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# IMF Working Paper

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## Assessing Liquidity Buffers in the Panamanian Banking Sector

by Andras Komaromi, Metodij Hadzi-Vaskov, and Torsten Wezel

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I N T E R N A T I O N A L M O N E T A R Y F U N D

**IMF Working Paper**

Western Hemisphere Department

**Assessing Liquidity Buffers in the Panamanian Banking Sector****Prepared by Andras Komaromi, Metodij Hadzi-Vaskov and Torsten Wezel**

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**Abstract**

This paper assesses the resilience of Panamanian banks to (i) a very severe short-term, and (ii) a significant long-lasting liquidity shock scenario. Short-term liquidity buffers are evaluated by approximating the Liquidity Coverage Ratio (LCR) defined in the Basel III accord. The risk of losing a substantial part of foreign funding is analyzed through a conventional liquidity stress test scrutinizing several layers of liquidity across maturity buckets. The results of this study point to some vulnerabilities. First, our approximations indicate that about half of Panamanian banks would need to adjust their liquid asset portfolios to meet current LCR standards. Second, while most banks would be able to meet funding outflows in the stress-test scenario, a number of banks would have to use up all of their liquidity buffers, and a few even face a final shortfall. Nonetheless, most banks displaying sizable liquidity shortfalls have robust solvency positions.

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Keywords: Bank liquidity, LCR, Liquidity stress tests

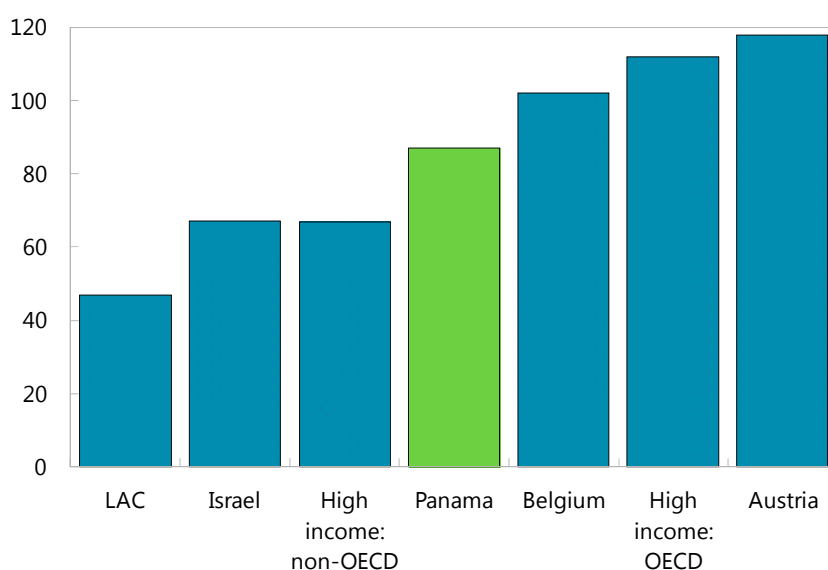
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## I. INTRODUCTION AND MOTIVATION

**Since Panama has a sizable and globally-integrated banking sector, ensuring financial stability is essential for macroeconomic stability.** Consistent with Panama’s role as a financial center, the national banking system’s assets amounted to 189 percent of GDP at the end of 2015.<sup>1</sup> Financial depth, as measured by domestic credit-to-GDP, is comparable to levels in some advanced economies and much higher than the regional average (Chart 1). More than half of the banks operating in the country are foreign, and banks tap external markets both for funding and for investment opportunities. Given the importance of the financial system for the domestic economy, adequate monitoring and regulation of risks, including those stemming from liquidity mismatches, is key.

**Chart 1. Domestic Credit to Private Sector by Banks (% of GDP)**



Source: World Development Indicators

**Many countries rely on a formal financial safety net and an effective interbank market to enhance the banking sector’s resilience to liquidity shocks.** Although maturity transformation is an inherent part of financial intermediation, most countries’ financial stability frameworks include institutional arrangements and market-based solutions to mitigate liquidity risk. Deposit insurance schemes reduce the ex-ante probability of bank runs. Lender of last resort (LOLR) facilities can provide ex-post support to prevent illiquidity at an individual bank from unnecessarily leading to its insolvency and to avoid contagion effects. Similarly, a well-functioning interbank market can be instrumental in managing idiosyncratic liquidity shortages by redistributing aggregate liquidity holdings to banks under temporary pressure.

<sup>1</sup> The National Banking System (Sistema Bancario Nacional) excludes the international license banks (“offshore” banks) that are not allowed to carry out banking activities with domestic residents. In this paper, references to the banking sector should be understood as the national banking system.

**In the absence of deposit insurance and a lender of last resort, Panamanian banks have to self-insure against abrupt shifts in their liquidity needs.** Panama is the only country in the region which has neither a LOLR facility nor a deposit insurance arrangement. Ecuador and El Salvador, the other fully dollarized economies in Latin America, have maintained a financial safety net after replacing their national currencies with the US dollar.<sup>2</sup> In addition, market mechanisms do not seem to operate smoothly in allocating liquidity among Panamanian banks either. The interbank market is segmented, particularly when under stress, as the bigger foreign banks tend to lend only to the larger domestic banks. The market froze completely during the 2009 downturn. Against the backdrop of missing public sector safety nets and underdeveloped interbank markets, banks should hold sufficient liquidity buffers on their balance sheets to cope with potentially large liquidity shocks.

**Based on the local supervisory framework, the banking sector appears highly liquid.** Panama's New Banking Law of 2008 stipulates that banks must hold a minimum amount of liquid assets, but the technical details of compliance are delegated to the Superintendency of Banks (SBP). Fulfilling this mandate, the SBP issued a regulation that same year that defines the Legal Liquidity Index (LLI) as a measure of liquidity and sets a 30 percent minimum requirement on liquid assets as a share of qualifying deposits.<sup>3</sup> The SBP relies heavily on the LLI to monitor and to communicate to the public the liquidity conditions in the banking sector.<sup>4</sup> According to this official metric, bank liquidity has been ample since 2008. Recently the LLI of the whole banking system has fluctuated around 60 percent – twice the required level (Chart 2).

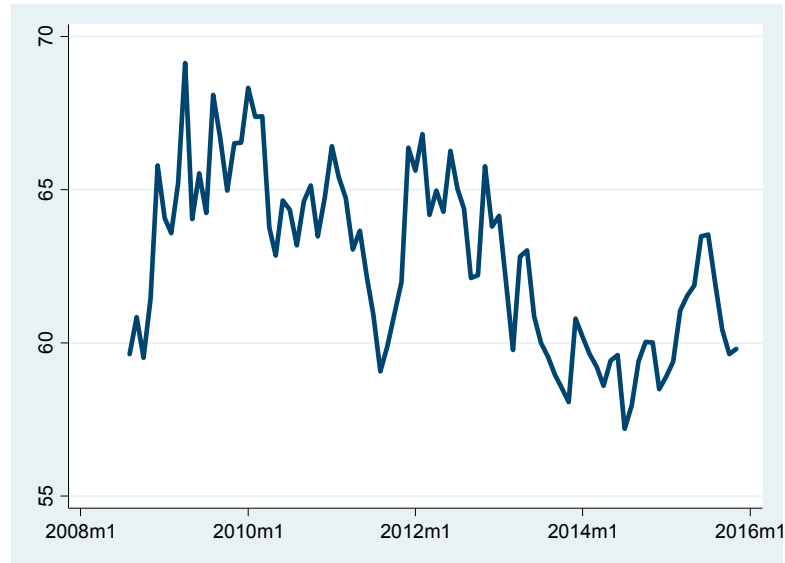
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<sup>2</sup> Both countries have deposit insurance schemes. Ecuador has a liquidity fund for banks, while El Salvador is in the process of implementing a lender of last resort facility. It is important to note that these two countries had their own currencies and central banks before they dollarized in the early 2000s. These central banks continue to exist and provide the institutional setting for the liquidity facilities. Panama, on the other hand, adopted the dollar as legal tender in 1904 immediately after becoming independent from Colombia. Hence, it has never had an institution with the classical central banking function of emergency liquidity provision.

<sup>3</sup> The term "New Banking Law" refers to Executive Decree N° 52 dated April 30, 2008. Liquidity related regulations are covered in Chapter VI of this law. The LLI is defined by the SBP in Rule 4 of 2008 dated July 24, 2008. The 30 percent minimum requirement applies to all general license banks and international license banks that are subject to the home supervision of the SBP. Banks have to submit a liquidity report to the SBP at the end of each week to demonstrate their compliance.

<sup>4</sup> When assessing the liquidity of individual banks, the SBP does not rely solely on the LLI, but also carefully examines the bank's risk management framework and how liquidity risk is mitigated.

**Chart 2. Evolution of the Legal Liquidity Index**



Source: Superintendency of Banks (SBP)

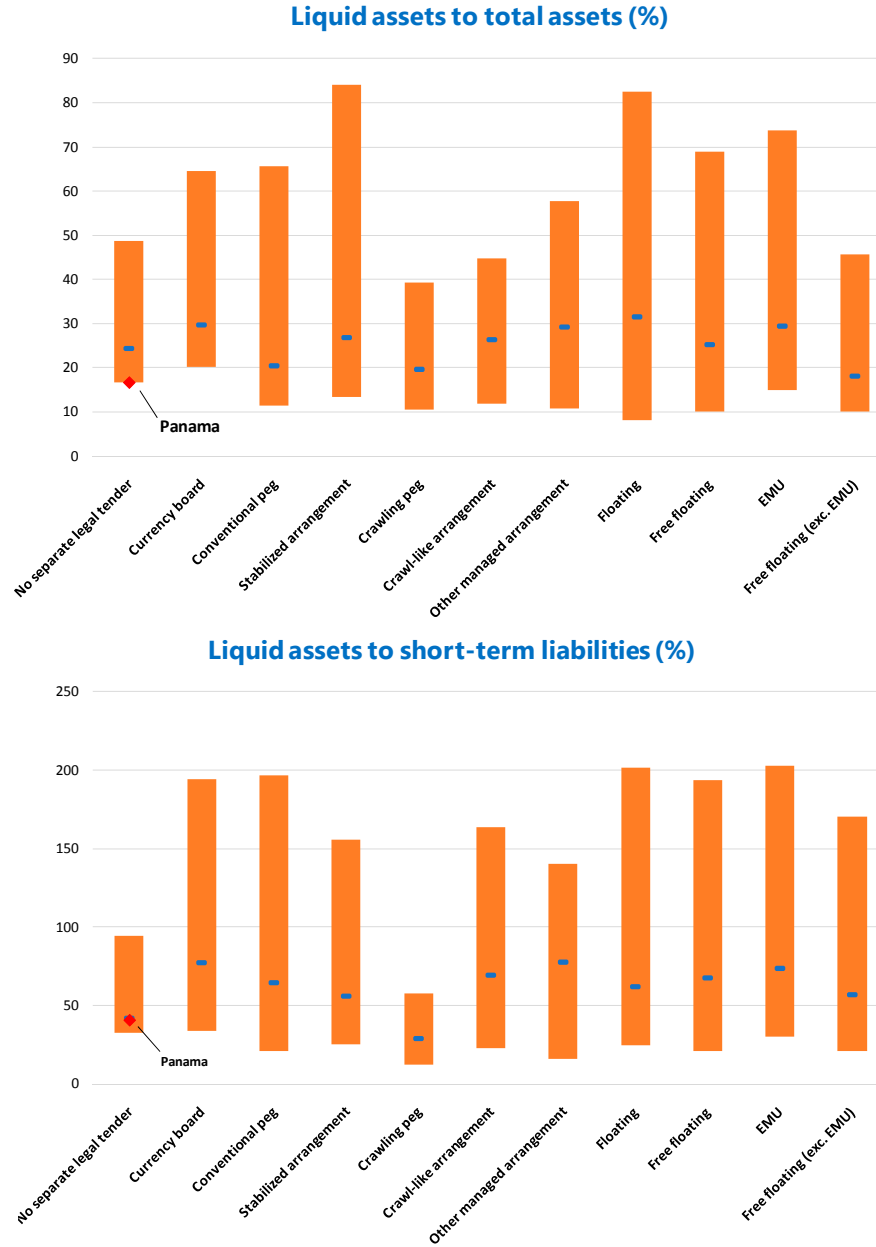
**Panama’s historical experience of financial stability reinforces the perception of a highly liquid, self-disciplined and resilient banking sector.** The only systemic banking crisis in the last 45 years was the crisis of 1988–89 which was political in origin.<sup>5</sup> There has not been any systemic banking crisis caused by contagion from foreign financial markets nor from excessive risk taking. Bank failures have been isolated cases with no contagion effects to other domestic banks. This exceptional track record of banking system stability shapes the views of Panamanian regulators, bank executives and outside observers as well. It is widely believed that the lack of backstops reinforces extreme market discipline, so that banks are very conservative at managing their risks, including by holding a large amount of liquidity.

**However, benchmarking based on publicly available cross-country measures suggests that aggregate liquidity in Panama’s banking system is low relative to other comparable countries.** It is challenging to compare liquidity levels across countries, because the definition and measurement of liquidity vary considerably across jurisdictions. The Financial Soundness Indicators (FSI) dataset, maintained by the IMF, is the most comprehensive publicly available multi-country source of liquidity ratios that are designed to follow a harmonized methodology. Since the IMF only sets the reporting standard and member countries submit their own data, there is still considerable uncertainty about the cross-country comparability of these measures. Nevertheless, the FSIs show that the aggregate ratios of liquid assets to total assets and liquid assets to short-term liabilities in Panama’s banking

<sup>5</sup> Panama’s modern banking history dates back to 1970 when the first banking law created the international banking center. The stability of the banking system was put to the most severe test in 1988 when, in the context of the “Noriega crisis”, the U.S. government froze official Panamanian deposits in the United States, suspended the clearing arrangement between the National Bank of Panama and the Federal Reserve, and withheld payments for use of the Panama Canal. After a 9-week bank holiday and following the U.S. release of government funds, the banking system quickly recovered, with only three bank failures.

sector are relatively low in international comparison. In fact, all countries with similar exchange rate regimes report higher liquidity as a share of total assets (Chart 3).

**Chart 3. Cross-Country Comparison of Aggregate Liquidity Holdings**



Sources: Financial Soundness Indicators (FSI), Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), and Fund staff calculations. Note: Orange bars show the range of liquidity ratios and blue marks represent the average.

**Given this conflicting evidence, one goal of this paper is to carry out an in-depth analysis of bank liquidity buffers using a framework that is better aligned with international standards.** In order to reconcile the official view of high liquidity based on the LLI and the relatively low liquidity suggested by FSI data, we examine the construction of these measures. Closer inspection reveals a number of differences. First, the definition of liquid assets is quite broad in the official LLI, as it includes some lower-rated securities without any haircut and all expected inflows within 6 months. The FSI dataset has a 3-month horizon and a more stringent definition of liquid securities. Second, each liquidity ratio has a different denominator. The LLI measures liquid assets as a share of certain types of deposits, while the FSI uses total assets and, alternatively, total short-term liabilities as the reference point. Importantly, neither measure is in line with the Liquidity Coverage Ratio or the Net Stable Funding Ratio which are the *de facto* international best practices defined by the Basel Committee on Banking Supervision (BCBS).

**A second goal is to ascertain whether Panamanian banks maintain sufficient liquidity to meet a substantial outflow of foreign funding triggered by a loss of correspondent banks.** Reflecting the global trend of de-risking, large foreign banks have reduced their correspondent banking services to some smaller Panamanian banks. The consequences of losing many or even all correspondent banks can be severe: local banks may lose access to credit lines, cease to be able to carry out transactions abroad, and in the worst case, face pre-emptive withdrawals by foreign clients worried about access to their deposits under such circumstances.

**To this end, this paper takes a fresh look at the adequacy of liquidity buffers from two different angles.** First, we analyze banks' short-term resilience to severe liquidity shocks by approximating, as well as possible, the Liquidity Coverage Ratio (LCR) defined in the Basel III standard. Second, in a conventional liquidity stress test we take stock of the different layers of liquidity over a prolonged period of hypothetical funding outflows.

## II. SHORT-TERM LIQUIDITY IN LIGHT OF THE LCR

**The Basel Committee developed the LCR to promote the short-term resilience of the liquidity risk profile of banks.** During the early “liquidity phase” of the financial crisis that began in 2007, many banks—despite adequate capital levels—still experienced difficulties because they did not manage their liquidity in a prudent manner. In response, the Basel Committee developed an internationally standardized framework for liquidity regulation and monitoring, including, most prominently, the LCR. The LCR's objective is to ensure that banks maintain an adequate stock of unencumbered high-quality liquid assets (HQLA) that can be converted easily and immediately in private markets into cash to meet their liquidity needs for a 30 calendar day liquidity stress scenario (BCBS, 2013).

**The LCR is a data-intensive prudential measure.** The LCR takes a granular view of the liquidity of assets issued by various entities, as well as the stability of different funding sources and the likelihood of receiving scheduled inflows of cash. The standard distinguishes three categories of HQLA—Level 1, Level 2a and Level 2b—with different haircuts and caps applied to each of them. For example, highly rated Level 1 sovereign securities can be counted at their market value, while lower medium grade Level 2b corporate debt securities



get a 50% haircut. In addition, Level 2a and 2b assets can only comprise a certain share of the stock of HQLA so that banks are forced to hold a minimum amount of the highest quality Level 1 assets. When calculating outflows, retail deposits are more stable than wholesale deposits from non-financial corporations, while funding from other financial institutions is assumed to be highly vulnerable to sudden withdrawals. The treatment of expected cash inflows also varies by the type of counterparty.<sup>6</sup> Because of the heavy data requirements on credit ratings, issuing entities, and counterparties, the LCR imposes a considerable burden of data collection and reporting on banks and regulators.

### **Approximating the LCR**

**Due to data limitations, the analysis imposes assumptions and approximations to obtain the baseline LCR estimates and the surrounding uncertainty.** The data in the liquidity reports that the SBP currently collects from banks is insufficient to calculate the LCR.<sup>7</sup> We therefore added the essential breakdowns, and created a mapping from the SBP template to the LCR categories. Using this mapping, we take two complementary approaches to address the data gaps. First, we derive bounds on the bank-level LCR distribution by analyzing extreme scenarios in which the missing data is replaced with best-case and worst-case values. Second, for calculating the baseline results, the technical staff of the SBP provided their best estimates of the missing breakdowns based on data collected for other purposes, including the results of on-site supervisory inspections (Box 1). It is important to emphasize that our methodology is only an adaptation of the LCR standard; therefore, the results are only indicative and should not be compared to any other jurisdictions.

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<sup>6</sup> For the technical details of the LCR standard, see BCBS (2013).

<sup>7</sup> With technical assistance from the Bank of Spain, the SBP has identified the necessary adjustments in their data collection procedures to comply with Basel III standards. However, the new methodology has not been implemented yet.

## Box 1. Panama: Mapping the SBP's Liquidity Report to the LCR

The liquidity reports and balance sheets that the SBP collects from banks lack the necessary detail along several dimensions:

The LCR has a 30-day horizon, while the LLI lumps together inflows and outflows within 186 days.

The LCR uses a relatively fine breakdown of credit ratings, while the LLI distinguishes only investment grade and below investment grade securities.

The LCR assumes different run-off and flow-in rates for retail, non-financial wholesale and financial counterparties, while the LLI report distinguishes only bank and non-bank funding.

The LCR considers all sources of funding in the stress scenario (including all notes, bonds and other debt securities issued by the bank), while the LLI only considers certain types of deposits.

**To bridge the data gaps, we constructed a template that augments the SBP reports with the essential details.** The table in this box shows a sample from this template. Each boldfaced line comes directly from the existing reports, while the inserted breakdowns allow us to map categories to the LCR.

**The technical staff at the SBP completed the survey for each bank.** Some items were readily available from other reports. For example, the capital adequacy reports contain information on the credit rating of securities holdings (these being a necessity for the calculation of risk-weighted assets). Similarly, banks report the breakdown of deposits by maturity and type of counterparty. In other cases, SBP staff used estimates to allocate total amounts between the subcategories. This was the case, for example, for the maturity and sectoral distribution of loan receivables.

### REPORTE DE LIQUIDEZ

#### PASIVOS

##### Depósitos a la Vista No Bancarios

- a. Minorista (incluye depósitos de pequeños negocios)
- b. Corporaciones no financieras, estados soberanos, etc.

##### Depósitos a Plazo No Bancarios hasta 186 días

- a. Depósitos a Plazo No Bancarios hasta 30 días
  - i. Minorista (incluye depósitos de pequeños negocios)
  - ii. Corporaciones no financieras, estados soberanos, etc.
- b. Depósitos a Plazo No Bancarios desde 31 hasta 186 días

##### Depósitos a Plazo de Bancos hasta 186 días

- a. Hasta 30 días
- b. Desde 31 hasta 186 días

##### Depósitos a Plazo de Otras Instituciones Financieras hasta 186 días

- a. Hasta 30 días
- b. Desde 31 hasta 186 días

#### ACTIVOS

##### Obligaciones con grado de inversión emitidas por Gobiernos Extranjeros

- a. AAA to AA-
- b. A+ to A-
- c. BBB+ to BBB-

##### Obligaciones con grado de inversión emitidas por Org. Financieros Intern.

- a. AAA to AA-
- b. A+ to A-
- c. BBB+ to BBB-

##### Obligaciones con grado de inversión de empresas privadas nacionales

- a. AAA to AA-
- b. A+ to BBB-

##### Obligaciones con grado de inversión de empresas privadas extranjeras

- a. AAA to AA-
- b. A+ to BBB-

##### Obligaciones de Agencias Priv. y Gub. Extranjeras largo plazo AAA

- a. Agencias Privadas Extranjeras
- b. Agencias Gubernamentales Extranjeras

##### Depósitos a Plazo en Bancos en Panamá hasta 186 días

- a. Hasta 30 días
- b. Desde 31 hasta 186 días

##### Depósitos a Plazo en Bancos en el Extranjero hasta 186 días

- a. Hasta 30 días
- b. Desde 31 hasta 186 días

##### Obligaciones de Bancos Pagaderas en Panamá hasta 186 días

- a. Hasta 30 días
- b. Desde 31 hasta 186 días

##### Abonos de Obligaciones Pagaderas en Panamá (Vcto.< 186 Días)

- a. Hasta 30 días
  - i. Instituciones financieras
  - ii. Otros
- b. Desde 31 hasta 186 días

### Balance de Situación

#### PASIVOS

##### Obligaciones

- a. Hasta 30 días
- b. Más de 30 días

##### Otros pasivos

- a. Hasta 30 días
- b. Más de 30 días

**Table 1 describes two hypothetical scenarios spanning extreme cases.** To calculate the LCR from the available reports, we need to make assumptions on the maturity breakdown of certain assets and liabilities, on the credit rating distribution of securities, and on the sectoral composition of counterparties (sovereign, retail, nonfinancial and financial wholesale). Both scenarios assume that the maturity distribution of term deposits and loan receivables is uniform within the 6-month horizon of the official LLI. However, the optimistic (pessimistic) scenario envisages that all securities have the highest (lowest) possible credit rating and that all funding and inflows are the most (least) stable within their respective categories.

**Table 1. Assumptions in the Extreme Scenario**

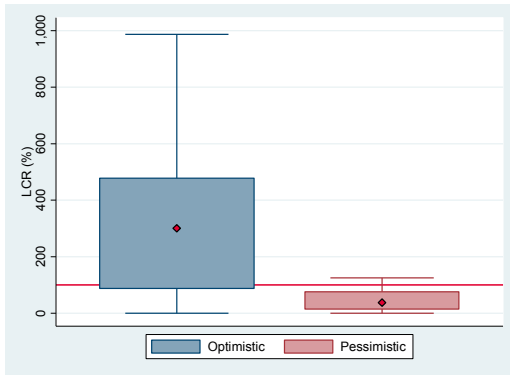
	Optimistic	Pessimistic
Maturity distribution	uniform (30/186 of total assumed below 30 days)	
Credit rating	100% prime/high	100% upper/lower medium
Nonbank deposits (outflow)	100% retail	100% wholesale
Loan receivables (inflow)	100% financial	100% nonfinancial

**The range of possible LCR outcomes is wide, but even the most optimistic scenario has a number of banks failing the mark.** Panel A of Chart 4 summarizes the distribution of bank-level LCRs in the two scenarios.<sup>9</sup> The available data allows for very different conclusions about the short-term liquidity position of the banking system, ranging from almost no bank meeting the 100 percent LCR threshold to most banks passing the LCR test. This is a *prima facie* case for improving data reporting requirements in line with international standards. Furthermore, although the median bank has comfortable liquidity buffers in the optimistic scenario, about a quarter of banks would not be able to cover their cash outflows in a short-term liquidity shock scenario even under the most generous assumptions.

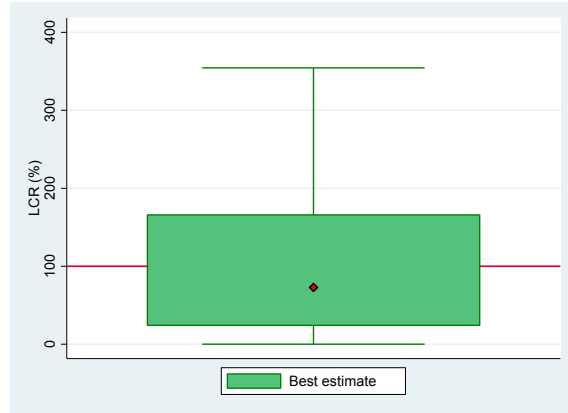
<sup>9</sup> The dataset contains the liquidity reports and balance sheets reported by 46 onshore banks as of end-October 2015.

### Chart 4. LCR Calculations Under Different Assumptions

Panel A: Extreme Scenarios



Panel B: Best Approximation

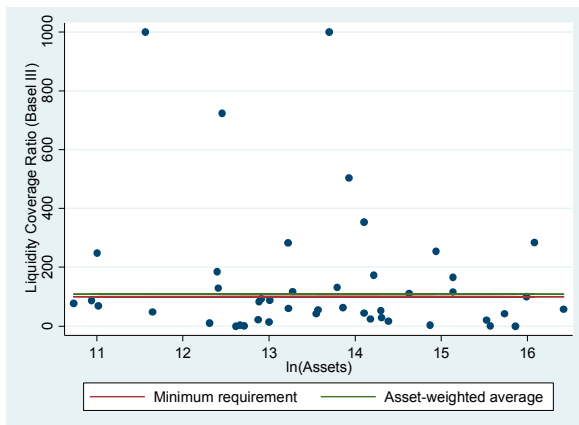


Source: Staff calculation based on SBP data. Note: Outliers are not shown on the chart to increase readability.

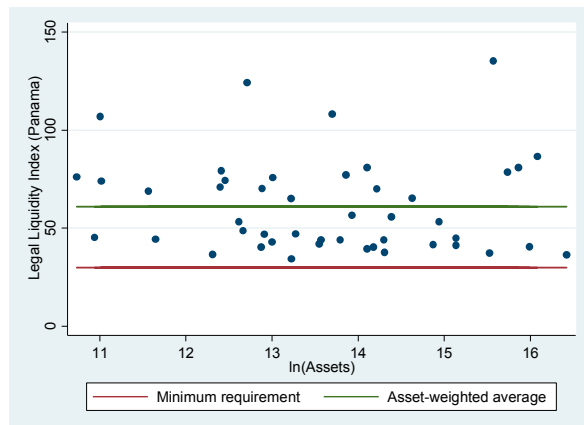
**Our baseline estimates imply that a significant part of the banking sector does not meet the 100 percent LCR requirement.** Unlike the uniform assumptions of the two extreme scenarios, the baseline estimates incorporate all bank-level information of the experts at the SBP. Under these assumptions, only 40 percent of banks could cover their net cash outflows through the use of HQLA, with the median bank having an LCR of 72.7 percent (Panel B of Chart 4). Chart 5 also shows that the banking system as a whole barely meets the LCR requirement with an asset-weighted average of 108.3 percent. Furthermore, most of the largest banks display below average short-term resilience to liquidity shocks according to the LCR. This is in stark contrast to the official LLI measure, which suggests that some of the biggest banks are among the most liquid ones.

### Chart 5. Liquidity Ratios and Bank Size

Panel A: LCR



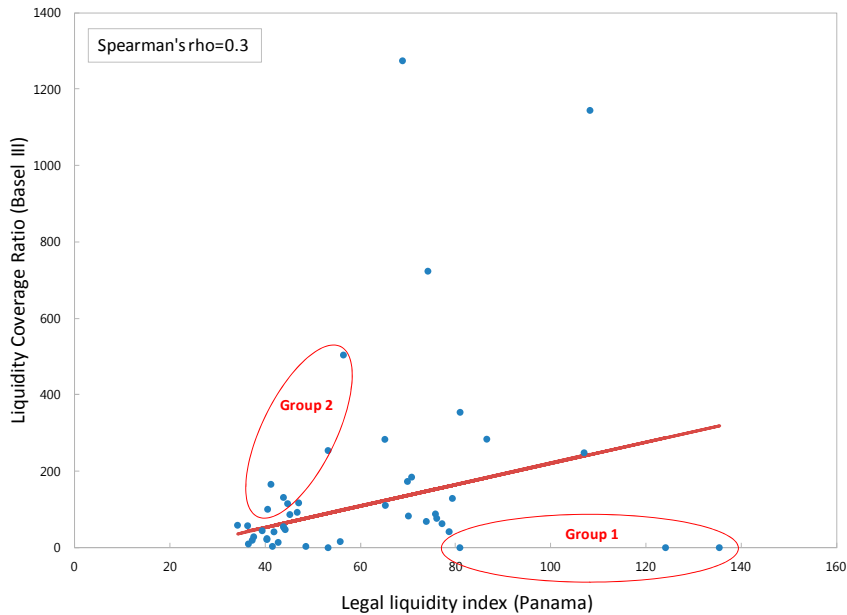
Panel B: LLI



Source: Staff calculation based on SBP data.

**The LCR calculations show a very different ranking of bank liquidity buffers than the official measure.** Chart 6 demonstrates that the LLI and LCR are quite disconnected across banks. The rank correlation is only 0.3, implying that the relative liquidity position of banks can be remarkably different under the two measures. In fact, some of the most liquid banks according to the LLI have a particularly low LCR (Group 1 in Chart 6), while some banks with low or medium official ranking show ample short-term liquidity under Basel III standards (Group 2 in Chart 6).

**Chart 6. Relationship between the LCR and the Official Liquidity Ratio**



Source: Staff calculation based on SBP data.

**An analysis of the outliers highlights the crucial differences between the current supervisory measure and the LCR.** The banks in Group 1 (low LCR, but high official liquidity) tend to be foreign-owned with a large share of parent bank and wholesale funding, and little to no securities holdings. The local regulation completely excludes from the calculation all non-deposit wholesale funding, as well as deposits from affiliated banks. The LCR, on the other hand, considers these liabilities highly unstable under stress, leading to a significant wedge between the two measures. Similarly, the LCR strongly favors tradable securities over interbank placements, which penalizes banks that fulfill their official liquidity requirement with deposits at other banks. By contrast, Group 2 banks tend to hold highly-rated securities and rely more heavily on non-bank and retail funding, often with longer maturities. These characteristics boost their calculated liquidity relative to the LLI, because the LCR rewards more stable funding sources and high quality securities.

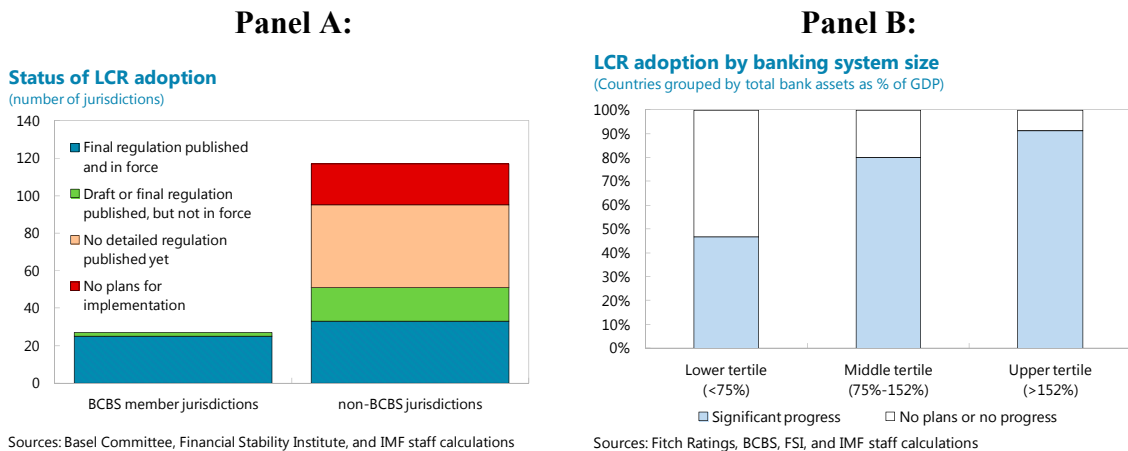
### **International outlook on liquidity regulation**

**The 100 percent LCR is a high standard for short-term liquidity buffers, and it will take effect fully only in 2019.** Internationally, the LCR became effective on January 1, 2015, with a 60 percent minimum requirement growing by 10 percentage points each year until

reaching 100 percent by January 1, 2019. The current threshold is 70 percent which is incidentally very close to the median of our baseline LCR estimates. Complying with the LCR requirement is a challenge for some banks, even in BCBS member jurisdictions, so it is not surprising that many Panamanian banks would need to substantially adjust their liquid asset portfolios and/or funding structures to comply with the standard.

**However, regulators in many countries—especially with large banking sectors—have already made decisive steps towards the Basel III liquidity standards.** Almost all of the BCBS member jurisdictions have fully implemented the LCR in their domestic supervisory framework (BCBS, 2015ab). According to data collected by the Financial Stability Institute (FSI, 2015), more than 40 percent of the 117 surveyed non-BCBS jurisdictions have also made significant progress by either fully implementing or by publishing a draft law of the LCR, and only 22 countries indicated that they have no plans for implementation. Panama is among the 44 non-BCBS countries that are planning to adopt the LCR standard, but have not published any official document about the proposed domestic regulations yet (Panel A of Chart 7). Closer inspection also reveals that most of the laggard jurisdictions have relatively small banking sectors. Panel B of Chart 7 sorts countries by their banking system assets/GDP ratio, and, in each tertile, displays the share of countries with significant progress in LCR implementation. The upper tertile, into which Panama falls, is dominated by jurisdictions that are in an advanced phase of implementation.

**Chart 7. Adoption of the Basel III LCR as of November 2015**



Note: Panel A includes the 27 members of the BCBS and the 117 non-BCBS jurisdictions surveyed in FSI (2015). Panel B includes a subset of 94 jurisdictions for which banking system asset data is available. The minimum requirement for “significant progress” is the publication of a draft law.

### III. TESTING FOR BANK’S RESILIENCE TO LOSS OF FOREIGN FUNDING

**A conventional liquidity stress test supplements the LCR calculation to assess liquidity buffers under a scenario contemplating a substantial loss of foreign funding.** This test assumes a stronger run-off of foreign-sourced funding compared to funding provided by local entities. The idea is to simulate the impact of a large-scale loss of correspondent banking relationships on the availability of funding from foreign banks and depositors.

**Specifically, the liquidity stress test assumes that banks' access to foreign funding is severely curtailed, exceeding the stress assumed in the LCR calculation in some cases.** First, the run-off of liquidity is assumed to continue beyond the 30-day horizon underlying the LCR calculation so that maturity mismatches in buckets of longer maturities are also factored in. Historical experience in emerging markets and during the Global Financial Crisis suggests that illiquidity can last for a protracted period, warranting analysis over longer horizons. Second, while the 100-percent run-off rate for foreign bank funding is identical to the LCR, the test imposes a severe 50 percent run-off rate for foreign retail deposits (LCR: up to 10 percent). On the other hand, a few parameters are relatively benign, reflecting the current favorable local conditions: all local retail funding is subject to a uniform 10 percent run-off rate (as under the LCR),<sup>10</sup> while bonds issued by banks and local interbank funding are assigned a rate of 50 percent rather than 100 percent, and no run-off is assumed for funding from headquarters (applicable to foreign banks in Panama), as well as all other liabilities. This set of assumed run-off rates may actually lead to relatively benign stress test outcomes for some banks (for example those with ample funding from parent banks), although the results are not directly comparable to the LCR calculation. The individual run-off rates are summarized in Table 2.

**Data limitations require a few simplifications in the liquidity stress test.** Funding by residual maturity is available at the SBP only in three relatively wide maturity buckets: up to 6 months, between 6 and 12 months, and above 12 months, which does not allow for assessing funding and liquidity in more detail at shorter maturities. This also implies that no direct comparisons with the LCR calculations in Section II are possible. Furthermore, as mentioned above, the SBP does not provide a breakdown between retail and wholesale funding (the latter subject to a higher run-off rate in the LCR calculation), but rather between bank and non-bank funding only. As a result, in this liquidity stress test the funding from non-financial corporates is, by necessity, included in the retail category.<sup>11</sup>

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<sup>10</sup> All retail deposits in Panama are considered unstable in the test owing to the lack of deposit insurance.

**Table 2. Funding Run-off Rates by Type of Funding and Residual Maturity**

Category:	Stress scenario - assumptions		
	Run-off rates		
	1	2	3
	Up to 6 months	6 to 12 months	Above 12 months
Foreign retail funding: sight deposits			
Unstable	50%	0%	0%
Foreign retail funding: savings deposits			
Unstable	50%	0%	0%
Foreign retail funding: term deposits	50%	50%	50%
Bank funding from parent bank	0%	0%	0%
Bank funding from foreign banks	100%	100%	100%
Bank funding from domestic banks	50%	50%	50%
Local retail funding (sight, savings and term deposits)	10%	10%	10%
Bank bonds	50%	50%	50%
Other liabilities	0%	0%	0%

Source: Staff calculations

**The overall run-off of funding resulting from the assumed rates is arguably severe but broadly in line with international experience during crises.** The average overall run-off amounts to one-third of total liabilities (33.6 percent; rates ranging between 6.9 and 64.2 percent). A rule of thumb gained from previous crisis episodes around the globe for calibrating the overall funding outflow suggests that 20 percent of funding may be lost within 3 months and 30 percent within 6 months.

**Next, the projected outflows are compared to different layers of available liquidity in each maturity bucket.** The liquidity stress test takes a gross perspective. That is, a certain outflow in a given bucket must be met by the available liquidity buffer in the same bucket; an offset of a liquidity shortfall by excess liquidity at a longer horizon is not permissible. This may lead to the seemingly paradoxical outcome that a bank is “long” in liquidity overall, but still registers a liquidity gap in one of the buckets. In the event, shortfalls appear only in the two shorter buckets of maturities of up to 6 months and between 6 and 12 months.



**The stress test stipulates three layers of liquidity that banks can resort to in meeting a funding outflow.** The order of accessing liquidity buffers is the following:

- Banks are assumed to first use inflows from maturing investment and lending operations, i.e. securities and loans coming due. The rate of usable inflows (“roll-off” rate) for shorter-term securities maturing within 6 months is set to be 100 percent—corresponding to full repayment of the securities at maturity—while that for maturing loans to the non-financial sector is 50 percent, which is broadly in line with the LCR framework;
- If, after using up the first buffer, a shortfall in a certain maturity bucket remains, banks can still resort to the second layer of liquidity which consists of the stocks of cash and of interbank loans carrying a 100 percent roll-off rate as in the LCR;<sup>12</sup>
- In the relatively rare event that even the additional buffer of cash and cash-like instruments does not suffice, banks are finally forced to sell securities with longer residual maturities (of over 6 months), representing the third layer. As in a systemic event many banks may be forced to sell at the same time, a fire-sale haircut of 20 percent to the recorded value of the security is applied.<sup>13</sup>

Any remaining shortfall after sale of securities means that a bank is out of options and in the absence of a lender of last resort in Panama must be considered terminally illiquid.

**Applying the framework to 46 general license banks<sup>14</sup> shows that funding outflows can generally be met using the first and second layers.** While most banks show considerable shortfalls in the shorter maturity buckets after utilizing inflows from operations—the first line of defense—the gaps generally disappear when accessing the stock of cash and maturing interbank loans. Only in less than one-third of cases (14 out of 46 general license banks with a share of 30 percent of system assets) does a shortfall persist after using the second layer, and the number of banks with a terminal shortfall after exhausting the third layer is only four (accounting for 18 percent of system assets). Still, the finding that a number of banks would have to resort to selling less liquid instruments and a few even be left with a final liquidity gap can be construed as a certain susceptibility to withdrawals of foreign funding under the assumed rather severe conditions. This is also true of international license banks, for which the analysis of liquidity shortfalls was calculated separately (see Appendix I).

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<sup>12</sup> This is arguably a somewhat optimistic assumption as some counterparty banks may become illiquid following the curtailment of correspondent bank relationships. However, this type of interbank contagion analysis that was conducted for the previous Article IV mission (Cerdeiro et al., 2015) was deemed beyond the scope of the exercise, and therefore full repayment was assumed.

<sup>13</sup> The choice of this haircut rate was also informed by discussions with representatives of the securities exchange of Panama.

<sup>14</sup> All bank data as of end-December 2015.

**Table 3. Summary Results of Conventional Liquidity Stress Test—General License Banks**  
(In percent)

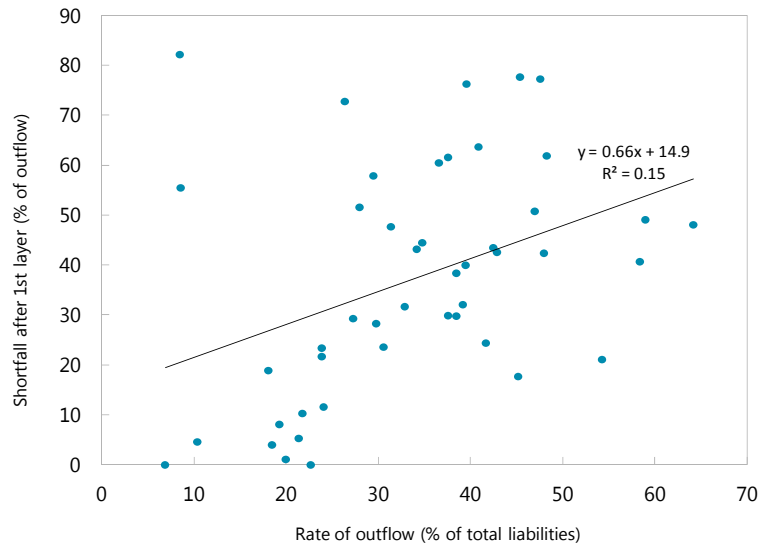
	Average (mean)	Maximum	Upper quartile	Lower quartile
Funding outflow in percent of total liabilities	33.6	64.2	42.3	23.9
Liquidity gap in percent of outflows after using 1 <sup>st</sup> layer	37.1	82.2	51.4	21.3
Liquidity gap in percent of outflows after using 2 <sup>nd</sup> layer	5.5	39.5	3.3	0.0
Final liquidity gap in percent of outflows after using 3 <sup>rd</sup> layer	0.9	16.8	0.0	0.0

Source: Superintendency of Banks (SBP); staff calculations

**There is a reasonably tight relationship between the degree of funding outflows and the liquidity shortfall after using the first layer of liquidity.** As Chart 8 shows, most general license banks projected to experience severe funding outflows also exhibit sizable liquidity gaps after having used the first buffer (inflows from maturing operations). However, there are a few exceptions: banks above the regression line and particularly those toward the upper left hand corner have relatively large gaps despite not being exposed to high funding outflows. Conversely, banks below the regression line dispose of a large initial buffer that dampens the impact of, in part, substantial funding shocks.

**Chart 8. Relationship Between Funding Outflow and Liquidity from Operations**

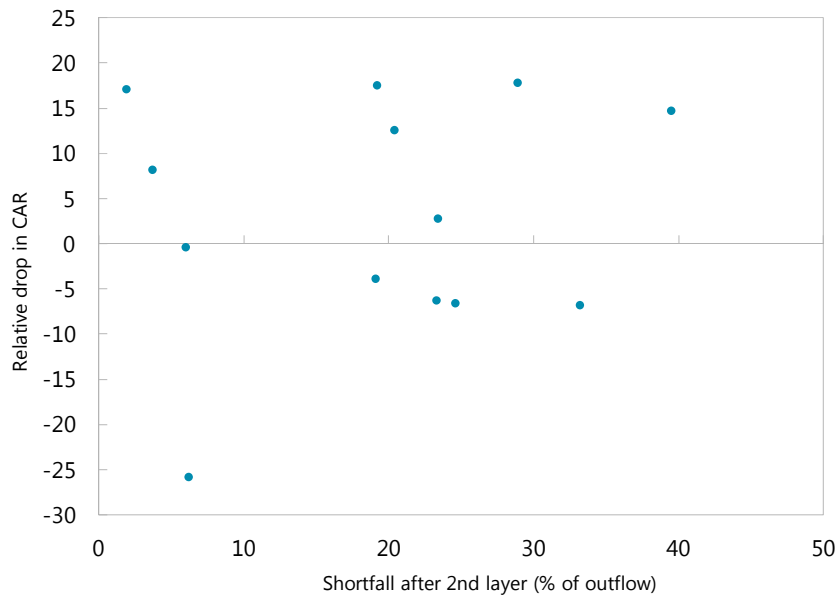
(In percent)



Source: SBP, staff calculations

**Reassuringly, most banks displaying sizable liquidity shortfalls have robust solvency positions.**<sup>15</sup> In Chart 9, the banks with a liquidity shortfall after using the second layer are plotted against their relative drop in the capital adequacy ratio (CAR)<sup>16</sup> in the severe stress scenario of a solvency stress test conducted by the SBP as of end-December 2015. In fact, there is no evident link between illiquidity and insolvency: most of the relatively illiquid banks turn out to have robust solvency positions, reflected in below average declines in the CAR under severe stress. Put differently, all banks but one failing the solvency test perform reasonably well in the liquidity stress test, with none having a liquidity shortfall after using the second layer.

**Chart 9. Relationship Between Liquidity and Solvency Under Stress**  
(In percent)



Source: SBP, staff calculations

<sup>15</sup> The SBP regularly conducts solvency stress tests for general license banks.

<sup>16</sup> The relative drop in the capital adequacy ratio is computed as the difference to the percentage drop in the CAR at the system level, which in the solvency stress test turned out to be 16.85 percent or about one-sixth of the initial CAR. For example, a bank with a drop in CAR of 20.72 percent is shown as having a relative drop in CAR of -3.87 percent (16.85 percent minus 20.72 percent). This relative measure (as opposed to the change expressed in percentage points) was taken to account for different starting levels of capitalization across banks.

**This finding implies that the risk of a simultaneous deterioration in both the liquidity and solvency position appears muted, but risks still prevail.** Banks showing non-negligible liquidity gaps do not exhibit solvency issues. Still, liquidity problems in the aftermath of a severe loss of correspondent banks and, hence, foreign-sourced funding may spill over to solvency in the medium run, as funding costs may rise and fee income fall. Conversely, perceived lack of solvency may precipitate funding outflows and loss of correspondent banks.

#### IV. CONCLUDING REMARKS

**The analysis of liquidity positions performed in this paper points to some vulnerabilities.** A number of banks would not meet the LCR requirement for short-term liquidity at this point, owing to the over-reliance on interbank placements and scheduled inflows instead of high-quality tradable securities. Similarly, some banks do not perform well under a conventional stress test assuming a substantial outflow of foreign funding, having to sell less liquid instruments in order to close a liquidity gap that remains after using readily-available liquidity.

**The current favorable conditions would promote the accumulation of even stronger balance sheet buffers and the strengthening of the regulatory framework.** In light of the steady global progress in the adoption of Basel III liquidity norms, stepping up on-going efforts to update the Panamanian liquidity regulation and corresponding data collection is a worthwhile policy option. Adopting the LCR (and the Net Stable Funding Ratio (NSFR) at a later stage) would improve the banking sector's ability to absorb large and unexpected shocks arising from financial and economic stress, thus reducing the risk of spillovers from the financial sector to the real economy.

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**APPENDIX I. RESULTS OF CONVENTIONAL LIQUIDITY STRESS TEST FOR BANKS WITH INTERNATIONAL LICENSE**

**The conventional liquidity stress test was performed also for banks with international license.** These banks, sometimes referred to as “offshore” banks, differ from the general license banks in that they are prohibited from engaging in transactions with domestic clients. This restriction implies, for example, that these banks do not have a domestic retail funding base, which in itself causes a higher overall funding run-off rate in comparison to general license banks.

**Several international license banks do not pass the stress test owing to their particular liquidity and investment structures.** Five out of 26 international license banks accounting for about 40 percent of assets of this segment—a higher share than among the general license banks—show a shortfall after resorting sequentially to all three liquidity buffers. While the funding outflows as such are not overly severe (around 50 percent of liabilities) despite the lack of retail funding, the asset side does not produce much in the way of operational inflows from loans or short-term securities nor does it provide for sufficient cash, interbank deposits or securities in these cases. Generally, though, almost three-fourths of international license banks are able to cover their funding shortfalls through cash and cash-like positions. This finding goes to show that most “offshore” banks are wary of the risk of having to rely exclusively on funding from the exterior due to their license and keep adequate liquidity buffers. Still, the banks showing a final liquidity gap in the test do so with quite a margin so that in order to pass they would need to adjust the composition of their asset portfolios, including maintaining a larger share of instruments with short-term maturities.

**Text Table I. Summary Results of Conventional Liquidity Stress Test—International License Banks**  
(in percent)

	Average (mean)	Maximum	Upper quartile	Lower quartile
Funding outflow in percent of total liabilities	40.9	60.7	49.5	46.9
Liquidity gap in percent of outflows after using 1 <sup>st</sup> layer	60.7	100.0	77.7	51.4
Liquidity gap in percent of outflows after using 2 <sup>nd</sup> layer	10.6	60.5	17.7	0.0
Final liquidity gap in percent of outflows after using 3 <sup>rd</sup> layer	5.0	39.7	0.0	0.0

Source: SBP, staff calculations.