

Effective Cash Management

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Overall Plan

This talk consists of one short sermon and three practical discussions. These are:

- The key points of cash management.
- How can we analyze a system?
- What about cash forecasting?
- Managing cash balances.

Effective Cash Management

THE KEY POINTS ABOUT CASH MANAGEMENT

Cash is the mechanism that allows the government to operate. When a government has no cash, it cannot act.

To obtain the most usefulness of its cash resource, cash management practices are adopted.

Cash management is not the same as budget execution.

Budget execution is the implementation of a plan reflecting the priorities of the government based on the resources currently available and on expected resources in the future.

Cash management is a set of principles and associated practices to transfer funds efficiently and with certainty.

Use the appropriate tools and practices to move funds; it may be advantageous to use banks as financial agents.

A key practice of cash management is to structure funds repositories so that the government always knows what funds are at its disposal and where they are and that it can move these funds at will. This is most easily accomplished by a TSA.

The treasury maintains an adequate cash balance to meet its near-term contingencies.

It adjusts its cash position by borrowing or investing as conditions dictate to maintain a target balance.

There are recognized good practices for borrowing (e.g., public auctions) and investing (e.g., collateralization) public funds.

The key tool for balance management is the cash forecast. This should be distinguished from the budgetary schedule.

The forecast should be daily, based on trends, and not limited to the current fiscal year.

Any forecast will be imperfect. Measure the forecast's errors and seek ways to reduce them. In delivering the forecast, include a measure of variability.

Document ALL processes.

Effective Cash Management

HOW TO ANALYZE A SYSTEM

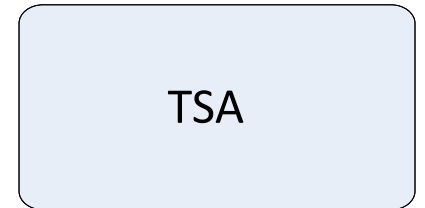
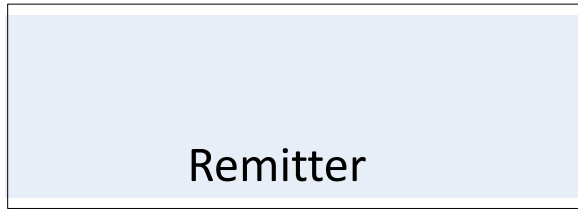
Sometimes the biggest hurdle in doing something new is knowing where to begin.

One guide may be to look at the cash flows that are the most expensive.

Expensive? Yes. Transferring funds between parties may require time and explicit transfer costs. Good cash management strives to minimize the costs associated with funds transfers.

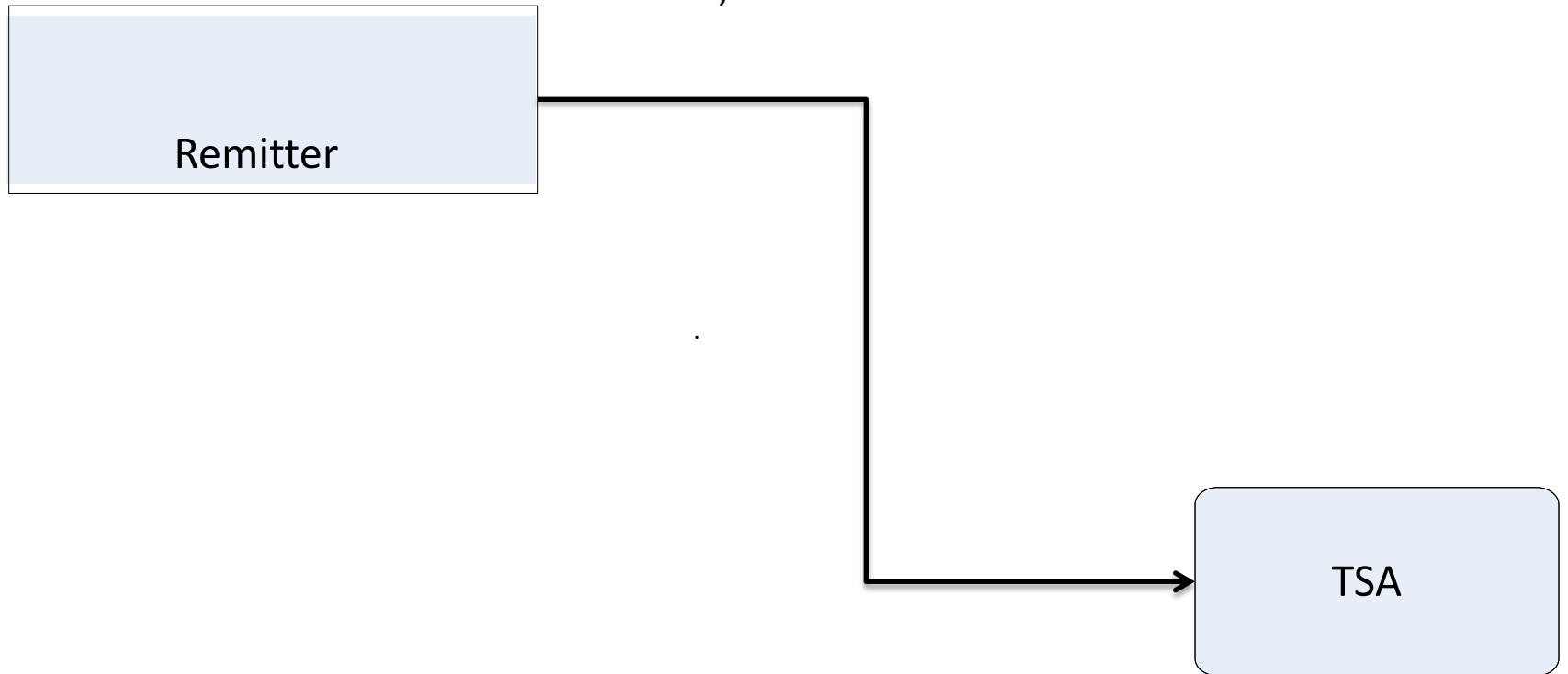
Consider the transfer of funds into the government from remitters.

The Receipts Network



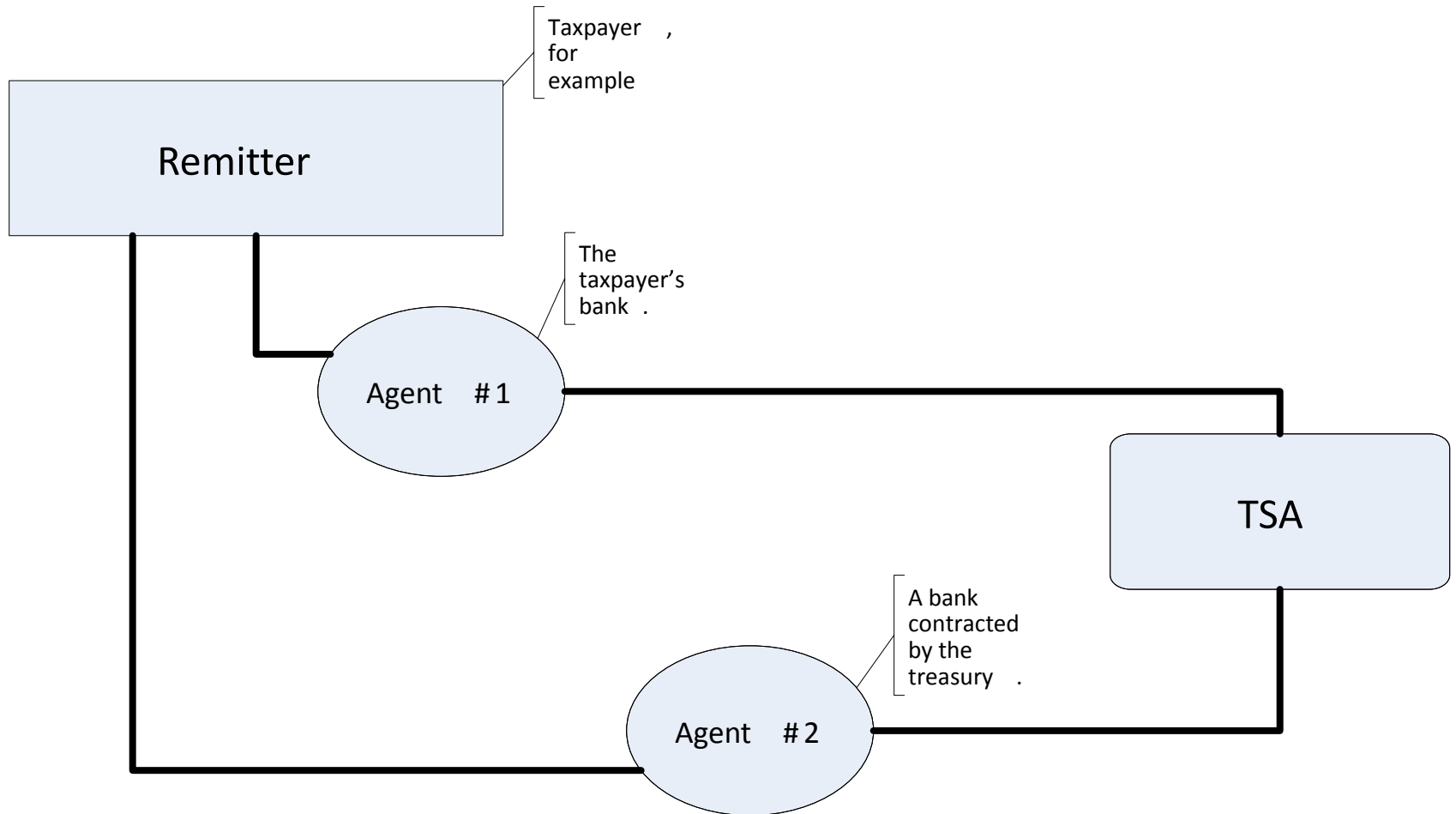
The Receipts Network

An Internal System



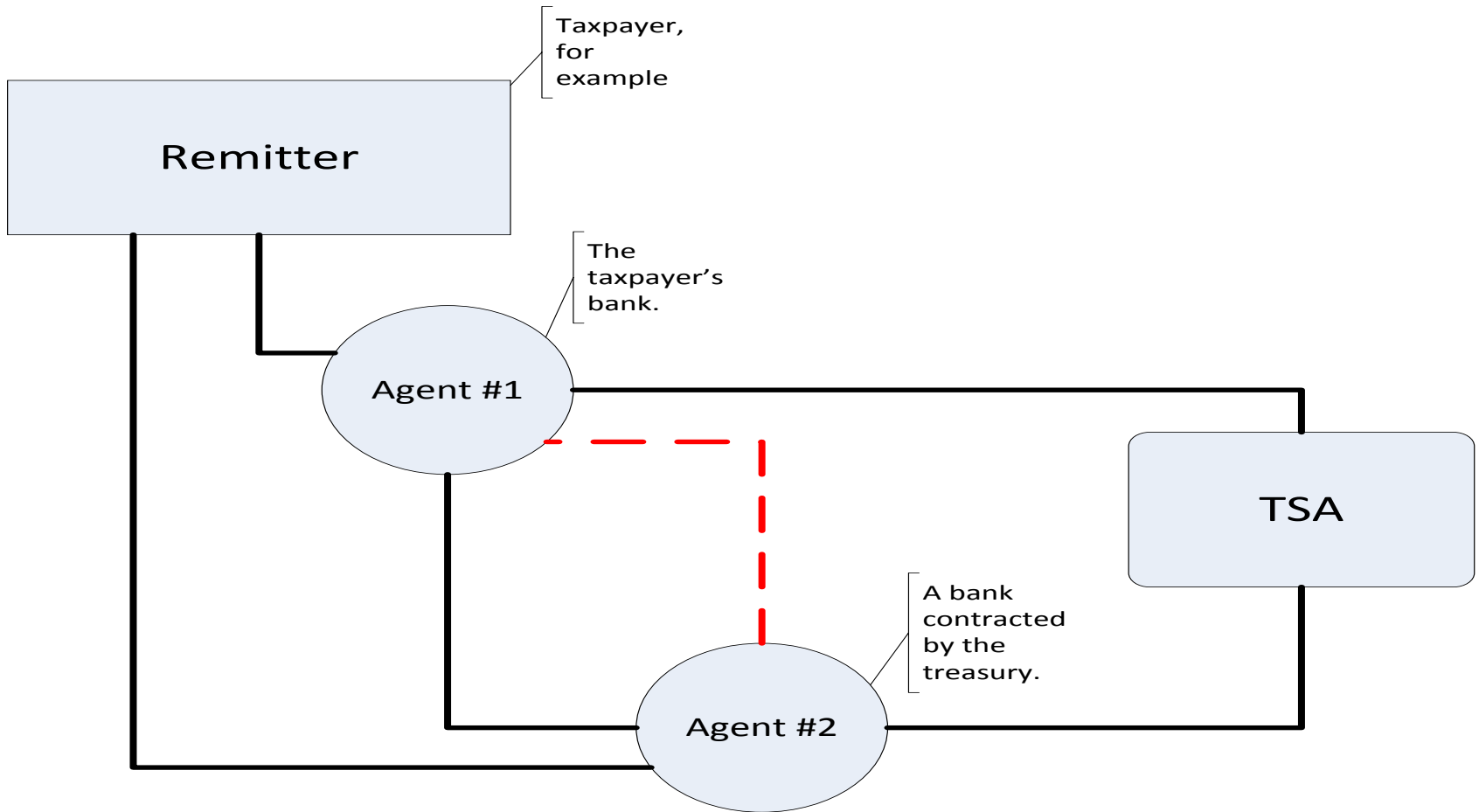
The Receipts Network

Using Agents, e.g., Banks



The Receipts Network

Full System



What is the cost of receiving funds?

- Does the system involve paid agents?
 - Banks are not expected to transfer funds for free
 - Developing one's own collection network can be expensive
 - These are explicit costs of collection
- Float is an implicit cost of each system

Float

- Float is a measure of the time value of funds.
- Float is measured as the delay in funds while they are in transit between the remitter and the recipient (in days) multiplied by the financing or opportunity cost of the funds multiplied by the amount in transit.
- If there is any variability in transfer times, float should be based on the expected time to transfer. The risk of losses (funds never transferred) must be recognized.
- It is measured in units of currency.
- Key variables:
 - The amount that is in transit.
 - The number of days delay.
 - The daily rate of interest to apply.

Total collections cost

- The cost of collection by any method available is equal to the sum of any explicit costs of operations plus the float costs for that method.
- Even if the government owns its own network for collections (e.g., payment at local office cash windows), the collection has an explicit cost which is the time value of the clerks and messengers used to collect and transfer the money.
- As funds for any cash flow may be collected in several ways, one must compare the total expected costs of each collection channel to select the most efficient one.

Managing costs

How does one balance float and explicit costs?

By explicitly pricing float and including it in the calculation of cost.

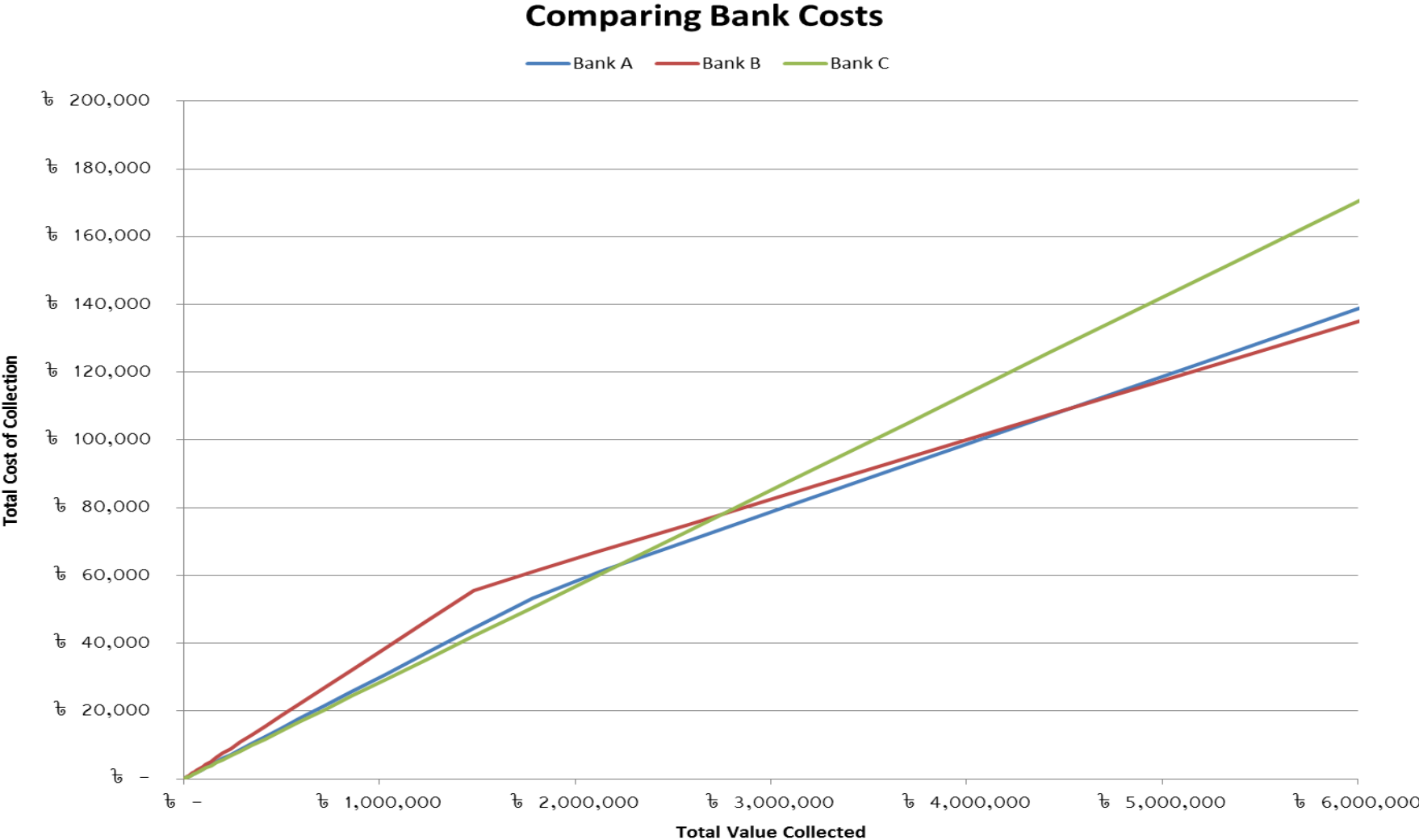
Comparing Agents

- Consider the need to collect funds for some government program.
 - The average transaction may be about Euro 250.
 - There are various estimates as to the monthly volume
- Three banks have proposed to collect the funds and transfer them to the TSA
 - Bank A offers to work for a commission with a reduction in rate above a certain volume
 - Bank B bids to collect the funds for a (different) commission rate plus a fixed fee per transaction up to a certain volume.
 - Bank C will charge a fixed amount per transaction but will delay funds transfer.

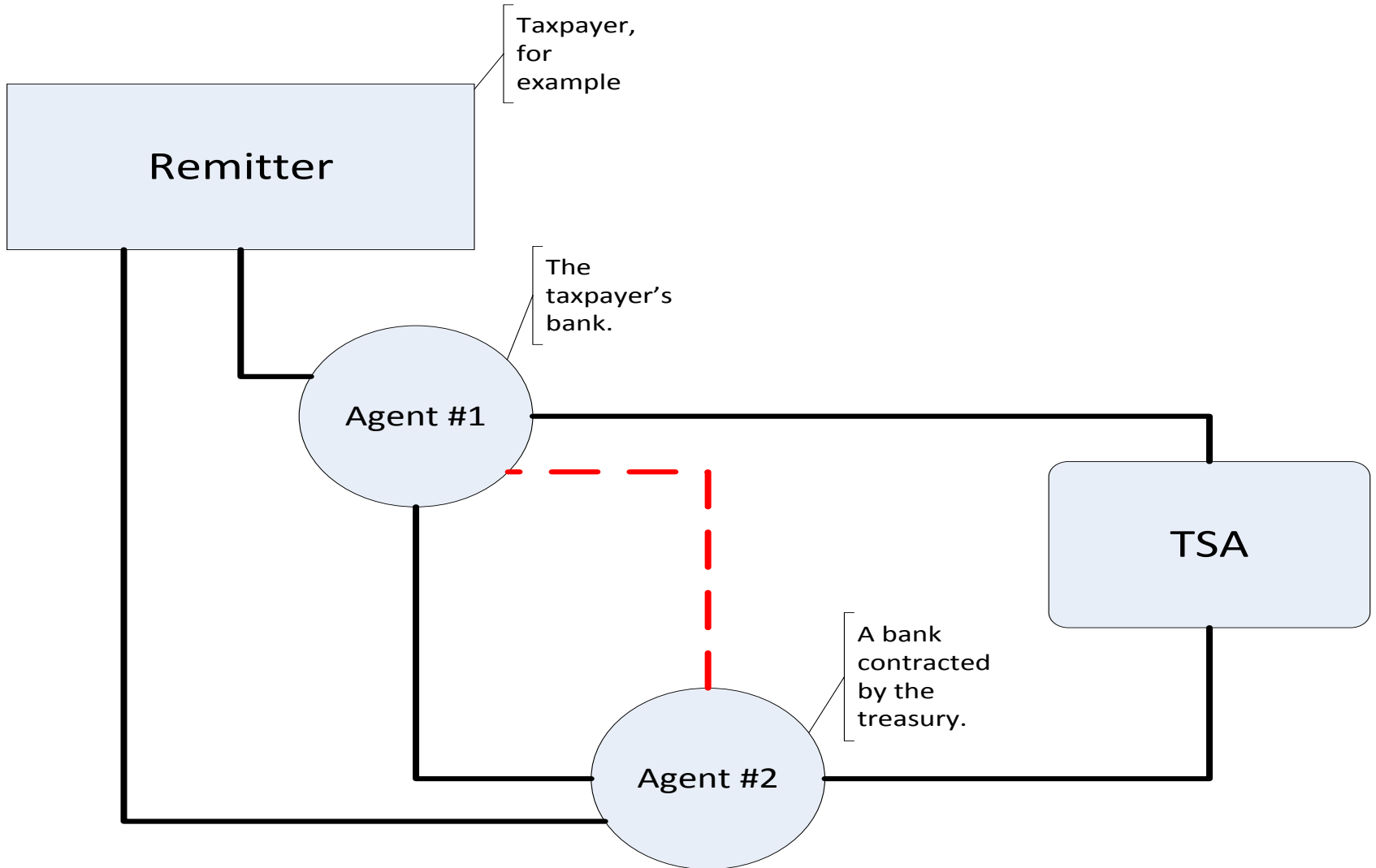
Making your selection

- Which bank you should choose depends upon
 - the average transaction amount,
 - the expected volume, and
 - the float costs based on the cost of funds to the government.
- The values assumed may have a major impact on the outcome, so test a range of values for each variable

Each bank has a zone of advantage



The Receipts Network



Banks may provide tools to improve collections

- Contracting with a bank to provide services gives an explicit cost to each cash flow. This allows better comparison of methods.
- Banks can often supply the newest technology.
 - By contracting for services, one is renting the newest technology
 - At the close of the contract, it is possible to obtain newer technology
 - This is usually better than buying because it is difficult to replace
 - *Fixed cost thinking: “we already own it, why throw it away?”*
 - *Maintenance and repair follow with ownership.*

Banking Products

- Zero Balance Account
- Automated Clearing House
- Fraud Prevention
- Wire Transfers
- Disbursements
- Purchasing Cards
- Deposits - Paper Checks
- Credit Cards

Effective Cash Management

WHAT ABOUT CASH FORECASTING?

Forecasting Cash Balances

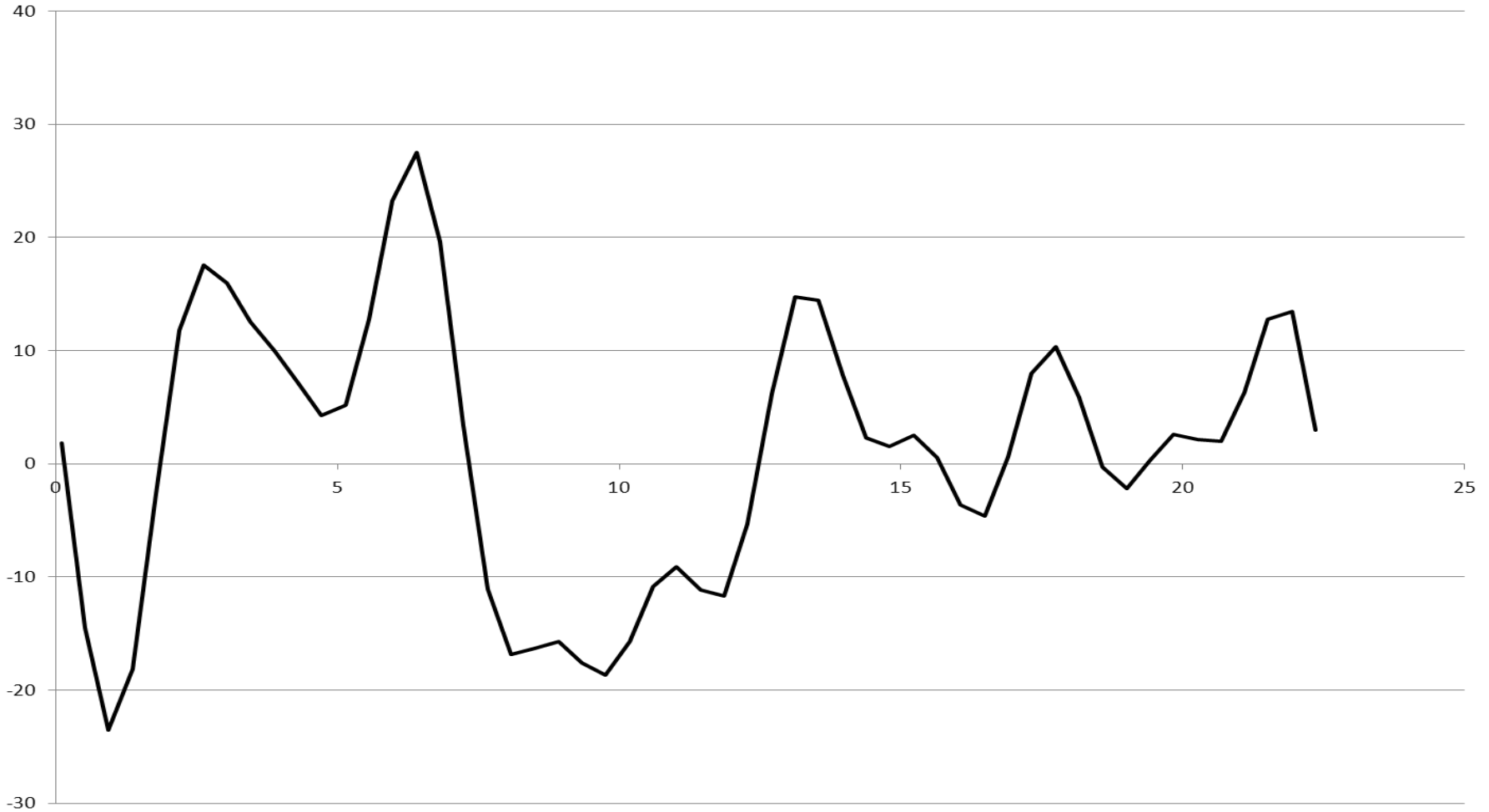
This is needed to understand when and how much money must be borrowed to maintain adequate resources to meet net cash flows.

It is rarely done well because it is too often treated as a statistical modeling problem only.

It should be done to provide a *DAILY* forecast of cash balances.

A complex, aggregate series can be difficult to model.

An Aggregate Data Series



The General Balance Forecast Problem

- Attempting to model the net value of a sum of cash flows is very difficult.
 - A cash balance is the sum of many individual cash flows.
 - Each flow contributes its own error to the whole.
 - Mathematically, the aggregate error structure can be very unstable, will likely be heteroscedastic, and will depend upon correlations among sub-flows.

Aggregate Cash Models have other challenges

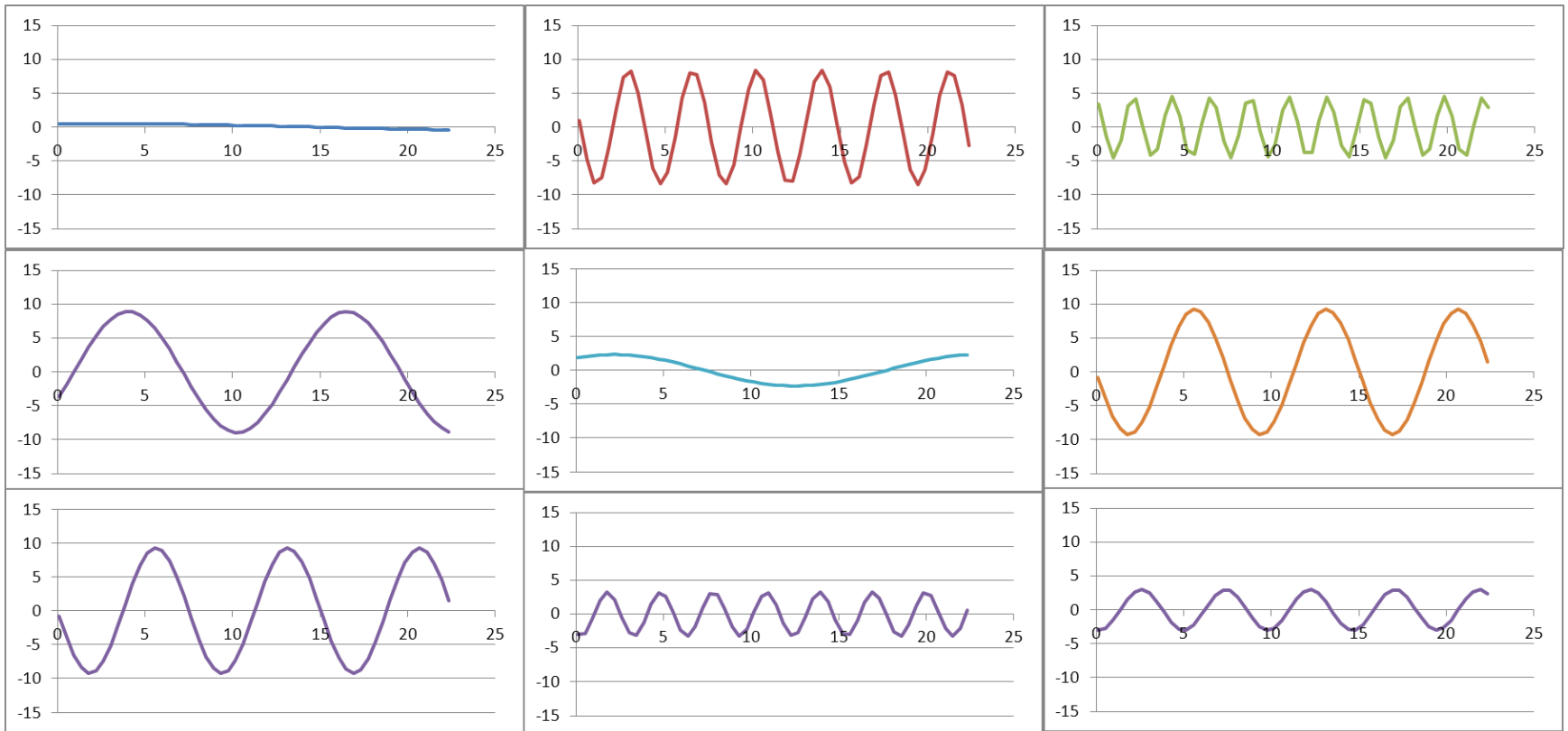
- Models of the aggregate cash balance will have limited sources of data to drive the forecast.
- One can use the naïve method of using trends of past values.
- A second approach would involve modeling the cash balance from the series itself using autoregressive methods.
- It may be necessary to rely on exogenous estimates of GDP or other economic activity to serve as a proxy for unseen fiscal flows.

Fourier's Theorem provides a clue -

- Complex series can be generated by a collection of simple sub-series.

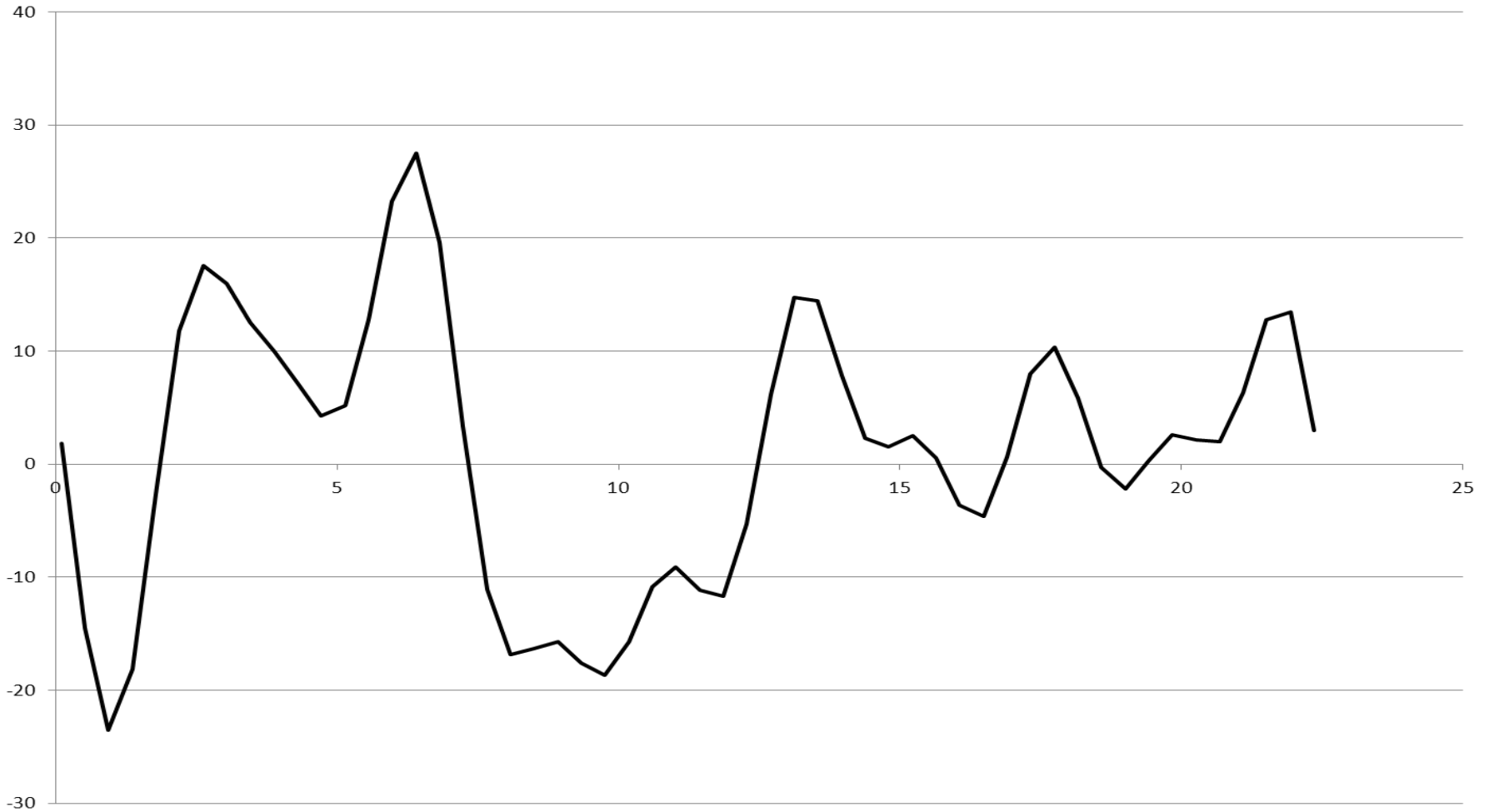
It is easier to model component sub-flows.

These nine simple flows created the complex structure given in the earlier slide.



They form this ...

An Aggregate Data Series



Disaggregation may ease the forecasting problem.

- It is recommended that the cash balance forecast be derived from forecasts of all constituent sub-flows.
- For most of these, the statistical modeling requirement will be slight.
- Known schedules and trend analysis can be used for a first cut forecast.
- Accounting will replace much of the statistical and econometric work.

Triage for cash flows

- **Most cash flows will fall into one of three categories:**
- Those flows that are purely administratively determined such as interest payments, debt maturities, social pensions, and payroll. They are generally day specific and easily predicted with only small changes from month to month. These can be entered into the calendar easily.
- Those flows which are fairly even or of such non-material sums, such as office supplies, that they are easily represented by a proxy of straight line entries or simple regression values.
- Those flows which are material but variable, such as some taxes or energy payments. These are the only flows which may need to be modeled. Historic values (from the accounting system) may be critical to success in this effort.

Disaggregation

- **This changes the forecast method significantly.**
- The goal is to use accounting data, known cash flow movements, and limited statistical analysis to model individual cash flows at individual or related combined budgetary entities.
- The cash balance is estimated by adding for each day (or week) forwards the net change in cash resulting from the sum of all estimated sub-flows.
- The result is the cash forecast for all forward periods.

The cash balance forecast would be updated each day.

- The closing cash balance for the most recent day will be the starting point for the new forecast.
- Estimates of cash sub-flows would be adjusted as new information is obtained or if errors prompt review.

The forecasting team members would specialize in particular sub-flows.

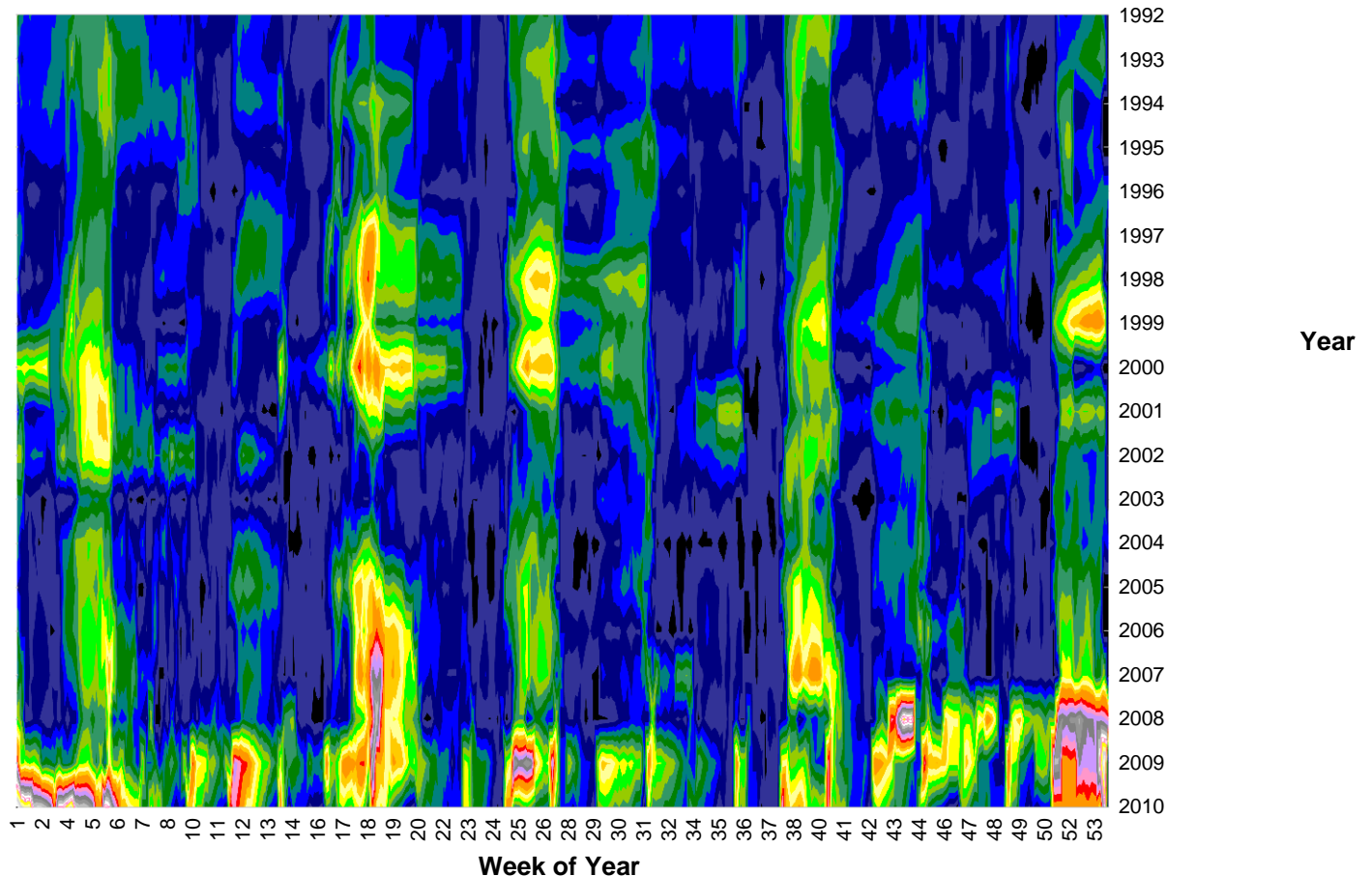
- Their responsibilities would include understanding well the functions and operations of the budget entities assigned to them.
- They would be expected to maintain constant contact with those entities to learn of new developments and to interpret data.
- Constant interaction and discussion with key budget entities or agencies should be actively encouraged.

Effective Cash Management

USING THE CASH FORECAST TO MANAGE BALANCES

The cash balance will vary across the year, but there may be larger patterns to exploit.

Treasury Daily Operating Balance
1992-2010



Maintaining the correct cash balance

- Are there prohibitions on a negative balance?
- Using the cash forecast
- Adjusting the balance
- The target cash balance is an insurance against unexpected net outflows.

What is a safe balance range?

- What is the minimum?
 - The more critical problem
 - The zero boundary
- What is cost of going below zero?
- What is the targeted maximum?
 - Can one hold too much cash?
 - What are the costs of holding too much cash?

How to set a target.

- What is the volatility of the forecast?
- What is the volatility of the balance?
- Both of these will affect your insurance need.

How to maintain a target value.

- Funds should be managed so that the amount in the TSA for immediate use should be between the minimum and maximum target values.
- If funds are greater than the target, they may be invested to earn interest or used to reduce interest costs.
- If funds are less than the minimum target, they must be augmented by calling in deposits or borrowing or other credit means.
- The cash forecast will provide some guide to the options available in either case.

Handling surplus funds

- Funds may be deposited in commercial bank accounts to earn interest during periods of excess balances.
- The term of the deposit should be chosen by reviewing the cash forecast to see how long such a balance will persist.
- The commercial bank should be chosen competitively based on the return being offered for the deposit.
- All funds deposited should be fully collateralized with liquid securities acceptable to the treasury.

Handling a funds shortfall

- One of the chief uses of treasury bills is to finance short-term funds balances.
- Other credit instruments may be used, such as an overdraft line, but there are benefits to developing a local securities market through bill issuance.
- This is a key use of the cash forecast: to predict in sufficient time funds shortfalls.