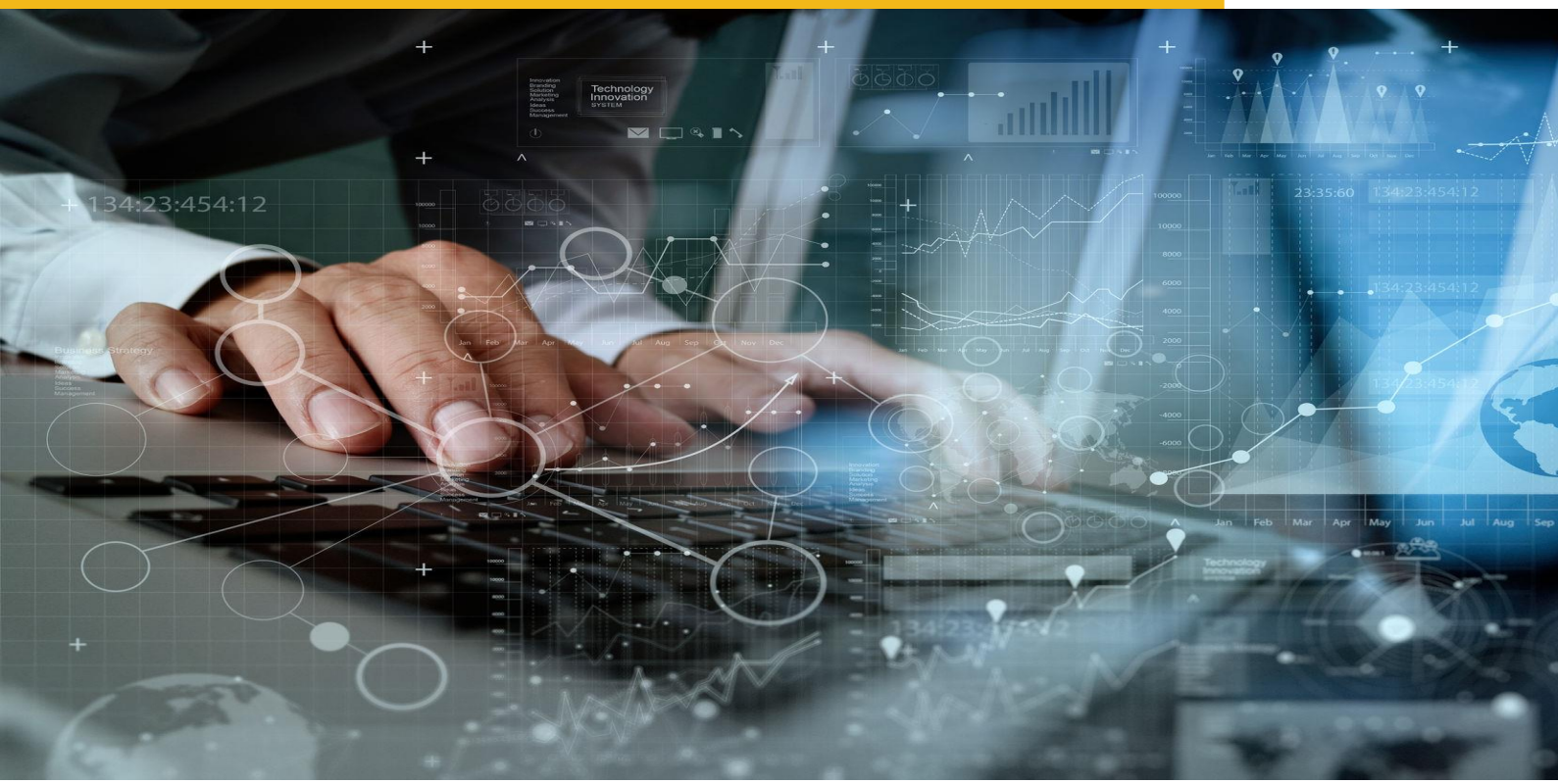
Aptivaa

Demystifying PD Terminologies



A key metric that summarizes the credit worthiness of a bank's obligor is the Probability of Default (PD). Besides credit worthiness assessment and capital computation under IRB, PD is one of the key metrics required in the updated IFRS 9 accounting standards. At present, there are many PD related terminologies used in the banking industry, such as: PIT PD, TTC PD, 12-month PD and so on. Such a wide spectrum of terminologies has led to confusion among users, especially when it comes to IFRS 9, which lays special focus on PIT PD and lifetime PD. This blog intends to clarify these key terminologies.

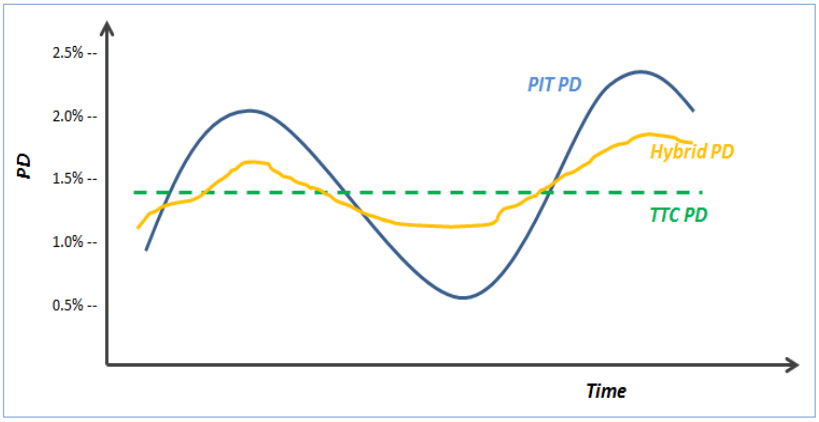
Contrary to the common misconception, PD as a parameter is very distinct from default rate. The default rate accounts for actually realized defaults over a given period, while PD is the predicted probability that a pool of obligors will default over the predefined future time horizon. This time horizon is– typically 12 months in a Basel environment, which has evolved to become the de facto industry standard.

Rating Philosophies:

The nature of the PD and what it represents can fall under one of two rating philosophies: point-in-time (PIT) and through-the-cycle (TTC). Under IFRS9, PIT PD is recommended for computation of expected losses whereas TTC PD (with a 12 month horizon) is recommended under Basel IRB capital calculation framework. Moreover, while the Basel TTC PD horizon is typically 12 months, the PD required under IFRS 9 is either 12 month PIT or a lifetime PIT PD. Of these two PDs, the lifetime PD is often confused with TTC PD; however, in reality they are quite different by definition. For instance, the PIT PD, TTC PD, 12-month PD (PIT) and even PD term structure related to obligors through their rating. Lifetime PD distinguishes itself from these PDs on the grounds that it accounts for maturity of the facility, in addition to borrower rating.

PIT PD:

PIT PD accounts for the variations in economic cycle and thus it moves along with it. A PD generated from a rating model that includes both idiosyncratic and macroeconomic factors gives PIT PD and is said to follow PIT rating philosophy. Such rating models account for the current macroeconomic scenario, and as a result, the model score or rating of obligors will closely track business cycle. The PIT rating philosophy also implies that the resulting PIT PD will closely mimic observed default rates with correlation closing in to 100 percentage under ideal conditions.

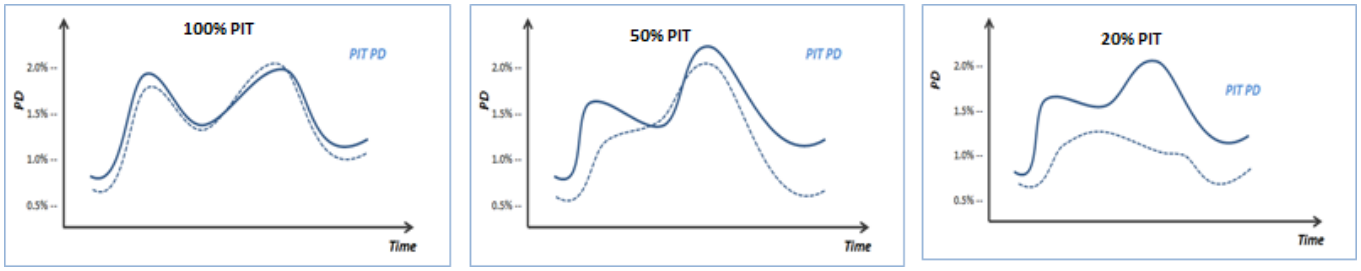


TTC PD:

On the other hand, if a rating model includes only idiosyncratic factors, the model is said to follow TTC philosophy. As a result, scores or rating generated by TTC rating model/ scorecard does not change (largely) with a change in macroeconomic factors. In such cases, the score or rating will remain stable over the economic cycle. Under such a TTC rating philosophy, the resulting TTC PD will show little or no variation over the economic cycle and will tend to deviate from the observed default rates when the economy is at its peak or trough.

Hybrid PD:

While the concept of pure PIT and TTC philosophy follower models or PDs is theoretical, in practice the PDs implied by such rating models tend to be at somewhere midway between PIT and TTC. Such PDs are called hybrid PIT-TTC PD.



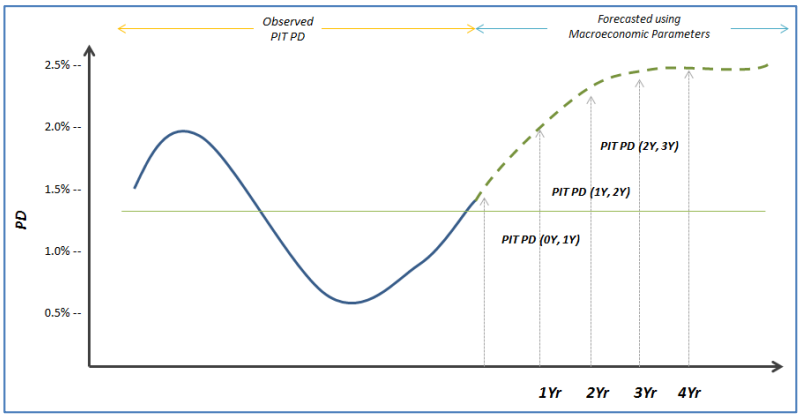
There are few approaches to assess PITness or TTCness of the PDs, such as Use test, Model Build test, Default correlation and Outcome analysis. Under use test, the degree of PITness can be assessed by considering the purpose for which a model was developed. For instance, a model developed for pricing should be as per PIT philosophy, while the one developed for capital computation should generally be as per TTC philosophy. Similarly, a model that accounts for complete macroeconomic changes should be as per PIT philosophy. Unlike subjective tests like use test and model build test, the default correlation and outcome analysis can provide statistical tests. A PD that is significantly correlated with default rate can be termed as PIT PD, while reverse is true for TTC PD.

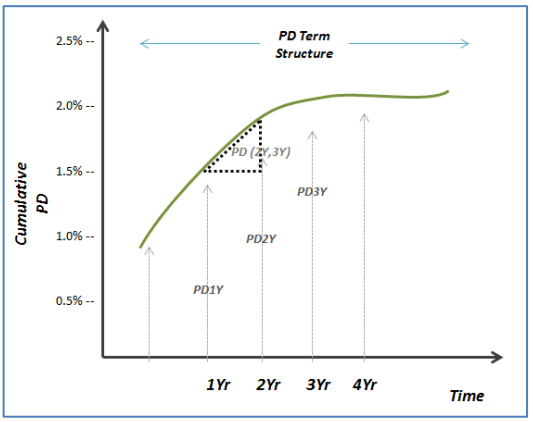
12-month PD (PIT):

The 12-month PD, by definition, is the PIT PD with 1 year forward looking performance window. This PD essentially dictates the tendency of an obligor to default over next 12 months based on present obligor-specific parameters.

Lifetime PD:

The lifetime PD is the extension of PIT PD for remaining life or maturity of the loan. The computation of lifetime PD requires a long term perspective on macroeconomic parameters and a broad overview of the economy for upcoming years. A robust time series analysis on macroeconomic parameters is generally carried out and its relation with PIT PD is established for future time periods to arrive at PD term structure over the remaining maturity of the loan. From this extended term structure, a Lifetime PD is derived depending upon the maturity of the facility. For instance, one can define a 10 year PD term structure for given rating grade using projected 10 year macroeconomic parameters. For a facility that is maturing in 6 years, the 6 year PD will be used as a lifetime PD out of the 10 year term structure.





Lifetime PD vs PIT PD, TTC PD, 12-month PD:

The differences between lifetime PD and other PDs can elaborated effectively through an example. For instance, if one borrower has 3 different facilities maturing in different time period, then the borrower will have same PIT PD, TTC PD, 12-month PD, and PD term structure for a given borrower rating, but the lifetime PD will be different for each facility of this borrower depending upon their maturity. Thus, the borrower will have one single value of PIT, TTC, 12-month PD and PD term structure, but will have 3 different lifetime PDs.

In the coming post, we will be discussing PD Calibration, which is a critical exercise to assess how well the PDs fit the data.