Accounts Receivables Risk Management in Indian Pharmaceutical Industry: Financial Model Building in Revived Scenario

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Abstract

A firm's profitability is determined partly by way of its receivables management. An efficient management of receivables will yield significant results and its neglect can be highly dangerous to any firm. A sample of thirty two pharmaceutical companies are selected for this study on the basis of high sales turnover and data for this study were collected for a period from 2000-01 to 20100-11 to analyze whether the sample companies really managed their Receivables or not. The paper aims at presenting the importance of accounts receivable in the credit policy management and developing a suitable model for managing receivable risk in Indian context.

Keywords: Pharmaceutical Industry, Receivables Management, Risk, India
JEL Classification Codes: M31, G21, C83

1. Introduction

The process of medical accounts receivable management is truly a misnomer. In a perfect world, accounts receivable would require nothing more than collection—not management or process. However with growing complexity, payment ambiguity, payer plans, co-pays, co-insurance and other factors that drive up costs in healthcare delivery, the management of the accounts receivable process continues to demand more attention. With an average of 30 percent in denial rates and informed

speculation of 15 percent in lost revenues on an annual basis, we must conclude that the management processes currently in place are woefully inadequate and costly. Unfortunately, the national healthcare debate on improvement does not address the A/R management process (or lack thereof) where significant cost savings could achieved.

According to most industry publications, the majority of medical providers collect a portion of their charges within 60 to 70 days from the date of service as compared to five to 10 days required of most retail service providers. Why the difference?

On average, medical providers have over 60 various contracts with payers for services rendered that do not typically include the reimbursement amounts. Each patient has a unique status within annual healthcare insurance plans as it relates to eligibility, allowable, network status, coinsurance, and covered services—factors not available to medical providers in advance of the visit with any consistency or clarity from the various payers. The allowable and eligibility are reset and, in many cases, change annually. This eliminates any consistency from payer, procedure and patient over the years.

A 30 percent denial or reject rate for services rendered would incur significant financial hardship on the provider. The cost of collection approximates 20 percent of the benefit. To justify this cost, each claim requires an average cycle process of two to four times from provider to payer to resolve the balance owed. If the cycle cost were $5.00 each, the average cost would be from $10.00 - $20.00. With an estimate of $100.00 paid per cycle, the cost would be 10 percent to 20 percent. These figures are substantially higher than the cost of collection for other retail service providers.

Besides, the process of sales often results in offering trade credit which means that money will be paid at some future time for goods and services already sold. There are numerous reasons for offering trade credit. Sometimes the industry and competitors pressure exists. The company cannot offer credit terms that are less generous that their competitors offerings.

However, the main reason why companies offer trade credit is that it helps to increase sales revenues. Therefore, the trade credit should be associated with a form of investment. As with all investments, there is a risk involved. In particular, the credit risk exists as the company offering trade credit is exposed to the possibility that the debt will not be paid on time or at all.

In order to reduce the risk involved in trade credit offering, a company should apply a credit management process. The credit management process should begin with defining the credit goal and then defining the company's credit policy. The credit management process is then constituted by the decisions to grant the credit, applying risk reduction methods and credit screening, monitoring the level of receivables, collecting cash, and reporting the whole process. The credit policy management usually aims at setting the optimal credit policy and thus the optimal level of accounts receivable.

In particular, the optimal credit policy is connected with the decision to grant the trade credit. In a model version, and within the credit management process, a company aware of the risk involved should constantly analyze the credit performance. Thus, it is able to adjust properly the model of optimal credit policy to the current market situation. The credit risk influences strongly the effectiveness of the whole credit management procedure. Some companies even introduce the collection policy which refers to obtaining payment of past-due accounts. It should also be pointed that the problems with credit collection often appear as a result of wrong customers' creditworthiness analysis.

Therefore, the company should continuously revise if the collection of receivables is proper. Here an important role plays an accounts receivable risk management model.

The aforesaid facts give enough reasons
- To conduct research and analyze collection risks and
- To created a new model of collection risk management suitable for the business environment in Indian Pharmaceutical Industry.

2. Background

Cash collection is one of the most important functions of a company, second only to revenue generation. Thus, accounts receivable risk management is an indispensable tool for every company. The accounts receivable collection risk cannot be fully avoided, and cannot be reduced by the full amount. Nevertheless, it can be reduced to an acceptable, tolerable and reasonable measure that does not jeopardize the business success and long-term business goals. Accounts receivable risk management includes research, analysis and detection of possible risks of receivables collection failures prior to the execution of the sales contract and insurance measures against these risks. The results obtained by the conducted research and by analysis of existing models of accounts receivable collection risks, created a new model of collection risk management suitable for the business environment found in India.

Furthermore, this model may be applied in other similar economies in transition, lacking the features of a modern market economy such as: a fully functioning legal system based on the rule of law, the existence of all necessary institutions to enforce the contracts, a developed democratic and social system, and a functioning economic system. No risk management model can replace a fully functioning legal and economic system. Implementation of reforms in all areas is a fundamental condition for solving these problems. Nevertheless, a well designed risk management system of accounts receivable collection is a good and appropriate transition tool that may create the preconditions for recovery and development of a market economy.

3. Design of Study

The proposed model of accounts receivable risk management is based on cash flow indicators, working capital and assets ratios, the coefficient of accelerated liquidity and the relationship between total liabilities and equity. The proposed model should be optimal in the assurance against accounts receivable payments risks in India because it is based on domestic financial statements data and insurance instruments that do exist in the country.

The fundamental hypothesis is that the existing system of revenue collection risk management in India is not appropriate for the transition period. A new one should be introduced, which will create the preconditions for the recovery of the economy and its development on the principles of market economy. With the goal of statistical testing, the working hypothesis was transformed into the corresponding statistical hypotheses.

The first statistical hypothesis relates to the selection of adequate economic indicators, and inquires whether there is such a set of economic indicators which could ensure maximum informational efficiency with respect to India's payment system. The second statistical inquiry relates to the design of optimal receivables collection risk management model, which along with the selected indicators takes into account other factors, such as the amount of debt and the strength of the instruments of insurance. This hypothesis presumes there is no such system of managing the risks of receivables collection in India' s system of payments, which is good and appropriate for the transition period and can create assumptions for development of a market economy.

4. Sample Definition

The base for a new model of collection risk management was provided by a sample of statistic indicators, which is a result of a selection of economic indicators chosen to best represent the data taken from financial statements of selected companies. The sample of companies was selected from a set of companies that have been recorded in the Bombay Stock Exchange. The observed period covers 11 years: between 2000-01, and 2010-11.

Out of the total pharmaceutical companies, thirty two pharmaceutical companies have been taken from the pharmaceutical Industry as mentioned in table 1 on the basis of their annual turnover.

Based on the data from financial reports, the sample was divided into two groups of 30: the ones operating at profit and the others, operating at a loss during the analyzed period.

5. The Indicators & Variables

The indicator "value added", was used as a criterion to differentiate between profitable and non profitable enterprises. The indicator "value added" is according to the "Business Excellence model" based on the economic profit over and above the own cost of capital, i.e. opportunity cost of capital. Own cost of capital is a product between the enterprises equity and the cost of debt capital represented by the average bank savings rate (6%). The "value added" indicator is calculated by the following formula:

Value added = (Net profit)/ Equity X 0.04

Enterprises having this rate greater than 1 are profitable and the other having this rate lower than 1, are not.

Regarding the variables, selected statistical tests and the application of regression analysis is done to define the dependent and independent variables. The dependent variable is a dummy variable shown in binary form, and defined by the value added indicator. Independent variables are indicators chosen by the analysis of relevant scientific literature and suggested by the majority of its authors. Independent variables are numerical and classified into three groups: liquidity indicators, cash flow indicators, and solvency indicators as shown in the following table. The independent variables are the most commonly used financial ratios.

Table 2: Indicators

Indicators	Ratio	Definition	Data Source
Liquidity Indicators:	1. Current Ratio	Current Assets/ Current Liabilities	Balance Sheet
	2. Working Capital to Total Assets Ratio	(Current Assets – Current Debt)/ Total Assets	Balance Sheet
	3. Quick Ratio	(Current Assets – Inventories)/ Current Liabilities	Balance Sheet
Cash Flow Indicators:	1. Cash Flow Ratio	Free Cash Flow/ Current Liabilities	Cash Flow Report Balance Sheet
	2. Free Cash Flow Ratio I	(Operating CF ± Investment CF)/ Total Liabilities	Cash Flow Report Balance Sheet
	3. Free Cash Flow Ratio II	Net Cash Flow of all activities/ Total Liabilities	Cash Flow Report Balance Sheet
Solvency Indicators:	1. Gearing Ratio	Non-current Liabilities/ (Non-current Liabilities + Equity)	Balance Sheet
	2. Debt Ratio	Total Liabilities / Total Assets	Balance Sheet
	3.Debt-to-Equity Ratio	Total Liabilities / Equity	Balance Sheet

The used liquidity ratios are: the current ratio, the working capital to total assets ratio, and the quick ratio. The current ratio is the ratio of current assets to current liabilities. It shows the company's ability to pay back its short-term liabilities with its short-term assets (cash, inventory, receivables). The higher the ratio, the more capable the company is of paying its current obligations. The limit to the ratio is 1. Working capital to total assets ratio (WCTA) shows the availability of working capital (difference between current assets and current debt) in relation to total assets. The limit value of this indicator is 25% of working capital in relation to the total assets, i.e. the values higher than 25% mean there is sufficient liquidity. Quick ratio (QR, also known as Acid-test) is an alternative measure of liquidity, similar to the current ratio, but it does not include the inventories into current assets as they may be difficult to liquidate quickly. The limit value is (0.8).

The used cash flow ratios are: the cash flow ratio, free-cash-flow 1 to total liabilities ratio and free-cash-flow 2 to total liabilities ratio. Cash flow ratio shows the firm's capability to pay off its

current liabilities. The limit value was set on 0.4, i.e. 40%, and assumes the company's ability to meet all its current obligations. When the ratio of cash flow is greater than 0.4 the company should have no problems with liquidity, and when the coefficient is lower than 0.4, the company indicates a financial instability and possible future illiquidity. The cash flow from operating activities in "healthy" companies and financial institutions is at least 40% of the current liabilities, or at least 20% of total liabilities.1

Recently, the most frequently used, but also the most controversial category of cash flow is free cash flow. However, the problem in literature is that there is no single definition for the calculation of free cash flow. Usually, defined as the difference between cash flow from operating activities and capital expenditures necessary to maintain the same level of operations, the two sub-categories of free cash flow are free cash flow 1 (a money flow necessary to maintain the present business activities), and free cash flow 2 (a money flow readily available to improve the present business activities). To get these measures in form of a ratio, they are compared relative to total debt to receive:

Free cash flow 1 to total debt (FCF1TD) and Free cash flow 2 to total debt (FCF2TD).
The used solvency indicators are:
Gearing ratio (GR), shows the level of long term debt relative to total capital.
Debt ratio (DR) shows the company's ability to meet all its outstanding obligations.
Debt-to-equity ratio (D-E).

6. Model Assumption

Before deriving a Model for accounts receivables risk management it has become pertinent to discuss the assumptions on which it is developed.

a. The data set is based on a relatively small number of observations, which can be used in a wide spectrum of industries.
b. The data set is based on financial reports of only Indian pharmaceutical companies and they do fully comply with the International Financial Reporting Standards.
c. There persists data unification without error, in spite of changes in financial reporting rules in 2006.
d. All the companies under study fully disclose complete sets of all financial data correctly and accurately in the verification forms.
e. The indicators are optimal across all observed companies.

7. Model Building

The process of financial model building for receivables risk management has two parts. Within the first part, an analysis of financial reports is conducted and the needed ratios are calculated. During the second part, the data is statistically analyzed. The software, IBM SPSS v.19.0 was used to compute the data, enabling the logistic regression and the non-parametric tests ($\chi 2$ test and others).

The binary logistic regression is the following:

$$E[Y_i] = \frac{e^{\beta_0 + \beta_1 X}}{1 + e^{\beta_0 + \beta_1 X}}$$

The Wald significance test is used to test each and every variable. The model as a whole is tested on Nagelkerks R^2, and Hosmer & Lemesh $\chi 2$ test.

The model's function is the following:
Company type = f (CR, WCTA, QR, CFR, FCF1TD, FCF2TD, GR, D-E)
Where:
Company type: binary variable with values: 0 (bad) and 1 (good).

CR: current ratio
WCTA: working capital to total assets ratio
QR: quick ratio
CFR: cash flow ratio
FCF1TD: free cash flow 1 to total liabilities ratio
FCF2TD: free cash flow 2 to total liabilities ratio
GR: gearing ratio
DR: debt ratio
D-E: debt-to-equity ratio

The following table shows the coefficients for each indicator, its significance and the results of the Wald test:

Table 3: Wald Test

Indicators	Coefficients	Wald	Sig.
CR*	1.877	15.562	0.000
WCTA*	4.174	9.143	0.002
QR*	1.257	18.373	0.000
CFR*	0.718	10.643	0.001
FCF1TD	0.008	0.067	0.796
FCF2TD	-0.117	0.043	0.835
GR	1.116	0.642	0.423
DR	0.198	0.026	0.873
D-E**	-0.566	6.806	0.009
Constant	-1.333	9.719	0.002

* Indicator Is Statistically Significant At 95% Level
** Indicator Is Statistically Significant At 90% Level
Source: Own computation in IBM SPSS v 19.0

Such an expression of a logistic regression function with the use of the ENTER method and a Wald significance test enables us to discover the relative importance of particular ponders of selected indicators.

The computed logistic regression function is as follows:

Log (Tip) = -1.333 + 1.877(CR) + 4.174(WCTA) + 1.257(OR) + 0.718(CFR) – 0.566(D-E)

The displayed results of the multivariate analysis show that the affiliation of a particular group of companies with regard to whether a company creates value-added is associated with the performance of the current ratio, working capital and liquid assets ratio, quick ratio and cash flow ratio at the level of confidence of 95%.

When the confidence level is decreased to 90%, (which is still acceptable) the debt and equity ratio proves to be a statistically significant indicator too. Within the parameters of the analyzed model, other variables were unable to show statistically significant difference in the companies belonging to the group of good or bad. According to the presented results, it may be concluded that the statistically significant variables include indicators of liquidity, while the variables representing the indicators of solvency are not statistically significant when estimating the risk of collection of receivables. This was expected because of the liquidity nature of the claim itself.

The most significant indicators at the 95% significance level are the WCTA with the value of 4.174. Other indicators ranked according to their importance are: CR = 1.877,

QR = 1.257, CFR = 0.718. At the 90% significance level, the D-E = -0.566 may also be included.

The accuracy of the model is shown in the next table:

Table 4:   Model Accuracy (A)

Step	-2 Log likelihood	Nagelkerke R^2	Chi square	df	Sig.
1	2004.484 (a)	0.552	11.732	8	0.010

Source: Own computation in IBM SPSS v 19.0

It is visible from the table and based on the Nagelkerke R^2, that the regression function relatively fairly explains the risk of default on the liabilities. However, when the logistic regression model is used, the pseudo R^2 results are insufficient, so a more precise significance test based on the maximum likelihood Hosmer & Lemeshovim $\chi2$ test. It is visible from the table that the $\chi2$ test is statistically significant at the 0,10 level, which confirms the conclusion based on the Nagelkerke R^2, that the model fairly explains the data from which it was derived and has high accuracy which can also be tested by comparing the hit rate of classified enterprises.

Table 5:   Model Accuracy (B)

Classification			Expected		
			Type		Accuracy in %
Given			0	1	
Step 1	Type	0	103	17	85.80
		1	26	94	78.30
	Overall		82.10		

Source: Own computation in IBM SPSS v 19.0

The model's prognostic accuracy has reached a satisfactory 82.10%. And it is better in detecting bad enterprises (85,80%), as opposed to the good ones (78.30%).

8. A Model of Accounts Receivables Risk Management

Based on the results of the regression analysis, following indicators were identified as having the largest impact on defining the instruments that could be used as collateral or some other form of insurance of receivables collection:

1. Working capital and assets ratio (coefficient 4.174)
2. The current ratio (coefficient 1,877) and the quick ratio (coefficient 1.257)
3. Cash flow ratio (coefficient 0.718)
4. Debt to equity ratio (coefficient 0.566)

In the accounts receivable risk management model, these values need to be observed according to their relative impact. When selecting the insurance instrument, the value of debt should be taken relative to its total size and ratio to total income. Accordingly, the value of the indicator should be observed inversely to the debt amount and insurance instrument.

Table 6:   A Model of Accounts Receivables Risk Management
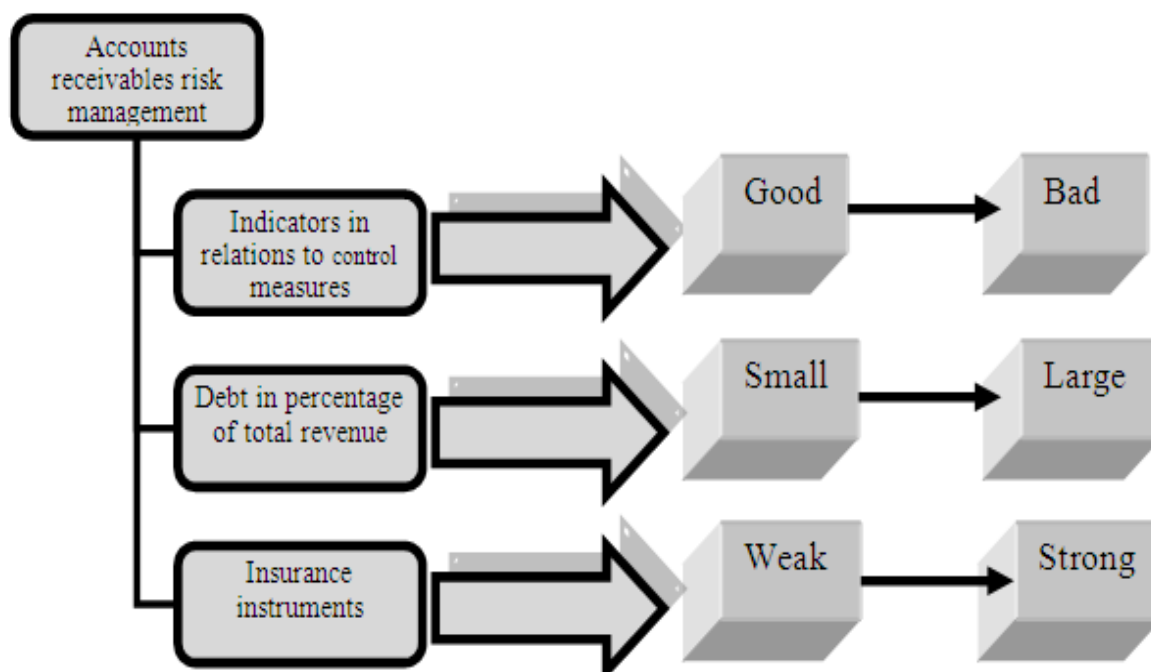
The worse the indicators, the stronger the collaterals needed. When signing a contract with a business partner, the company shall not ask for any collateral if the analyzed indicators' values are better than the control values, and if the claims size from the contract is not greater than 5% of overall claims. If the receivables' value, on the other hand, amounts to 25% or more of all claims, very strong collaterals shall be asked for (bank guarantees and secured bonds) It has been shown that it is possible to construct a corporate system of receivables collection risk management in India's system of payments that could safeguard the lenders from debtor's default.

9. Conclusion

The problem of receivables collection is complex, large and not easily solvable in the existing situation. It is partly inherited from earlier economic system without clear market rules and defined ownership rights. As the illiquidity infection spreads, the collection of receivables problem is threatening the national economic collapse. When successful and profitable enterprises enter into liquidity problems, it is only a matter of time when they'll stop paying to their creditors. Because of lacking legislative, executive and judicial authorities, mortgages and other instruments of insurance of receivables, are insufficient means of guarantee. Bankruptcy proceedings are not implemented in a way commensurate to developed market economies. The problems with unpaid receivables in India will be solved neither quickly nor easily. Implementation of reforms in all areas of institutional development is critical for solving collectables problems, particularly reforms in payments and transactions system.

When signing a contract with a business partner, the company shall not ask for any collateral if the analyzed indicators' values are better than the control values, and if the claims size from the contract is not greater than 5% of overall claims. If the receivables' value, on the other hand, amounts to 25% or more of all claims, very strong collaterals shall be asked for (bank guarantees and secured bonds).

It is possible to construct a corporate system of receivables collection risk management in India's system of payments that could safeguard the lenders from debtor's default. The created model is optimal in Indian context as it is based on datasets from financial reports of Indian pharmaceutical companies.

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