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## **Real Time Gross Settlement: Emerging Issues and Challenges**

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# Agenda

- An overview of Hong Kong's financial infrastructures
- Basic design of a typical RTGS system
- New innovations in RTGS systems
- Role of RTGS in national payment systems and cross-border payments





# An overview of Hong Kong's financial infrastructures



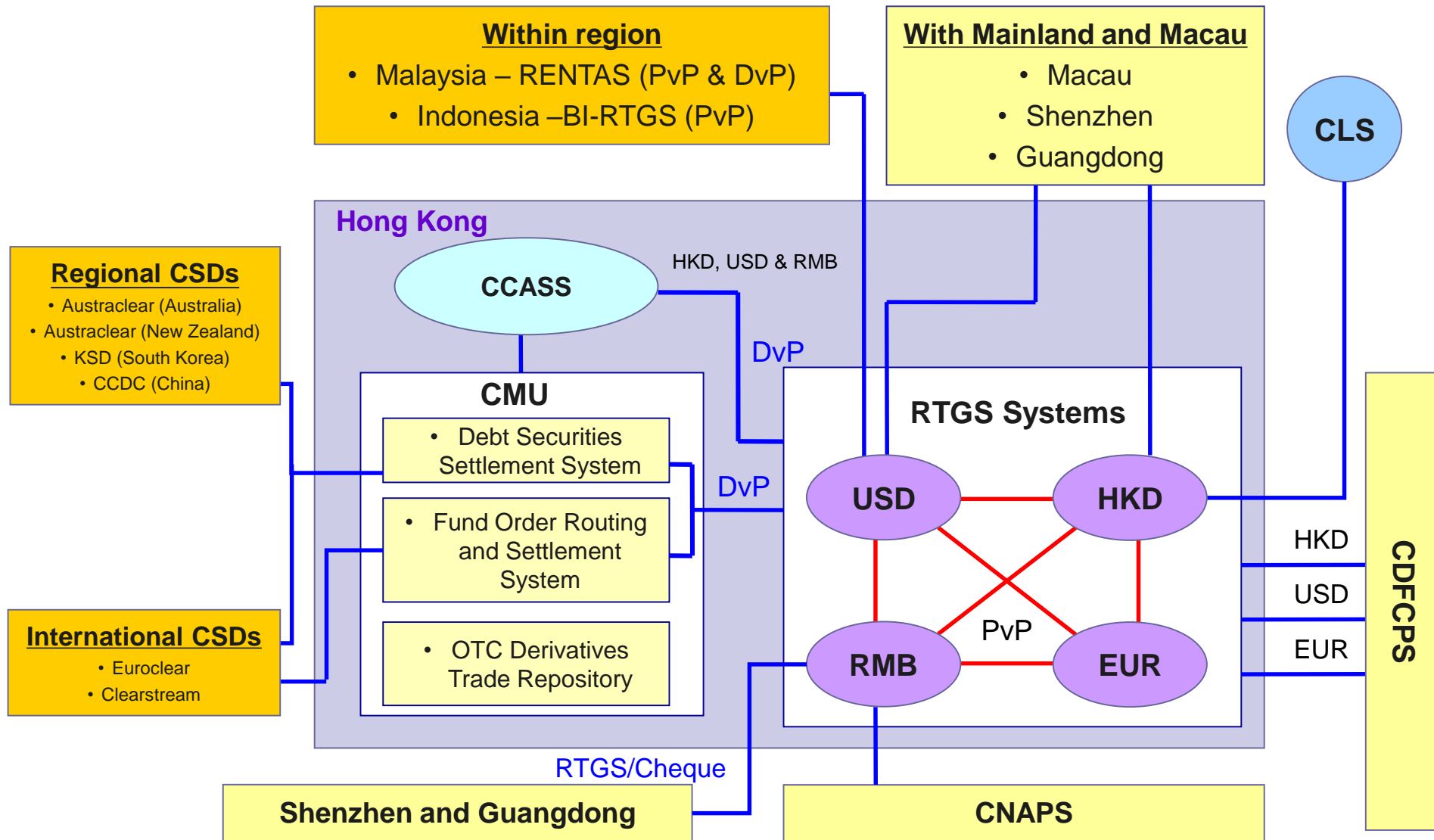
# Policy stance of Hong Kong Monetary Authority

To have a safe and efficient system based on a multi-currency, multi-dimensional platform, which helps maintain the stability and integrity of monetary and financial systems, and consolidate Hong Kong's position as an international financial centre

- Multi-currency: RTGS systems cover HKD, USD, Euro and RMB
- Multi-dimensional:
  - ◆ Covers diverse financial intermediation channels, including banking, equity and debt
  - ◆ Covers large value interbank payments as well as interbank payments arising from cheque, auto-credit/debit and credit card transactions



# Hong Kong's financial infrastructure



# Basic design of a typical RTGS system



# Payment System

**“ A payment system consists of a set of instruments, banking procedures, and, typically, interbank funds transfer systems that ensure the circulation of money”**

**“ Essential oil that lubricates the economy”**



# Real Time Gross Settlement (RTGS)

- **Final and irrevocable settlement across the books of central bank/settlement institution**
- **Processing and settlement take place in real time (continuously) on a gross basis**
- **In “ a reliable and simple way” to address the credit and settlement risks between payer and payee**





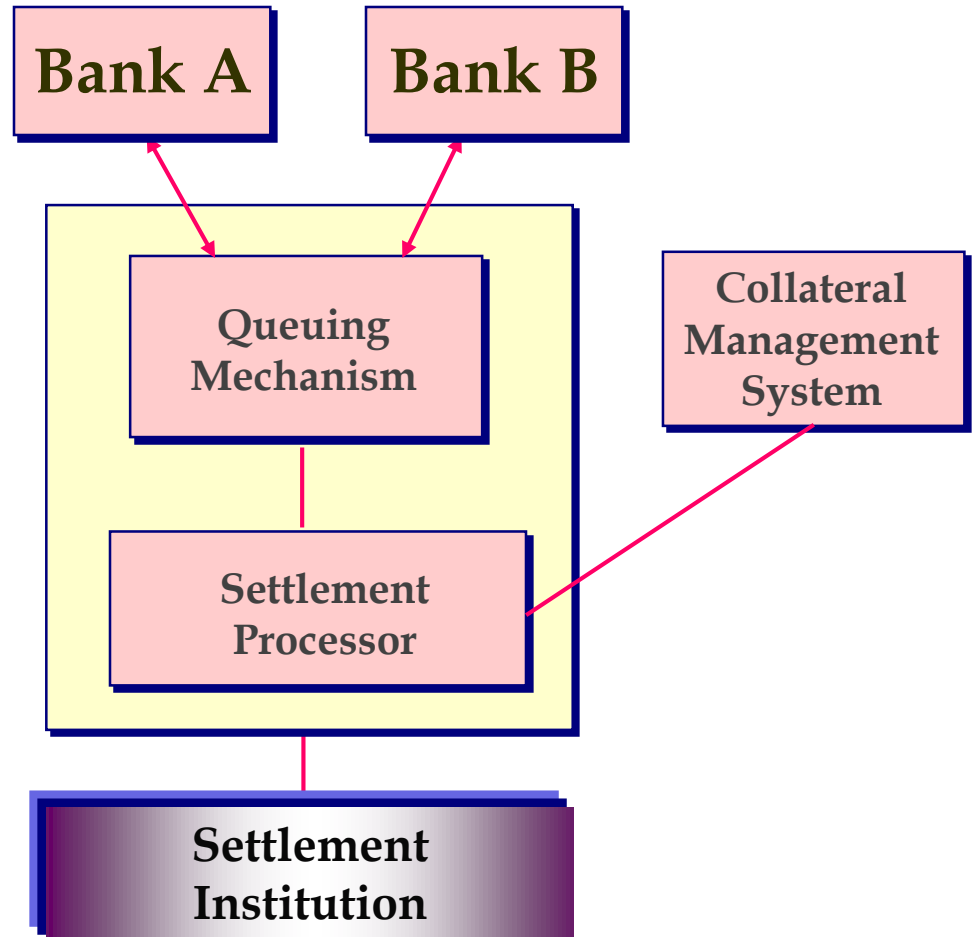
# Advantages of RTGS

- Reduction of settlement risk : good funds already credited to the receiving bank account when the payment instruction arrives
- Settlement on a gross basis, thereby avoiding legal complications of netting and unwinding
- Enable bank treasurers to monitor cash flow on a real-time basis
- Building block for real-time Delivery vs Payment (DvP) and Payment vs Payment (PvP)

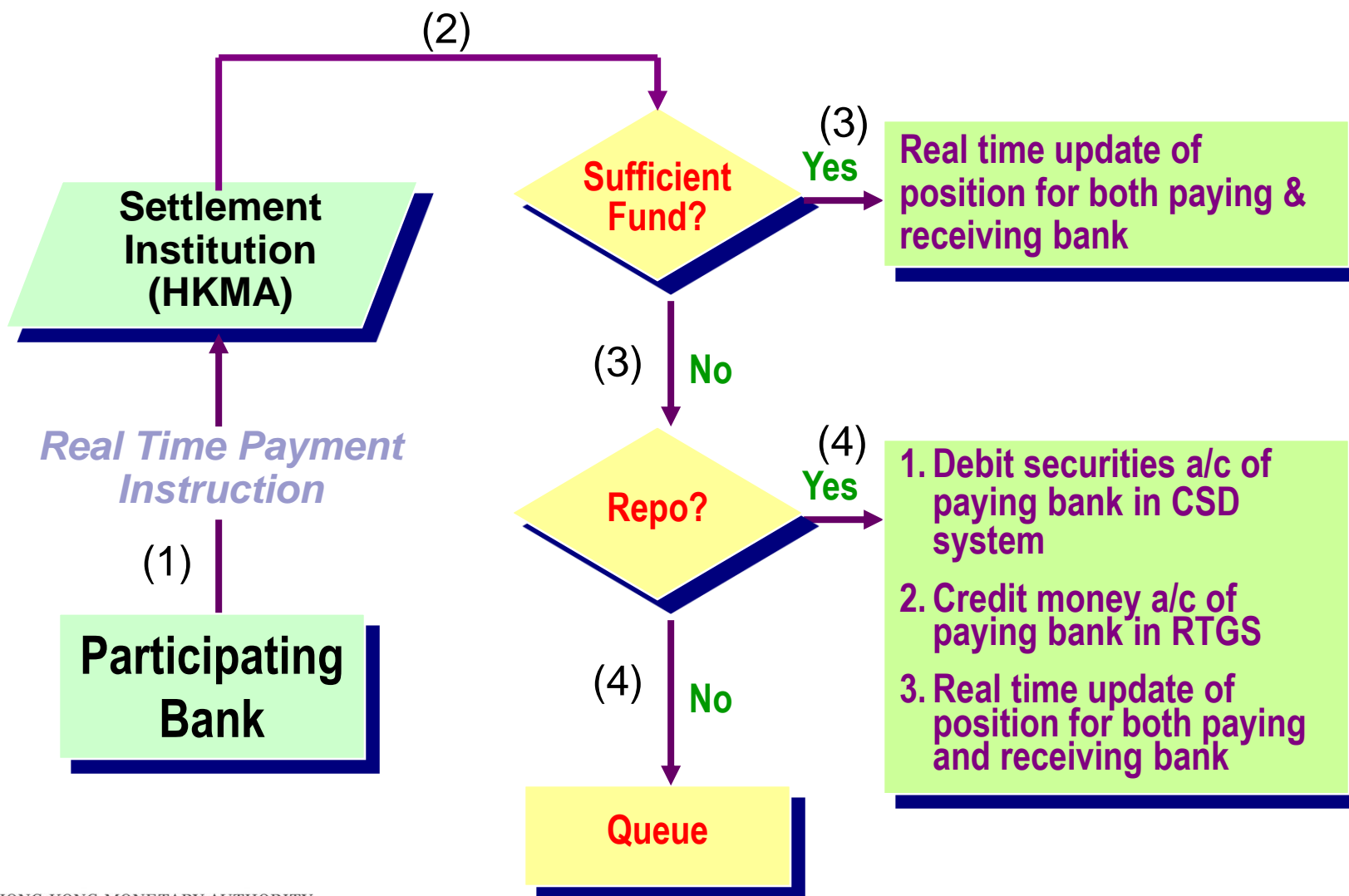


# Basis design of a RTGS system

- Y-shaped or V-shaped topology
- Single-tier system
- Real time settlement across the books of the Settlement Institution
- Provision of Intraday liquidity through a collateral management system
- Queuing mechanism



# Provision of intraday liquidity





# New innovations in RTGS systems



# Why new innovations in RTGS systems

- Mitigate risks
- Improve operational efficiency
- Provide business opportunities



# Examples of new innovations in RTGS systems

- DvP and PvP settlement
- Gridlock resolution mechanism (or liquidity optimisers)
- Open platform



# Example 1A: PvP links with Malaysia, Indonesia and Thailand

## Benefits of PvP links in the Asian region:

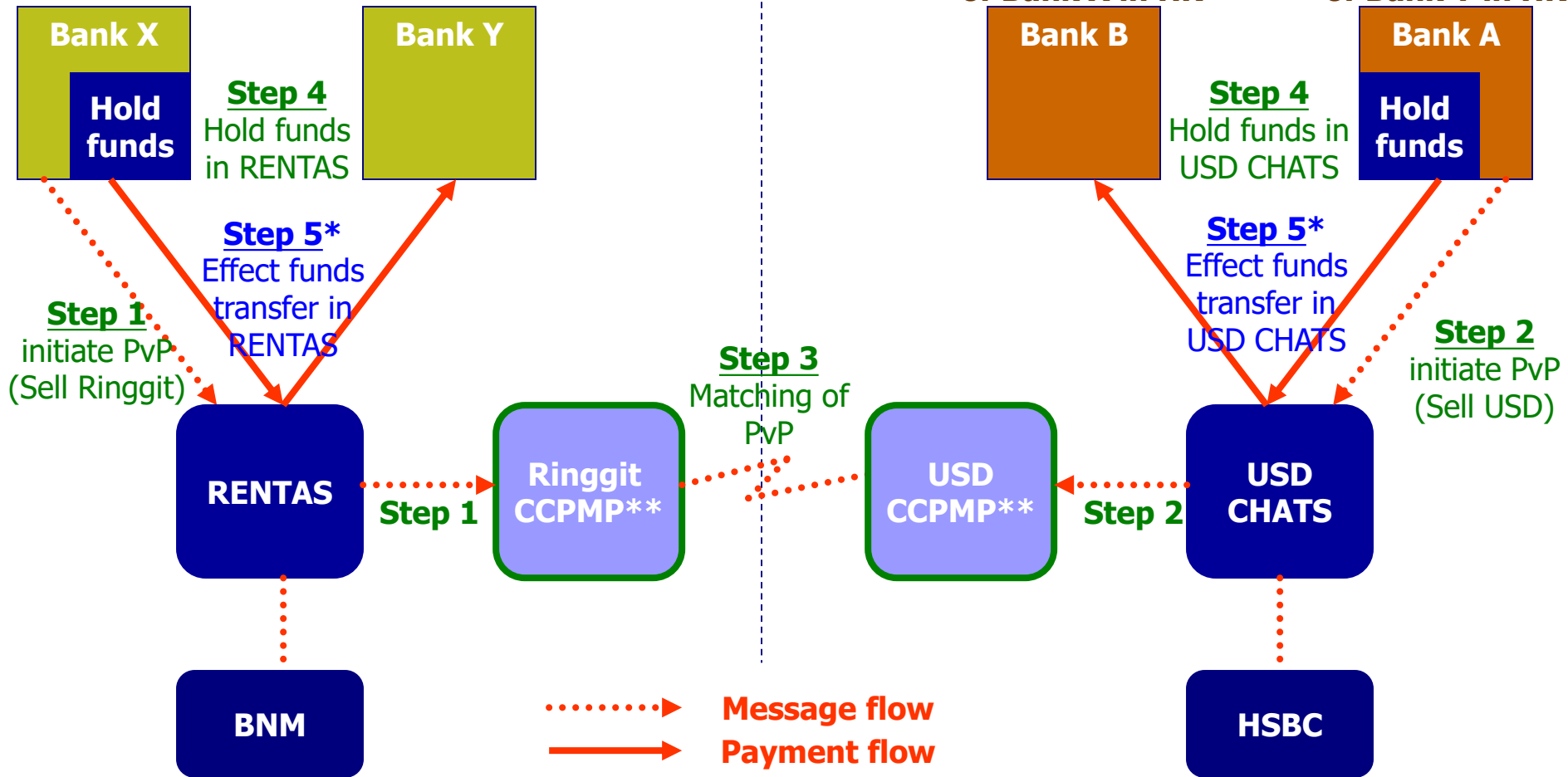
- Eliminate settlement risk of foreign exchange transactions
- Safe and efficient payment and settlement flows
- Cost-effective settlement
- Wide operating window
- Improved liquidity management
- Better banking services



# PvP Link with Malaysia: Conceptual Framework

## Malaysia

## Hong Kong



\* **Step 5** will be done in the Ringgit and US dollar RTGS respectively in a synchronised manner.

\*\* **CCPMP** - Cross Currency Payment Matching Processor



## Example 1B: DvP Settlement for USD Bonds Issued in Malaysia

- Building on the success of the PvP link, HKMA and Bank Negara Malaysia have jointly introduced the Delivery-versus-Payment (DvP) link between the securities settlement system in Malaysia and Hong Kong's USD RTGS in October 2007
- Achieves real-time DvP settlement for USD bonds in Malaysia during local business hours: the settlement of USD in Hong Kong and USD-denominated bonds in Malaysia are seamlessly linked and synchronised



## Example 2: Liquidity optimisers in Hong Kong

2A. RTGS Liquidity Optimiser (RLO)

2B. CHATS Optimiser

2C. Cross Currency CHATS Optimiser (CCPO)



## Example 2A: RTGS Liquidity Optimiser (RLO)

Gridlock is a situation where payment instructions fail to be settled on a gross basis because the necessary funds are unavailable, preventing a substantial number of instructions from other system participants from being executed.

The consequence of a serious payment gridlock may pose liquidity problems to the banks involved, which may generate systemic risk threatening financial and banking stability.



# RTGS Liquidity Optimiser (RLO)

RLO is a settlement mechanism combining the instantaneous finality of the real time gross settlement system and the liquidity efficiency of net settlement system by incorporating a multilateral or bilateral offsetting feature.

The offsetting process will optimize the use of the liquidity in the RTGS system to settle as many as possible the payments that have been posted in the queue, in order to avoid a **gridlock** developed in the RTGS system.



# Algorithm of the RLO

Individual payments are settled simultaneously on a gross basis (i.e. the individual obligations are not replaced by a net obligation), which will observe the following criteria in order to avoid legal disputes:

- a) sequence of the queued items, **first-in-first-settle (FIFS)**,
- b) no partial settlement of any payment, and
- c) settlement will only be done if the individual account balance after settlement is positive



# Major Processes of a RLO Run

- Scan Payment Queues
- Hold eligible securities for repo in CMUP
- Eliminate payment queues
- Settlement



## Example 2B: CHATS Optimiser

- Objective: to ease banks' liquidity pressure, particularly during times of large fund flows associated with IPOs
- Introduced in June 2004, CHATS Optimiser is a system mechanism that settles paper cheques and large-value CHATS payments simultaneously and in an offsetting manner



# CHATS Optimiser

- Paper cheques are settled daily in a bulk run at a specific time by multilateral netting. When the gross amounts required to settle paper cheque payments are substantial, banks, having known their net cheque settlement positions, can make use of the CHATS Optimiser to make offsetting CHATS payments to their counterparties during the bulk settlement run
- This improves the funding management efficiency of the banks by alleviating them from the need to sit on substantial amounts to settle the payment obligations at the time of the bulk settlement run





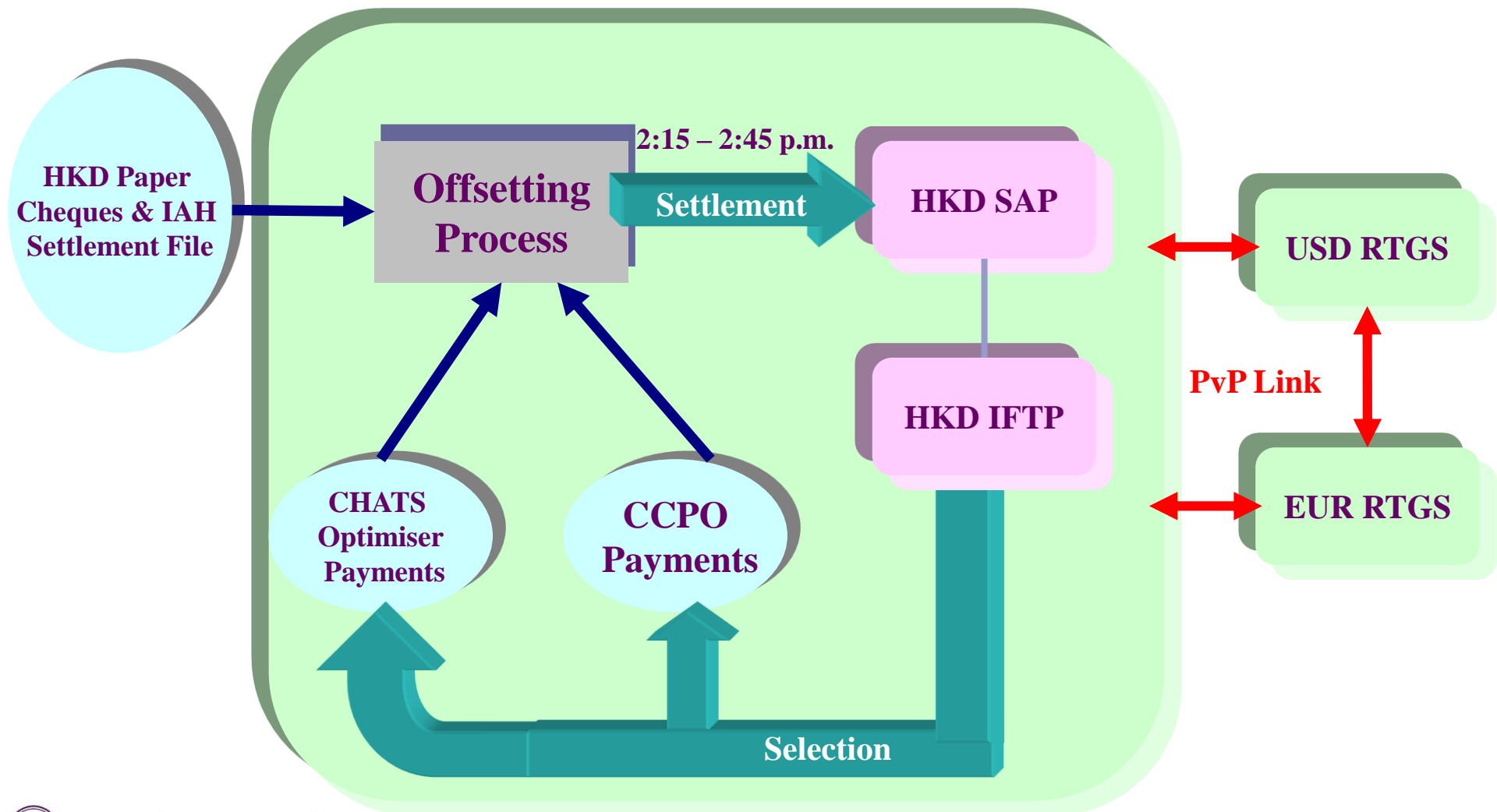
## Example 2C: Cross Currency CHATS Optimiser

- Cross Currency CHATS Optimiser (CCPO) is a system mechanism that settles the following transactions simultaneously in an offsetting manner:
  - paper cheques & IAH items
  - CHATS Optimiser payments (Payment Code 37)
  - HKD-leg of PvP transactions (CCPO payments)



# CCPO Settlement Process

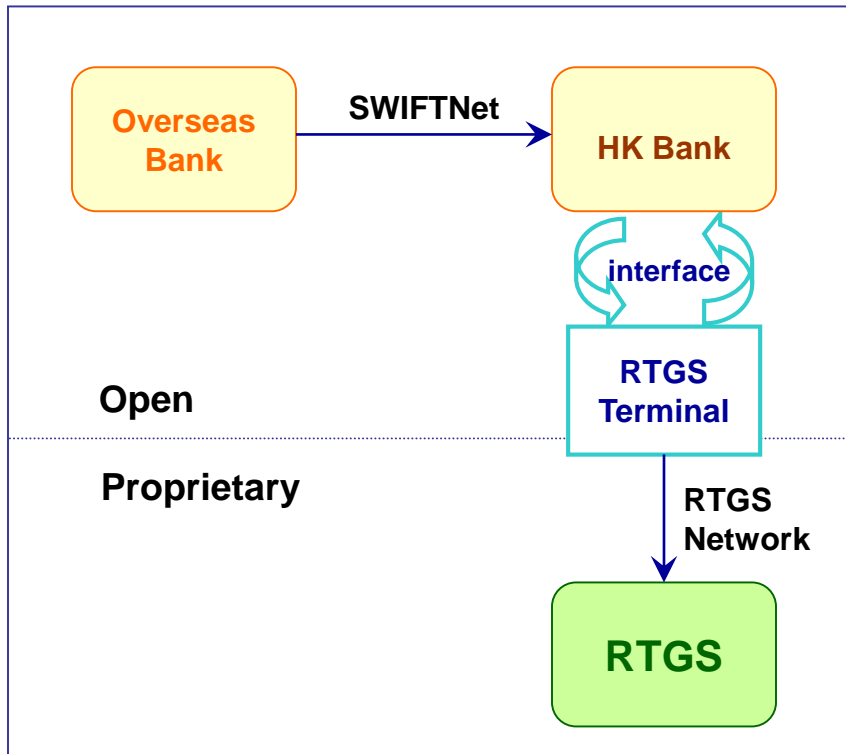
HKD RTGS



# Example 3: Migration to an open platform: SWIFTNet platform

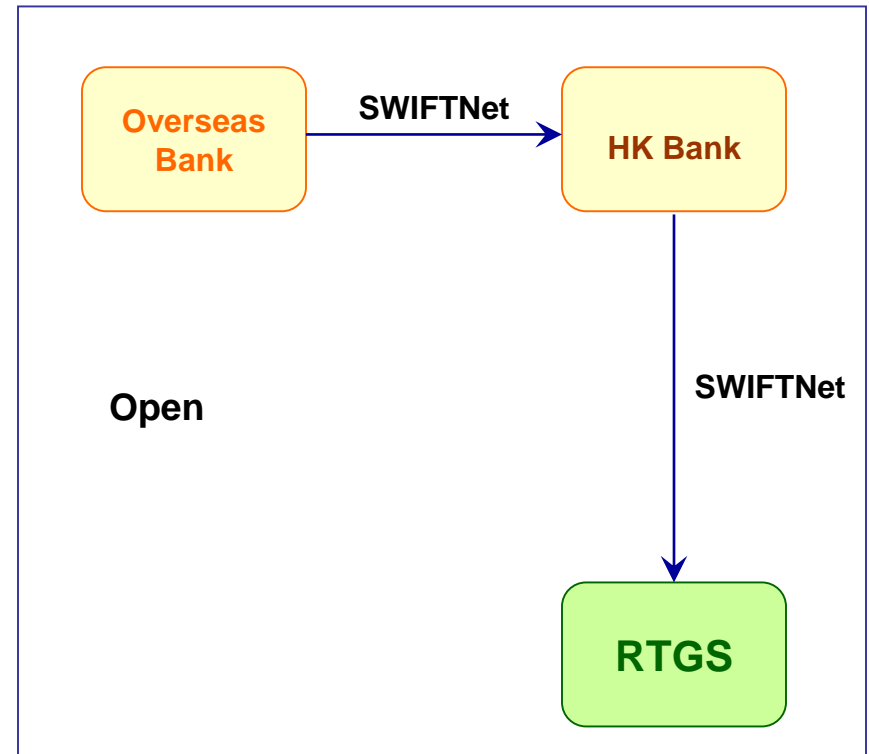
**Open platform:** an open worldwide Internet communication network and standard message protocols allowing domestic and cross-border access and exchange of remote information (eg. SWIFT). It facilitates straight-through-processing.

Old Proprietary Platform



- local payment: proprietary
- cross-border payment: open
- interface developed by banks

New Open Platform



- straight-through: no interface needed

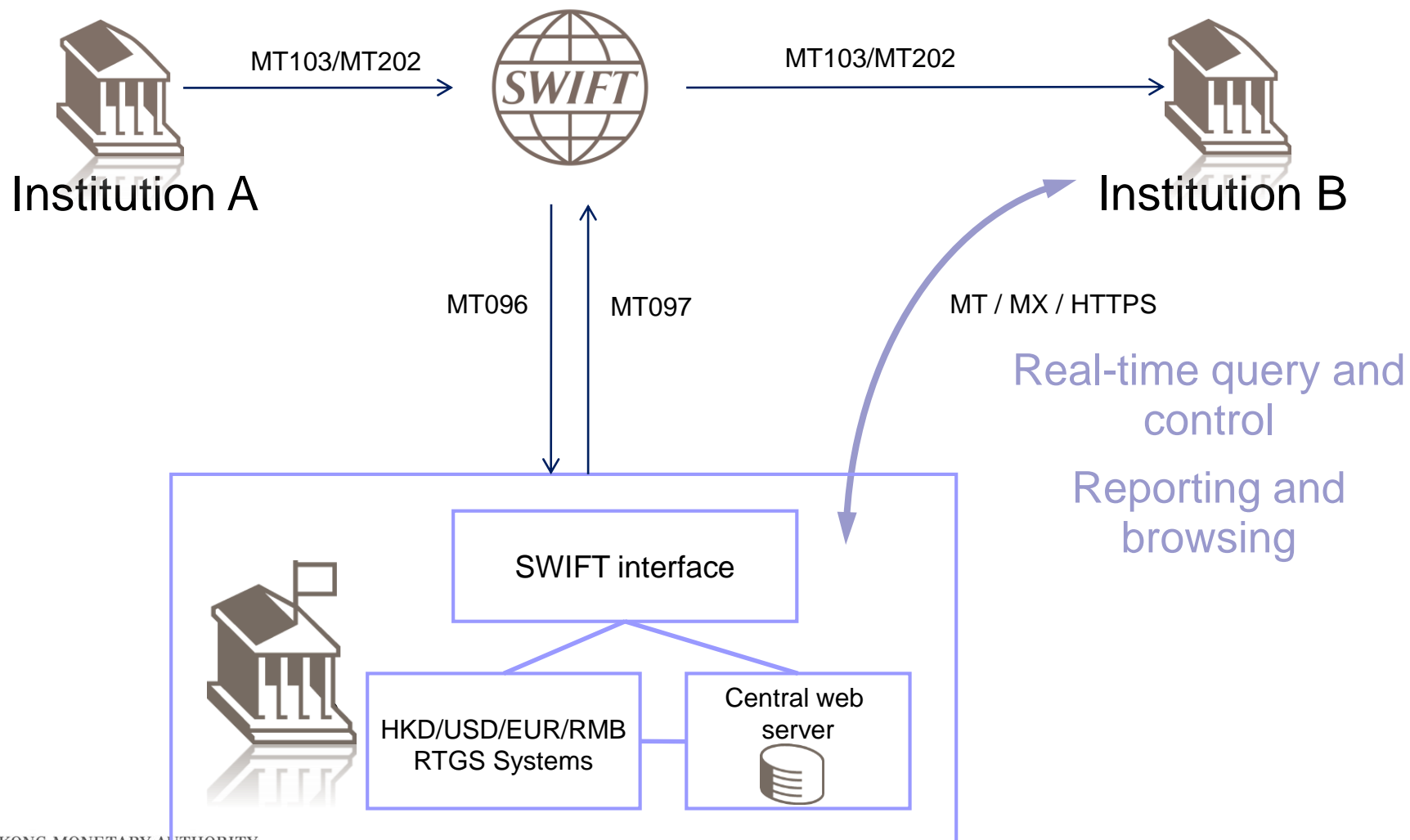
# Migration to an open platform

## Benefits

- **Attract more overseas users** for USD, Euro and RMB RTGS systems by removing technological constraints
- **Capture Mainland's payment needs** where over 1,000 banks and other financial institutions are SWIFT user
- **Reduce participants' operating cost** with less terminals/interfaces required
- **Provide technical upgrade** by achieving straight-through-processing and enhancing inter-operability




# SWIFTNet Platform - Y-copy Service (adopted in Hong Kong)



# ISO 20022 messaging standards

- Increase flexibility in including additional data
- Support multiple languages
- Enhance Operational efficiency and STP
- New messaging standards for next generation RTGS systems (e.g. CNAPS II in China, new RTGS in India)

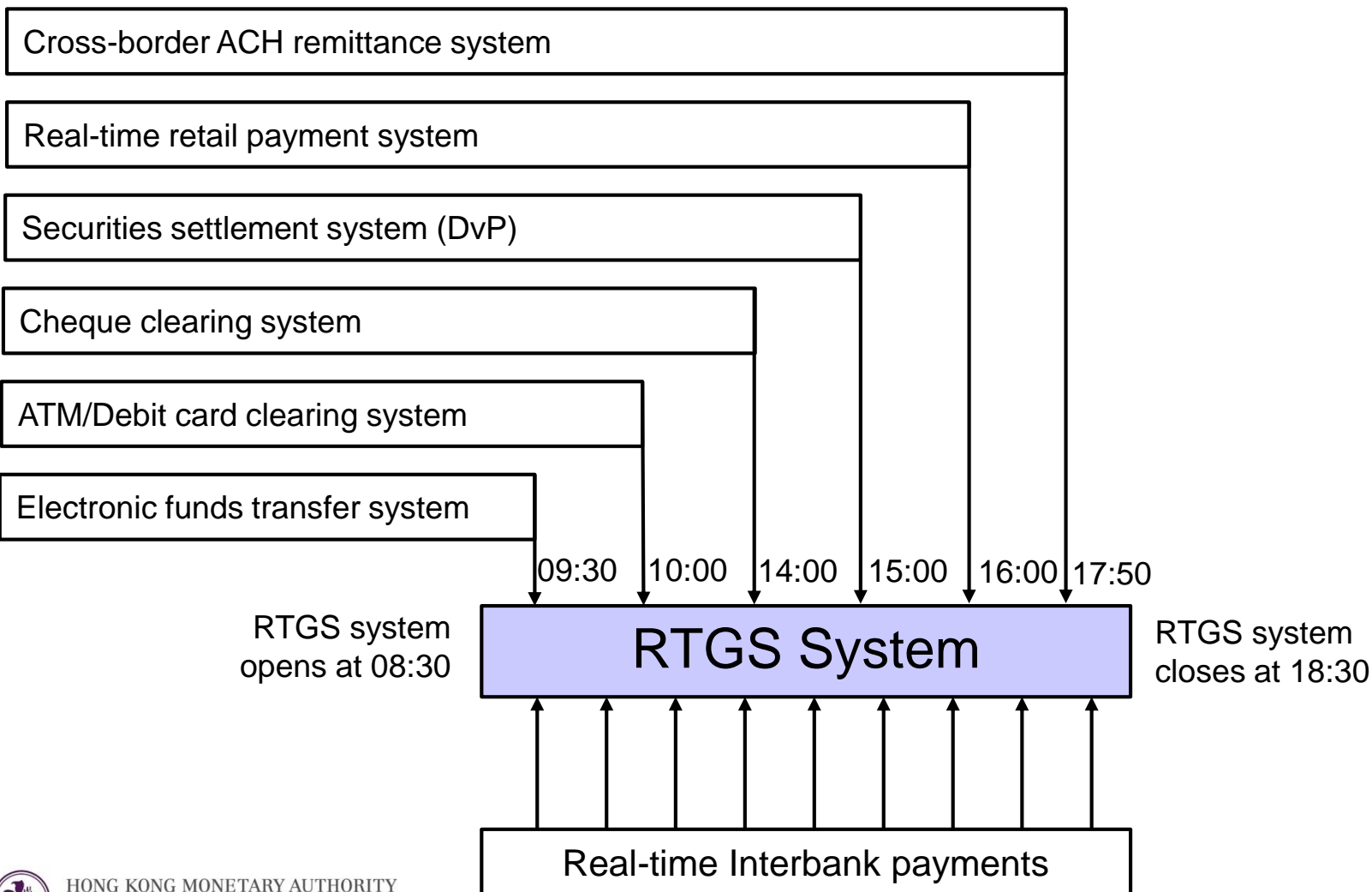




# Role of RTGS in national payment systems and cross-border payments



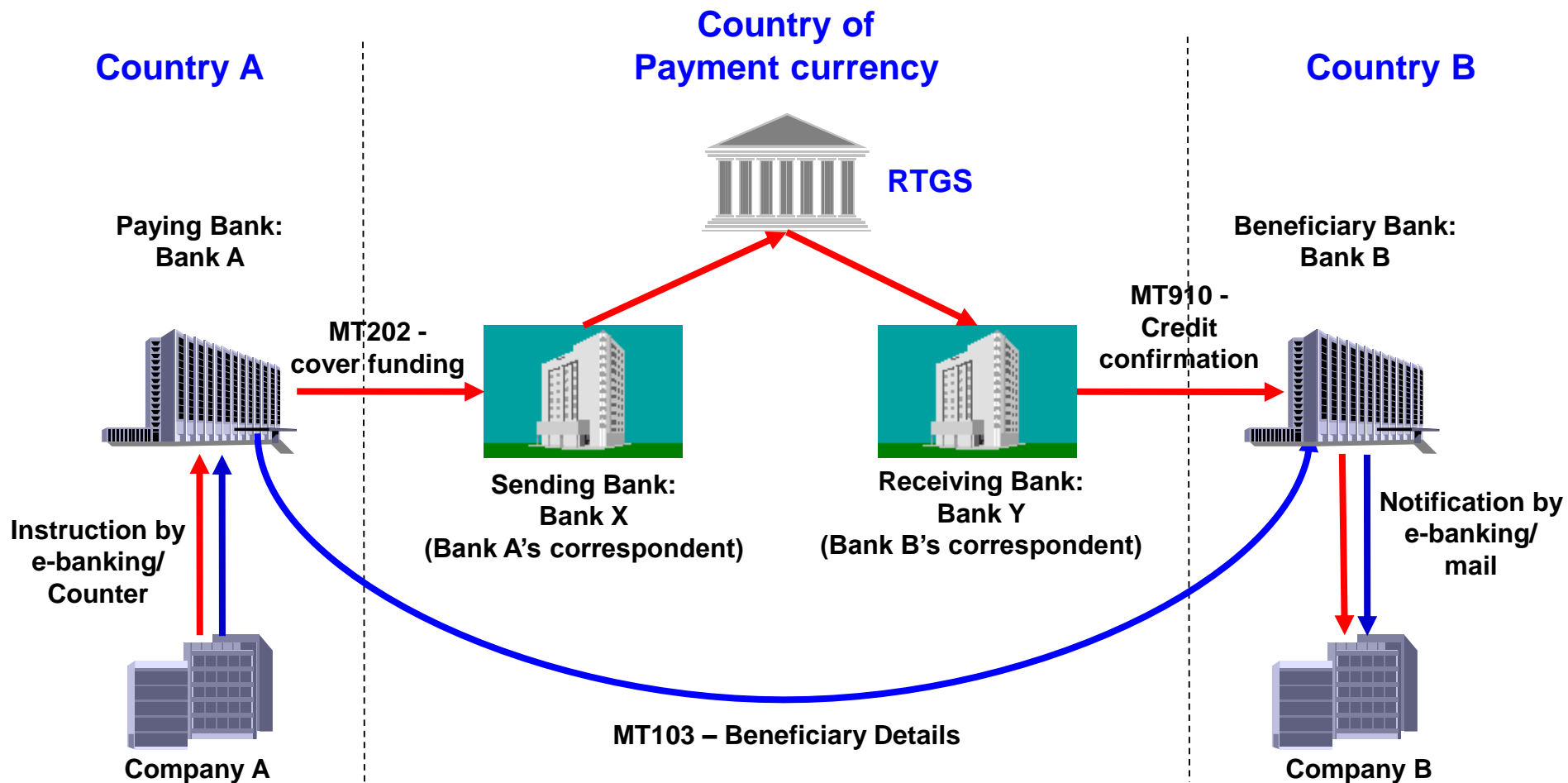
# Role of RTGS system in other national payment and settlement systems





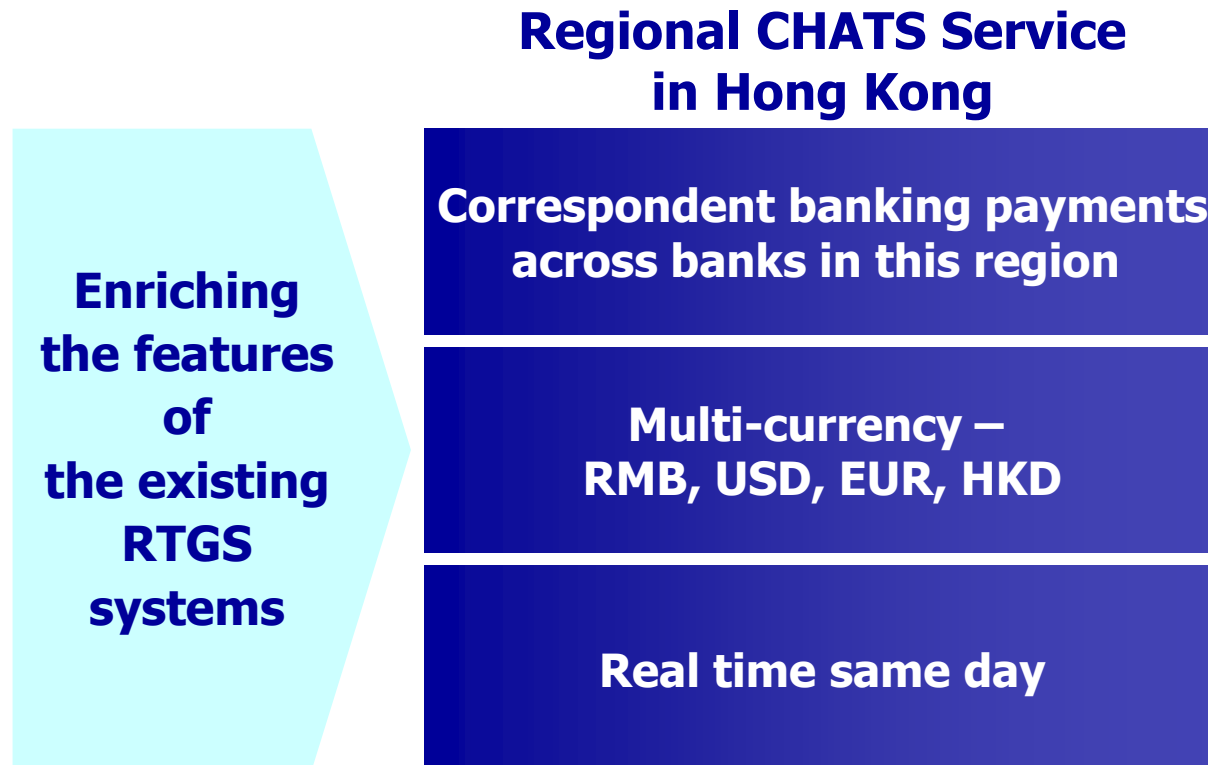
# Role of RTGS system in cross-border payments

Option 1: Cross-border payment services traditionally provided by correspondent banks



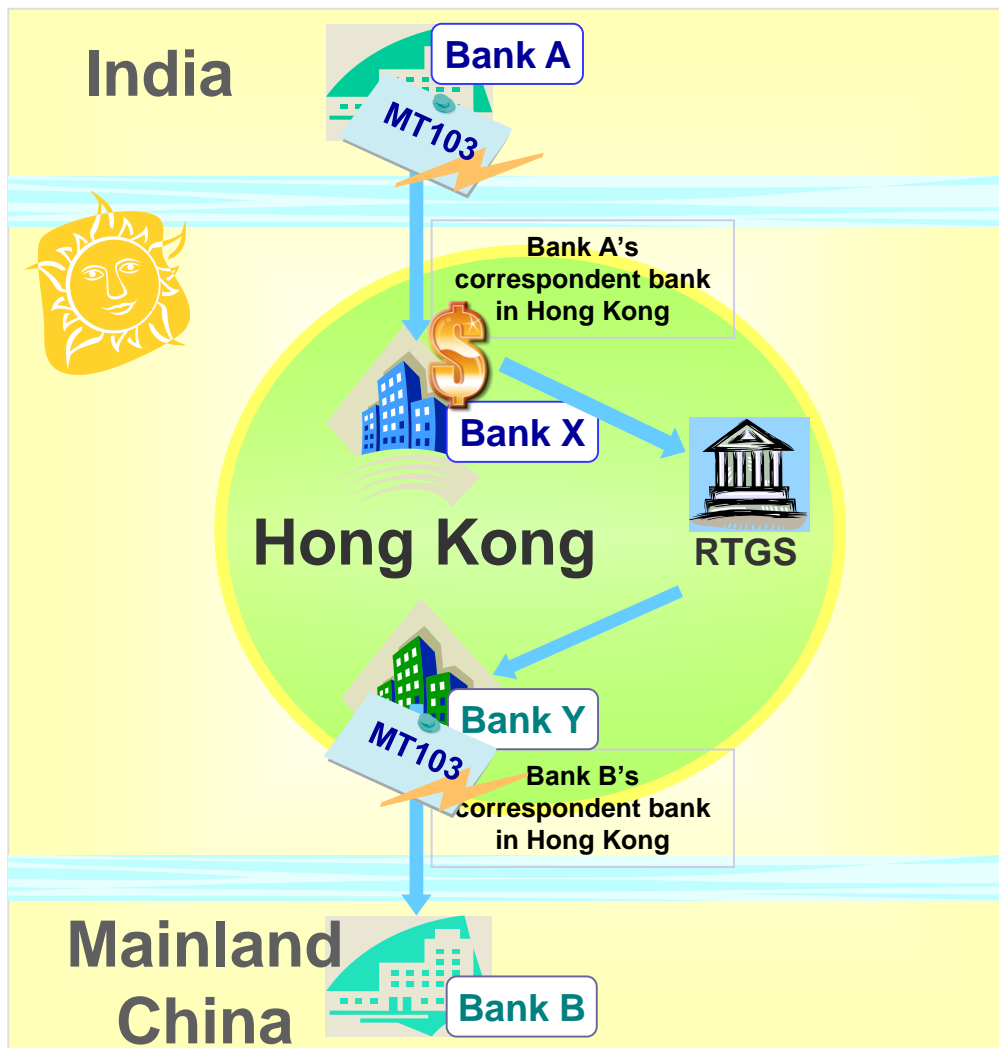
# Role of RTGS system in cross-border payments

Option 2: Cross-border payment services provided by add-on services of RTGS systems



Regional CHATS is a corresponding banking solution to facilitate multi-currency cross-border payments through RTGS systems

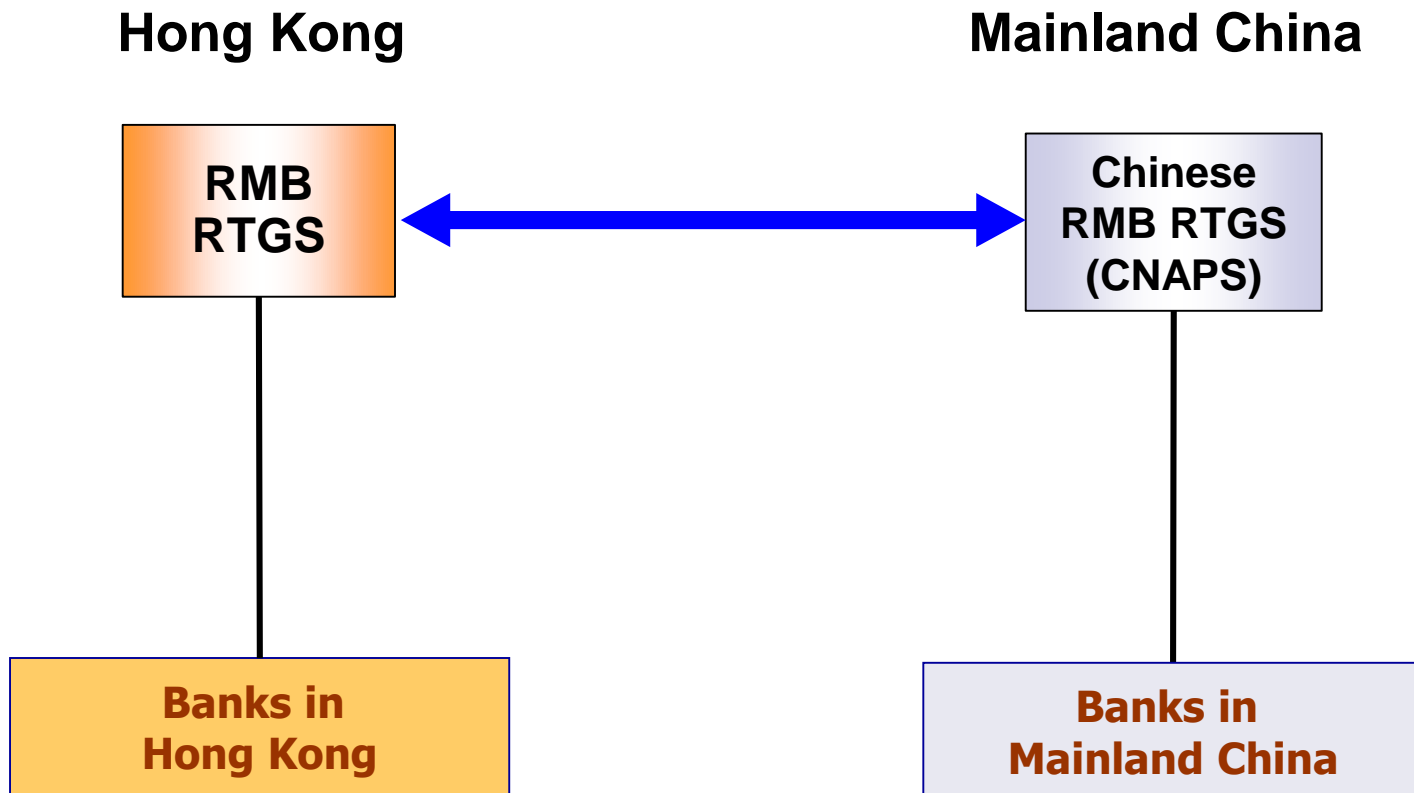
# Regional CHATS: Efficient regional cross-border payments



- With the USD, EUR and HKD RTGS in Hong Kong, **USD, EUR and HKD payments across the region** can be conducted efficiently in Asian time

# Role of RTGS system in cross-border payments

Option 3: Cross-border payment services provided by by RTGS link between two RTGS systems



# Questions and Answers

