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Financial Development and Growth in the Caucasus and Central Asia

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Financial Development and Growth in the Caucasus and Central Asia

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ABSTRACT: This paper presents stylized facts on financial development in the CCA countries relative to their EM and LIC peers and assesses how financial development can boost growth in the CCA. Drawing on IMF's multidimensional index of *financial development*, we find that CCA countries have made progress following the independence in early 1990s. However, the progress was uneven across the CCA, resulting in a divergence of financial development over time and mixed performance relative to EM and LIC peers. *Financial institutions* have progressed the most, while *financial markets* remain underdevelped in most CCA countries except Kazakhstan. In terms of sub-indicators of financial development, *financial access* has expanded markedly, while the *depth* of financial intermediation has remained largely shallow and *efficiency* of financial intermediation has fluctuated over time. Standard growth regressions suggest that CCA countries with relatively lower level of financial development have scope to boost annual growth rates between 0.5-2.5 percent by reaching the level of financial development of frontier CCA countries.

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WORKING PAPERS

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Contents

I. Introduction

The Caucasus and Central Asia (CCA) countries have experienced a secular slowdown in output growth rates and slower convergence to higher income countries in the aftermath of the global financial crisis, which was exacerbated by the COVID-19 pandemic. There is a long-standing policy discussion on how to boost CCA growth in the medium-term. Business surveys suggest that insufficient financial development (low access to finance, lack of financing instruments, high lending rates, etc.) is one of the most prominent impediments to growth (Gigineishvili and others, 2022). The purpose of this paper is to provide stylized facts on financial development in the CCA and assess how financial development can boost growth in these countries.

While the relationship between financial development and growth can go both ways, there are good theoretical and empirical reasons to expect that financial development causes growth. Theoretically, financial development allows mobilizing savings for investment purposes and supports efficient allocation of resources to their most productive use. This in turn raises potential output and support growth. Empirically, there is a well-established literature (see, e.g., King and Levine, 1993; Levine, 1997) providing evidence that financial development is a good predictor of future growth. These empirical studies typically employ cross-country panel data, using the size of the banking system or credit relative to GDP or size of the stock market relative to GDP as a proxy for financial development. They use instrumental variable, panel GMM, and difference-in-difference methodologies, among others, to ensure that the relationship goes beyond simple correlations and to establish causality from financial development to growth. Channels through which financial development affects growth include: (i) deeper and more liquid equity markets supported by institutional investors, such as pension funds and insurance companies, provide a more varied source of project financing (Catalan and others, 2000), (ii) expansion of institutional investors can enhance the efficiency of the banking system itself and make it more resilient to credit and liquidity risks (Impavido and others, 2002), (iii) greater financial development can increase the maturity of debt and reduce leverage of firms, making them more resilient to shocks (Impavido and others, 2001) and allowing economic agents better diversify macroeconomic risks (Impavido and Tower, 2009).

Drawing on this work, Sahay and others (2015) develop a broad-based index of financial development for 183 advanced (AE), emerging (EM) and low-income (LIC) countries from 1980s. The main advantage of this index is that it is multidimensional. Unlike previous measures focusing on selected aspects of financial development (volume of private credit, size of stock markets, etc.), this indicator encompasses institutions (banking and non-banking) and measures development across multiple dimensions (depth, access, and efficiency). Using this measure of financial development, Sahay and others show that the relationship between financial development and growth is bell-shaped: financial development leads to higher growth up to a turning point, beyond which "too much finance" can hurt growth due to growing agency problems and asymmetric information.

Our objective is to draw on this financial development index to provide evidence on financial development and growth in the CCA countries, complementing the recent analysis of Gigineishvili and others (2022). We start by presenting stylized facts on financial development in the CCA, monitoring its evolution over time and benchmarking it against EM and LIC peers. We find mixed evidence across CCA countries: while most countries have experienced some improvement in financial development over time, the pace of improvement varied across countries and some CCA countries are still behind their EM and LIC peers. Next, we confirm that CCA countries stand on the left side of the bell-shaped relationship between financial development and growth, suggesting that important gains in growth could be achieved by further financial development. This finding echoes earlier results of Blancher and others (2019) showing that improving financial inclusion of small and medium-sized enterprises in the Middle East and Central Asia region can lead to sizeable growth dividends. Finally, we provide policy recommendations on specific areas where financial development could be improved.

The remainder of the paper is structured as follows. Section II presents stylized facts on financial development in the CCA and benchmarks it against peer EMs and LICs. Section III provides empirical evidence on the relationship between financial development and growth. The last section concludes.

II. Financial Development in the CCA: Stylized Facts

A. Financial Development Index

The overall financial development index developed by Sahay and others (2015) consists of two sub-components: (i) financial development of institutions and (ii) financial development of markets (Figure 1). Financial institutions include banks, insurance companies, pension funds, mutual funds, and other non-bank financial institutions. Financial markets include stock and bond markets.

Each of these sub-components is measured using three sub-indices, showing depth, access, and efficiency of institutions and markets. The following indicators are used to evaluate the depth, access, and efficiency of institutions and markets (Svirydzenka, 2016):

- For *financial institutions*, the indicators include the size of private sector credit, pension and mutual fund assets in relation to GDP, life and non-life insurance premiums in relation to GDP, bank branches and ATMs per 1000 adults, net interest margin, spread between lending and deposit rates, non-interest income in relation to total income, overhead costs to total assets, and measures of profitability (return on assets and return on equity).[1]

- For *financial markets*, the indicators include the size of the stock market, the volume of stocks traded, the size of international debt securities of government, financial, and non-financial corporations relative to GDP, percent of market capitalization outside of 10 largest companies, total number of debt issuers, and stock market turnover (stocks traded to capitalization).

Each indicator is normalized between 0 and 1, so that the highest (lowest) value of a given variable across time and countries is set to 1 (0) and all other variables are measured relative to these maximum (minimum) values.[2] Indicators are then aggregated into depth, access, and efficiency sub-indices using weights derived from the principal component analysis, reflecting the contribution of each underlying series to the variation in the specific sub-index. Finally, sub-indices are aggregated into sub-components of the financial development index and the financial development index itself using the same procedure.

B. Financial Development in the CCA

The CCA economies lack diversification and heavily depend on oil and mining exports as well as remittances from migrant workers (Khandelwal and others, 2022). As a result, they are vulnerable to large external shocks to commodity prices and trading partners and greater financial development is meant to cushion external shocks, contributing to sustained economic expansion.

[1] The recent expansion of fintech and mobile banking operators is changing the landscape of financial development (Sahay and others, 2020). However, these are relatively new developments, and the absence of a sufficiently long data prevented the authors from including it in the financial development index (Svirydzenka, 2016).

[2] Data are winsorized at 5th and 95th percentiles to mitigate the impact of outliers.

The evolution of the overall financial development index (FD) in the CCA countries over 1993-2019 shows an improvement in most countries (Figure 2).[3] The improvement was particularly pronounced in Armenia and Georgia, where the FD has more than doubled from around 0.1 in 2000 to around 0.2-0.25 in 2019. Notably, Kazakhstan has seen a rapid improvement of the FD from 0.15 in 2000 to 0.4 in 2008, which coincided with rapid expansion of the stock market, followed by a reduction in the aftermath of the global financial crisis and convergence to the 0.3 level in 2019. In general, financial development in the CCA was characterized by periods of swings in financial and credit cycles, which fed back to the real economy through macro-financial linkages (Khandelwal and others, 2022).

There is wide variation of FD across CCA countries. It is notable that in the early 2000s, the FD varied in a narrow range of 0.08-0.15 across CCA countries, while in 2019 the dispersion in FD has increased, ranging from 0.1 (Kyrgyz Republic and Tajikistan) to 0.3 (Georgia and Kazakhstan). Moreover, in early 2000s the level of FD in five CCA countries was below that of an average LIC, while in 2019 the level of FD exceeded that of an average LIC in five CCA countries and two CCA countries converged to an average EM. This implies that some countries have achieved faster improvements in FD compared to others over the last two decades. As expected, some CCA LICs (Kyrgyz Republic and Tajikistan), tend to have lower FD compared to CCA EMs (Armenia, Azerbaijan, Georgia, and Kazakhstan).

Breaking down FD into its sub-components – financial institutions index (FI) and financial markets index (FM) – reveals big differences between the two (Figure 3). Not surprisingly, the FI level is much higher than the FM level for all countries, which is consistent with a bank-dominated structure of the financial sectors.[4] Kazakhstan is an exception, where FM shows a relatively higher level of financial markets development.[5] Over time, the level of FI has improved in most CCA countries and exceeded the LIC average in 2019, while the level of FM has stagnated in all countries, remaining below LIC average during most of the sample for all CCA countries except Kazakhstan. This implies that analysis of financial development and growth should mainly draw on the FI, since financial markets remain underdeveloped in most CCA countries.

Looking at individual sub-indices entering the FI – financial institutions depth (FID), access (FIA), and efficiency (FIE) – also reveals contrasting patterns (Figure 4).

- Most CCA countries started from comparable levels of FID in mid-1990s (around 0.02), while the variation across countries have increased widely in 2019 (from 0.03 in Tajikistan to 0.15 in Georgia and Kazakhstan). Nevertheless, the depth of financial institutions remains relatively shallow. In 2019, FID of only three CCA countries exceeded that of LIC average and FID of all CCA countries still falls well below the EM average of 0.23. Factors suppressing FID include relatively high spreads between lending and deposit rates making borrowing prohibitively expensive (Gigineishvili and others, 2022; Teodoru and Akepanidtaworn, 2022), low domestic savings (Gigineishvili and others, 2022), weak trust in deposit insurance schemes based on memories from relatively recent financial crises that make households reluctant to deposit their savings in banks (Vera Martin and others, 2018), and relatively stringent regulatory frameworks giving a preference to financial stability (Khandelwal and others, 2022; Teodoru and Akepanidtaworn, 2022) and constraining the scope for further financial deepening.

- By contrast, the level of FIA has improved quite rapidly across CCA countries between mid-1990s (less than 0.1 in most CCA countries) and 2019 (between 0.2 and 0.7). As of 2019, FIA in all CCA countries exceeded LIC average and FIA in three CCA countries exceeded EM average. This implies that CCA countries enjoy relatively good access to financial institutions.

[3] The sample includes seven CCA countries: Armenia (EM), Azerbaijan (EM), Georgia (EM), Kazakhstan (EM), Kyrgyz Republic (LIC), Tajikistan (LIC), and Uzbekistan (LIC). The sample does not include Turkmenistan due to data limitations on some indicators that are used to measure the financial development index.

[4] Banks represent almost 90 percent of total financial system assets in the CCA (Teodoru and Akepanidtaworn, 2022).

[5] The FM data for Kazakhstan should be interpreted with caution, since it may be affected by one-off developments in the pension fund industry and financial markets in general.

- Finally, the level of FIE has not shown any directional trend over the 1993-2019 period. It has stayed below LIC average in most CCA countries during the sample under consideration. There was a sizeable improvement in the level of FIE in four CCA countries in the last three years of the sample. Nevertheless, risks to macroeconomic and political stability and uncertainties related to business environment, institutions and governance continue weighing on FIE. In addition, high markups reflect banks' ownership structure, market concentration[6], competition, and the legal framework on creditor rights, collateral recovery and foreclosures, and bankruptcy (Gigineishvili and others, 2022; Teodoru and Akepanidtaworn, 2022).

To summarize, financial development has improved in most CCA countries following the independence in early-1990s. Nevertheless, there is wide variation across CCA countries as of 2019, falling between average LIC and EM globally. Most of the progress in financial development came from improvement of financial institutions, while financial markets remain underdeveloped in most CCA countries. The main contributor to financial institutions development is enhanced financial access, while financial institutions depth and efficiency has further scope for improvement. All in all, these stylized facts reveal scope for further growth expansion in the CCA through financial development.

III. Financial Development and Growth: Empirical Analysis

A. Empirical Specification

Drawing on stylized facts above, this section quantifies the potential for boosting output growth through further financial development. For this purpose, we re-run the standard growth regression model from Sahay and others (2015) using the updated financial development dataset through 2019.

The empirical specification takes the following form:

$$\Delta \ln(y_{it}) = \beta_0 + \beta_1 \ln(y_{it-1}) + \beta_2 FD_{it} + \beta_3 FD^2 + CONTROLS + \alpha_i + \rho_t + \varepsilon_{it} \quad (1)$$

where *y* is per capita GDP at chained PPPs (in mln 2017 USD)[7], *FD* is the financial development index or its subcomponent, *CONTROLS* refers to control variables (education proxied by secondary school enrollment, foreign direct investment-to-GDP ratio, government consumption-to-GDP ratio, CPI inflation, and trade-to-GDP ratio), α and ρ denote country and time-specific fixed effects, and ε is an i.i.d. error term. The estimations are performed over non-overlapping five-year time intervals covering 134 LIC and EM countries for the period 1980-2019.[8] We use a system dynamic GMM estimator to control for a possible endogeneity between financial development and growth.

Following Sahay and others (2015), a quadratic functional form allows testing the bell-shaped relationship between financial development and growth. For the bell-shaped hypothesis to hold, coefficients β_2 and β_3

[6] Top five banks (ranked by assets) hold between 55 and 85 percent of system assets in the CCA (Teodoru and Akepanidtaworn, 2022),

[7] The data is taken from the Penn World Table version 10.0 database maintained by the University of Groningen (https://www.rug.nl/ggdc/productivity/pwt/?lang=en).

[8] We excluded AEs from the sample to have a comparable benchmark for the CCA countries, neither of which is AE. The results remain qualitatively unchanged when AEs are included. Some countries drop from the estimations due to absence of corresponding data from the Penn World Table.

should be positive and negative, respectively. Insignificant coefficient of the quadratic term (β3) would imply a linear relationship between the two variables.[9]

B. Estimation Results

Table 1 presents estimation results for financial development index, its sub-component financial institutions index, and three sub-indices of the financial institution index measuring depth, access, and efficiency.[10] Similar to Sahay and others (2015), we find evidence of a bell-shaped relationship between financial development and growth as the coefficients of the linear and quadratic terms are significant with positive and negative signs, respectively.[11] This implies that the overall financial development, and development of financial institutions, including their depth and access, contributes to growth up to a turning point.

To assess the room for CCA countries to boost growth through financial development, Figure 5 plots the bell-shaped relationship between the overall financial development index and growth and marks the location of individual CCA countries on this curve. As shown on the figure, all CCA countries lie on the left part of the bell-shaped curve well below the turning point in the relationship between financial development and growth. This suggests that there is further scope to boost growth through financial development in the CCA.

In addition, individual CCA countries with relatively lower level of financial development relative to their CCA peers could boost growth by converging to frontier CCA countries with highest level of financial development index (Georgia and Kazakhstan). The additional contribution to growth from convergence to the frontier level of financial development in the CCA is estimated at around 2.5 percent for the Kyrgyz Republic and Tajikistan, 1.5 percent for Azerbaijan, and 0.5 percent for Armenia and Uzbekistan.[12] An important caveat is that these are point estimates that are subject to uncertainty associated with the confidence bands around coefficient estimates.

These results should be interpreted with caution. As shown in Blancher and others (2019), greater financial inclusion supported by a larger role of the state is unlikely to yield large growth dividends. Therefore, more emphasis should be given to private sector financing, which remains quite low in some CCA countries and might bias regression estimates of gains from financial development. In addition, the analysis does not take into account institutional factors, such as strong governance, financial regulatory and supervisory capacity, credit information availability, modern collateral and insolvency frameworks, adequate enforcement of property rights, which are key for fostering growth dividends from financial development. Nevertheless, country fixed effects should capture to some extent the variation in institutional factors, since they tend to move slowly over time. Finally, the analysis does not capture the implications of fintech for financial development and inclusion, in part because fintech is not part of the financial development index used in this paper. Fintech has been developing rapidly in the CCA, especially following the COVID-19 pandemic, enhancing access to affordable financial services for unbanked populations and underserved SMEs and reducing costs in cross-border remittances. However, sustainable development of fintech requires enabling environment and need to balance financial

[9] In addition, the coefficient β_1 is expected to be negative, consistent with the growth convergence hypothesis (countries with lower initial level of income are expected to growth faster).

[10] The coefficient of lagged GDP per capita (β_1) is negative and significant in line with growth convergence hypothesis. We have not done estimations for the financial markets sub-component and its sub-indices, since the stylized facts suggest that financial markets are underdeveloped in the CCA countries and their relevance for growth is premature at this stage of development.

[11] Coefficients on the quadratic term of the index of efficiency of financial institutions are insignificant. Potential caveats are related to Sargan p-values, which are slightly below 0.1 in two specifications, and low AR2 p-value in column 3.

[12] The bell-shaped relationship estimates are comparable with Sahay and others (2015) results, according to which the inflection growth-maximizing point for the financial development index is in the range of 0.45 and 0.7 and it is compatible with 4-5.5 percent growth dividend. For example, they report that Ecuador could achieve 1.5 percent higher growth rate by converging to the financial development of Morocco or Poland.

innovation with risk management (Lukonga, 2018, Sahay and others, 2020). The impact of fintech on financial development and growth in the CCA requires further research.

C. Policy Recommendations

The empirical analysis suggests that there is scope to boost growth in the CCA through further financial development. In this section we discuss the country-specific financial development indicators that could be improved to achieve higher growth rates in the CCA.

Figure 6 presents selected financial development indicators in the CCA countries and compares them to respective medians in EM and LIC peers. The comparison provides the following insights:

- *Private sector credit/GDP*. Among EM CCAs, Azerbaijan and Kazakhstan are lagging behind the median EM, which could be due to deteriorated loan quality from mid-2010s and ongoing bank restructuring efforts. Among LICs, there is scope to improve this indicator in Tajikistan.

- *Pension fund assets/GDP*. Due to lack of data, this indicator is available only for three CCA countries, among which only Kazakhstan shows a level exceeding the EM median. There is scope to improve this indicator in the other two countries (Armenia and Georgia), fostering private pension schemes investing in domestic markets.

- *Life and non-life insurance premiums/GDP*. Again, this indicator is not available for all CCA countries. However, those CCA countries for which data exists show levels well behind their EM and LIC peers, suggesting that there is scope to expand the insurance sector in these countries.

- *Efficiency of financial intermediation*. As discussed above, several indicators are used to proxy efficiency (or inefficiency) of financial intermediation, such as net interest margins, lending-deposit spreads, non-interest income/total income, overhead costs/total assets, and returns on assets and equity. More efficient institutions are expected to have lower costs and generate more income and profits. However, high spreads and returns may also reflect weak competition in the financial sector,[13] while high non-interest income and overhead costs could point at greater reliance on non-core activities and less efficient financial intermediation. Therefore, these results should be interpreted to mean that efficiency could be improved by fostering competition in the financial industry (including through reduction of the role of state and promotion of fintech), reducing risks, and enhancing financial stability through strengthening banking supervision (Khandelwal and others, 2022; Teodoru and Akepanidtaworn, 2022).

To sum up, the comparison of financial development indicators suggests that these indicators vary widely across CCA countries and compared with EM and LIC peers. Improvement of financial development in the CCA requires country-specific approach that considers specific areas where individual countries are lagging and takes into account country-specific characteristics.

IV. Conclusions

This paper presents stylized facts on financial development in the CCA countries and assesses how financial development can boost growth in these countries. We draw on the financial development index from Sahay and others (2015) to assess how financial development has evolved in the CCA countries during 1993-2019 and how it compares to EM and LIC peers. We also re-estimate growth regressions for a sample of 134 EMs and

[13] See, for instance, empirical evidence from the Kyrgyz Republic in the Staff Report for the 2021 AIV Consultation (link, Annex V).

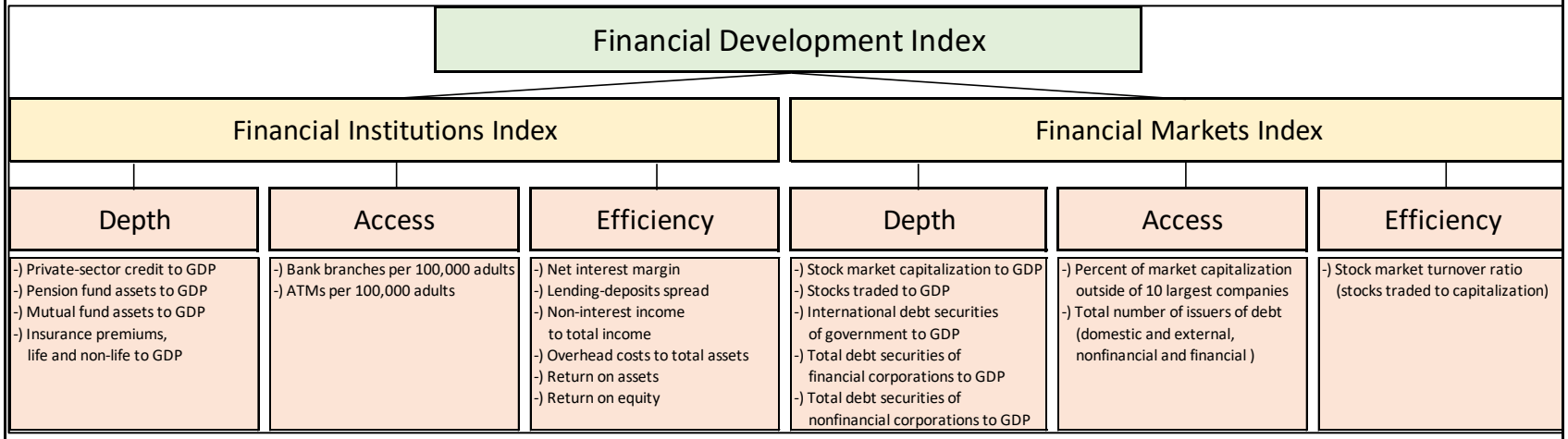
LICs using updated data on financial development through 2019 to establish a bell-shaped relationship between financial development and growth and locate CCA countries on this relationship.

We find that CCA countries have made progress with financial development following the independence in early 1990s. However, this progress has been uneven across individual countries and specific financial indicators. As a result, the level of financial development has diverged across CCA countries over time. There is also mixed performance in individual CCA countries relative to average financial development in peer EMs and LICs.

In terms of sub-components of financial development, most progress was made in terms of financial institutions, while financial markets remain underdeveloped in most CCA countries (except Kazakhstan). As for sub-indicators of development in financial institutions, the depth of financial intermediation remains relatively shallow and most CCA countries underperformed average EMs and LICs on this count over the 1993-2019 period. More progress was achieved in terms of access, where most CCA countries currently outperform average EMs and LICs. Finally, there is mixed performance in terms of efficiency, which fluctuated widely over time, across CCA countries, and in relation to average EMs and LICs.

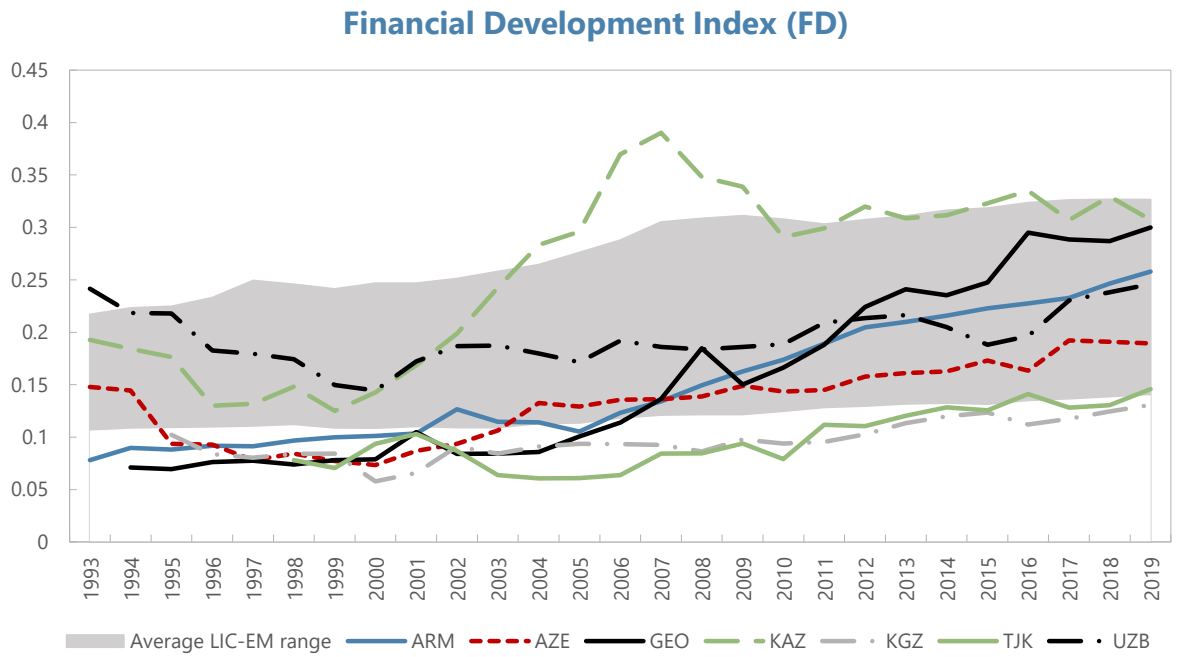
We also find that CCA countries lie on the left side of the bell-shaped relationship between financial development and growth, which means that growth can be boosted through improving financial intermediation. In particular, CCA countries with relatively lower level of financial development have scope to increase their annual growth rates between 0.5-2.5 percent by reaching the level of financial development of frontier CCA countries. This improvement could be achieved through country-specific measures targeting individual indices of financial development covering depth, access, and efficiency of financial intermediation.

Figure 1. Financial Development Index



Source: Sahay and others (2015), Svirydzenka (2016).

Figure 2. Financial Development Index in the CCA Countries



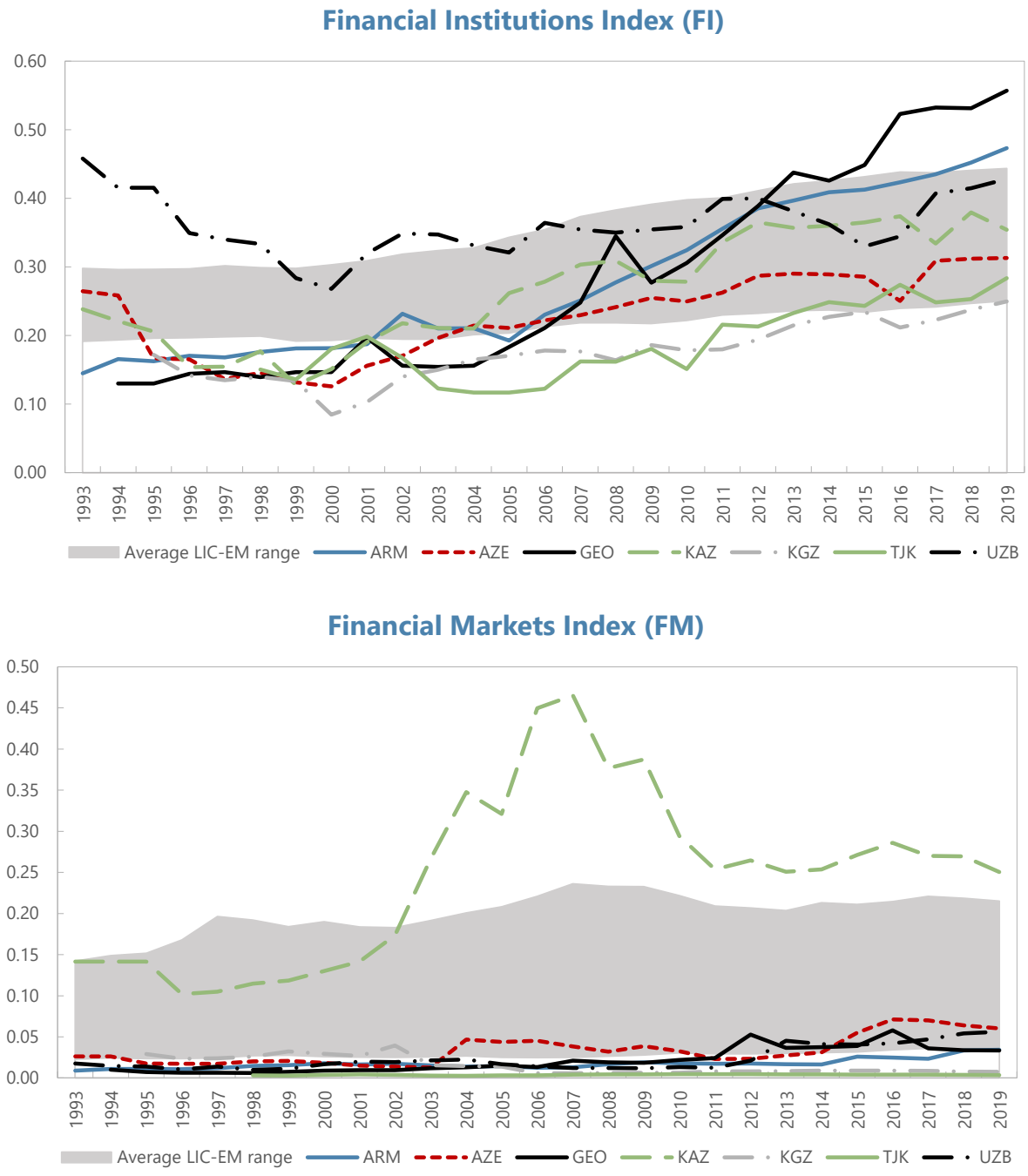
Source: Sahay and others (2015) and IMF Staff calculations.

Note: The shaded area shows the range between average LIC (bottom line) and average EM (upper line) in the total sample.

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.13	0.11	0.11	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20	0.21	0.22	0.22	0.23	0.23	0.25	0.26
GEO		0.07	0.07	0.08	0.08	0.07	0.08	0.08	0.10	0.08	0.08	0.09	0.10	0.11	0.14	0.18	0.15	0.17	0.19	0.22	0.24	0.24	0.25	0.30	0.29	0.29	0.30
KGZ			0.10	0.08	0.08	0.08	0.08	0.06	0.07	0.09	0.08	0.09	0.09	0.09	0.09	0.09	0.10	0.09	0.10	0.10	0.11	0.12	0.12	0.11	0.12	0.12	0.13
TJK						0.08	0.07	0.09	0.10	0.09	0.06	0.06	0.06	0.06	0.08	0.08	0.09	0.08	0.11	0.11	0.12	0.13	0.13	0.14	0.13	0.13	0.15
Energy exporters																											
AZE	0.15	0.14	0.09	0.09	0.08	0.08	0.08	0.07	0.09	0.09	0.11	0.13	0.13	0.14	0.14	0.14	0.15	0.14	0.15	0.16	0.16	0.16	0.17	0.16	0.19	0.19	0.19
KAZ	0.19	0.18	0.18	0.13	0.13	0.15	0.13	0.14	0.17	0.20	0.24	0.28	0.30	0.37	0.39	0.35	0.34	0.29	0.30	0.32	0.31	0.31	0.32	0.33	0.31	0.33	0.31
TKM						0.13	0.12	0.11	0.14	0.12	0.12	0.11	0.12	0.11	0.11	0.11	0.08	0.08	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10
UZB	0.24	0.22	0.22	0.18	0.18	0.17	0.15	0.14	0.17	0.19	0.19	0.18	0.17	0.19	0.19	0.18	0.19	0.19	0.21	0.21	0.22	0.20	0.19	0.20	0.23	0.24	0.25

Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

Figure 3. Financial Institutions and Financial Markets Indices in the CCA Countries



Source: Sahay and others (2015) and IMF Staff calculations.

Note: The shaded area shows the range between average LIC (bottom line) and average EM (upper line) in the total sample.

Figure 3 (concluded). Financial Institutions and Financial Markets Indices in the CCA Countries

Heatmap of financial institutions index (FI)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.14	0.17	0.16	0.17	0.17	0.18	0.18	0.18	0.19	0.23	0.21	0.21	0.19	0.23	0.25	0.28	0.30	0.32	0.36	0.39	0.40	0.41	0.41	0.42	0.43	0.45	0.47
GEO		0.13	0.13	0.14	0.15	0.14	0.15	0.15	0.20	0.16	0.15	0.16	0.18	0.21	0.25	0.34	0.28	0.31	0.35	0.39	0.44	0.43	0.45	0.52	0.53	0.53	0.56
KGZ			0.17	0.14	0.13	0.14	0.13	0.08	0.10	0.14	0.15	0.16	0.17	0.18	0.18	0.16	0.19	0.18	0.18	0.19	0.21	0.23	0.23	0.21	0.22	0.24	0.25
TJK						0.15	0.14	0.18	0.20	0.17	0.12	0.12	0.12	0.12	0.16	0.16	0.18	0.15	0.22	0.21	0.23	0.25	0.24	0.27	0.25	0.25	0.28
Energy exporters																											
AZE	0.26	0.26	0.17	0.17	0.14	0.15	0.13	0.13	0.16	0.17	0.20	0.21	0.21	0.22	0.23	0.24	0.25	0.25	0.26	0.29	0.29	0.29	0.29	0.25	0.31	0.31	0.31
KAZ	0.24	0.22	0.21	0.15	0.15	0.18	0.13	0.15	0.19	0.22	0.21	0.21	0.26	0.28	0.30	0.31	0.28	0.28	0.34	0.37	0.36	0.36	0.36	0.37	0.33	0.38	0.35
TKM						0.20	0.19	0.18	0.21	0.18	0.19	0.18	0.20	0.19	0.20	0.18	0.13	0.13	0.13	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18
UZB	0.46	0.42	0.42	0.35	0.34	0.33	0.28	0.27	0.32	0.35	0.35	0.33	0.32	0.36	0.35	0.35	0.35	0.36	0.40	0.40	0.38	0.36	0.33	0.34	0.41	0.41	0.43

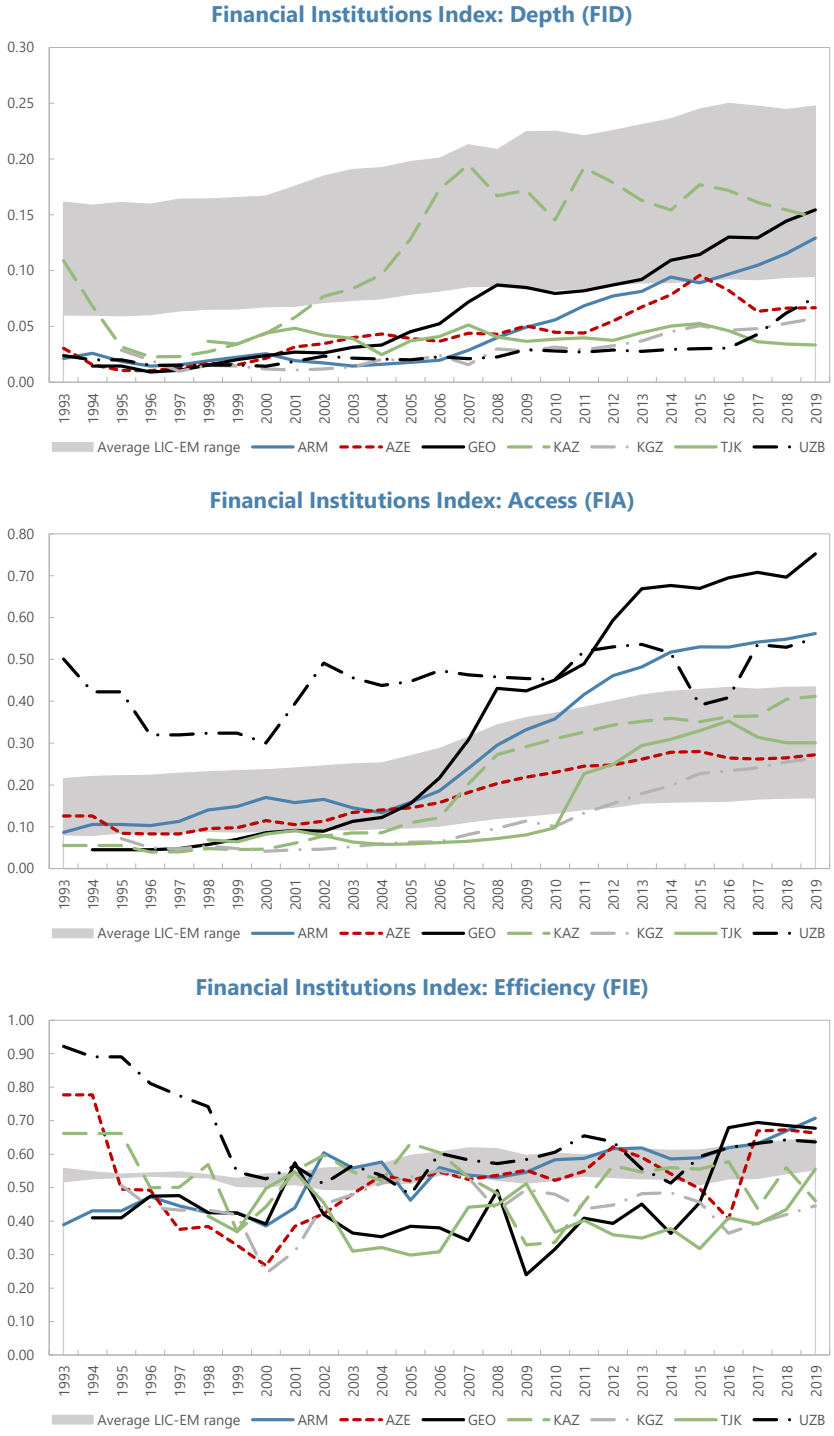
Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

Heatmap of financial institutions index (FI)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.03
GEO		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.04	0.04	0.04	0.06	0.04	0.03	0.03
KGZ			0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TJK						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy exporters																											
AZE	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.05	0.04	0.05	0.04	0.03	0.04	0.03	0.02	0.02	0.03	0.03	0.05	0.07	0.07	0.06	0.06
KAZ	0.14	0.14	0.14	0.10	0.10	0.11	0.12	0.13	0.14	0.17	0.27	0.35	0.32	0.45	0.47	0.38	0.39	0.29	0.25	0.26	0.25	0.25	0.27	0.29	0.27	0.27	0.25
TKM						0.05	0.04	0.03	0.06	0.05	0.05	0.04	0.03	0.03	0.02	0.03	0.04	0.04	0.04	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.02
UZB	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.04	0.04	0.04	0.05	0.05	0.06

Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

Figure 4. Sub-Indices of Financial Institutions Index in the CCA Countries



Source: Sahay and others (2015) and IMF Staff calculations.

Note: The shaded area shows the range between average LIC (bottom line) and average EM (upper line) in the total sample.

Figure 4 (concluded). Sub-Indices of Financial Institutions Index in the CCA Countries

Heatmap of financial institutions index: depth (FID)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.02	0.03	0.02	0.01	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.10	0.12	0.13
GEO		0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.05	0.05	0.07	0.09	0.08	0.08	0.08	0.09	0.09	0.11	0.11	0.13	0.13	0.14	0.15
KGZ			0.03	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.06
TJK						0.04	0.03	0.04	0.05	0.04	0.04	0.02	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.03	0.03
Energy exporters																											
AZE	0.03	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.05	0.07	0.08	0.10	0.08	0.06	0.07	0.07
KAZ	0.11	0.07	0.03	0.02	0.02	0.03	0.03	0.04	0.06	0.08	0.08	0.10	0.13	0.17	0.19	0.17	0.17	0.15	0.19	0.18	0.16	0.15	0.18	0.17	0.16	0.15	0.15
TKM																											
UZB	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.06	0.08

Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

Heatmap of financial institutions index: access (FIA)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.09	0.11	0.11	0.10	0.11	0.14	0.15	0.17	0.16	0.17	0.15	0.13	0.16	0.19	0.24	0.30	0.33	0.36	0.42	0.46	0.48	0.52	0.53	0.53	0.54	0.55	0.56
GEO		0.05	0.05	0.05	0.05	0.06	0.07	0.09	0.09	0.09	0.11	0.12	0.16	0.22	0.31	0.43	0.42	0.45	0.49	0.59	0.67	0.68	0.67	0.70	0.71	0.70	0.75
KGZ			0.07	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.08	0.10	0.11	0.10	0.13	0.16	0.18	0.20	0.23	0.23	0.24	0.26	0.26
TJK						0.07	0.06	0.08	0.09	0.08	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.10	0.23	0.25	0.29	0.31	0.33	0.35	0.31	0.30	0.30
Energy exporters																											
AZE	0.13	0.13	0.08	0.08	0.08	0.10	0.10	0.11	0.11	0.11	0.13	0.14	0.15	0.16	0.18	0.20	0.22	0.23	0.25	0.25	0.26	0.28	0.28	0.26	0.26	0.26	0.27
KAZ	0.06	0.06	0.06	0.04	0.04	0.05	0.05	0.05	0.06	0.08	0.09	0.09	0.11	0.12	0.20	0.27	0.29	0.31	0.33	0.34	0.35	0.36	0.35	0.36	0.36	0.40	0.41
TKM																											
UZB	0.50	0.42	0.42	0.32	0.32	0.32	0.32	0.30	0.39	0.49	0.46	0.44	0.45	0.47	0.46	0.46	0.45	0.45	0.52	0.53	0.54	0.52	0.39	0.41	0.54	0.53	0.55

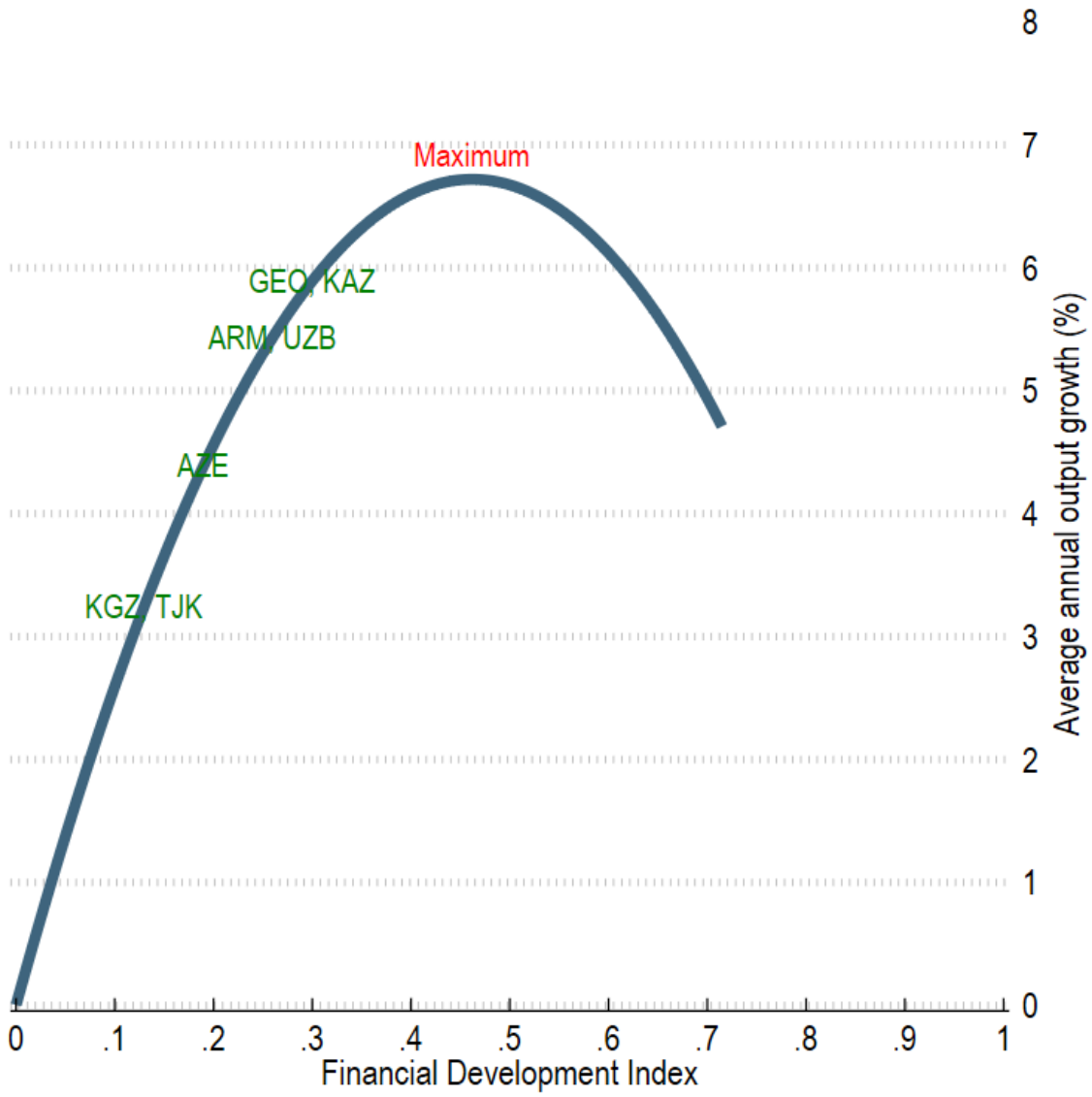
Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

Heatmap of financial institutions index: efficiency (FIE)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy importers																											
ARM	0.39	0.43	0.43	0.47	0.45	0.43	0.43	0.39	0.44	0.60	0.56	0.58	0.46	0.56	0.54	0.53	0.55	0.58	0.59	0.62	0.62	0.59	0.59	0.62	0.63	0.67	0.71
GEO		0.41	0.41	0.47	0.48	0.43	0.42	0.39	0.57	0.42	0.36	0.35	0.38	0.38	0.34	0.49	0.24	0.32	0.41	0.39	0.45	0.36	0.46	0.68	0.69	0.69	0.68
KGZ			0.51	0.44	0.43	0.43	0.42	0.24	0.31	0.45	0.48	0.51	0.53	0.55	0.53	0.43	0.49	0.48	0.44	0.45	0.48	0.48	0.46	0.36	0.39	0.42	0.45
TJK						0.42	0.37	0.50	0.55	0.46	0.31	0.32	0.30	0.31	0.44	0.45	0.51	0.37	0.40	0.36	0.35	0.38	0.32	0.41	0.39	0.43	0.55
Energy exporters																											
AZE	0.78	0.78	0.50	0.49	0.38	0.38	0.33	0.27	0.38	0.42	0.48	0.54	0.52	0.55	0.52	0.54	0.55	0.52	0.55	0.62	0.59	0.54	0.50	0.41	0.67	0.67	0.66
KAZ	0.66	0.66	0.66	0.50	0.50	0.57	0.37	0.44	0.55	0.60	0.55	0.52	0.63	0.60	0.53	0.48	0.33	0.34	0.46	0.57	0.55	0.56	0.55	0.58	0.44	0.56	0.46
TKM						0.78	0.76	0.72	0.82	0.71	0.76	0.69	0.77	0.73	0.76	0.72	0.50	0.51	0.53	0.74	0.76	0.76	0.71	0.72	0.72	0.71	0.71
UZB	0.92	0.89	0.89	0.81	0.77	0.74	0.55	0.53	0.56	0.51	0.57	0.54	0.48	0.60	0.58	0.57	0.58	0.61	0.65	0.64	0.56	0.51	0.59	0.62	0.63	0.64	0.64

Note: Color coding is centered around the median denoted in yellow, with higher numbers marked green and lower numbers marked red.

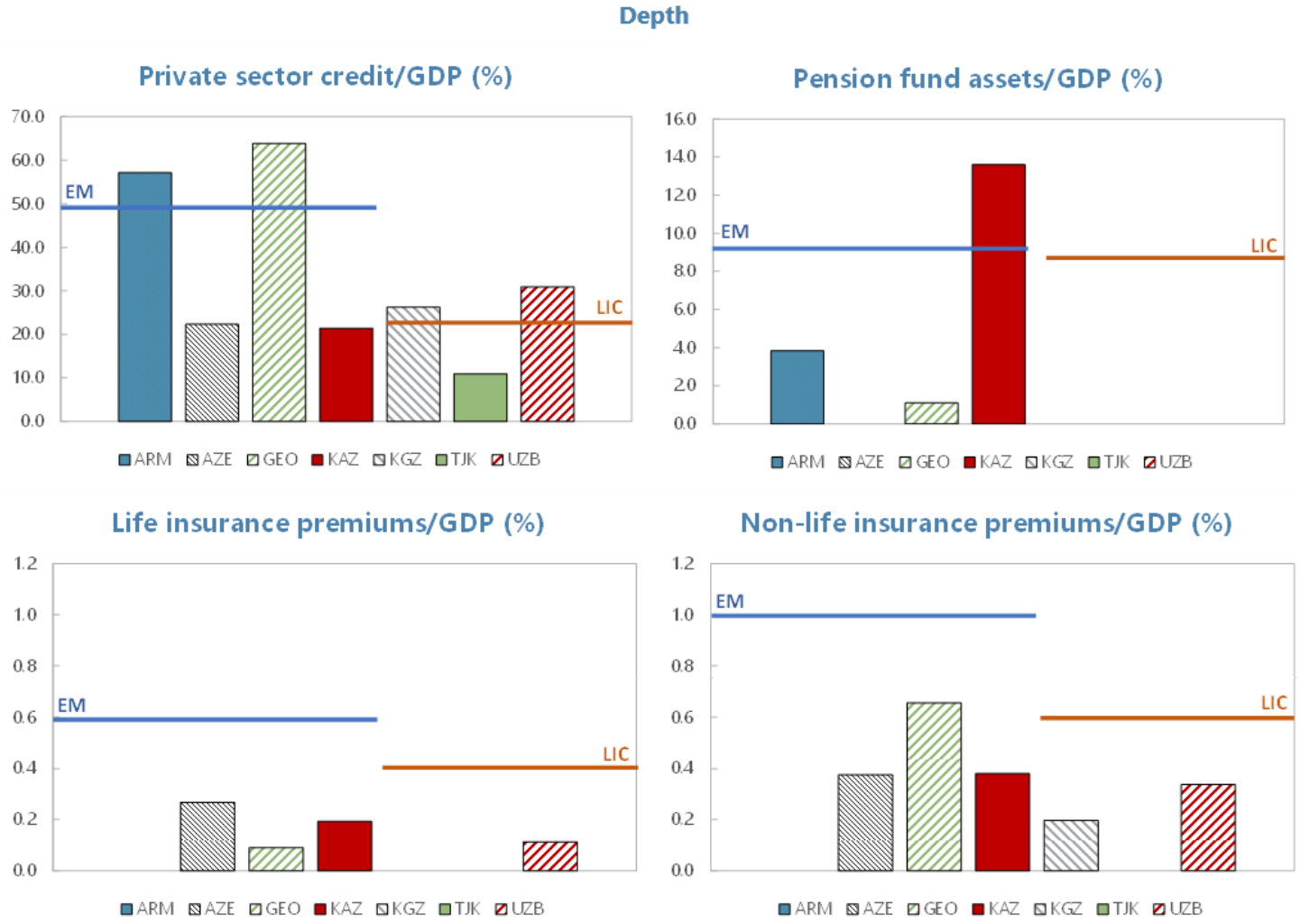
Figure 5. Bell-Shaped Relationship between Financial Development and Growth



Source: Sahay and others (2015), Penn World Table 10.0, and IMF Staff calculations.

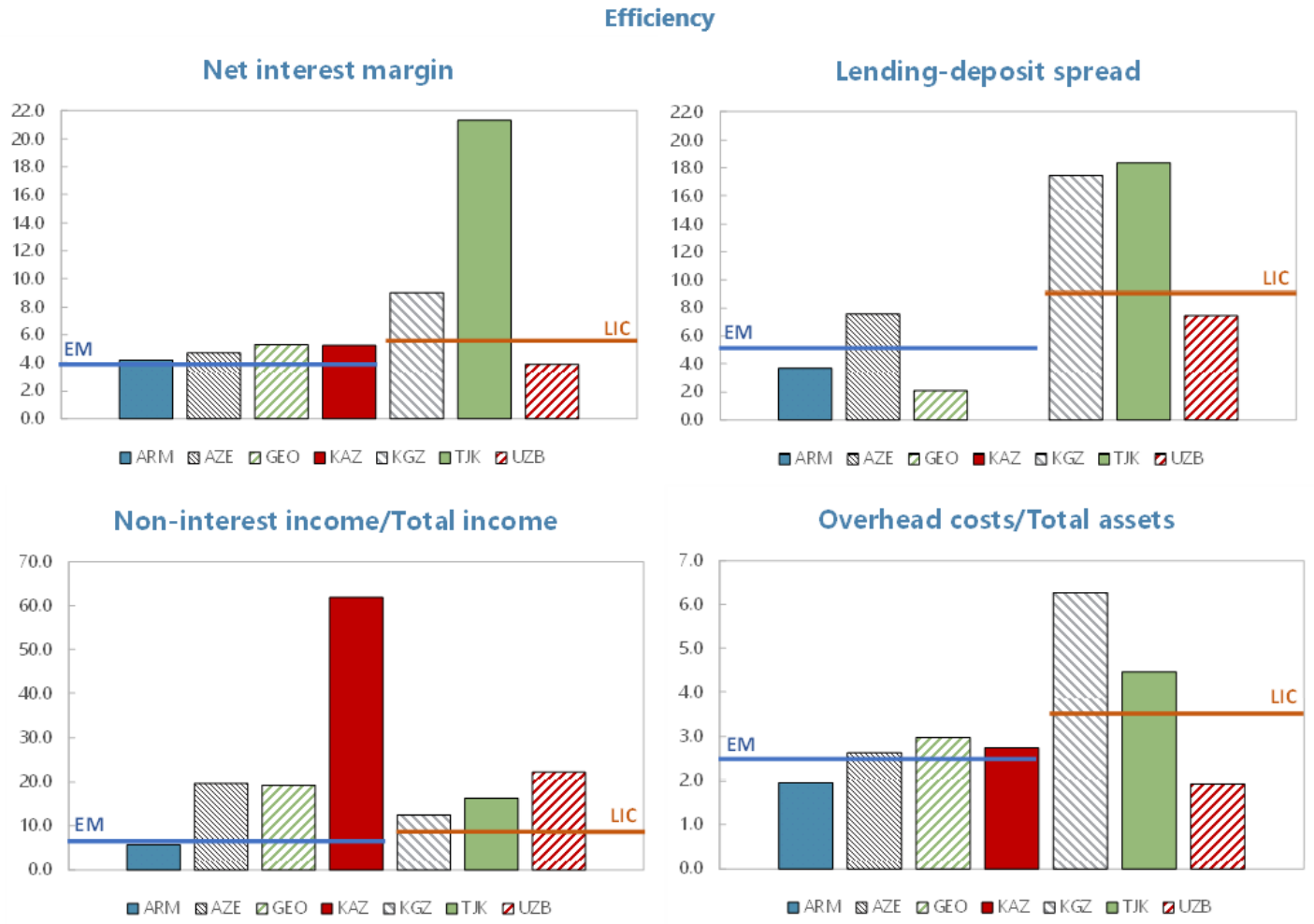
Note: Reported is a bell-shaped relationship between financial development and growth using coefficients of GMM regressions estimated above. CCA countries are placed on the curve based on the latest values of their financial development indicator in 2019. "Maximum" shows the turning point in the relationship between financial development and growth.

Figure 6. Selected Financial Development Indicators: CCA versus EM and LIC peers, 2019



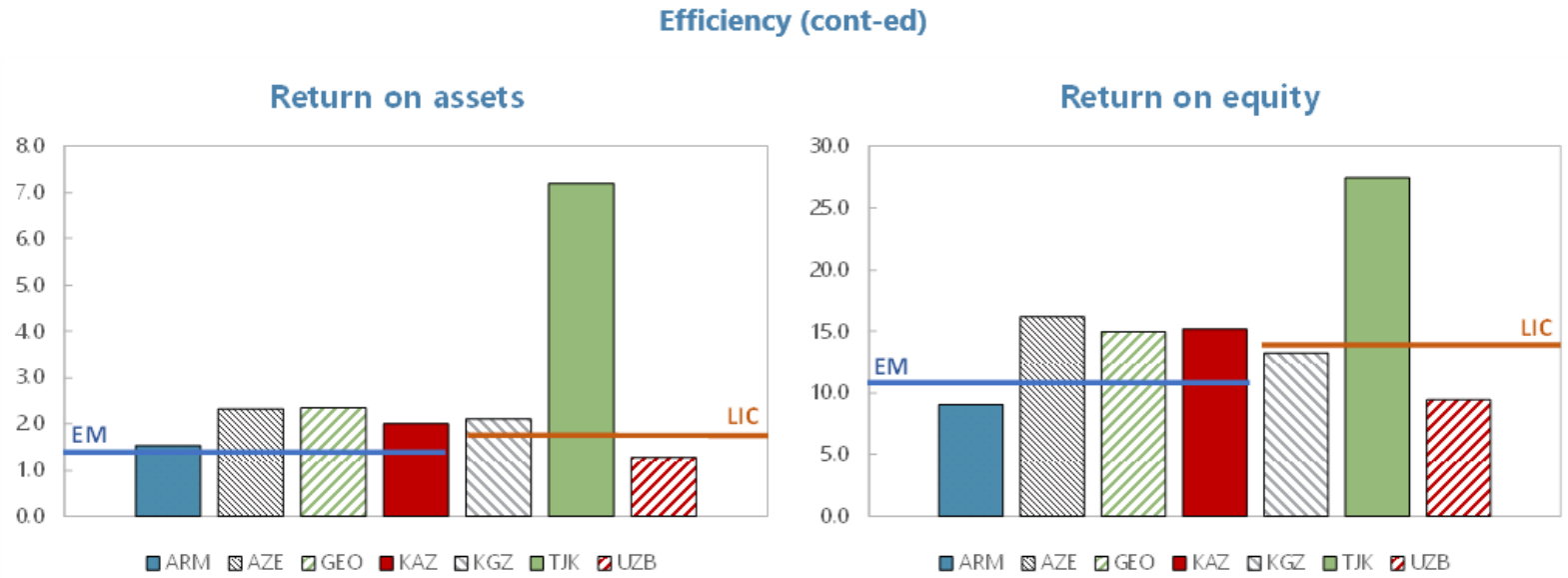
Source: IMF Staff calculations. EM and LIC denote median indicators for EM and LIC countries. Absence of a bar means missing data.

Figure 6 (cont-ed). Selected Financial Development Indicators: CCA versus EM and LIC peers, 2019



Source: IMF Staff calculations. EM and LIC denote median indicators for EM and LIC countries. Absence of a bar means missing data.

Figure 6 (concluded). Selected Financial Development Indicators: CCA versus EM and LIC peers, 2019



Source: IMF Staff calculations. EM and LIC denote median indicators for EM and LIC countries. Absence of a bar means missing data.

Table 1. Estimation Results

	(1)	(2)	(3)	(4)	(5)
Lagged GDP per capita	-8.225***	-5.829***	-7.652***	-6.488***	-14.349***
	(0.625)	(0.410)	(0.405)	(0.279)	(0.700)
Education (secondary enrollment)	0.042***	0.049***	0.108***	0.014	-0.006
	(0.016)	(0.017)	(0.016)	(0.013)	(0.023)
Foreign direct investment/GDP	0.075	0.081**	0.052*	0.084***	0.120**
	(0.050)	(0.038)	(0.028)	(0.030)	(0.056)
Government consumption/GDP	-0.026	0.062**	0.180***	0.033	-0.051
	(0.047)	(0.027)	(0.029)	(0.027)	(0.046)
CPI inflation	0.004***	-0.000	-0.001	-0.000***	0.004***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Trade/GDP	0.032***	0.030***	0.050***	0.025***	-0.000
	(0.010)	(0.009)	(0.005)	(0.005)	(0.011)
FD	29.084***				
	(10.795)				
FD^2	-31.470**				
	(14.167)				
FI		69.474***			
		(8.639)			
FI^2		-62.133***			
		(9.784)			
FID			21.778***		
			(3.294)		
FID^2			-22.695***		
			(2.378)		
FIA				19.058***	
				(3.398)	
FIA^2				-21.497***	
				(2.978)	
FIE					7.892
					(8.214)
FIE^2					-0.600
					(7.856)
Constant	55.751***	37.549***	52.491***	47.907***	108.358***
	(4.370)	(2.823)	(3.238)	(2.104)	(8.983)
Observations	433	436	509	431	372
Number of countries	114	114	115	113	104
AR2 p-value	0.719	0.685	0.0277	0.601	0.395
Sargan p-value	0.080	0.110	0.0949	0.344	0.225

Note: Estimations are performed using the system dynamic panel GMM, with a financial development indicator set as endogenous variable and two lags for instruments. The dependent variable is the 5-year average real GDP per capita growth. Financial development indicators are abbreviated as follows:
FD = financial development,
FI = financial institutions,
FID = financial institutions depth,
FIA = financial institutions access, and
FIE = financial institutions efficiency.
*** p<0.01, ** p<0.05, * p<0.1.

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