$$\text{MAPE} = \frac{\sum(|(A_t - F_t)|/A_t) \times 100}{n} \qquad (7)$$

Where A_t is the actual value, F_t is the forecast value, n is the number of ATM

IV. DISCUSSION

The analysis of the errors is reported in Table IV.

TABLE IV. Discrepancy or error of the forecast with actual data

Month	Criteria of fault		
	MAPE	MAD	RMSE
January	19.2608	17,843.7546	119,595.3757
February	17.0114	16,214.3901	98,628.2843
March	102.3508	19,257.7064	117,140.0546
Total	138.6231	53,315.8511	335,363.7146

From table 4 MAPE values are 19.26 % 17.01 % and 102.35 % for January, February and March 2014 respectively. For March, the bank has stopped the service ATM during the middle of the month and that caused the high value of error.

When compare the current procedure used by the bank with the prediction from Genetic Algorithm to forecast the demand, Genetic Algorithm can reduce the errors in the three months by 26.3694% 17.6318% and -10.7588%, averaging 33.2423% as shown in Fig 1.

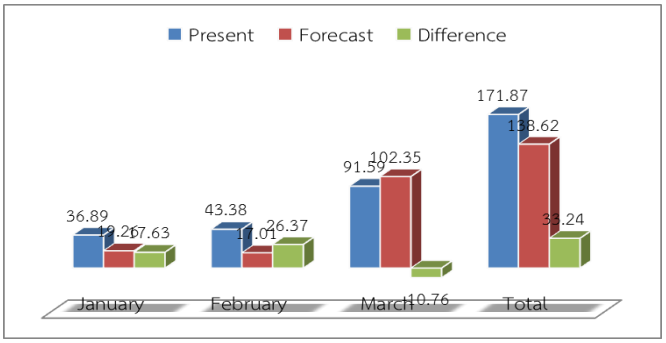

Fig 1. Comparing the errors of the current procedure with the Genetic Algorithm prediction measured by MAPE

With the method used by the bank, the reserve cash in ATMs in January to March 2014 are 203,500,000; 207,000,000; 205,000,000 baht. The reserve for the first quarter of this year is up to 615,500,000 baht. The forecasting method by GA has reduce the amount of cash reserve by 13.2727% 23.5096% and 24.0127% for January, February and March respectively. Average quarterly of the reserve is declined by the amount of 124,900,800 baht as shown in Fig 2.

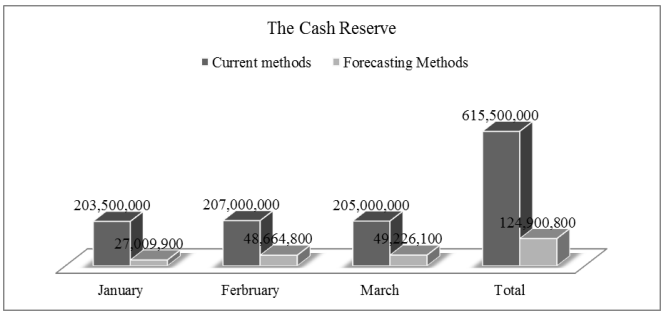

Fig 2. Show a decrease in the amount of cash reserve

V. CONCLUSION

By applying Genetic Algorithm to forecast the demand of the cash from ATM with 37 cabinets in the first quarter of 2014, the bank can reduce the amount of cash reserve almost 20 percent.

It can be concluded that the method of optimizing the refilled of ATM produces a very good result. The bank can save the "waste" cash because the forecast of the usage is reasonably accurate.

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