SECURITIES AND
FUTURES COMMISSION
證券及期貨事務監察委員會

Report on the Thematic Review of Prime Services and Related Equity Derivatives Activities in Hong Kong

10 June 2019

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A. Introduction

1. In October 2017, the Securities and Futures Commission (SFC) commenced a thematic review of prime brokers (PBs) to assess their practices, internal controls and risk management processes. These PBs are financial institutions providing prime services and conducting related equity derivatives[1] activities in Hong Kong.

2. Generally, prime services include the provision to institutional clients, such as hedge fund managers, of trade execution and clearing, securities borrowing and lending, custody, financing solutions, synthetic prime services, reporting, capital introduction and consulting services.

3. Hong Kong is typically the Asia hub for financial institutions' equities businesses, within which prime services tend to reside. As many prime services clients, including international hedge funds and other institutional clients, have a strong presence in Hong Kong, prime services provided locally to international clients conducting trading or related activities in the Asia Pacific region are often managed in Hong Kong with oversight at the group level.

4. While operating models for prime services can be complex and may involve multiple legal entities of a financial institution across different jurisdictions, if clients are serviced in Hong Kong or if PBs are carrying out their prime services in Hong Kong, PBs are expected to comply with the applicable rules and regulations in Hong Kong regardless of where the risk positions are booked. In addition, PBs acting as the Asia hub to conduct business activities for their groups should also have adequate controls and procedures in place to follow the standards established by their group companies to facilitate the group companies' compliance with the rules and regulations which apply to them.

5. The scope of the thematic review primarily covered the following:

   - Governance and management supervision;
   - Client life cycle management;
   - Margin financing;
   - Short selling and securities lending;
   - Handling of client assets; and
   - Risk management and controls.

6. The thematic review was conducted in two phases:

   (a) A questionnaire was sent to 17 selected financial institutions operating in Hong Kong to collect information about whether they offered prime services, their practices in relation to the scope of services provided, their front-to-back business processes and risk management frameworks for prime services and their related equity derivatives activities. According to the responses, 13 out of the 17 institutions surveyed offered a full range of prime services in Hong Kong.

   (b) In the second phase, PBs with different business models were selected for prudential visits to further verify their responses to the questionnaire or on-site

[1] For example, PBs often utilise equity derivatives in the provision of their synthetic prime services to allow clients to synthetically obtain certain exposure.

inspections to assess their key risks and validate their controls for the provision of prime services activities.

7. Together with the circular to intermediaries on prime services and related equity derivatives activities issued on the same day as this report, the SFC provides the industry with a summary of the findings of the thematic review as well as examples of good practices and our overall expectations. The examples of good practices from the thematic review are non-exhaustive and PBs should not regard them as the only methods for complying with the regulatory requirements. PBs are also encouraged to pay attention to the areas for improvement to avoid ineffective practices and internal control deficiencies.

8. As the financial market evolves, the SFC enhances regulatory requirements as needed. Market participants are reminded to continuously assess how regulatory changes would affect the regulated activities they carry out in Hong Kong, especially in the provision of prime services where the business processes could be spread across various jurisdictions or managed on a regional or global basis.

9. The SFC will keep abreast of both local and global developments relating to prime services and propose regulatory changes where appropriate.

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B. The prime services industry landscape in Hong Kong

I. Prime services provided in Hong Kong

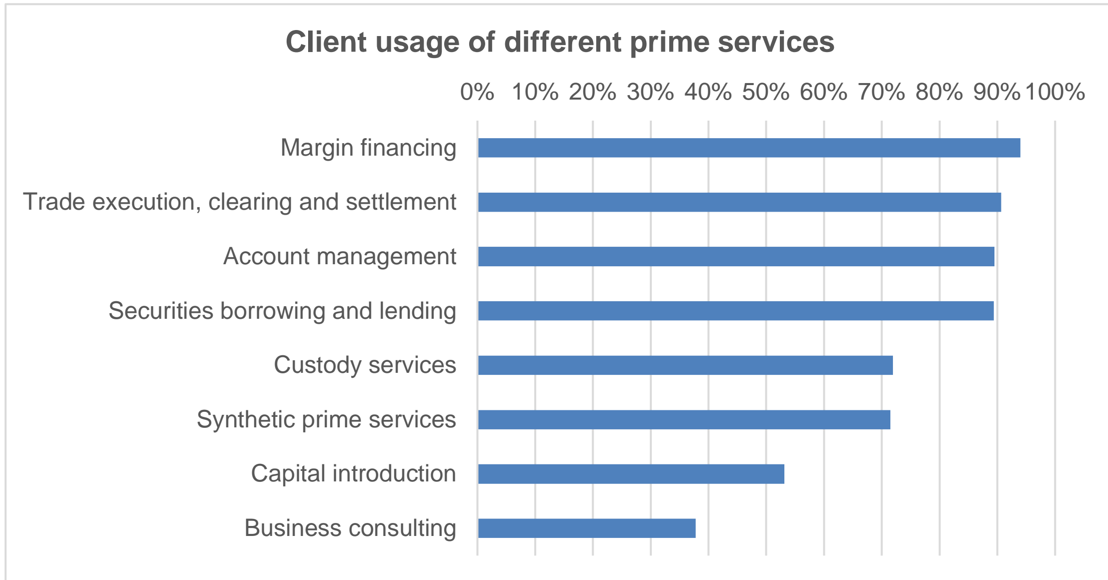
10. The initial core service of PBs was to provide margin financing. Over time, in order to retain hedge fund business, PBs diversified their operations to securities borrowing and lending (SBL) and synthetic prime services. All the PBs surveyed provided the following services which were also their key revenue drivers (also see charts in paragraph 12):

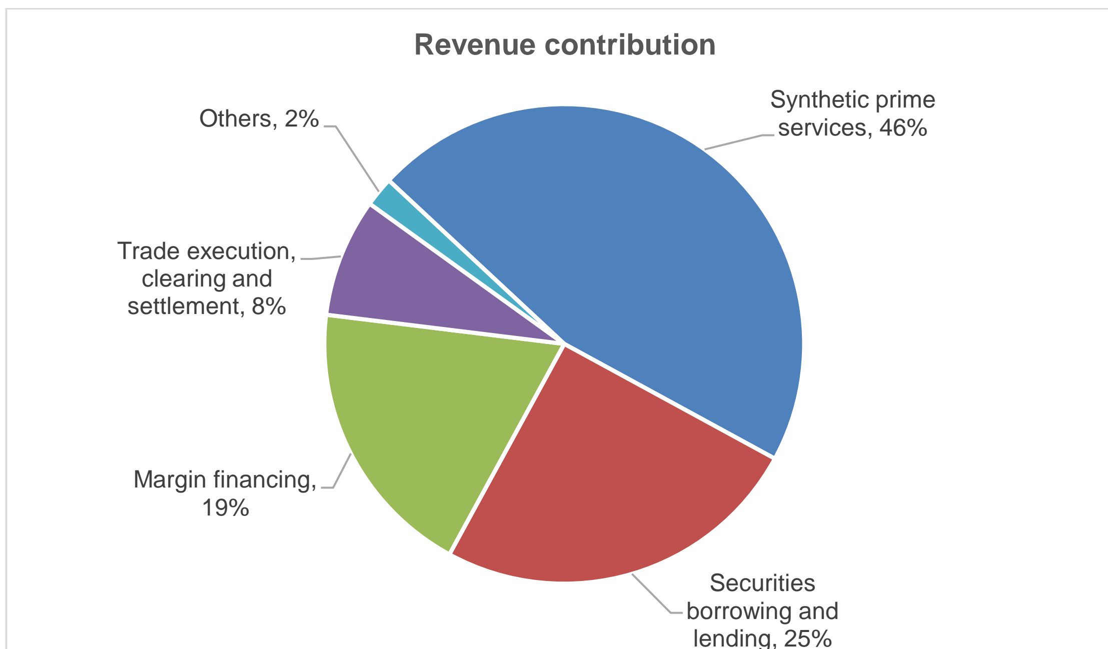
Core prime services		Synthetic prime services
Margin financing • PBs provided financing to their clients, allowing them to obtain the leverage required to support their trading strategies. • This could be achieved through the provision of a margin loan within a credit limit calculated through a defined margin methodology and collateralised by assets posted by a client to a PB.	***SBL*** • PBs provided their clients with access to lenders, such as institutional investors with deep portfolios of securities which could be used by hedge funds to cover their short positions and facilitate short selling strategies. • Securities were lent on a collateralised basis. Transactions were managed by PBs and governed by a securities lending agreement.	• PBs allowed clients to synthetically obtain exposure to a certain share without buying or borrowing the physical share, especially in restricted markets. This was often done through a total return swap transaction. • Synthetic transactions may be margined on a transaction-by-transaction or portfolio basis.

11. In addition to the key revenue drivers mentioned above, most PBs also provided operational support (eg, trade execution, clearing and settlement, custody services and account management services such as cash and position management, corporate actions and dividend event processing) and other ancillary services (eg, capital introduction[2] and business consulting[3]).

[2] PBs can introduce hedge fund clients to sources of funding, such as potential investors or capital streams from the asset and wealth management businesses of the PB's group.
[3] PBs can provide consulting services to fund managers across the hedge fund life cycle from pre-launch through maturity and guide decision making.

12. Based on our survey results, margin financing was the service most frequently used by clients, whereas synthetic prime services contributed the largest share of PBs' revenue.

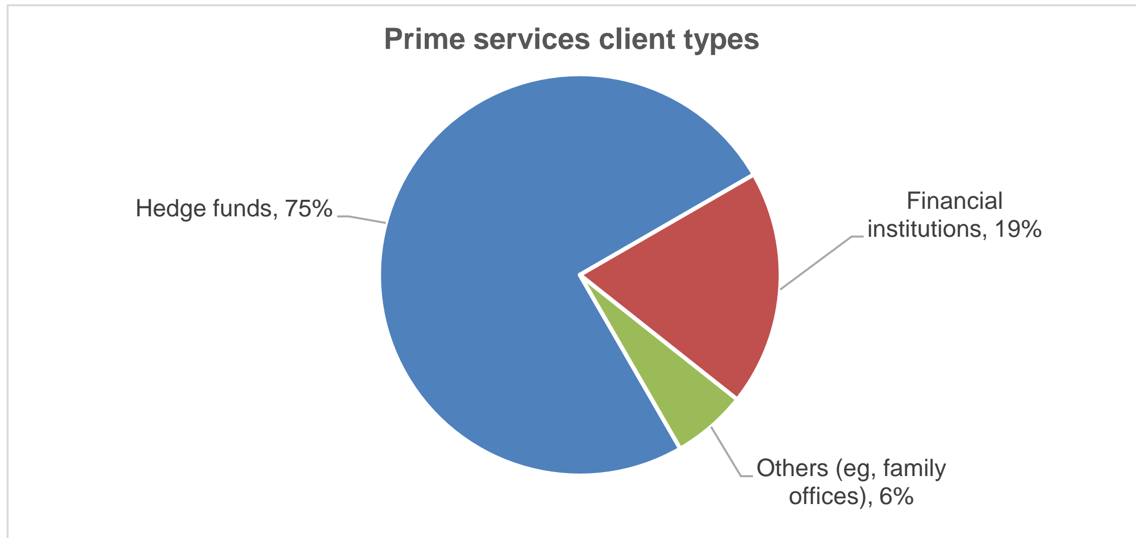




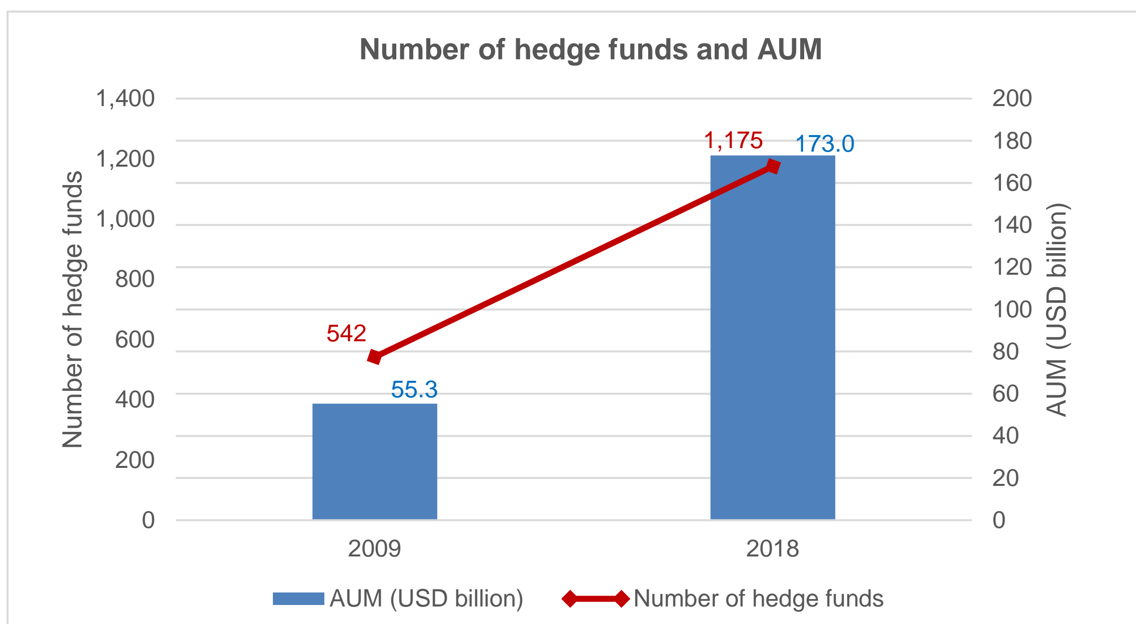
II. Prime services clientele and growth

13. According to the PBs surveyed, a majority of their prime services clients were hedge funds, whose trading strategies and activities often required them to engage PBs as one of their key service providers.

14. The remaining clients were mainly other institutional clients and family offices (see chart below).



15. From data collected in the SFC's periodic surveys of the Hong Kong hedge fund industry, the number of hedge fund managers and the value of total hedge fund assets under management (AUM) in Hong Kong grew significantly over the last decade. From 2009 to 2018, total hedge fund AUM in Hong Kong more than tripled and the number of hedge funds managed by SFC-licensed hedge fund managers in Hong Kong increased 117% from 542 to 1,175. The growth of hedge funds contributed to the increasingly significant role played by PBs in the financial markets.



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III. Contracting entities

16. The contracting entity for the provision of prime services could be a securities firm or a bank within a financial institution. The location of a contracting entity of a PB depended on a number of factors, such as the country where the client was domiciled and the location of its key operations. Most PBs had contracting entities based in the UK (all 13 PBs surveyed) and the US (10 out of the 13 PBs surveyed), and these were the most commonly used contracting entities for prime services clients globally and regionally. Some PBs had other contracting entities domiciled in Australia, France and Ireland. The centralisation of contracting entities allowed PBs to achieve higher efficiency in risk management and significant savings through hedging, netting and offsetting positions while reducing the overall risk profile of the their businesses and therefore their capital and liquidity requirements.

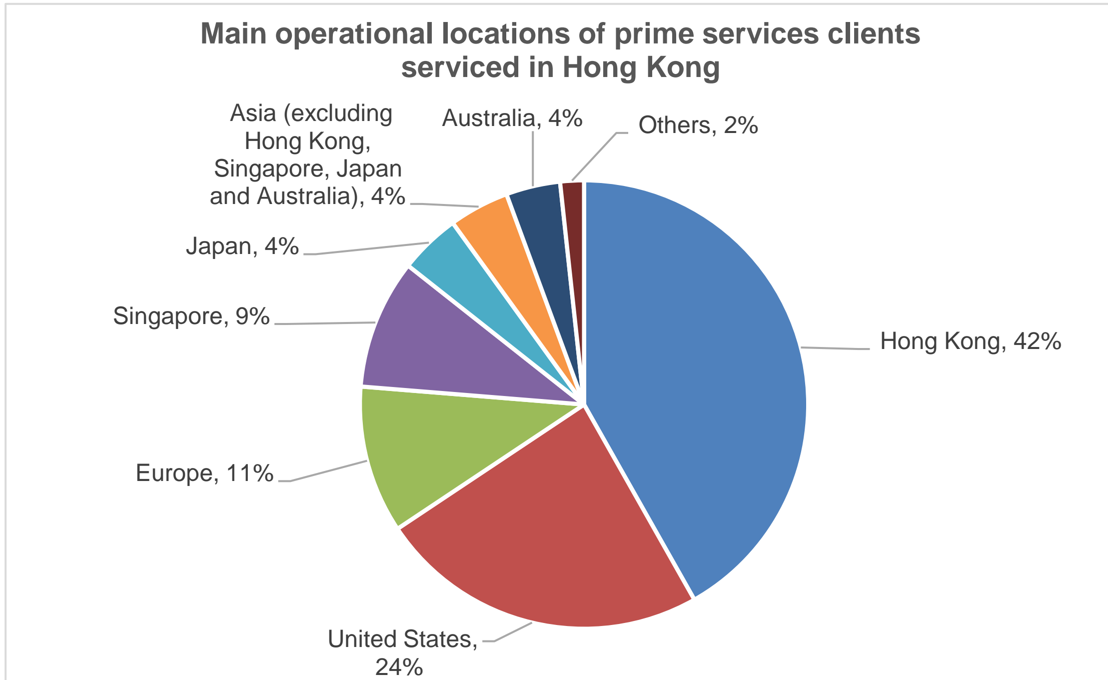
17. In practice, US clients generally contracted with the US entity while all other international clients mostly contracted with the UK entity. We observed that clients serviced in Hong Kong were mostly Asia-based or international clients, and these clients would generally contract with the UK entity of a PB.

IV. Global support model

18. Apart from serving Asia-based clients in the region, most PBs also offered "follow-the-sun" support for their global clients where Hong Kong, as the regional equities hub, provided services to global clients which conduct trading in Asian markets. While these global hedge funds were primarily based in the US or Europe, our survey shows a sizable proportion were being serviced in Hong Kong.

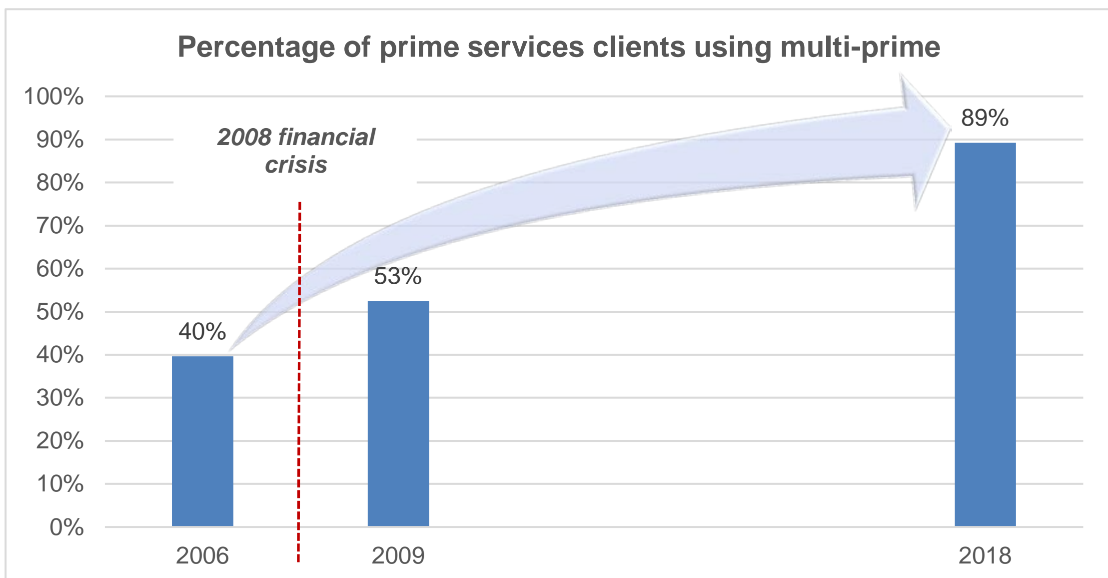
Percentage of global clients serviced in Hong Kong	Number of PBs
41% or above	2
Between 31% and 40%	1
Between 21% and 30%	2
Between 11% and 20%	4
10% or below	4
Total	**13**

19. The following table shows the distribution of the main operational locations of all the prime services clients, both local and global, serviced by the PBs from their Hong Kong offices:



V. Sole or multiple prime brokers

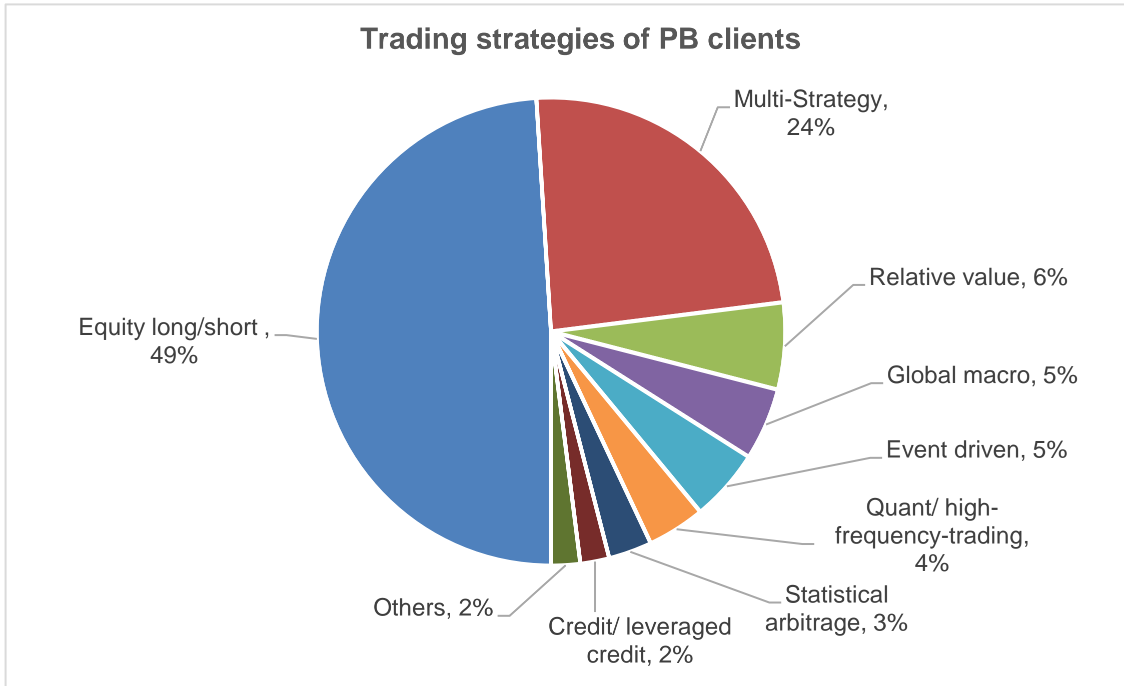
20. The 2008 global financial crisis highlighted concerns over counterparty risk exposure to PBs. As a result, prime services clients moved from maintaining a business relationship with a sole PB to contracting with multiple PBs (multi-prime) to diversify their counterparty risk. According to information collected by the SFC, multi-prime has become a model of choice for most clients over the past decade.



21. The multi-prime model increased competition amongst PBs, especially for high performing clients. Clients might transfer assets to another PB with more suitable technology, services which focused on their strategies or which provided financing at better rates. This also provided clients with access to a wider range of products and markets.

VI. Trading strategies used by prime services clients

22. Prime services clients adopted various trading strategies (see chart below).



C. Findings and good practices

I. Governance and management supervision

23. As a business line, prime services were typically grouped under PBs' equities franchises. The oversight of prime service activities could be specific (eg, with designated governance committees), or could be included as part of the overall oversight of PBs' equities franchises.

Expected standards
PBs should ensure adequate and effective management and supervision over prime services activities. While operating models for prime services can be complex and may involve multiple legal entities of a financial institution across different jurisdictions, if clients are serviced in Hong Kong or if PBs are carrying out their prime services in Hong Kong, PBs are expected to comply with the applicable rules and regulations in Hong Kong regardless of where the risk positions are booked. In addition, PBs acting as the Asia hub to conduct business activities for their groups should also have adequate controls and procedures in place to follow the standards established by their group companies to facilitate the group companies' compliance with the rules and regulations which apply to them. Sufficient management oversight[4] should be in place to ensure that matters related to prime services activities are brought to management's attention for timely review, and there is adequate accountability for the business and related risks[5]. Where the oversight of a certain process is performed by a committee, PBs should clearly define the roles and responsibilities of the committee and ensure the composition of the committee is appropriate to provide proper oversight. Effective policies and procedures should be established to identify and manage the conflicts of interest[6] relevant to prime services activities. These policies and procedures should be reviewed periodically to ensure they remain robust and effective and all relevant staff should be provided with training on a regular basis.

<u>Market practices</u>

a) Management oversight

24. Most PBs had formalised the governance process by establishing governance committees to manage prime services activities. Key committees were broadly categorised into three types:

- Business management committees – to define and implement business strategies and make business decisions;

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[4] General Principle 9 of the Code of Conduct for Persons Licensed by or Registered with the Securities and Futures Commission (Code of Conduct).
[5] Circular to Licensed Corporations Regarding Measures for Augmenting the Accountability of Senior Management issued by the SFC on 16 December 2016.
[6] General Principle 6 of the Code of Conduct.

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- Client on-boarding committees – to review and approve new prime services clients; and

- Risk management committees – to review risk and control issues arising from prime services activities.

25. In addition, most PBs set up regional governance committees to handle specific issues in the Asia Pacific region. Issues identified would be escalated to their global-level committees where necessary.

26. All PBs had a Manager-In-Charge appointed to exercise senior management oversight and supervision specifically over prime services activities or for the wider lines of business in which prime services activities operated.

27. Areas for improvement:

    - Some PBs did not have clearly prescribed terms of reference to govern the committees and define their roles and responsibilities (such as setting out a committee's scope and objectives, meeting frequency and required attendees) to ensure that members were clear about the purpose, structure and operation of each committee.

    - Some PBs did not mandate a second line of defence (eg, compliance) in the risk management committees. One PB did not mandate a second line of defence in the client on-boarding committee. A second line of defence should be mandated to ensure effective oversight and management of the risks and controls of key processes.

b) Conflicts of Interest

28. All PBs had policies requiring the identification and mitigation of actual and potential conflicts of interest involved in prime services activities.

29. Some PBs established designated governance committees or working groups to oversee the controls over the identification and mitigation of conflicts of interest.

30. Most PBs had set up a formal governance framework to manage conflicts of interest. Some common conflicts of interest identified by PBs as relevant to prime services activities and controls adopted to address them are as follows:

    - Leakage of client information to other teams in the financial institution: PBs implemented both system access control policies and physical segregation of prime services staff from other business units to prevent leaks of client information. Surveillance of electronic communication was performed to detect any actual or potential leakage.

    - Front running of prime services clients' orders: PBs put in place trade surveillance alerts to detect any actual or potential front running of orders.

    - Conflicts arising from the provision of capital introduction services: PBs banned the receipt of monetary benefits for such services to avoid being incentivised to favour the interests of one client over another.

- Conflicts arising from the provision of business consulting services: PBs banned the charging and receipt of fees and rebates from prime services clients or third parties (eg, external vendors) to avoid having an interest in the outcome of their consultancy services which may induce them to act in ways which were not in clients' best interests.

- Conflicts between staff and prime services clients: PBs imposed disclosure and approval requirements on staff's personal account dealings and outside business activities, enabling PBs to identify, manage and prohibit any activities which may give rise to potential or actual conflicts of interest.

31. Most PBs performed regular reviews to ensure that the framework and controls over the prevention, identification and mitigation of any potential and actual conflicts of interest remained appropriate and effective.

32. Areas for improvement:

    - In an isolated case, a PB did not apply sufficient detective controls to identify conflicts of interest. Instead, it mainly relied on escalation by its staff and regular training. PBs should ensure that there are monitoring procedures in place so that appropriate measures could be taken to detect and eliminate or manage actual and potential conflicts of interest.

II. Client life cycle management

33. In general, a client life cycle is comprised of client acceptance and on-boarding, on-going assessment and off-boarding.

34. The location of the client on-boarding process and on-going assessment would depend on the client's country of domicile or the location of its key operations. For Asia-based clients, these processes were often carried out in Hong Kong, which was the centralised client servicing hub in the region.

Expected standards
PBs should take all reasonable steps to establish the true and full identity of their clients[7] and to assess a client's credit worthiness and overall risk profile including through forming an understanding of its corporate structure, investment processes, risk management capabilities, governance and controls, pricing and valuation, investment experience of the persons responsible for making investment decisions, investment strategy, past performance and the investment portfolio's composition, complexity, liquidity profile and leverage. PBs should also assess the money laundering and terrorist financing risks[8] when accepting and on-boarding a client. Customer due diligence should be conducted by a PB on all clients to whom it provides services which are regulated activities (eg, taking trade orders for execution) in accordance with the anti-money laundering requirements[9], even when clients serviced in Hong Kong are contracted with overseas affiliates. PBs should conduct on-going assessments of clients' risk profiles to determine whether to continue the client relationship, taking into account factors including clients' strategies and the complexity of the products they trade. PBs should also identify triggers for ad-hoc reviews, for example, a material change in a client's strategy or products traded, a significant decrease in the value of AUM or a large redemption. Client information, data and documents obtained by the PB should be periodically reviewed to ensure they remain up-to-date and the PB's assessment of clients' overall risk profile remains valid. PBs should also ensure that information about the fees and charges for their products and services is clearly disclosed.

Market practices

a) Acceptance and on-boarding

35. Most PBs had designated committees to oversee the client acceptance and on-boarding process and determine the fees and charges imposed.

[7] General Principle 4 and paragraphs 5.1 to 5.4 of the Code of Conduct.
[8] Money laundering and terrorist financing risk factors include country risk, customer risk, product or service risk and delivery or distribution channel risk.
[9] As set out in the Guideline on Anti-Money Laundering and Counter-Financing of Terrorism (For Licensed Corporation) and the Anti-Money Laundering and Counter-Terrorist Financing Ordinance.

36. At client on-boarding, PBs performed due diligence on a prospective client (eg, to assess a client's credit worthiness and money laundering and terrorist financing risks) and took into account a number of factors, such as profitability and strategy fit, before coming to a decision.

37. PBs obtained inputs from different business units to conduct estimations and assessments of the profitability and risk of a potential client's portfolio. The results were then shared among the sales team, financing desk or trading team, who would run simulations to assess the new client opportunity and determine the fees and charges to be imposed.

38. Fees and charges were generally agreed upfront between the PB and the client and disclosed in the form of a fee schedule or term sheet.

39. The process of client acceptance and on-boarding could be lengthy. Some PBs took more than six months before a client was officially on-boarded. Generally, a substantial amount of time was spent assessing a client and negotiating the key contractual terms.

40. Some PBs would perform lookback reviews of new clients, generally within 12 months after they were on-boarded. The clients' profitability and risk profiles would be assessed, cross-referencing the projections made during the client acceptance stage.

Good practices

- Some PBs required that a prospective client's information be updated if the acceptance and on-boarding process exceeded a certain period to ensure the information remained relevant for client assessment.

b) On-going assessments

41. All PBs performed on-going assessments of their clients, typically on an annual basis, to ensure clients' overall risk profiles remained valid as well as to assess whether they could effectively manage the risks specific to each client (eg, creditworthiness and money laundering and terrorist financing risks) and determine if the business relationship with the client should continue.

42. PBs obtained information and data from clients and considered both quantitative factors (eg, revenue generated, composition and quality of collateral, significant changes in the net asset value of portfolios) and qualitative factors (eg, changes in key personnel, the impact of market conditions on clients' investment strategies and adverse news such as regulatory or legal actions as well as clients' business plans and their potential to raise additional funds in the future).

c) Credit due diligence

43. Credit due diligence, constituting the assessment of a client's credit worthiness and its risk profile, was usually carried out during the client acceptance stage as well as periodically thereafter as part of on-going assessments. This allowed PBs to set appropriate credit limits for clients as part of their measures to control and manage their counterparty credit risk.

44. Generally, PBs conducted credit due diligence using a scorecard model to derive a credit rating[10] for a client. Where an adjustment to the credit rating was considered necessary, there were typically controls and procedures in place to review and approve the adjustment.

45. The scorecard model assessed both quantitative and qualitative factors, including:

- Investment background of the persons responsible for making investment decisions and dependence on key personnel;
- Sophistication of the client's risk management and control functions, including middle and back office functions;
- Transparency of the client's operations and strategies to the PB;
- Consistency between a fund's performance and net asset value;
- Liquidity of the investment portfolio and funding structure;
- Risks of the trading strategy and associated leverage deployed.

46. More than half of the PBs surveyed performed annual reviews of their scorecard models. They also reviewed their methodologies to determine whether they were appropriately calibrated in terms of the risk categories and risk weightings used and they effectively assessed clients' credit risks.

47. Most PBs conducted credit assessments of clients on an annual basis. All PBs implemented controls to ensure timely completion, for example, through making credit assessments a key performance indicator for the credit risk management team.

48. Areas for improvement:

- Aside from regular (typically annual) credit assessments, changes in a client's circumstances may trigger an ad-hoc credit review[11]. These ad-hoc reviews typically focussed on the triggering event and thus differed from the comprehensive annual credit assessment. Some PBs deferred the regular periodic credit assessment for clients which recently completed an ad-hoc review without critically assessing the scope of the ad-hoc review and the appropriateness of granting an extension.

Good practices
▪ Many PBs automated their credit due diligence workflows by incorporating automated reminders of upcoming credit risk assessments, system-enforced workflows for maker-checker reviews and approvals of credit risk assessments and automated alerts when ad-hoc credit risk reviews were triggered (eg, when the net asset value of a client's fund portfolio fell to a certain level).

[10] The credit rating was presented as a weighted average credit score computed based on the weightings assigned to each category of the qualitative and quantitative factors being assessed.
[11] The triggers for an ad-hoc review included a client's request for additional extensions of credit limits, material changes to a client's financial position (ie, a significant decrease in net asset value) and adverse news about the client or its counterparties.

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d) Off-boarding

49. When off-boarding clients, most PBs took into account the results of on-going assessments of the client and based their decisions on a holistic review of various factors such as the client's profitability, credit worthiness, relationship and growth potential.

50. The off-boarding process was generally the same regardless of whether it was initiated by the client or the PB. All PBs maintained close communications with clients to determine the best way to terminate the relationship and ensure the PB migration process was agreed prior to termination.

51. PBs generally had established procedures to manage the client off-boarding process and the decision to off-board was subject to senior management approval. One PB set out written requirements for its client off-boarding process, including comprehensive record-keeping requirements for management approvals, the results of its client relationship review and all related correspondence.

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III. Margin financing

52. PBs take charge of the client assets, which are held as collateral, to provide margin financing to clients seeking leverage to support their trading strategies. For all the PBs surveyed, the contracting entity for clients serviced in Hong Kong (in most cases the UK entity) was the entity that provided credit to clients. These financial institutions adopted a combination of centralised and regional risk management approaches, where the risk appetite and risk management frameworks were set at the group level and the regional or local office implemented additional policies taking into account local conditions and regulatory requirements.

53. The day-to-day risk management functions, for example, maintenance of clients' margin profile, collateral valuation and margin calculation and margin calls were carried out in Hong Kong and typically involved both the first and second lines of defence.

Expected standards

Given that the entities which provide credit to clients are the overseas group contracting entities, PBs in Hong Kong act as a hub to conduct business activities for their groups. In this regard, PBs should have adequate controls and procedures in place to follow the standards established by their group companies to facilitate the group companies' compliance with the rules and regulations which apply to them.

Written guidelines should be established to provide adequate guidance when PBs apply the group-wide margin financing policies and procedures set out by their head offices, having regard to the nature, scale and complexity of the risks associated with the business operations in Hong Kong.

Adequate controls and procedures for critical work processes in the provision of margin financing should be put in place, for example:

- Instituting effective on-going monitoring procedures for clients' margin profiles to ensure the margin terms extended to clients are appropriate;
- Establishing procedures to ensure collateral pricing exceptions are identified for appropriate follow-up action and that manual price overrides are subject to review to ensure appropriate prices are used to value collateral;
- Enforcing margin call policies to ensure credit risk is effectively managed;
- Establishing procedures for adjustments or waivers of margin calls to ensure they are supported by sound justifications and relevant approvals are properly obtained.

Where deviations from the policies and guidelines may be approved by management, the factors to be assessed and the approval criteria should be clearly specified.

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Market practices

54. PBs generally had a robust global framework in place to monitor their margin financing activities. A business risk team, typically established in the front office, acted as the first line of defence responsible for managing the counterparty credit risk exposure arising from prime services activities. Risk management activities performed by the second line of defence will be discussed separately in Section VI - risk management and controls.

a) Setting of margin terms

55. All PBs which provided margin financing had established a formal methodology to govern margin terms which took into account clients' creditworthiness and the market risk exposure associated with their margined portfolios.

56. Almost all PBs adopted a rule-based methodology where defined rules were used to evaluate client portfolios in terms of asset mix, diversification, strategy and hedging efficiency to derive their basic margin requirements. Margin add-ons would be further imposed on client portfolios to adjust for factors such as concentration, market bias, liquidity and volatility to arrive at the final margin requirements.

57. PBs generally demonstrated sufficient oversight to monitor the initial setting and subsequent amendments of margin requirements to ensure that appropriate margin was obtained to cover client exposure and that the amount of leverage permitted for a client was in accordance with the PB's defined risk appetite.

58. Where deviations from the standard methodology were granted, some PBs performed periodic reviews to assess whether the margin requirements remained adequate. In one case, a PB would regularly compare the margin requirements derived using the deviations to the margin requirements derived using the standard methodology. If the difference exceeded a defined threshold, a detailed review would be triggered and the deviations would be reassessed.

59. Areas for improvement:

- Many PBs' policies and procedures did not document the factors to be considered in assessing and approving deviations from the standard methodology. Also, some PBs failed to maintain documentation to support the assessments performed and the factors considered before granting deviations.

- In one instance, there was no independent review of the set-up and amendment of client margin profiles, which may prevent the PB from detecting amendments which were unauthorised or erroneous.

- In another instance, a PB would choose to apply one of two methodologies as set out under the group policy to derive the margin requirements for its clients at the on-boarding stage, but the assessment criteria were not defined in its policies and procedures to ensure a consistent approach. There were also no defined procedures for conducting periodic reviews to ensure the selected methodology remained appropriate over time.

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b) Collateral valuation and margin calculation

60. Monitoring and controls for collateral valuations and margin calculations are critical as deficiencies could expose PBs to undue credit risks if a larger-than-expected loan default drains its capital.

61. All PBs ran collateral valuations and margin calculations on a daily basis to obtain the mark-to-market values of each client portfolio to determine whether the client had posted adequate collateral to meet the margin requirements.

62. PBs generally used the previous end-of-day price for daily collateral valuations. PBs had established a defined pricing hierarchy which utilised multiple market data sources for pricing purposes, such that if a price was unavailable in one feed, another price would be obtained from the next available source. Most sources came from major market pricing vendors or exchanges. Generally, PBs had established procedures to address situations where it was difficult to find pricing information.

63. Some PBs chose not to extend margin financing over long positions with no publicly available pricing information.

64. Generally, PBs had established procedures to ensure sufficient oversight, including that approvals were required for changes to pricing sources and manual adjustments to the pricing of client collateral positions and that the reasons for such changes were documented.

65. Some PBs offered a calculation tool in their client portals with which clients could forecast an indicative margin requirement based on their impending trading activities and the resulting changes in the portfolios.

66. Areas for improvement:

    - Certain PBs did not have adequate monitoring procedures to identify potential issues regarding the valuation of collateral (such as stale, static and zero prices and large day-to-day pricing variances).

Good practices

- One PB had controls in place to identify and further review client portfolios where a significant portion of them were subject to manual pricing. The first line of defence would highlight such portfolios to the senior management for review and approval during the regular regional and global management meetings.
- While all PBs had processes in place to effect manual adjustments to the defined pricing sources used in collateral valuations with approval from the first line of defence, some PBs also required that manual adjustments be subject to the review by other control functions (ie, the second line of defence) to minimise the risk of inappropriate valuations.

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c) Margin calls

67. Margin calls are a critical safeguard in PBs' margin lending frameworks and protect them from excessive credit exposure. A lack of oversight and control of outstanding margin calls could prevent PBs from taking adequate risk mitigation measures, eg, liquidating a client's collateral.

68. PBs ran margin calculations on a daily basis to determine the required margin calls. In terms of waiving margin calls, they were lenient to differing degrees. When margin calls were adjusted, PBs generally had procedures in place to ensure the revised margin calls were accurate and that adjustments were properly reviewed and approved by appropriate personnel.

69. An outstanding margin call could be an indicator that a client may default on its margin loan obligation. Some PBs monitored long outstanding margin calls through margin call aging reports and tracked the history of margin calls for each individual client. This enabled the business risk teams to identify and closely monitor those clients who were frequently on margin calls and had difficulty meeting them.

70. Areas for improvement:

- While all PBs had defined processes in place to make adjustments and revise a margin call with appropriate validation and oversight measures, some PBs' policies and procedures did not set out the assessment criteria for approving margin call adjustments.

- In one instance, the recalculation of margin requirements after a collateral price amendment involved certain manual processes which might lead to errors in margin calculation. This should be avoided where possible.

Good practices

- In addition to reporting outstanding margin calls to senior management within the first line of defence, some PBs would also report to a control function in the second line of defence (ie, credit risk management) so that an independent review could be conducted for the early identification of any pertinent risk management issues.

IV. Short selling and securities lending

71. As part of their key service offerings, PBs generally conducted short selling transactions:

- On an agency basis to execute clients' short selling orders; and
- On a principal basis to hedge exposure arising from the provision of synthetic prime services, which allow clients to obtain synthetic exposure[12] to underlying assets.

72. PBs would usually partner with the securities borrowing and lending (SBL) desk which would source securities from lenders to facilitate their agency and principal short selling transactions in global markets. Since Hong Kong is the Asia hub for many financial institutions' equities business, the SBL desk in Hong Kong would generally cover the Asian markets.

73. Uncovered or naked short selling is prohibited under section 170(1) of the Securities and Futures Ordinance (SFO). As such, a key function of the SBL desk is to provide stock locates, which act as a form of documentary assurance indicating that the SBL desk has located a sufficient quantity of securities to lend to a borrower to cover its short selling orders.

Expected standards
Effective controls should be in place to ensure compliance with the short selling requirements under the SFO and its subsidiary legislation[13]. Pre-trade controls over both agency and principal short selling should be established to ensure that assurance, or cover, has been obtained for any short selling orders. Post-trade controls over both agency and principal short selling should be in place to review and reconcile orders with the relevant documentary assurances to ensure that flagging errors and instances of uncovered short selling are identified in a timely manner. Paragraph 8 of the Guidance Note on Short Selling and Reporting and Stock Lending Record Keeping Requirements issued by the SFC sets out three acceptable approaches for the purpose of determining whether a seller has a presently exercisable and unconditional right to vest the securities in the purchaser of them: (a) the position of the seller's own trading book, (b) the aggregated positions of a number of trading books which the seller controls or has knowledge of (aggregation unit approach), or (c) the aggregated position of the entire legal entity. For principal trading, regardless of which acceptable approach is adopted, it should be consistently applied with proper controls to ensure that the positions of the relevant proprietary trading units or books are appropriately aggregated to determine whether the trading book, aggregated unit or legal entity is net long or net short in a

[12] This is typically achieved through equity derivatives, such as total return swaps, with the PB buying or selling the underlying security in the market to hedge the derivatives exposure.
[13] Including section 170 to 172 of the SFO and the Securities and Futures (Short Selling and Securities Borrowing and Lending (Miscellaneous)) Rules.

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security, so as to prevent any short sell order flagging errors. Where an aggregation unit approach is adopted, appropriate personnel from a different line of defence should be involved in the control processes for the set-up, amendment and deletion of aggregation units, as well as their underlying trading books, to prevent inappropriate or unchecked changes to aggregation unit structures.

Controls over SBL inventory management should be in place, such as applying haircuts on SBL inventory sources where appropriate, to avoid over-lending securities.

Market practices

a) Short selling

74. The short selling controls implemented by PBs could be broadly categorised into pre-trade and post-trade controls. The pre-trade controls were generally automated system controls, while some PBs implemented manual processes when automated system controls were unable to ensure sufficient cover through documentary assurance.

75. As post-trade controls, PBs conducted reviews of documentary assurance and reconciliation of short sell orders with the corresponding evidence of documentary assurance, or security borrow locate details, on a periodic basis.

76. Areas for improvement:

- Most PBs conducted timely post-trade reviews of documentary assurance. However, in one case, we noted that the reviews were only performed on a quarterly basis. Consequently, short sell tagging errors and uncovered short selling instances might not be identified in a timely manner.
- In one case, post-trade reviews only covered transactions tagged as short sell. As such, they would not be able to identify short sell transactions which might have been inappropriately flagged as long sell.
- In another case, principal transactions were excluded from the reconciliation with the documentary assurance obtained as part of the post-trade review.

Good practices

- A post-trade automated control was implemented to check principal sell orders conducted during a trade day against positions in the aggregation unit in order to identify any potential instances of uncovered short selling. This helped the PB to ascertain if all principal sell orders had been properly flagged as long or short sell.

b) Aggregation units

77. All PBs adopted the aggregation unit approach. PBs would map their trading books to specific aggregation units before trading. The positions of these trading books would form the underlying position data of the aggregation units. PBs generally relied on the accuracy of the underlying position data to determine whether they had a net long or short position in a particular security and tag the orders accordingly.

78. Most PBs relied on automated controls to ensure order flows were directed to the appropriate aggregation unit. This was usually done using system logic to channel trade orders, based on the nature of the transaction (eg, buy, long sell and short sell), to the corresponding aggregation unit from which it should be executed.

79. Some PBs implemented automated control procedures to prevent the creation of synthetic long inventory through short selling between internal aggregation units.

80. Areas for improvement:

- Some PBs did not document in their policies and procedures the process for the setup or amendment of aggregation units or underlying trading books, and how the appropriateness of changes to aggregation units should be assessed.

- Some PBs did not establish adequate controls for the reviews of the structures of aggregation units. For example, the reviews were not conducted with a minimum prescribed frequency and their objectives and parameters were unclear.

- In one instance, the automated controls directing transactions to aggregation units could be overridden without a review to verify the appropriateness of the override.

Good practices

- Some PBs involved the compliance function in the approval of changes to and periodic reviews of aggregation unit structures.

- Some PBs required compliance to review internal transfers between accounts across aggregation units to ensure the movement of internal inventory across trading books and aggregation units was in compliance with regulatory requirements.

- One PB placed system trading restrictions which specifically prohibited trading in accounts which were not mapped to an associated aggregation unit.

c) Securities borrowing and lending

81. The SBL desk's primary function was to actively manage inventory sources for securities borrowing and lending. The sources typically included rehypothecated client securities, internal trading desks and external lenders.

82. While the SBL desk might be able to obtain up-to-date system feeds for internal inventory, external inventory sources were generally not updated on a real-time basis. As such, the inventory tracked by the SBL desk (eg, shown in the SBL systems and

beginning of day reports) was only an indicative quantity and the SBL desk would actively monitor the available sources of inventory to determine their reliability or actively confirm the availability of securities as borrow requests were received.

83. Some PBs or their SBL desks implemented the following control procedures to avoid over-lending:

- Assess the quantity of a short sell order against the indicative quantity available for lending prior to confirming a stock locate to a short seller. Insufficient inventory would trigger a further investigation or the order would be rejected.

- Establishing haircuts to provide a buffer for the indicative stock quantity available for lending at an individual lender level based on various qualitative and quantitative factors, including the historical reliability of the lender's inventory data and the reputation of the lender.

- Applying haircuts to or excluding internal sources of SBL inventory to avoid lending "unstable" securities, eg, inventory from trading desks with frequent or large changes in their investment portfolios.

- Conducting an on-going review of haircuts, periodically or upon the occurrence of a trigger event, to ensure they remain appropriate.

- Excluding from the SBL inventory all securities from lenders whose data feeds had not been updated in the past 24 hours. Verifying the quantity of available stock with lenders before issuing a stock locate.

- Setting limits to trigger alerts informing the SBL desk of low SBL inventory of a specific security and setting a hard limit to stop all short selling for a security if the available quantity fell below a certain level.

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V. Handling of client assets

84. Most PBs are financial institutions with branches and subsidiaries established in multiple jurisdictions. This network could be leveraged in the provision of custody services through custody agreements between the PBs and their affiliates. Alternatively, PBs may also use third-party sub-custodians to hold client assets.

85. While prime services clients may be contracted with group affiliates domiciled outside of Hong Kong, certain client assets may still be kept by the PBs in Hong Kong acting as a sub-custodian of these group affiliates. Furthermore, day-to-day activities in the Asia Pacific region, such as trade execution and settlement and the resolution of discrepancies identified in trade reconciliations with counterparties, are often handled and monitored by middle and back office functions, such as settlement and operations, located in Hong Kong. While the processes for computing client indebtedness for the rehypothecation[14] of assets and recalling assets which are no longer available for rehypothecation are often automated, management supervisory reports allow PBs from all regions, including Hong Kong, to monitor and resolve issues as they arise.

Expected standards
Given that client assets may be kept by PBs as sub-custodians, and in performing their role as the Asia hub for their groups, PBs may also be involved in the handling and returning of rehypothecated assets to clients. PBs should have sufficient controls in place to ensure client assets are promptly and properly accounted for and adequately safeguarded[15]. Regardless of the type of custody arrangements under which client assets are held, PBs should properly maintain a client's entitlement to the relevant assets in their own books and records and keep client assets separate from the assets of the PB to ensure protection and prevent the misuse or offset of PBs' own liabilities. Management oversight should be in place for the rehypothecation of client assets based on client indebtedness with adequate monitoring and controls established to ensure assets which are no longer available for rehypothecation are returned to clients in a timely manner.

Market practices

a) Asset segregation

86. Asset segregation relates to the way in which client assets, including securities and money, were kept separate from the assets of PBs. Inadequate monitoring and controls over the segregation of client assets may result in a breach of contractual or regulatory requirements and may also lead to misuse of client assets.

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[14] Rehypothecation is a method of re-pledging or reusing client assets which have been posted as collateral.
[15] General Principle 8 and paragraph 11.1 of the Code of Conduct.

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87. Below were some common custody arrangements offered by PBs:

- **Pooled client accounts at a sub-custodian selected and managed by a PB**: Several clients had their assets pooled into the same segregated trust account held under the name of a PB. These assets would be identifiable as client assets of the PB.

- **Individually segregated at a sub-custodian selected and managed by a PB**: Client assets were held through individually segregated accounts under the name of the client and identifiable as property owned by the client.

- **Third-party custodian agreements**: Under a tri-party custody agreement[16], clients directly contracted to hold their long positions with a custody bank of their choice and their short positions with a PB.

88. All PBs had in place procedures to ensure the maintenance of proper books and records of client assets. Where such assets were held by a sub-custodian, PBs had procedures in place to reconcile their internal records and custodians' records to ensure the completeness, accuracy and timeliness of the physical segregation and the protection of client assets.

b) Rehypothecation

89. A PB's rehypothecation activities are limited by the level of the client's indebtedness and contractually agreed rehypothecation limits. PBs are required to return equivalent assets to clients when the client's indebtedness decreases. Inadequate monitoring and controls over the rehypothecation of client assets may lead to a breach of the regulatory requirements or the contractual rehypothecation limit.

90. Most PBs rehypothecated client assets. All had daily rehypothecation reports and processes in place to monitor calculations of client indebtedness and identify assets which were no longer available for rehypothecation.

91. Most PBs had policies and procedures in place to review the set-up and amendment of client asset terms (eg, rehypothecation limits) in the appropriate systems and ensure that such terms were accurate and in accordance with the client agreements.

92. Some PBs also provided clients with daily rehypothecation reports which included position-level details of the client assets rehypothecated by the PBs.

93. Areas for improvement:

- In one case, a PB's policies and procedures did not sufficiently document the process and approval requirements for the amendment of rehypothecation limits within the PB's systems.

[16] This custody arrangement is not common as it could be costly for clients. PBs might charge higher margin financing rates due to the inability to rehypothecate clients' collateral. Daily asset segregation between the PB and the custody bank is also complex.

Good practices

- Several PBs implemented a control to monitor rehypothecation at the individual client level which triggered automated alerts whenever a client's rehypothecation limit was changed in the system. The alert would require appropriate personnel, such as the operations team, to review the changes and validate that they conformed with the client agreement.

- Some PBs implemented further measures to monitor rehypothecation at the aggregate entity level. This allowed the PBs to identify and investigate anomalies in rehypothecation calculations (such as large day-to-day changes in overall client indebtedness).

VI. Risk management and controls

94. As previously discussed, financial institutions adopt a combination of centralised and regional risk management approaches, where the risk appetite and risk management framework are set at the group level and the regional or local office implements further policies taking local conditions into account. Financial institutions exercise governance and risk oversight of the prime services business through regional or local forums, and significant issues would be discussed at the global level.

95. PBs consider that the major risks they face are counterparty credit risk and the risk exposure from their trading portfolios. Liquidity risk is another major risk as the business activities of PBs use resources which need to be funded. While the first line of defence is primarily responsible for the management of daily prime services operations and monitoring liquidity risks, PBs generally have a comprehensive risk management framework carried out by the second line of defence to address major risks.

Expected standards

While PBs usually adopt the risk management framework set out at the group level, they should take reasonable steps to ensure that they operate within a holistic and robust risk management framework, with reporting and accountability processes clearly defined and suitably integrated across the different jurisdictions involved. PBs should overlay their risk management programmes with relevant local regulatory requirements and operational needs to ensure the standards are not less stringent than the applicable local rules.

In addition, PBs should establish and maintain effective policies and procedures to ensure the proper management of the risks to which they are exposed and that adequate information is provided to enable management to take appropriate and timely action to contain and otherwise adequately manage risks[17].

At a minimum, PBs should implement the following risk management measures in accordance with their business models to ensure the risks associated with the provision of prime services can be detected and mitigated effectively and in a timely manner:

- Risk limits should be established for individual funds, clients, counterparties, business units, specific risk categories, legal entities and others as appropriate. The risk limits should be periodically assessed for appropriateness, adherence to group policy and, where applicable, compliance with regulatory requirements both locally and at the group level.

- Monitoring procedures should be established to ensure that any breach of risk limits are escalated to management as well as independent control functions for appropriate follow-up actions.

- Stress testing should be conducted regularly to assess the impact of market stress on prime services activities. It should also be tailored to special situations, for example, when client portfolios hold illiquid positions or products with

[17] Management, Supervision and Internal Control Guidelines for Persons Licensed by or Registered with the Securities and Futures Commission.

complex features and risk profiles and in cases where risk mismatches exist.

- Stress testing methodologies should be properly defined. They should cover extreme scenarios such as lack of market liquidity and flash crashes of securities or commodities prices. Methodologies should also be periodically reviewed.
- When issues are identified, they should be escalated to management in a timely manner for appropriate follow-up action. Contingency plans should be in place in the event of a "black swan" market scenario.

Market practices

a) Setting and monitoring credit limits

96. PBs generally had comprehensive credit risk management frameworks in place with varying degrees of sophistication. Counterparty credit risk arising from prime services activities was covered as part of the group's or the PB's credit risk management processes.

97. Credit limits were established either at an individual hedge fund level or an aggregated fund manager level. Due to the wide scope of services under the prime services umbrella, product-based credit limits were also established.

98. For some PBs, credit limits were considered to be fungible and underutilised credit limits might be reallocated to different products. For other PBs, credit limits were measured based on an aggregated credit exposure metric and as such, could not be reallocated to different products.

99. Some PBs had established procedures to ensure credit analysts could consistently operate within the PBs' credit risk appetite when assigning credit limits. For example, where the proposed credit limits exceeded a set percentage of a client's net asset value, the proposal would be subject to an extended review and approval process.

100. The risk thresholds set for day-to-day monitoring were regularly reviewed and revised by the second line of defence (ie, credit risk management) to ensure the trigger levels for follow-up action remained appropriate.

101. Generally, credit risk exposure was minimised through the collection and monitoring of margin levels and collateral. As a result, margining and collateral valuation forms part of the PBs' credit risk management.

102. One PB was able to calculate profit and loss positions of its clients on a near real-time basis and could aggregate this data from a client level to the industry, regional or global levels as required. This enabled the second line of defence to be more responsive to potential changes in the market.

b) Credit risk stress testing

103. Credit risk stress testing could help PBs assess their credit risk exposure during market distress. PBs primarily conducted credit risk stress testing through scenario analysis, including single-factor or multi factor-scenarios. Credit risk exposure was assessed in two phases: the first line of defence conducted credit risk stress testing specific to the

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prime services exposure, mainly at the client portfolio level, to determine potential shortfalls in collateral under stressed conditions; the second line of defence tended to focus on a counterparty level. Most PBs conducted stress testing on a daily basis, although some conducted it on a weekly or monthly basis.

104. PBs generally had procedures in place to ensure stressed credit limit breaches were acted upon and escalated appropriately. Any unresolved breaches were further escalated to senior credit risk management for further review and action.

105. Most PBs periodically assessed their credit risk stress testing methodologies, with a focus on the robustness of the stress scenario assumptions, to ensure their appropriateness over time. There were also procedures in place to ensure proposed changes to the stress testing scenarios were reviewed and approved by senior management.

106. Areas for improvement:

- In one instance, there was no formal process to periodically review the adequacy and appropriateness of the stress testing methodology adopted.

c) Liquidity risk management

107. PBs face liquidity and funding risks. In managing the sources and uses of funding, a PB might be exposed if it had insufficient liquidity or capital to meet on-going obligations or regulatory liquidity requirements, eg, due to a mismatch of its asset and liability profile.

108. Liquidity risk management of the prime services business operated as one component of the overall liquidity risk management framework which was established and operated at both the legal entity and group level of a financial institution. The collateralised nature of the prime services business enabled PBs to operate on a self-funding model through secured lending transactions. Shortfalls in liquidity management were supplemented by unsecured lending access from the group's centralised treasury function.

109. Liquidity risk management, acting as the second line of defence, established the liquidity risk framework and ensured that the liquidity and funding profiles of the prime services activities were not overly aggressive. The front office operated within the liquidity risk framework with oversight from liquidity risk management and also from treasury which acted as the central liquidity manager implementing the liquidity risk framework.

110. PBs established liquidity risk limits including:

- Internalisation[18] limits – to restrict the level of internalisation a PB might utilise to manage the potential risk of facing sudden financing demands when a buyer or seller on one side of internalisation exited their position, placing an immediate strain on the PB's liquidity and funding position;

[18] Through internalising offsetting client positions.

- Liquidity and funding concentration limits – to reduce concentration in individual liquidity providers to avoid a sudden demand for funds upon the departure of a liquidity provider.

The liquidity risk limits were subject to periodic review and approval by liquidity risk management.

111. PBs also put in place procedures to monitor liquidity risk limit breaches on an on-going basis. Treasury, along with liquidity risk management, would investigate the cause of the breaches and determine the actions which should be taken. In addition, a forecast of liquidity demand and usage over a defined period (eg, three or six months) was projected with input from the front office, treasury and liquidity risk management and the actual usage of liquidity was compared against the forecast. Deviations above a set threshold were reported to senior management and the liquidity profile may be rebalanced to accommodate increased liquidity demand.

112. PBs would also perform liquidity risk stress testing to project potential liquidity shortfalls under stressed market scenarios. The scenario analysis aimed to determine the impact on the uses and sources of funding over a specified period of time, typically a 30 day and 365 day period. Common assumptions applied to simulate stresses included: loss of internalisation, loss of margins from synthetic prime brokerage transactions and loss of secured funding.

113. Contingency funding plans were developed to provide guidance for PBs to navigate “black swan” events. These were developed either on a stand-alone legal entity basis or as part of a broader group contingency funding plan. Some PBs also established triggers for when their contingency funding plans should be activated.

Good practices

- Some PBs incorporated reverse stress testing to assess liquidity and funding. Reverse stress testing began with a scenario where the business had failed, and worked to assess areas of vulnerability in the organisation.