AFP® GUIDE TO

Strategic Global Cash Position Forecasting

Global Liquidity Guide Series

Association for Financial Professionals®

Issue 1

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Strategic Global Cash Position Forecasting

Global Liquidity Guide Series

Welcome to AFP's Liquidity Management Guide to Strategic Global Cash Position Forecasting

The publication of this guide could not have come at a more appropriate time. Forecasting has always been a responsibility of corporate treasury, in one form or another. However, in today's volatile and risk-infested environment, cash forecasting has never been more critical.

Today, treasury is taxed more than ever to mitigate risk across the financial enterprise. New risk-tracking areas continue to surface. Danger areas such as liquidity risk, cash flow at risk, credit risk, country risk, continent risk, currency risk, counterparty risk, commodity risk, and operational and compliance risk, have emerged as top priorities that are here to stay. Treasury

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Jason Torgler, Reval

professionals are now being consistently tasked with reporting the status of these risks and putting proper solutions in place for sound risk mitigation.

Accurate, confident and timely cash forecasts often serve as the foundational underpinning when addressing these risk landmines. This guide provides key insights into common objectives on forecasting cash positions, and also into the factors that are leading so many organizations to examine how they manage these risks, and the transformational changes they need to undertake. The guide details proven techniques around the 'how-to' of forecasting.

There is no perfect recipe for forecasting. Each organization contains unique elements that require blending, and it is often best to accept that your forecasts will unavoidably be tainted to some extent. Expert forecasters learn to expect significant variances on a daily basis. It follows that organizations should have the technology systems and processes in place to pinpoint variances quickly and efficiently hone the reconciliation and adjustment process.

Bottom line: you are never done with forecasting. It is not an annual, routine event, nor can it be achieved with a magic crystal ball. Forecasting is an ongoing discipline that, when done effectively, can optimize decision-making for organizations of all shapes and sizes. The benefits, as detailed within, can be tremendous and rewarding. Happy forecasting!

Jason Torgler, Vice President, Corporate Strategy @ Reval

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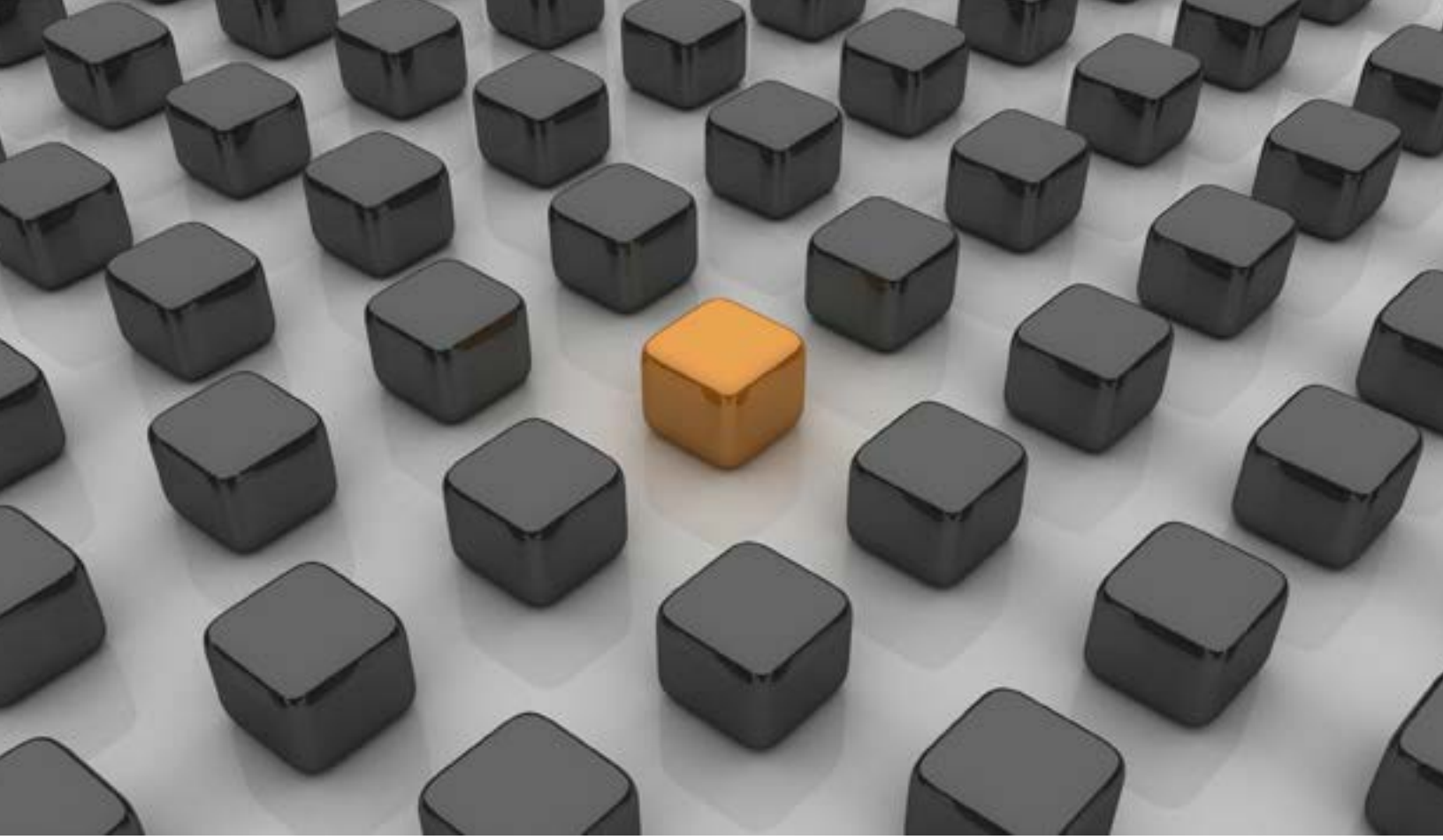

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Introduction

This paper assesses the techniques required to develop a series of global cash position forecasts. It focuses on forecasting operating cash positions for short-term liquidity management purposes. Although some of the issues raised when forecasting over the short term also apply over longer periods, this paper does not explicitly address longer-term forecasts; nor does it cover cash flow statement forecasting.

There are many organizations which need to develop a global cash position. These include multinational organizations with operations in many countries around the world, as well as domestically focused businesses with sales or production units outside their home markets. All these organizations need to know their cash positions to support their decision-making.

How these cash positions are prepared and presented will depend on the nature of the organization. Some will want a single consolidated global cash position denominated in the group headquarters' reporting currency. Others will want a series of cash positions for all their business units in each operating currency. The requirements will vary and each of these types of organization will have different liquidity management structures.

- A domestically focused organization
  A company doing 80% of its business in its home market may well try to manage liquidity in its overseas operations from the center. The group treasurer may want to monitor detailed cash positions in these overseas markets, to minimize any local funding requirement. An informed appreciation of the global cash position will help the treasurer prioritize activities to support those business units needing assistance.
- A highly centralized multinational treasury
  A multinational organization with decision-making concentrated in the group treasury will need detailed information about operations in business units around the world. The use of an in-house bank may result in greater levels of information being available to the group center. However, the treasury will still need to identify how to fund loan repayments and supplier payments denominated in many different currencies.
- A semi-centralized multinational with regional operations
  Many of the same issues apply for a multinational structured on a regional basis. In addition, the central treasury will want to identify the most efficient use of cash, to avoid regional operations simultaneously borrowing and investing, and may act as a line of communication between the regional centers.
- A decentralized multinational
  Where treasury operations and liquidity are managed locally, a central treasurer is more likely to have a largely advisory role. In this circumstance, a global cash position forecast can help the central treasury to support the local treasury teams.

In each of the different configurations outlined above, the requirements of the global cash position forecast are slightly different. However, in every case, the forecast is required to support decision-making and to give the treasurer visibility over activities across multiple areas of operation.

This paper outlines the steps required to develop a new cash position forecast that can be used to inform decision-making in a company with global operations. It starts from the beginning, when a treasurer needs to understand the way a forecast will be used. It explains the major obstacles to developing a global forecast, before analyzing different forecasting techniques. It then outlines the main practical steps in first developing and then improving a forecasting system.

Finally, this paper recognizes that each organization has different requirements of a cash position forecast. There is no single best way to structure a cash forecast and no single best tool to process it. Best practice is a forecast which meets the treasurer's objective.

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Why Forecast Cash Positions?

The decision to forecast cash should be based on some guiding principles. These might be set within the treasury's own policy document, or be derived from a board decision to focus on, for example, balance sheet management.

Once the decision has been made to forecast cash, the first task for the treasury team is to establish the way the forecast cash positions will be used, both within treasury and across the wider organization. These roles will vary according to the organization's business and its treasury and wider management structure.

The nature of cash flows and cash positions depends significantly upon the organization's activities. The length of the organization's business cycle will have a notable impact on cash flow. For example, food retailers have very short cash conversion cycles as they seek to sell produce before it spoils. In some cases, they may receive payment from consumers before they have to pay their own suppliers. At the other extreme, a pharmaceutical company may have to wait years from the research and development of a new drug through clinical trials before obtaining the regulatory approval necessary for it to be brought to market. As each organization operates to its own timescale, there are implications for the required cash position forecasts too. While most organizations will forecast overnight cash positions, treasurers will place differing emphasis on various forecast periods, to reflect the relative volatilities their businesses and cash positions experience.

An organization's general cash position must also be considered. For example, a cash-rich business may want to use the cash forecast to obtain the best return on its investments, given the constraints of its investment policy. Alternatively, a company with significant debt repayment obligations will simply want to ensure it has the funds available to make its loan repayments. Start-up companies may forecast cash as a going concern, or use a cash forecast to review their cash burn rate to determine whether they need to seek further funding. More generally, companies will often track their cash forecasts against figures in their annual plan, in order to understand any variances and how these might affect interest income or expense, as well as other income statement line items.

The treasury and wider management structure will also affect the importance of the cash forecast. In organizations where decision-making is highly centralized, tools to support that decision-making are very important. The cash position forecast is both a specific tool for the cash management team and a general tool for the wider corporate management. In decentralized organizations, the forecast may be used less as a basis for decision-making and more as an information-gathering tool. Finally, the organization structure, especially from a cash management perspective, will help to determine how easily data can be collated from across the group to produce a meaningful forecast.

Within these constraints, the treasury team will need to identify clearly the way the forecast will be used, both as a treasury activity and in its wider company role.

Core treasury roles

The potential use of the cash position will depend on the circumstances outlined above. It is not unusual for companies to have changing core objectives, as they mature and evolve as businesses. For example, a company may move from being reliant on external funding to being cash rich if it makes a significant divestment or when a product which has been in development for a long time finally comes to market. Given the potential for change, the following are the main ways a cash position forecast is used within a treasury department.

To meet external obligations

At the most fundamental level, the treasury department's task is to ensure the company has sufficient cash in the right place, at the right time in the correct currency to meet all of its obligations, such as paying its suppliers, making loan repayments, and paying tax bills as they fall due. All organizations must meet this fundamental objective, whether they are cash rich or heavily reliant on external funding.

Where a company is reliant on external borrowing, it may also be committed to complying with specific loan covenants. These typically include maintaining certain cash ratios and being able to demonstrate

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compliance to banks. Failure to comply with loan covenants will give the lender the right to foreclose on any loans. In these circumstances, cash position forecasts are a vital tool in managing loan covenants, as they provide advance warning of potential problems.

To minimize external borrowing costs

For most organizations, the next most important task is to minimize external borrowing costs. The position forecast can help in two ways: it can help to reduce the total external borrowing requirement, and also to reduce the cost of any necessary borrowing. We review each in turn.

An effective cash position forecast will help the organization to minimize simultaneous borrowing and investing. In a cash-rich organization, individual business units may have short-term borrowing requirements to cover seasonal variances in their cash balances. Using a cash position forecast will allow the treasury team to identify when and where these additional borrowing requirements arise, and to use surpluses from elsewhere in the business to fund these shortfalls. It may not be possible to eliminate external borrowing completely, as local regulations may effectively prevent this type of intracompany liquidity management. Even if no business units have effective surplus cash, the forecasts can still be used to minimize external borrowing. They can be used to identify the aggregate borrowing requirement across the business. These funds could be borrowed centrally and then distributed to group companies as needed, minimizing the charges for undrawn credit lines. This may also be cheaper across the organization than leaving each group entity to arrange its own credit lines, both in terms of interest charges and other borrowing costs (including management time and legal costs).

An effective cash flow forecast will also give the treasury advance knowledge of expected funding requirements. This will allow the treasury to plan its funding activity and to take advantage of opportunities as they arise. Short-term, late notice borrowing is likely to be more expensive than a strategic funding plan. In extreme circumstances, short notice funding can be difficult to find.

To maximize investment outcomes

Once the challenge of minimizing external borrowing costs has been attained, the next task is to maximize investment returns, both locally and at the center. Understanding where the group's cash surpluses are, and for how long they are available, will enable the treasury to place funds in a way that earns the highest return. In general terms, investors will be able to get a higher return the longer they are prepared to deposit funds, as a compensation for the loss of liquidity. In addition, there may be some operational benefits as a result of having to process fewer transactions. It is important to recognize that surplus cash can also be used to pay down debt or to fund strategic expansions, both of which may earn a better strategic return than a series of short-term investments. Funds can also be returned to shareholders, reducing the investment risk faced by treasurers.

To manage currency exposures

For international companies, cash forecasts also help the treasury to manage currency positions and foreign currency bank accounts. They allow the treasury to plan how to meet any foreign currency payment obligations. The forecasts will identify whether there will be any foreign currency cash surpluses available across the organization to meet these obligations, minimizing the requirement for either foreign currency funding or foreign exchange transactions.

Cash forecasts can also help manage any currency exposures by identifying natural and internal hedges of positions, before being used to assess whether any currency exposures need to be hedged via the external foreign exchange market.

Wider company management roles

As well as the fundamental treasury roles, the cash forecasts can also support wider company management in a number of ways. Again, these will vary according to the nature of the business and the culture that permeates within it.

To exercise control over group companies

Any cash forecasting activity will improve visibility over the group's activities as a whole. This improved visibility may be used to help group headquarters to exercise greater financial control over the group

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subsidiaries, especially if this activity is part of a wider treasury project to streamline processes and decision-making responsibilities. Improved visibility will help to prepare for the implementation of liquidity management structures such as cash pools. Using group-wide cash position forecasts will also demonstrate to external audiences, including shareholders, regulators and auditors, a greater degree of understanding and control of activities in the business units. This can be important in multinational organizations whose domestic regulators require an enhanced level of control over group companies.

To perform a general management role

In addition to any external requirement to demonstrate control, cash forecasts can be a useful internal management tool. A comparison between forecast and actual cash positions can be the first indication of any underlying problem within the company as a whole. For example, disparities between the two may reflect any emerging trends in sales figures. Instead of relying on monthly or quarterly management reports, the company leadership will be able to respond to events more quickly. Cash position forecasts may also provide other information, such as advance indications of problems with the company's counterparties, as they may identify a trend of slower payment (cash balances will be lower than expected).

A NORTH AMERICAN MINING COMPANY

This case study shows how the nature of a company's activities and the resultant cash flows determine how the cash position forecast is developed.

For every mine, the company develops a 'life-of-mine' plan. This first identifies the likely amounts of ore or other deliverables in the mine. This information is then used to determine and develop the costs of mining and processing the product. Using a range of assumptions, ranging from foreign exchange rates and fuel prices to wider input costs, the company can project the costs of production at this mine. These assumptions allow for the conversion of costs into USD equivalent terms. This is done since USD is the predominate currency for revenues, despite the fact that most mines are located outside of the USA.

In terms of business strategy, the 'life-of-mine' plans are designed to optimize production levels so mines run at a fairly constant rate of production and throughputs over the course of the year. This helps to build a stable cost structure that can be more readily and easily forecast. Most outgoing payments (payroll and supplier payments, for example) are made on a monthly or bi-weekly basis and, when aggregated, are relatively consistent over the course of the year. There are other, less frequent payments that the company is required to make, including tax and dividend payments. These are included in the forecast as well.

As a commodity business, the company's sales figures are highly dependent on the price of the commodities it produces. Inventory is typically turned over within 30 days at identifiable market prices. It does not face the same level of revenue uncertainty that retail businesses experience when forecasting accounts receivable, as there are little or no accounts receivable. In addition, as there are no 'customers' per se, there are no direct sales or marketing costs.

The final stage of the corporate planning process is to forecast the relevant commodity prices, revenues, production costs and earnings. Plans are evaluated to determine the price points in which revenues and margins are impacted. These scenarios are tested and reviewed on an annual basis for various forecasted commodity prices.

Each site models its own 'life-of-mine' plan, with the results consolidated centrally. Once each mine has used its sophisticated planning tools to develop its business models and subjected them to various price/costs scenarios, the process of developing the central cash position forecasts is relatively straightforward.

The cash position forecasts are developed using

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actual cash flow data, for both inputs and outputs. The forecast is submitted in both source currencies and converted USD equivalents. (In some cases, the source currency view is prepared on a proportional basis, based on treasury knowledge. For example, if 10% of its costs are in CAD, 10% of its cash flows would be forecast in CAD.)

The pattern of cash flows determined by the business also informs the timeframes required of the cash forecast. With both outgoing and incoming payment patterns identifiable and relatively certain, the company has no need for very short-term cash position forecasts. As a result, it builds monthly forecasts for the next year, and annualized forecasts out to five years.

This example shows the clear link between the 'life-of-mine' plans and the cash position forecasts. The information which is important for corporate planning is also relied upon by the treasury department on a operational basis.

Perform a strategic role

Cash position forecasts are also an important tool in helping the organization to manage future costs. They will identify any seasonal trends in the company's business cycle. These trends will help to determine longer-term working capital funding requirements, as well as identifying any surplus cash available for reinvestment back into the business, to fund acquisitions or to be returned to shareholders.

Conclusion

In most organizations, a cash position forecast will perform a number of the roles outlined above. Over the course of a year, a treasurer may place different emphasis on the cash position forecast figures, as operational challenges vary. The key for any organization is to ensure the forecast is structured in such a way that it captures any necessary data and generates a forecast that is effective enough to inform decision-making.

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What Makes Forecasting Difficult?

The next task for the treasury team seeking to build a cash position forecast is to understand the challenges of collating data from across the organization. All forecasts are built on a variety of data from different sources, including central treasury as well as business units around the world. The simple mechanics of collating this data can be difficult, requiring communication with these entities and an understanding of the level and quality of information that they will be able to provide, as well as the frequency with which they will be able to provide it. In an ideal situation, all required data can be provided as an automatic feed from the original source. In reality, however, differences in operating methods and systems mean this is not possible, even within a single country. These problems are magnified in an organization operating on a global basis, with business units located across the world.

The following factors will all have an impact on the quality of data collected:

- Time zones. Ensuring the timely submission of data can be difficult. A late submission is not usually a major problem, although it may add inaccuracy and uncertainty to the forecast.
- Different countries. Understanding the impact of different value dating conventions between countries will add complexity to the data collation process. This will be magnified where different definitions apply in different locations, which can result in different levels of data being provided. This can be a particular problem when requirements have to be translated into different languages.
- Group culture. In many organizations, it can be difficult to get business units around the world to provide the data necessary to populate forecasts. Where the organization operates a decentralized decision-making structure, there can be reluctance for operating companies to comply. This is especially likely when forecasts are used to oversee or manage activities in the business units. Even if there is no cultural resistance, the fact that operating companies typically have access to the information required in the forecast can make the collation process difficult. Ultimately, the business units have to choose to prepare the appropriate data for the forecast, and then choose to submit it.
- Integration of data from other external sources. Although much of the data entered into the forecast will be submitted by the business units, there will be other sources of data that need to be included in the forecast. Some of this data will come from the platforms used by the treasury team to manage the department. These platforms can range in sophistication from a treasury system installation to specialist spreadsheets. The challenge for treasurers is to ensure as seamless a transition of data as possible. Where a forecasting module of a treasury workstation is used, this will not pose too many problems. However, most companies do not use a workstation to produce their cash forecasts.
  Data from other sources will also be required. This may include information from the accounting system, an ERP system (or multiple ERP systems in some cases) and external banks, where possible. In these circumstances, the objectives are twofold. Firstly, to ensure data is provided on a consistent level across data providers such that, for example, data from banks is provided on a matching basis. Secondly, the forecast system is populated with this data in as automated a way as possible. This will be partly down to functionality. Different banks in the same country will have different capabilities in this respect. The more banks are feeding data, the greater the challenge for the treasury team. Although much work has been done to standardize bank information, major differences still remain. One such example is value dating, which varies widely across banks and geographies. Standardizing data from multiple banks so that the team can review data on a consistent basis is very difficult and potentially time-consuming.
- Multicurrency forecasts. Maintaining forecasts in more than one currency poses additional challenges because of the extra risk of error when data is entered into the system. It may be appropriate to aggregate forecasts denominated in different currencies; however, this may provide a misleading picture, as it will be subject to translation risk. In addition, any aggregated multicurrency forecasts

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may mask any shortfalls in particular currencies and so they should not be relied upon in terms of meeting payment obligations in different currencies.

- Status and quality of underlying data. Broadly speaking, cash flows can be characterized as certain, predictable or less than predictable. Certain cash flows are those which are essentially fixed: they include tax payments, loan repayments and dividends. Predictable cash flows are those which can be determined from business plans and contracts: they include sales collections, payroll and supplier payments. Although the value of these payments is known, the precise timing may not be certain, especially for collections. Less than predictable cash flows are unforeseen payments: these might include development costs for new product lines, or the cost of urgent repairs. Understanding the status of these payments allows the team to know which flows can be relied upon when developing the forecast, and which may require modeling or revision.

Given these variables, the treasury team will need to evaluate the reliability of the underlying data. The team will want to review forecast data against actual outcomes and identify whether any differences are the result of simple submission error or a change in the business unit's performance.

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How Can Cash Positions be Forecast?

Most short-term cash position forecasts are variations on two core techniques: the receipts and disbursements forecast, and statistical modeling. We will examine these in turn.

Receipts and disbursements forecast

A treasurer using this technique identifies a list of all anticipated cash inflows and outflows, which are combined with the closing position for the previous period and any threshold (for reserves) to produce the position forecast.

On the inflow side, the company will make projections of collections from customers and also include other regular cash receipts, such as interest earned on overnight deposits. This data will be combined with anticipated, but non-recurring, cash inflows, such as the proceeds from asset sales. These are combined to produce a figure for total inflows.

At the same time, the treasury team will forecast cash disbursements. These will include payments to cover operational costs during the forecast period, such as supplier payments and payroll. Other outflows such as tax payments, dividends and loan repayments will also be included. These are combined to produce a figure for total outflows.

These two elements are then combined with the cash position from the previous time period (as well as any reserve or safety margin figure) to produce the next cash position forecast.

ILLUSTRATION OF RECEIPTS AND DISBURSEMENTS METHOD

Table One shows a daily receipts forecast. This structure can be made more or less detailed, depending on the requirements of the user. For example, the sales data could be broken down by geography (state) or bank account.

Note that this example forecasts cash at the level of detail of USD x 1,000. It is important that this is set at an appropriate level. Many companies will not have this much cash at hand, so they should choose a lower figure. The level of detail in the forecast should reflect the target daily forecast amount.

Table Two shows a daily disbursements forecast. Again, this could be prepared in more detail, if necessary.

These forecasts are then combined with an opening bank balance to provide the cash position forecast for the next five days. This is shown in Table Three.

The opening cash balance can be taken from actual bank data every morning, allowing the forecast to be reset every day. In addition, both the receipts (inflows) and disbursements (outflows) totals can also be reset each day as the timing of these cash flows becomes known.

This technique is widely used to forecast a daily cash position. This will use the bank's overnight

Table One: Daily receipts forecast

Total (USD x 1,000)	Tuesday Week 1	Wednesday Week 1	Thursday Week 1	Friday Week 1	Monday Week 2
Sales	800	380	325	500	950
Cash	150	100	100	150	650
Collections from credit accounts	650	280	225	350	300
Loan or other income	0	0	0	0	200
Investment income	50	50	50	150	50
Other	0	0	0	0	0
Total Receipts	**850**	**430**	**375**	**650**	**1,200**

Table Two: Daily disbursements forecast

Total (USD x 1,000)	Tuesday Week 1	Wednesday Week 1	Thursday Week 1	Friday Week 1	Monday Week 2
Payroll	200	0	0	450	0
Tax	205	0	0	0	225
Supplier payments	200	330	280	500	460
Supplies	*145*	*160*	*100*	*440*	*30*
Utilities	*0*	*170*	*120*	*0*	*0*
Services	*55*	*0*	*0*	*20*	*100*
Rent	*0*	*0*	*60*	*40*	*330*
Other payments	*0*	*0*	*0*	*0*	*0*
Interest	0	0	0	100	0
Dividends	125	0	0	0	0
Other	0	0	0	0	0
Total Disbursements	**730**	**330**	**280**	**1,050**	**685**

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balance as the base cash position. The treasury team will know most of the disbursements falling due on that day, although they may need to use a statistical average to forecast check clearances. (This will be a larger problem in locations where check payments are more common.) They will also predict collections for that data. It can also be used to forecast positions by business unit and by currency relatively easily.

This technique can be adapted to apply to weekly, monthly or quarterly forecasts, as required. Whatever forecast period is required, the cash position forecast (Table Three) needs to be continually linked back to the receipts and disbursements forecasts. This will ensure the cash position is always being forecast with the latest available data. Note that some or all of the data in the receipts and/or the disbursements forecasts may be generated using some of the statistical techniques outlined below.

Over longer forecast horizons, this technique becomes less accurate, as payment values and dates are less certain. The realistic forecast horizon using this technique will depend on the volume of cash flows expected and the degree of certainty of any prediction.

Table Three: Daily cash position forecast

Total (USD x 1,000)	Tuesday Week 1	Wednesday Week 1	Thursday Week 1	Friday Week 1	Monday Week 2
Opening cash balance	1,050	1,170	1,270	1,365	965
Receipts	850	430	375	650	1,200
Disbursements	730	330	280	1,050	685
Closing cash balance	**1,170**	**1,270**	**1,365**	**965**	**1,480**

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Statistical Techniques

There are many different statistical techniques used in the preparation of cash position forecasts. The objective of these techniques is to use historical data, trends and other forecasts to anticipate cash flows or positions. They can also be used in combination with receipts and disbursements forecasts to anticipate uncertain cash flows.

Commonly used statistical techniques in cash position forecasting include:

Simple moving average

This technique uses historic data to forecast future results. A simple average does not assign a weighting to any data used to create the average. The average is updated as new data is collated to replace the ageing data. The challenge for the treasurer is to choose the number of data points to include in the average. Too many data points produce smoother results, but may mask changes. Too few data points may allow new trends to emerge sooner, but with more variance between forecasts. As the team collates more data points, it may be possible to incorporate data patterns from previous years.

ILLUSTRATION OF SIMPLE MOVING AVERAGE

Total (USD x 1,000)	Actual cash	Daily moving average	Error
Tuesday Week 1	1,050	-	-
Wednesday Week 1	1,170	-	-
Thursday Week 1	1,270	-	-
Friday Week 1	1,365	1,163	202
Monday Week 2	965	1,268	(303)
Tuesday Week 2	1,480	1,200	280

The simple moving average takes data from the previous three days to calculate the forecast position for the currency day. In this case, the daily moving average results in a greater volatility than changes in the actual cash figures, reflecting the fact that only three figures are used to calculate the daily moving average. Having more data points is likely to reduce that volatility.

ILLUSTRATION OF EXPONENTIAL SMOOTHING

Total (USD x 1,000)	Actual cash	Daily moving average	Error	Exponential smoothing forecast	Error
Tuesday Week 1	1,050	-	-		
Wednesday Week 1	1,170	-	-		
Thursday Week 1	1,270	-	-		
Friday Week 1	1,365	1,163	202		
Monday Week 2	965	1,268	(303)	1,062	(97)
Tuesday Week 2	1,480	1,200	280	1,419.5	60.5

The weighting is designed to remove some of the volatility of the simple moving average. This is done by including a weighting of the error of the previous day. In this example, the previous day's error is given a negative 50% weighting such that the new forecast is calculated from the daily moving average less half of the previous day's error. This gives the results above. On this small sample, this reduces the variance between the actual and forecast figures.

Exponential smoothing

Smoothing uses the moving average and then assigns a weighting to some or all of the input data to try to produce results which are more accurate. This technique can be used to put greater weight on more recent events, for example. It can also be used when a company has known seasonal variations; for example, sales figures may be affected by promotional activity every September. Where a company has a pattern of data over a number of years, the team could also weight that historical data in the model.

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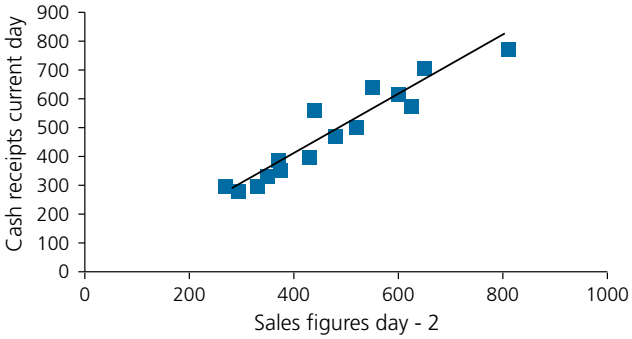
Regression analysis

Regression analysis uses past data to try to identify relationships with the forecast information. Once this relationship is established (it can be plotted on a graph), the team can extrapolate a value for the forecast cash position (or input data) from the relationship between the cash position and another known (dependent) variable in the past. For example, the model might suggest a relationship between cash outflows in one month and cash positions in the following month. By using the previous month's actual data for the cash outflows, the model will forecast cash positions for the current month, using a line of best fit in the regression model.

ILLUSTRATION OF REGRESSION ANALYSIS



The diagram shows how a treasury team can extrapolate an expected measure for a day's cash receipts based on sales figures from two days before. In this example, sales figures can be used to calculate future cash receipts. The line of best fit uses the formula: Cash receipts = (0.9991 x (Sales figures day – 2)) + 5.2322. The outcome can then be combined with predicted cash outflows to generate a cash position forecast using the receipts and disbursements model. This is one of a number of statistical tools available in most spreadsheet packages.

Distribution model

This is a technique which allows the treasury team to disaggregate data. This can be useful when the team is trying to develop a daily cash position using business plans which predict weekly sales figures. For example, a retail business can anticipate total weekly sales receipts. However, because payment is made by cash, check, or credit card, the business cannot forecast the value date for the receipts. A distribution model can use previous payment patterns to predict the likely use of payment instruments and, from that, the likely date that cleared funds will be available at the bank. This technique can be used to model a range of data, as long as there is sufficient historic data on which to base the forecast.

A combination of tools

As long as the treasury team understands its data, it will usually be possible to develop a forecasting technique using a combination of these tools. When developing the forecast itself, it is important to record the expected relationships, which will be one of the key factors to review if the forecast positions start to vary from the actual outcomes.

ILLUSTRATION OF DISTRIBUTION MODEL

This example uses historical sales data to predict the pattern of cash flows over the course of a week.

Day of the week	Proportion of cash inflows
Monday	17%
Tuesday	18%
Wednesday	20%
Thursday	22%
Friday	23%

This pattern can then be used to predict the cash inflows for a week in which total sales are forecast to be USD 5.3 million.

Day of the week	Proportion of cash flows	Forecast cash flow (USD x 1,000)
Monday Week 2	17%	901
Tuesday Week 2	18%	954
Wednesday Week 2	20%	1,060
Thursday Week 2	22%	1,166
Friday Week 2	23%	1,219

This data can then be entered into next week's cash position forecast as the expected receipts.

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How to Build a Forecast

The final element of a successful cash forecast is the selection of the appropriate tool to build it. There is no shortage of available software solutions to help. Most of the popular cash, treasury management systems (TMS) and treasury and risk management (TRM) solutions have cash forecasting systems either core to the system or available as add-ons. The same applies for ERP systems. In addition, there are some standalone cash forecasting systems which can be integrated with other platforms. In addition to the available technology, many companies still leverage some form of spreadsheet to help develop their cash forecasts.

There is no single correct tool to use to generate an effective forecasting system, just as there is no single correct way to build a forecast. However the system is built, the treasury team's objective when developing the system should always be twofold: to allow data to be input as simply as possible, and to generate a forecast which produces reliable and understandable results within a usable timeframe. In other words, the system needs to make it as easy as possible for submitters around the world to provide their data, overcoming many of the challenges outlined above. At the same time, the system must require minimal daily input (to assess and possibly amend the quality of input data, for example) so that the forecast position is available early enough for the treasury team to be able to act upon it, especially if it reveals an intraday funding requirement. Any work to improve the operation of the forecasting system is a separate and likely ongoing task.

Within this challenge, there are three main requirements of the system: to capture data, to process data, and to be able to use the forecasts themselves. We will review each one in turn.

Data capture

The ability to capture data from the required sources is a vital element for any forecasting system.

Data sources

Although they will vary between organizations, the sources are likely to include:

- The treasury management platform
  This will hold the core details about currency and future treasury payments: loan repayments, dividends, tax, etc. In some cases, the treasury will use this platform to develop the cash flow forecast, in which case the data flow should be seamless. However, if the platform and the forecasting system are different, the team will need to decide how to interface the two systems.
- Other centralized group activity
  A data feed from centralized group activities, such as in a shared services center or a central accounts payable department, will be required. The cash forecast may also use data from business plans and the accounting system to populate the forecast. If ERP systems are used at a group level, data feeds from these will also be needed. Information from any other departments, such as payroll/human resources and tax, with which treasury interfaces and which might impact on cash flows, should be included. In addition, the group cash conversion cycle will provide additional information to compare both with the cash forecast and, if peers are public entities, to the company's competitors.
- Business units and operating companies
  Much of the information required for the forecast will come from business units and operating companies around the world. This data will include accounts receivable and accounts payable, as well as details of any loan repayment schedules and investment activity arranged locally.
- Bank data feeds
  Many banks are now able to provide daily data feeds providing details of, for example, any overnight cleared funds. This data will be provided by bank account and can be automatically entered into forecasts working on a variety of different platforms, including treasury workstations, ERPs and spreadsheets. These data feeds will need to be checked for errors and omissions. Data from banks which cannot be submitted via an automated feed can be entered manually or from the treasury management platform. In these cases, data may be based on expected rather than actual cash balances.

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- Other software feeds

  The treasurer will also want to consider other sources of data, as necessary. For example, feeds from data analysis platforms might provide currency rates for an official and consistent reference.

One of the challenges will always be to maximize participation across the group in the forecasting process. There are two elements: to persuade business units to want to participate, and to make it as easy as possible for them to do so.

Persuading the business units to participate is crucial to the preparation of an accurate forecast. In many organizations, the business units hold a tremendous amount of information. Part of the treasury team's role when developing the cash position forecast is to educate personnel in the business units as to how the forecasting process can support their own activities. In most cases, it will be appropriate for the business unit to provide information by currency, legal entity and bank account, especially if the forecast is measured against automated bank account feeds (which will provide data in this format).

The discipline required to prepare this data submission will help business units to manage their own working capital and liquidity. For example, it will allow business units to measure cash positions against predictions incorporated in their business plan. Understanding how data flows through a business unit will help the business operate more efficiently, as the management understands the nature of the pressure points on the financial supply chain during the business cycle. In other words, the treasury team can persuade group entities to participate through self-interest and ultimately help them do their jobs more effectively.

WINSTON CUMMINS, DIRECTOR OF OPERATIONAL ACCOUNTING, LULULEMON ATHLETICA INC

lululemon is a billion dollar retail business with a healthy cash surplus on deposit. It has nominal local funding requirements and no material monthly bank covenants to meet. Even so, Winston Cummins still views the company's cash forecast as important.

'Even though cash forecasting is not as necessary from a liquidity point of view, it is still a good company management tool,' says Winston Cummins, Director of Operational Accounting at lululemon athletica inc. 'Comparing our forecast with actual figures does allow us to identify trends or opportunities much earlier than if we simply relied upon monthly or quarterly management reports.'

Cummins oversees the production of both a daily cash position report and a 12-month rolling cash forecast on a consolidated level. The rolling forecast is updated once a month.

There are two main sources of information for what is a cash-based forecast. It is developed from the group's strategic business plans and populated with data from the business units or company departments covering their regular and large occasional payments, notably on inventory. The team then receives daily position reports from the group's banks. These two sources of information are compared, to assess the group's cash position.

Because the company has a streamlined banking structure covering several countries around the world, calculating the cash position does not take much time each day. Even so, the daily report gives the group's position by company, bank and currency, as well as its investment positions.

'Even though the forecast does not require a huge investment of time, it does give us a strong estimate of the day's cash position,' says Cummins. 'It also gives me a good overview of our currency exposures. Most importantly, the cash position can be measured against our cash forecast and acts as a key metric for the group as a whole.'

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Collation method

Once the possible sources of data have been identified, the treasury team needs to determine the method of collation of that data. In effect, the team needs to decide which tools should be used to collate the data and the rules to be followed by submitters when providing the data. We will review each one in turn.

- Collation tool

  The treasury team will want to consider carefully how best to collate data from the different data sources. In small organizations, it may be possible for operating units to submit data via email attachments. For most organizations, this will not be practical. Automated feeds from reliable sources are best, in terms of both time taken to acquire data and the lack of manual data input, although the data will need to be subjected to a reality check. Banks often have the capability to provide automated data feeds. If used, group entities may be able to provide data feeds from their ERP system. However, in many cases, the operating companies will need to submit data manually. The objective in this situation is to make it as easy as possible for the operating companies to do so. Spreadsheet workbooks are the most popular tool for this purpose, as data entry requires little training to allow submission. Other tools available include internally developed databases, intranet tools and sharepoint sites. The key point is to use the company's technology to enable global participation. It is also important to consider maintenance of any solutions: it is worthwhile considering the use of existing technology, as it will be IT supported. Some treasury departments allow operating units to submit forecasts direct into the treasury management platform, often via internally developed interfaces. Expanding access to the treasury platform can impose a significant operational requirement on the treasury team in terms of managing authorities and in ensuring participants have sufficient training.

- Submission rules

  The larger the pool of data submitters, the more scope there is for a range of different data to be provided. As a result, the treasury team will want to be strict when trying to structure the collation tool. In effect, the treasury team will want to reduce the opportunity for free form data entry and to try to direct the submitters to provide the data needed by the forecast system. Ideally, the treasury will work with the business units to help them to identify the required data and to reduce any confusion over data definition. This can be helped by designing an interface into the forecasting system which only permits certain data to be provided.

  'Without a clearly defined set of requirements for operating companies, any collated data will not be suitable for inclusion in a forecast. If an automated data feed is not possible, you need a specific tool to collect data for a cash flow forecasting system. This allows the center to set the parameters for the information it requires from operating companies. Once collected, there needs to be an additional process to check the quality of the submitted data before it is entered into the forecast,' says Jörg B. Bermüller, Head of Cash & Risk Management at Merck KGaA.

In terms of the data submission process, the best solution is one which works. The more complex an organization is, in terms of countries of operation, numbers of bank accounts and currencies, the more challenging the collation of data will be. Preparing forecasts across groups of companies operating in Asia, the Americas and Europe will have significant issues with timing. The issue from a business unit perspective is to try to make the provision of information process effective for them, while ensuring the data provided is as accurate and timely as necessary.

Data processing

The next element in the forecasting system is its ability to process the submitted data. If a simple forecast using a straightforward data feed is required, it is not necessary (and may be inappropriate) to use a sophisticated forecasting system. However, if the treasury wants to use a more advanced modeling technique to produce the forecast, it may be necessary to use a system with greater processing power.

The system will need to give the treasury the ability to review the input data to assess its quality. If necessary,

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SHELDON WAGNER, SENIOR MANAGER, TREASURY OPERATIONS, CAPITAL POWER

Capital Power's cash forecasting process

Capital Power develops its cash forecasts via a two-stage process that allows the treasury operations team to retain control of the forecast data. The first stage is the collation of the data from across the group. The different business units enter their forecasts into an Excel workbook, ideally daily but sometimes less frequently. The data which is collated is subject to a minimum threshold of CAD 250,000, although many smaller amounts are aggregated before being fed into the forecast. Treasury payments such as dividends and debt repayments are also fed into the forecast via the company's cash management platform.

These forecasts are calculated daily. Each morning, the treasury analyst compares the previous day's forecast with the actual figures. (The cash management platform is populated via automated data feeds from the company's banks showing the previous day's cleared positions.) These overnight actual figures are input and combined with the business units' forecasts to form the current day's forecast, as well as others out to two years. Every six months, the underlying assumptions of the forecast are reviewed in light of its performance over the previous six months.

The cash manager then acts on the basis of the forecast cash positions. Surplus cash is invested in commercial paper or similar instruments, perhaps for a few days if appropriate. If the forecast shows a cash deficit, funds will be drawn down from the company's committed credit lines. The cash manager will also perform any necessary foreign exchange transactions. The expected cash position is also circulated throughout the group.

Explaining the two-stage process

Sheldon Wagner, Senior Manager, Treasury Operations, explains the reasons for using a workbook to collate the underlying data.

'We have two main objectives. We want to make it is easy as possible for our business units to submit the information to us. We have a very simple, six-column form for them to complete. We also have to retain the integrity of our cash management platform. We cannot risk occasional users entering inaccurate data or accidentally deleting information. At present, the potential costs of allowing wider access to the cash management system (in terms of time to train people to use the platform and then to manage their ongoing use of it) continue to outweigh any potential benefits. When this changes, we will review our processes.'

the team will also need to be able to amend the data, to correct errors or to qualify inputs. For example, the team will want to be able to amend data as expected payment data becomes more certain, both in terms of value and value date.

Ultimately the chosen processing platform must be robust enough to cope with the volume of data (and data sources) being used and the forecasting technique employed.

Use of forecasts

The final stage of the platform selection is the ease of use of the forecasts themselves. There is clearly little point investing time in making the collation and processing of information effective if the forecasts are difficult to use or understand.

At this stage, the treasury team will want to review the potential output of the system with the objectives identified at the beginning. This will help the team determine whether there needs to be any integration of the forecasts with platforms or systems used

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within the treasury department or the wider business. For example, will the forecasts be entered into the treasury management platform to support decision-making within the department? If the platform is used to generate the forecast, this is part of the platform's output. The issue in this case is to make sure the forecast data is disseminated to people and departments without direct access to the treasury platform. If a standalone spreadsheet is used to generate the forecast, does the treasury team need an interface between the spreadsheet and the treasury platform?

A Step-by-step Guide to Developing a Cash Forecast

Given the variables outlined above, there is no single correct way to develop a cash position forecast. However, there are a number of decisions which need to be made as part of the development of an effective forecast. These are outlined below:

1. Identify data to be captured

However the data is to be processed, the treasury team needs to identify the data available and necessary to complete the forecast. This will vary from organization to organization for two main reasons. First, some organizations may only want to forecast large-value items. This may be appropriate if the organization is cash-rich and is using the forecasts to plan investment activity. In these circumstances, they may set a value threshold for data submission. They may choose to aggregate lower-value items and use experience to recognize cash flows which offset each other, limiting their impact on the forecast position. On the other hand, organizations using the forecasts to manage covenants will need a much more detailed forecast position, and therefore may require a greater level of data to be submitted. Second, some organizations may only forecast central group positions, leaving business units responsible for managing their own short-term cash positions.

Within this process, the treasury team will need to consider a number of questions:

- Will forecasts be prepared at business unit level? This may be important if the group devolves payment decisions to business units.
- Will forecasts be consolidated at group level? If so, does this reflect the treasury's ability to move funds efficiently between group entities? Note the importance of exchange controls and restrictions on intercompany loans in different locations.
- If forecasts are consolidated, should all business units be part of that consolidated forecast? Should recent acquisitions, or divisions expected to be divested, be forecast separately?
- Will forecasts be prepared in a base currency, or will separate currency forecasts be prepared?
- Will the forecasts incorporate a reserve or safety margin to accommodate inaccuracies? If so, how will the treasury determine these?

2. Identify data sources

Once the team has determined which data is necessary for the forecast, the next step is to establish the best sources for that data.

These are likely to include:

- The treasury management platform – whether a workstation or a set of spreadsheets.
- Company planning documents – business plans, sales forecasts, etc.
- Centralized financial departments – accounting, shared services centers, etc.
- Business units and operating companies – accounts payable and accounts receivable.
- Banks – automated bank data feeds as well as bank statements.

Once the data sources have been identified, the team will need to ensure the same level of data is provided from each submitter. For example, if business units provide accounts receivable information, all data needs to be submitted with a consistent approach to value dating.

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At this point, the team should try to ensure that each piece of data is only provided from one source, to avoid duplication in the forecast and to ensure consistency of preparation over time.

3. Evaluate submitted data

As part of the process of identifying the data and its source, the treasury team will need to classify the data for accuracy and completeness.

In terms of accuracy, the team will need to decide whether it is:

- A certain item: tax payment, loan repayment.
- A predictable item: payroll.
- A less than predictable item: contingency for repairs.

The team will also want to establish a method of recognizing data in the forecast as it becomes more predictable.

In terms of completeness, the team will need to assess two points:

- Whether the data is available. Although the team may require data to complete the forecast and may have identified a potential source, some data is not going to be available early enough to be entered into the forecast.
- Whether the submitted data is complete. In this case, the team may identify a potential source for the data, but the submitted data may not be completely reliable, in terms of accuracy or in terms of frequency of submission. The team will need to consider how to weight this data in any forecast.

Understanding whether submitted data is likely to be incomplete for any of these reasons is a vital tool in developing an accurate forecast. The team will need to take action to develop a model to use the submitted data to develop complete, although simulated, information to include in the forecast. The statistical techniques described above can be used to achieve this.

4. Set the forecast timeframe

A key objective of any cash forecast is to make it appropriate to the available data while also meeting the required outcome. Whilst most companies will forecast a daily cash position, the nature of the organization's business will determine the other forecast horizons. For example, a retail business may want to forecast on a weekly basis out to three months, whereas an agricultural business may only forecast monthly from the first month. In general terms, the greater the variance of the submitted data, the more frequently the treasury team will want to calculate its forecasts.

5. Select the forecast technique

The next decision is to select the method to create the forecast. This will be determined by the quality of the forecast data and the horizons over which positions need to be forecast. Where reliable data is available over the forecast horizon, there may not be a need to manipulate the data via the use of statistical methods. Where data is less reliable, or incomplete, there will be a need to manipulate the data to some degree to produce a meaningful forecast position.

As part of this decision, the team will also need to consider any constraints set by the available technology. Although statistical modeling can be done using spreadsheets, dedicated forecasting software is generally more powerful.

At this point, the team will be able to build its forecasting system, which may include interfaces to allow the submission of data.

6. Check the input data

Once the system is operational, it will need to be managed on a day-to-day basis.

The first step is to check the input data. The team should already be aware of potential gaps or other problems in the submission phase. However, it remains likely that some data will be submitted in error on a daily basis. There are a number of checks which need to be made on a daily basis. These include:

- Check expected data. Has it arrived from the expected sources? Is the submitted data complete? Has it been provided on a consistent basis? For example, are value dates treated the same? The team will want to check that the submission is consistent with the previous submission by the same source, and also with submission by different sources.
- Check any unexpected data that has been provided. The team will want to establish that information is

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not replicated. It may be possible for business units to include data which is also provided from elsewhere, such as the treasury management platform.

- Reconcile data with external information, if possible. If it is possible to verify data with a source outside the forecasting system, such as bank or accounting systems, this will be useful.

7. Identify output

The final stage is to review the forecast output. Cash position forecasts should give a good indication of likely balances, which the treasury team and others will want to rely upon when making decisions.

Improving the Forecast

Over time, the effectiveness of the forecast can be reviewed by measuring previous forecasts against actual data and/or comparing them against company strategic plans longer term. The goal of the cash forecast should be towards improving the variances to planned amounts, not necessarily the focus on improving accuracy. Forecasts by their very nature are just that. Allowing more emphasis on identifying and reconciling variances can lead to more thoughtful and insightful forecasts as well. Although variances are always likely to occur, because of the nature of the activity, the team will want to minimize these. Improving the forecast will require a review of each stage from data collection and collation, through processing to the calculation of the forecast positions.

One of the main questions continues to be the choice of processing platform. Most treasury departments still use spreadsheets to develop their cash forecasts. There are very good reasons for this:

- Spreadsheet forecasts are easy to develop, use and amend.
- They are widely available as part of standard office-based software suites, so business units have a degree of expertise. Training on the software is not usually required.
- Because they can be amended easily, they can be customized to suit the requirements of the company as a whole. They can be semi-fixed, so that the treasury department can control which fields can be amended by data submitters.
- Most spreadsheet programs have sufficient processing power and capacity to manage a cash position forecast.
- Together, these points mean it is perfectly possible to forecast a series of cash positions sufficiently accurately with very little cost, in terms either of software development or of internal training.

Some companies will have the opportunity to use a more sophisticated software solution to generate the cash forecast. These will include using:

- ERP systems and modules of treasury management systems, where they are used;
- specialty systems or custom developed solutions;
- treasury management systems (TMS); or
- all-in-one treasury and risk management (TRM) solutions.

Specialized forecasting solutions offer some inherent benefits over spreadsheets:

- They have better tools for integrating and consolidating data across a multitude of data sources and formats.
- These solutions are dynamic, adjusting when new information is included.
- They have built-in audit trails, enabling better analysis.
- They include error protection against common keying mistakes.
- They are generally more standardized and packaged. In contrast to spreadsheets, they do not include hidden, potentially devastating, macros.

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- They are better equipped for performing stress testing and forecast shocks.
- They enable reporting and presentation of the forecast in a multitude of formats, without the need to rekey data.

As with any software decision, any decision to move to a more sophisticated system will be based on an evaluation of the costs and benefits. The outcome of such an evaluation is likely to change over time as circumstances within the treasury department and the wider business change. Common scenarios which might initiate a review include:

- A treasury technology project
  If the treasury department is considering the adoption of a new treasury management platform, cash forecasting should be included in the process of developing the requirements definition. Implementation within the treasury department will be more straightforward at this point, although this may not apply throughout the group, as more people may need to be included in the training process. The use of the cash forecasting module as a later extension of such a project is also not unusual. Again, there will be additional training costs if it is used to collate data, and ongoing operational costs for the treasury if access permissions need to be managed.
- The treasury's responsibilities change
  In a relatively decentralized operation, there may be little requirement for a centralized cash position forecast. Any forecasting may be on the medium term or longer basis, and may be prepared solely on an accounting basis. However, as more activities become the responsibility of the central treasury, it may be necessary to develop a more sophisticated tool to forecast cash positions as it becomes more difficult to track the various positions.
- A treasury transformation
  In highly centralized structures, using in-house banks, a separate short-term forecasting system may not be necessary. In these circumstances, the central treasury generally acts on behalf of all participating group entities, managing collections and payments for them. Business units need to make payment requests to the in-house bank, which will be entered into the in-house bank system and act as the equivalent of a data submission into the cash forecast. The bank system will be able to generate forward-looking balance positions, certainly on an outflow basis. Platforms capable of running an in-house bank all come with cash forecasting capabilities; however, there will be a need to go through at least some of the steps mentioned above to forecast receivables before generating the full cash forecast.

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Best Practices in Cash Forecasting

Given all the variables discussed in this paper, it is not appropriate to define a single best practice for cash position forecasting. The case studies show that different operational requirements mean that treasurers take different views of the importance of cash position forecasting (also based on different company mandates for doing so). However, in every case, they have the same fundamental objective: to have a cash position forecasting system which is as simple as possible to develop and operate, and which provides as accurate an output as necessary within a timescale in which it can be used.

In terms of output, there are clear differences in the detailed requirements from the forecast. At one end of the scale, some treasurers need to develop highly accurate and detailed short-term forecasts to support their needs to comply with conditions established in loan covenants, or to ensure sufficient short-term funding is in place. At the other end, treasurers in cash-rich organizations will want to maintain position forecasts as a check on activities, but may only require a consolidated position.

Although the specific detail will vary according to each organization's requirements, there are a number of general points which suggest best practice.

- Use appropriate detail

  Perhaps the most important requirement is to make sure positions are forecast in sufficient detail for the company's requirements. If the forecast is to be used to determine whether there is sufficient cash to meet obligations in different currencies, positions need to be forecast in each of those currencies. On the other hand, if a company uses the forecast to manage its surplus balances, aggregated forecasts may be sufficient, even if this means some funds sit idle in bank accounts overnight.

- Use the appropriate platform

  The team should use the most appropriate platform to develop the forecast. In organizations where the cash flows are relatively stable and known in advance, there is very little need for sophisticated specialty tools to analyze the input data. On the other hand, where there are big fluctuations in data and significant variables involved, it may be necessary to a system or software with greater processing power to generate the forecast positions. Treasurers should always review the systems and solutions available to ensure they are being used to the maximum efficiency for the department as a whole. It might be appropriate when developing a global cash position forecast to use solutions that are already global in scope, such as an intranet, internal databases or other proprietary tools. Alternatively, the team could have access to additional functionality in the treasury management platform or the ERP system. Even if a treasury department has a sophisticated forecasting system, it will not necessarily be worth deploying.

- Invest appropriate amount of resource

  A forecast which takes a few minutes first thing every day and which provides a result which is 90% accurate most of the time may well be sufficient in many organizations. Only when there is more pressure on accuracy, to comply with covenants for example, will it be worthwhile to invest additional resources for a more accurate forecast. The costs of breaching a covenant may outweigh the investment necessary to develop a forecasting system to prevent this happening.

- Ensure the forecast is useable

  The investment in developing the forecast has to be justified by the outcome. It is no use investing lots of time and effort producing a forecast that is unusable because it is too late to act upon it. In addition, the forecast must have sufficient robustness to provide meaningful data.

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ERNIE CABALLERO, HEAD OF TREASURY, MERGERS AND ACQUISITIONS, AND RISK MANAGEMENT, EUROPE AND ASIA, UNITED PARCEL SERVICE (UPS)

UPS Cash Forecasting Process

For many organizations operating on a global scale, establishing a new structure to forecast cash positions may only be possible as part of a wider and ongoing treasury project. This case study shows how measures taken to centralize treasury activity have enabled UPS to develop an effective cash forecasting system.

To help understand the requirements of business units operating around the world, the UPS treasury department has had to develop a robust understanding of those business units. As part of that process, the UPS treasury team has, over a number of years, put in place a structure in which cash positions are forecast by legal entity and by currency.

Gaining control of bank accounts has helped treasury to gain visibility over cash across the group. Central treasury started the process by getting the board to pass a series of resolutions on banking policy. When implemented, these resolutions took away the powers of local business units to determine their own banking arrangements. For example, these banking board resolutions mean only central treasury is permitted to open and close bank accounts, arrange overdraft facilities, and set up foreign exchange mandates. Central treasury then delegates select responsibility for managing day-to-day accounts payable and accounts receivable activities to the local business units. At the same time, central treasury reviewed the number of bank accounts held in the name of each legal entity. All duplicate bank accounts were consolidated (as long as each consolidated bank account could be used for multiple purposes), with the result that the number of bank accounts held by the group has fallen from 1,600 to 800. Reducing the number of bank accounts resulted in savings across the group through reduced operational costs, better visibility into global cash balances, and a streamlined manner in which cash is consolidated on a global scale.

With a streamlined bank account structure, treasury has been able to implement a more efficient forecasting process. This starts when every bank submits a SWIFT MT 940 message to UPS's main aggregating bank. Each MT 940 message contains a bank account's closing balance from the previous day. The aggregating bank collates all the messages from all the banks and sends a single data file to the UPS treasury. This data file is automatically injected into the UPS treasury system with the end-of-day balances for all UPS bank accounts around the world. This data then forms the basis for UPS's two types of cash forecasts and global cash balance reports/views.

The first is the monthly cash forecast, in which all legal entities within the group participate. This forecast starts with the previous month's actual data. Receipt and disbursement activity is populated by each business unit and the end of month bank account balance is objectively obtained via the aforementioned MT 940 message process. The receipt and disbursement line items must balance to the actual bank account balance in order for the forecast to be submitted to the central treasury for approval. In addition to the actual information, the forecast also includes the relevant cash movements for the current month and for the next 11 months on a rolling basis. The actual information is used for variance measurement tracking. To ensure the accuracy of the forecast, each business unit uses its record of receipts and disbursements to develop its own starting cash position. This must match the data provided by its banks before the business unit's forecast data can be entered into the system. If a business unit believes there is an error in a bank's data, it must submit a request to treasury to make a change. (It cannot amend the data unilaterally.) This process is used to prepare monthly forecasts for every legal entity within the group by currency. As a result, treasury has great visibility over cash in the group as a whole.

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The second forecast is the daily cash forecast. Only those entities which participate in the UPS global cross-currency, cross-border notional cash pool have to forecast cash daily. This forecast is used to monitor the safety margins which each participating bank account has. The forecast follows the same process as the monthly forecast. It uses end of day actual figures as the basis of the forecast. Positions are then forecast for the current day and for between one to four days, depending on the entity. The company's objective for the notional cash pool is to take all cash out of every country every day. Today, Ernie Caballero and his team have managed to keep in-country safety margins to approximately 2% of total balances on a daily basis.

Together, the cash forecasts have allowed the treasury team (which operates through three regional treasury centers) to work with business units around the world to reduce in-country safety margins which, in-turn, has facilitated the use of the balances for the global needs of the business. This frees more cash to be used to fund acquisitions or specific capital projects of business units internally, with any surplus cash invested externally.

Conclusion

Unless the adoption of a new forecasting system is part of a wider treasury project, the treasury needs to work with the structures that are there. In many organizations, investment in systems and software is likely to go into those elements which deal with actual data rather than forecast data. In any case, it is usually not necessary to invest in new systems or processes to make a more accurate and timely cash position forecast. Improving the performance of an existing forecast will achieve the same ends. This will require a review of three elements:

- The quality of input data
  All treasury teams should review data on an ongoing basis. Forecast data should be checked against actual outcomes, to identify discrepancies. If these are identified, they can be corrected. In addition, they may suggest operational problems which also should be investigated.
- The participation in the system
  In large, complex organizations, the collation of data can be very difficult. Making the process as efficient as possible for the submitters will help them to engage in the process. They are more likely to submit data accurately and regularly if they identify a benefit for their own part of the organization.
- The method of data processing
  Finally, the way the input data is processed to produce the forecasts should always be subject to ongoing assessment. Any differences or variances between forecast and actual positions should be examined to try to identify whether the cause is a weakness in the forecast process, or unexpected operational performance.

In every case, the treasury team needs to keep in mind their objectives for the forecast. A best practice forecast is one that meets those objectives.

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About the Author

WWCP Limited

WWCP's team of financial researchers, journalists and authors provides its WorldWideCountryProfiles service to a number of banks and financial institutions and professional bodies. Purchasers use the individual country profiles, which are researched and written to their specification, for their customers and prospects, sales literature, their intranet and extranet sites and sales training. WWCP researches over 190 countries.

WWCP researches, authors and publishes authoritative Treasury Managers' Handbooks for Scandinavia/Nordic/Baltic countries; Central and Eastern Europe; Europe (five editions); Africa; the Americas (four editions); and a Global Treasury CD covering 98 countries (three editions). Publications also include a number of definitive treasury guides: Best Practice and Terminology; with The ACT, Investing Cash Globally (three editions), International Cash Management and Trade Finance; and, with AFP, Treasury Technology and this Global Liquidity Guide Series.

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