Flat vs Declining Balance Interest Rates

What is the Difference?

One of the main components to the price of a loan is the interest rate. A somewhat abstract concept, this can be difficult to understand, particularly in a non-transparent environment. We frequently hear about "flat" and "declining balance" interest rates, but what exactly is the difference between the two? How do they relate to transparency? This article will explain the concept of interest, the different methods used to calculate it and some industry standards for disclosure.

Definitions of "Interest Rate"

The concept of interest on a loan can be understood as *renting*. Similar to renting a home, the interest charged on a loan is the price of renting money. Interest is the amount the borrower pays to the lender for the use of money for a given period of time. The money is then returned to the lender at the end of the loan period, much like a tenant "returns" the house he has rented from the landlord at the end of a lease. An interest rate is therefore the percentage ratio of the interest to the principal, or the price of borrowing relative to the loan amount. For example, if a lender charges a customer $90 on a loan of $1,000, then the interest rate would be (90/1,000)*100% = 9%.
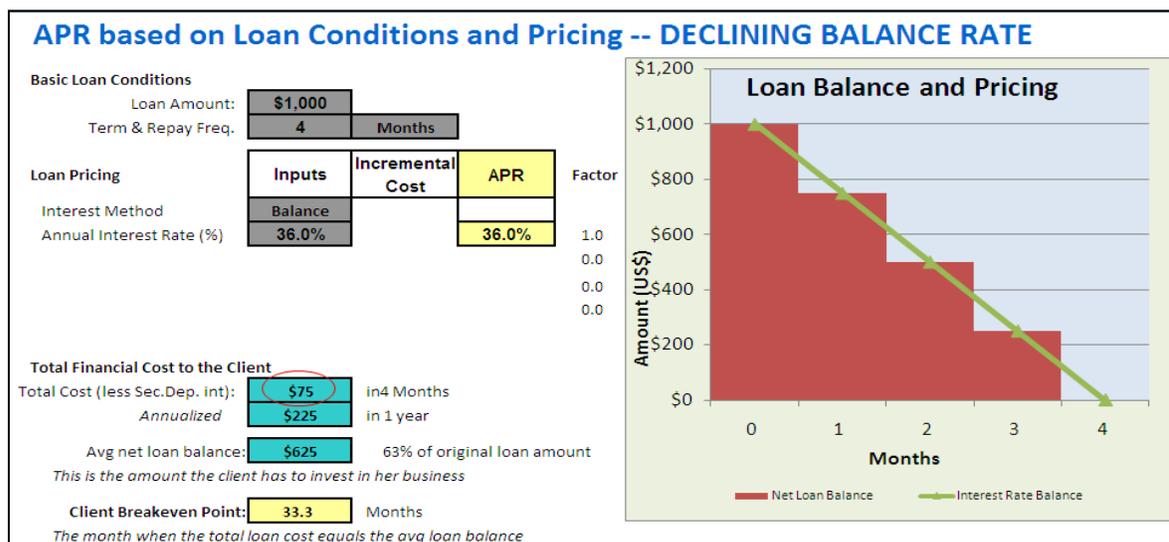
Flat vs. Declining Balance

Interest payment amounts depend both on the interest rate stated and on the method used to calculate it. Two main techniques are common within the microfinance industry: the "declining balance" method, also known as "reducing balance", and the "flat rate" method.

The Declining Balance Calculation Method

Using the declining balance method, interest calculation is based on the outstanding loan balance – the balance of money that remains in the borrower's hands as the loan is repaid during the loan term. As the borrower repays installments, the remaining loan balance declines over time. Interest is then charged only on the loan amount that the borrower still holds. The idea is that the borrower is only paying interest on the actual money he or she has in hand at any given time.

This is illustrated in the figure below, from the MF*Transparency* Calculating Transparent Prices Tool.[1]


APR based on Loan Conditions and Pricing -- DECLINING BALANCE RATE

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[1] This tool is available for download, free of charge, here http://www.mftransparency.org/pages/ctp-tool/

Suppose you lend $1,000, to be repaid in 4 equal monthly payments. The stated interest rate is 36% per year, or 3% per month, calculated on declining balance. Each period, before applying the interest rate, the outstanding balance is recalculated. On the graph at right, the red area represents the loan balance and the green line represents the interest rate balance. As you can see from the red-steps on the graph, in early months, the outstanding balance is high. Accordingly, the interest payment is relatively high, 3% of $1,000 or $30. As the principal balance declines over time, the interest rate balance follows. In the last period the interest amount paid is only $7.50. In this case, as the borrower retains less of the original loan amount, their interest payments decrease. They are only paying "rent" on the loan amount they still have. In our example, total interest payments made by the borrower are $75 in 4 months.

The Flat Calculation Method

When using the flat rate method, interest is charged on the full original loan amount throughout the loan term, rather than on the money that the borrower actually has in her hands. This scenario is depicted in the figure below.
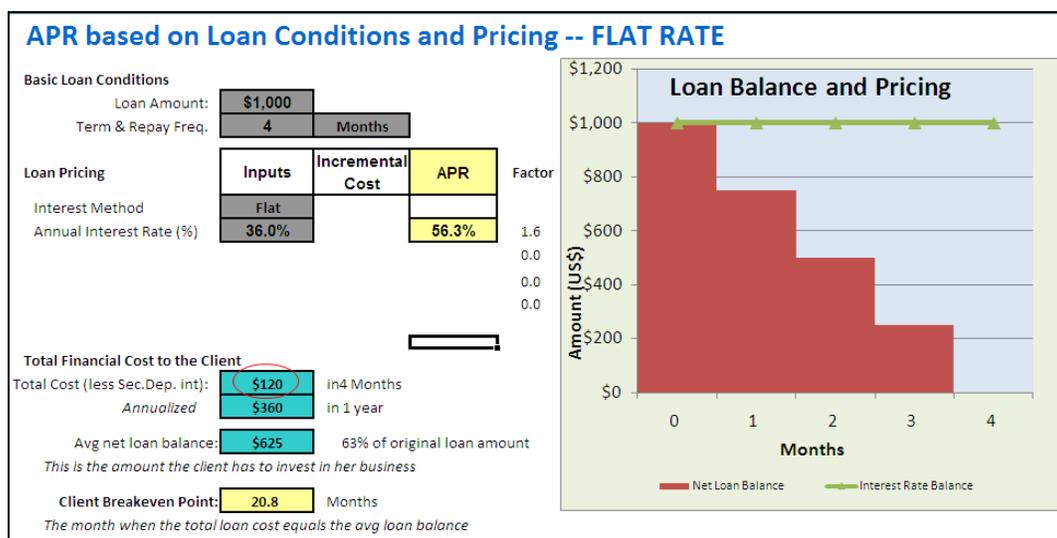
Consider a similar example of a $1,000 loan with an interest rate of 3% per month, but charged using the *flat* method, for 4 months. Like the first example, the interest paid in the first month is $30. But unlike the first, this payment remains $30 throughout the loan term. As you can see by looking at the green line relative to the red area on the graph, the interest rate is charged on the initial loan balance the entire term, although the borrower is holding less and less money. The area of the rectangle under the green line is almost double the area under the red-step loan balance. The overall interest paid in 4 months is then $1,000 multiplied by 3% and then by 4 months, a total of $120.

Recall, when using the same interest rate of 3% per month on a $1,000 loan, with the declining balance method the total interest rate was only $75. **Although both loans state an interest rate of 3% per month, the one using the flat interest rate calculation method results in almost twice as much in interest payments for the client.**

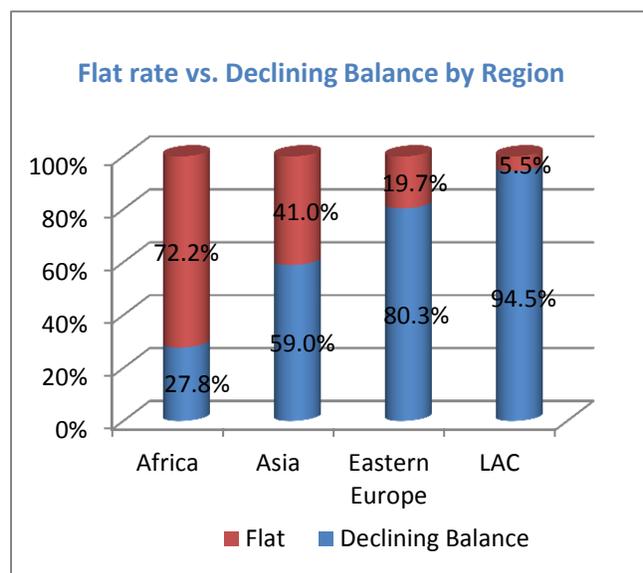## Why is the Flat Calculation Method So Commonly Used in the Microfinance Industry?

The flat rate calculation method is widely used by micro lenders. As illustrated in the figure below, according to the MF*Transparency* database[2], interest for more than 3 in every 10 micro loan products is calculated using flat rate method. This is particularly prevalent in Africa, where about 70% of loan

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[2] Countries are Azerbaijan, Bolivia, Bosnia and Herzegovina, Burkina Faso, Cambodia, Colombia, Ecuador, India, Kenya, Malawi, Senegal, Uganda

products include interest calculated using the flat rate method as compared to Latin America where the ratio is just 5%. Interestingly, this is largely due to the fact that the Latin American markets represented in the database all operate under legislation that promotes the use of the declining balance method. The following table illustrates the use of flat interest rates by country, according to the MF*Transparency* dataset:

Country	% Products Using Flat Interest Rates
Azerbaijan	14%
Bolivia	9%
Bosnia and Herzegovina	22%
Burkina Faso	86%
Cambodia	8%
Colombia	3%
Ecuador	2%
India	57%
Kenya	81%
Malawi	79%
Rwanda	50%
Senegal	68%
Uganda	77%
TOTAL	**35%**

The flat rate calculation method has become prevalent in markets where there is a lack of transparency and the mechanisms to facilitate it. The flat rate allows financial institutions to advertise costs that are nearly twice as high as they appear. To most borrowers, especially those with minimal financial education, the flat rate seems cheaper.

Flat rate vs. Declining Balance by Region

Region	Flat	Declining Balance
Africa	72.2%	27.8%
Asia	41.0%	59.0%
Eastern Europe	19.7%	80.3%
LAC	5.5%	94.5%

Legend: Flat, Declining Balance

The flat rate calculation method is often preferred by microfinance institutions for several reasons. As explained above, using the flat rate calculation method is an easy way for institutions to increase their income without giving clients the impression that their prices are more expensive. Because the interest payment is the same amount each repayment period, some institutions also argue that using the flat method is easier for their staff and clients to understand. In reality, it is possible for institutions, even without a sophisticated MIS, to calculate the declining balance interest rate and communicate payment amounts to clients effectively.

Once one institution begins to calculate their prices this way it is difficult for others to compete using a declining balance rate that appears higher but may actually be less expensive. For example, a lender using declining balance calculation must set the interest rate as high as 56.3% per year to collect the same amount of total interest payment as another one who is using a 36% per year flat rate. Without policy or standards in place to prevent this, institutions must resort to non-transparent practices in order to be competitive.

Why Should Institutions Use the Declining Balance Rate?

Widespread adoption of the declining balance interest rate calculation method is better for microfinance borrowers, and the market as a whole, for several reasons:

- **It is an accurate reflection of the cost of borrowing.** There is no theoretical basis for the flat method. It does not make sense for a borrower to pay interest on money they do not have.
- **It is closer to the actual price.** A transparently communicated price is one that most closely matches the overall cost of borrowing when all charges are considered. Compared to the declining balance, the flat calculation method is far from this. Prices calculated using flat interest payments *sound* much lower than those using declining balance interest rates. However, the declining balance calculation method is more transparent because the figure communicated to the client is closer to the figure representing the actual percentage of the loan amount paid in interest.
- **Using one method, borrowers can compare prices.** It is very difficult for borrowers to compare a loan with a 15% flat interest rate to a 25% declining balance rate. If all institutions used the same calculation method then borrowers would be able to make more informed decisions.
- **It enables price competition based on transparency.** When borrowers are able to compare prices then institutions can compete more effectively, potentially resulting in better services and ultimately lower rates. Institutions can also make smarter price-setting decisions.

For institutions that are concerned that borrowers may find it difficult to pay a different amount in interest each repayment period, amortizing principle payments is an effective way to use a declining balance interest rate and still require equal repayment amounts each period. Through amortization, the principle payment each period increases over the loan term while the interest payment decreases (or declines), so that the total *installment* amount the borrower must pay is the same each period.

For example, consider a loan of $1,000 with a declining balance interest rate of 24% annually and a loan term of 6 months. If an institution required equal principle payments each month, the repayment schedule would be as follows:

Repayment Schedule – Equal Principle Payments			
Period #	**Balance**	**Principal Paid**	**Interest Paid**	**Installment Amount**
0	1,000.00			
1	833.33	166.67	20.00	186.67
2	666.66	166.67	16.67	183.33
3	499.99	166.67	13.33	180.00
4	333.32	166.67	10.00	176.67
5	166.65	166.67	6.67	173.33
6	0.00	166.67	3.33	170.00
	TOTALS:	**1,000.00**	**70.00**	**1,070.00**

Notice the installment amount is different each month. Alternatively, the institution could use the amortization method. In this case, the repayment schedule would be as follows:

Repayment Schedule – Equal Installment Amounts			
Period #	Balance	Principal Paid	Interest Paid	Installment Amount
0	1,000.00			
1	841.47	158.53	20.00	178.53
2	679.78	161.70	16.83	178.53
3	514.85	164.93	13.60	178.53
4	346.62	168.23	10.30	178.53
5	175.03	171.59	6.93	178.53
6	0.00	175.03	3.50	178.53
	TOTALS:	1,000.00	71.15	1,071.15

Notice that the installment amount is the same each month, much easier for the borrower to remember and the loan officer to track. The amount of interest paid is slightly more on the amortized loan but the APRs are the same, 24%, because through amortization the borrower repays the loan amount more slowly, and therefore has more time to use the principle amount to generate income.

There are several ways of encouraging the use of the declining balance method. Regulators and policymakers can implement official policy requiring it. Reporting standards such as the *Transparent Pricing Initiative* can help create a conducive environment for transparency. Through coordinated industry-wide effort, microfinance markets can take important steps toward establishing transparent pricing practices.

MF*Transparency* is promoting price transparency by educating stakeholders, promoting standards for disclosure and by publishing the true costs of microfinance products in a clear, consistent fashion. To learn more please visit www.mftransparency.org or contact us at resources@mftransparency.org