impact of Time Impact of Interest Rates March 22 $0.00 March 23 $149.50 $149.50 March 24 $0.10 $0.03 $0.07 March 25 $0.12 $0.02 $0.10 March 26 $0.11 $0.01 $0.10 March 27 $0.17 $0.01 $0.16 March 28 $0.00 See that the sum of the three explanatory columns adds up to the PnL? That is the ideal case for a PnL Explained report. In order to help out the reader of a PnL Explained report, the report will typically include a column summing the explanatory columns called 'PnL Explained' and another column showing the difference between the 'PnL' column and the 'PnL Explained' column called 'PnL Unexplained'. For example, for the March 25 example values: PnL PnL Explained PnL Unexplained Impact of New Trades Impact of Time Impact of Interest Rates $0.10 $0.10 $0 $0 $0.03 $0.07 If for some reason, the formula for PnL due to changes in interest rates was off and calculated $0.05 instead of $0.07 then the report would look like this PnL PnL Explained PnL Unexplained Impact of New Trades Impact of Time Impact of Interest Rates $0.10 $0.10 $0.02 $0 $0.03 $0.05 PnL Unexplained is bad and should be avoided, meaning to be minimized or reduced to zero. Depending on the methodology used, it may not be possible to eliminate all PnL Unexplained. Question 4) What are the methodologies for calculating PnL Explained? Answer 4) There are two methodologies for calculating PnL Explained, the 'sensitivities' method and the 'revaluation' method. The Sensitivities Method involves first calculating option sensitivities known as the greeks because of the common practice of representing the sensitivities using Greek letters. For example, the delta of an option is the value an option changes due to a $0.01 move in the underlying commodity or equity/stock. To calculate 'Impact of Prices' the formula is Impact of Prices = Option Delta * Price Move so if the price moves $0.05 and the option's delta is $100 then the 'Impact of Prices' is $500. The Revaluation Method recalculates the value of a trade based on the current and the prior day's prices. The formula for Impact of Prices using the Revaluation Method is Impact of Prices = (Trade Value using Today's Prices) - (Trade Value using Prior Day's Prices) Question 5) What are the pros and cons of the Sensitivities Method versus the Revaluation Method? Answer 5) Pros Cons The Sensitivities Method 1) Since this method uses the greeks (delta, gamma, vega, theta, etc) and since many trading systems already calculate the greeks, this method can be easier to implement than the revaluation method. 1) The sensitivity method is inherently incapable of explaining P&L unless all first, second, and higher order sensitivities are calculated as well as all cross effects. However, calculating all sensitivities is not usually practical from a performance point of view. The Revaluation Method 1) Can be fully accurate, meaning there can be no explained since the revaluation method isn't subject to the limitations in accuracy of the sensitivities method as it is typically implemented. 1) Does not allow for PnL to be attributed to second order effects. Question 6) How do you calculate 'Impact of Gamma' (aka Gamma PnL), i.e., changes in PnL due to option gamma? Answer 6) First... some definitions... For example, the delta of an option is the value an option changes due to a $0.01 move in the underlying commodity or equity or bond. The gamma is how much the delta changes for a $0.01 move. For example... suppose you have a commodity trading at $50. Suppose the delta of your position is currently $10. In other words.. you make $10 if the price of the underlying goes up $0.01 to $50.01 You could put that in a table like this: Underlying Price $50 Delta $10 With a non-option trade.... such as a futures or a swap... the delta won't change... it remains the same... so they'll call this a linear (meaning in this case unchanging in a straight line) trade... or call it a linear instrument.... You get something like this for various market prices Futures Trade Price Unchanged Underlying Price $49.98 $49.99 $50 $50.01 $50.02 Delta $10 $10 $10 $10 $10 In other words, whatever the market price (and I just show it for the unchanged prices of $50 plus and minute a couple of cents... the delta is the same. Now suppose we are talking about an option trade.... and suppose the gamma of the trade is $1. That means that if the delta of an option is $10 now (i.e., with the underlying trading at $50... then the new delta will be $11 (i.e., old delta of $10 plus the gamma of $1) if the market price of the underlying goes to $50.01. We can put that in a table like this: Option Trade Price Unchanged Underlying Price $49.98 $49.99 $50 $50.01 $50.02 Delta $8 $9 $10 $11 $12 Notice that the delta goes up from $10 to $11 when the market price goes up $0.01 and it goes down to $9 if the market price goes down $0.01. Notice also that the rate of change of the delta isn't changing... the gamma is staying at $1.... that is not realistic. In reality the gamma would also be changing... however for the simplicity of this example I kept the gamma at $1 for each $0.01 move in the underlying price. The gamma at each price of the underlying would be shown like this: Option Trade Price Unchanged Underlying Price $49.98 $49.99 $50 $50.01 $50.02 Delta $8 $9 $10 $11 $12 Gamma $1 $1 $1 $1 $1 Now let's add in the value of the option trade... and let's assume that the value is $200. The option could be anything... none of the trade details matter except for the value of the option (which is $200), the delta (which is $10) and the gamma (which is $1). However... in order to make the example clearer... let's assume the option is... The right to buy 100 barrels of crude oil at a strike price of $50 when crude oil is trading at $50/barrel and the option expires in three month. I.e., the underlying is crude oil and it is an at-the-money call option. So what would the value be at different market prices (i.e., different prices of the underlying crude oil)? We can create a table like this: Option Trade Price Unchanged Underlying Price $49.98 $49.99 $50 $50.