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A Confidence-Financial Inclusion Nexus in the Caucasus and Central Asia?

Prepared by Kalin Tintchev and Kady Keita

WP/YY/XX

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Authorized for distribution by Nicolas Blancher and Iva Petrova
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ABSTRACT: We document novel evidence that confidence in macrofinancial stability has a positive impact on financial inclusion in CCA countries and more broadly. This channel is particularly important for CCA countries, with confidence gains of 1 unit leading to 0.7 unit improvement in financial inclusion. Institutional factors such as level of governance and reliance on transparent policy rules and robust financial safety nets explain a large fraction of the variability in confidence in the region. We find that governance reforms are critical for deepening financial inclusion while the impact of inflation targeting, fiscal rules and deposit insurance schemes is positive and material only when governance levels exceed certain thresholds.

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WORKING PAPERS

A Confidence-Financial Inclusion Nexus in Caucasus and Central Asia?

Prepared by Kalin Tintchev and Kady Keita[1]

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Contents

I. INTRODUCTION 3

II. CONFIDENCE-FINANCIAL INCLUSION NEXUS 4

III. STYLIZED FACTS 5

IV. EMPIRICAL ANALYSIS 7

IV. BUILDING SUPPORTIVE INSTITUTIONS 10

V. CONCLUSION 11

ANNEX I. ROBUSTNESS ANALYSIS 12

ANNEX II. GOVERNANCE AND DEPOSITOR PROTECTION 13

ANNEX III. SYNTHETIC CONTROL CASE STUDIES 15

REFERENCES 20

I. Introduction

Financial inclusion, defined as the level of access and use of financial services by households and firms, is essential to fostering more sustainable and inclusive growth. Financial inclusion incentivizes economic agents to shift away from short-term decision making towards a more efficient intertemporal allocation of resources, thereby promoting increased savings, reduced reliance on self-financing, enhanced incentives for productive investments, and deeper markets for goods and services (Rojas-Suarez and Amado, 2014).

Despite progress made over the last decade, closing financial inclusion gaps, especially with respect to financial deepening, remains a key challenge for the Caucasus and Central Asia (CCA) countries. The 2021 Findex Survey found trust in banks to be a major barrier to bank account penetration in the region. In fact, multiple external shocks over the last decade have resulted in economic and financial distress, putting confidence in the CCA's macroeconomic policy and institutional frameworks to the test.

Public confidence in banking institutions and the broader economy is an important driver of demand and supply of financial services. In the presence of asymmetric information, banking is inevitably based on trust. Higher levels of confidence in banks enhance financial inclusion by bolstering demand for formal bank savings (Allen and others, 2016). Confidence is however fragile, especially in the aftermath of macro-financial crises, and once lost, it is difficult to recover. Globally, past confidence crises have been associated with contagious bank runs and durable retrenchment in financial intermediation.

A growing body of literature has examined the development policy drivers of financial inclusion, but the confidence-financial inclusion nexus remains relatively unexplored, to the best of our knowledge. Existing research has highlighted the interlinkages between financial inclusion, growth, and stability. Sahay and others (2015) and Čihák and others (2016) document a non-linear relationship between financial inclusion and financial stability at the global level. Khera and others (2021) and Aguilar and others (2024) underscore the benefits of digital financial inclusion for economic growth. Blancher and others (2019) show that enhanced financial inclusion of small and medium-sized enterprises has a robust positive impact on growth in CCA countries. Poghosyan (2022; 2023) find that human development and the rule of law are essential for financial inclusion in the CCA region.

This paper addresses this gap by examining the nexus between public confidence and financial inclusion in the CCA region. We look at both confidence in banks and the broader economy as they are inextricably linked and employ innovative empirical modeling and case studies to investigate their key drivers. Our findings indicate that financial inclusion in CCA countries is particularly sensitive to confidence effects, with institutional drivers of confidence such as governance and policy transparency playing a much larger role relative to global peers.

Confidence hinges on broad-based improvements to institutional quality and greater reliance on transparent policy frameworks and robust financial safety nets. Importantly, we find that the effects of inflation targeting, fiscal rules and deposit insurance on financial inclusion depend in a non-linear fashion on the level of governance. Their positive effects on financial inclusion are reinforced by better governance but eroded by governance slippages. Consequently, advancements in governance are key to unlocking the benefits of policy rules and financial safety nets for financial inclusion and should be at the forefront of future reforms.[1]

The remainder of this paper is organized as follows. Section II provides a brief overview of related literature. Section III presents stylized facts. Section IV discusses the empirical analysis. Section V focuses on policy implications. Section VI concludes. Additional econometric analysis, robustness tests and case studies based on synthetic control methods are presented in Annexes I-III.

[1] See also Gigineishvili and others (2023).

II. Confidence-Financial Inclusion Nexus

Unlike previous research, the paper focuses on confidence in macro-financial stability as opposed to trust in individual financial institutions. Public distrust in banks is one of the micro-level barriers to financial inclusion measured by Gallup's Global Findex Survey. Using Findex data, Allen and others (2016) identify trust in banks as an important determinant of account ownership for individual bank users. We aim to extend the literature by examining the macro-level relationship between financial inclusion and public confidence in macro-financial stability. Our approach is based on the premise that bank-specific risk is diversifiable, and the public at large would be first and foremost concerned about systemic risks to macro-financial stability.[2]

We model confidence in macro-financial stability as a function of sentiment and policy uncertainty. In line with the literature, we view sentiment about the economy as primarily driven by conjunctural factors such as income level, GDP growth, inflation, occurrence of banking crises, and progress in market-based reforms such as trade openness and capital account liberalization (Nowzohour and Stracca, 2017; Chernykh and others, 2023). Importantly, we focus on the forward-looking, policy dimension of confidence and posit that it is driven by the degree of uncertainty over the actions policy makers will take and how they will affect the economy.

Economic policy uncertainty affects confidence through multiple channels. Uncertainty over future macroeconomic policies and outcomes would weaken public confidence in banks, reducing demand for formal bank savings. In addition, policy uncertainty can incentivize banks to reduce their risk exposure by supplying fewer financial services to firms and households (Berger and others, 2020). Reduced policy uncertainty, on the other hand, can foster financial inclusion, among others, through its positive effects on banking stability (Shabir and others, 2021), financial system efficiency (Aman and others, 2024), cross-border capital flows (Alok and others, 2022) and the risk premium required by financial institutions (Ali and others, 2022).

Strong institutional and policy environments are key to promoting confidence in macro-financial stability.[3] Good governance mitigates economic policy uncertainty (Večeřová, 2023). Among monetary policy rules, inflation targeting has emerged as a strong commitment device to systematic and rational monetary policy based on transparency and accountability (Svensson, 1999). Inflation targeting supports financial inclusion by promoting transparency and ensuring that interest rates offer adequate real returns (Boyd and others, 2001; Dunbar and Li, 2019). Fiscal rules foster financial inclusion by improving sovereign risk perceptions and fiscal transparency (Fernandez and Parro, 2019; Trabelsi, 2023) and reducing deficit bias, the public debt burden, and the crowding out of private credit (Hauner, 2006; Grembi and others, 2016; Brändle and Elsener, 2018).

Adherence to transparent policy rules and regulations is essential to limit the room for political interference and distorted incentives. Likewise, strong banking supervision, regulation, and depositor protection are key to supporting confidence in banks, particularly in turbulent times (Anginer and others, 2014; Davison and Ramirez, 2016). While the literature has overall examined various governance aspects of financial inclusion in the CCA region, the policy rule and depositor protection angles, as well as their interactions with the level of governance, have been explored to a lesser extent.

Sound governance and transparency can bolster confidence not only directly but also indirectly by lending credibility to rules-based policy frameworks and financial safety nets. Improved central bank governance and transparency are critical to ensure a positive effect of inflation targeting on banking resilience and capital inflows (Mishra and Dubey, 2022). Likewise, deposit insurance schemes can have a negative effect on financial development in lax regulatory environments but a positive effect in sound regulatory environments (Cull and

[2] This approach also helps overcome the limitations of Findex survey data which are available for a short time span.

[3] Inflation targeting and fiscal rules could also affect confidence and financial inclusion indirectly through their positive concurrent effects on inflation, real GDP growth and financial stability (Khan and others, 2006; Guerguil and others, 2017; Romdhane and others, 2023). These effects are captured in the econometric analysis by the conjunctural macro-financial controls.

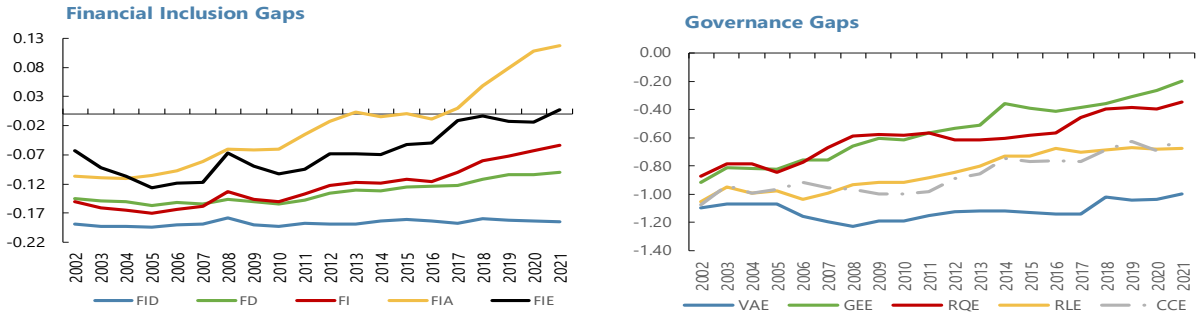
others, 2003; Demirgüç-Kunt and Detragiache, 2002). Last but not least, fiscal rules can lead to good or bad fiscal outcomes, depending on the level of budget transparency (Milesi-Ferretti, 2000).

III. Stylized Facts

Our dataset covers key dimensions of financial inclusion. The literature defines financial inclusion as the extent to which "individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way."[4] To gauge the level of financial inclusion, we avail ourselves of a composite financial institution development index (FI) proposed by Sahey and others (2015) and its three subcomponents which capture the key aspects of banking services outlined above: (i) financial institution access (FIA), (ii) financial institution depth (FID), and (iii) financial institution efficiency (FIE). We use the composite financial institution index as our primary financial inclusion variable for the econometric analysis. For robustness, we also utilize the broader financial development index which includes a financial market component (Svirydzenka, 2016).

In addition, we utilize granular data on governance from the World Bank Worldwide Governance Indicators (WGI). The World Bank defines governance as "the traditions and institutions by which authority in a country is exercised, notably (i) the process by which governments are selected, monitored and replaced; (ii) the capacity of the government to effectively formulate and implement sound policies; and (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them" (Kaufman and others, 2010). Using principal component analysis, we derive a composite governance index from the six dimensions of governance covered by the WGI: voice and accountability (VAE), political stability (POS), government effectiveness (GEE), regulatory quality (RQE), rule of law (RLE) and control of corruption (CCE).

Figure 1. Financial Inclusion and Governance Gaps in CCA Countries



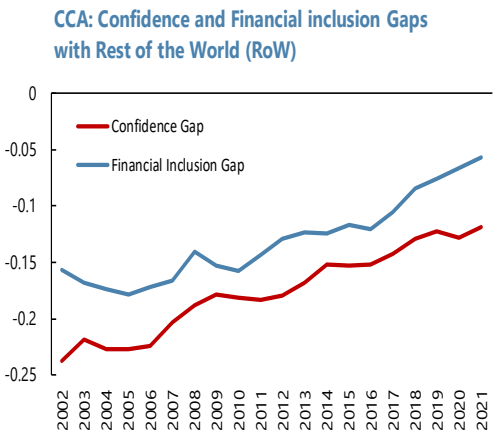
Sources: IMF Financial Development Database and World Bank Worldwide Governance Database; authors' calculations.

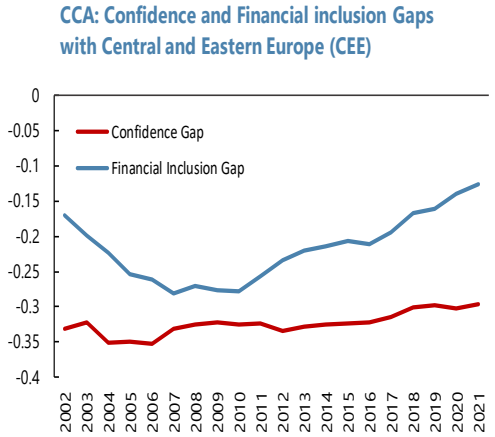
Note: The financial inclusion (governance) gaps measure the difference between the financial inclusion (governance) indices for each CCA country (specified below) and their respective averages for the rest of the world. A negative (positive) gap implies that CCA countries are behind (ahead) of the global average on a particular dimension of financial inclusion (governance).

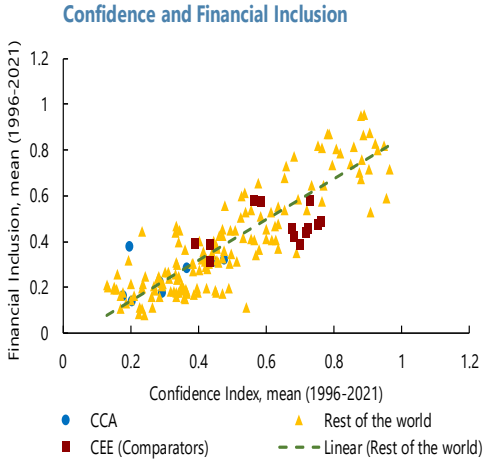
FID: Financial institution depth; FD: Financial development; FI: Financial institutions; FIA: Financial institution access; FIE: Financial institution efficiency. VAE: Voice and accountability; GEE: Government effectiveness; RQE: Regulatory quality; RLE: Rule of law; CCE: Control of corruption.

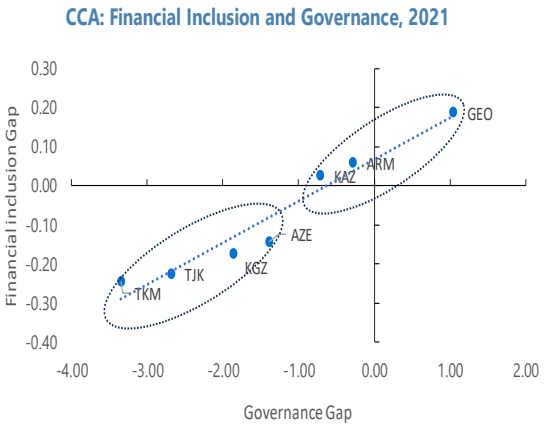
[4] See World Bank https://www.worldbank.org/en/topic/financialinclusion/overview.

Figure 2. Financial Inclusion and Confidence in CCA Countries









Sources: IMF Financial Development Database, World Bank Worldwide Governance Database; authors' calculations.

Despite progress over the last decade, CCA countries still lag global peers on key financial inclusion and governance dimensions. To benchmark financial inclusion against a global yardstick, we calculate the gaps between the average CCA financial inclusion indexes and the global average. The analysis shows that although the level of access to financial services in CCA countries has surpassed the global average, financial inclusion is held back by below average financial institution depth and overall financial development (Figure 1). Likewise, benchmarking the governance gaps indicates that CCA countries remain behind global peers on key governance dimensions, notably voice and accountability, rule of law and control of corruption.

Across CCA countries, there is strong positive correlation between financial inclusion and key governance and policy dimensions of confidence. Plotting the composite financial inclusion and governance gaps in Figure 2 reveals two country clusters - one with smaller financial inclusion and governance gaps (Armenia, Georgia, Kazakhstan), and the other with larger financial inclusion and governance gaps (Azerbaijan, the Kyrgyz Republic, Tajikistan, and Turkmenistan) It is noteworthy that all countries in the first cluster have put in place inflation targeting regimes and fiscal rules while reliance on policy rules is more limited in the second cluster where only two countries have introduced fiscal rules (Azerbaijan and Turkmenistan).

Combining the governance and policy dimensions of confidence in a composite confidence index indicates a strong positive correlation between confidence and financial inclusion, both in CCA countries and globally. Using a principal component analysis, we derive a composite confidence index from (i) the six governance indicators outlined above, (ii) two binary variables equal to 1 in periods of inflation targeting and deposit insurance schemes, and a fiscal rule index reflecting key fiscal rule characteristics, based on Davoodi and others (2022). We see decreasing but persistent confidence gaps relative to both the rest of the world and Central and Eastern Europe (CEE) and strong positive correlation between confidence and financial inclusion.[5]

IV. Empirical Analysis

Composite confidence indicator

Drawing on the stylized facts above, we start our analysis by estimating the following baseline panel model:

$$FI_gap_{i,t} = \alpha + \beta Confid_gap_{i,t} + \sum_{k=1}^{n} \theta_k X_{i,t,k} + n_i + \varepsilon_{i,t} \quad (1)$$

where $FI_gap_{i,t}$ is the gap between the financial institution (FI) index and its global average in country *i* and year *t*; $Confid_{gap_{i,t}}$ is the gap between the confidence index defined above and its global average and $X_{i,t,k}$ is a vector of *k* control variables, including detrended real GDP growth, inflation, a banking crisis dummy, a trade openness index[6], the Chinn-Ito capital account liberalization index, the UN human development index, and the ratios of bank concentration and overhead cost to total assets.[7] The model is estimated on annual data for the period 1996-2021, using the Hausman-Taylor instrumental variable estimator (Hausman and Taylor, 1981) where the financial inclusion and confidence gaps are treated as endogenous variables.

As expected, the impact of confidence on financial inclusion is positive and significant. Consistently across the model specifications for the overall financial inclusion gap and its underlying components (access, depth and efficiency) the impact of confidence on financial inclusion is statistically significant, and considerably stronger for the CCA region relative to global peers (Table 1). A 1-point decline in the confidence gap reduces the financial inclusion gap in the CCA region and the global sample by 0.739 points and 0.289 points, respectively.

[5] The confidence index is normalized to vary between 0 and 1 by subtracting the minimum from each observation and dividing by the new maximum.

[6] The trade openness variable is defined as the ratio of imports and exports over GDP.

[7] The macroeconomic variables are sourced from the World Bank World Development Indicators (WDI), the banking variables from the World Bank Global Financial Development Database and the human development index from the UNDP database.

Table 1. Model Estimates: Composite Confidence Index

	Financial Inclusion Gap		Financial Access Gap		Financial Depth Gap		Financial Efficiency Gap	
	CCA sample	Global sample	CCA sample	Global sample	CCA sample	Global sample	CCA sample	Global sample
Confidence Gap	**0.739*** **	**0.289*** **	**1.384*** **	**0.401*** **	**0.114** **	**0.139*** **	**0.329***	**0.193*** **
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	140	2605	168	2605	168	2605	168	2605
Countries	8	150	8	150	8	150	8	150

* p<0.05, ** p<0.01, *** p<0.001

Source: Authors' estimates.

Note: Full estimates including control variables available upon request. The composite confidence index is normalized to vary between 0 and 1 and the estimates are not comparable to the estimates for its underlying components in Table 2.

Table 2. Model Estimates: Institutional and Policy Drivers of Financial Inclusion

	Financial Institution Gap		Financial Development Gap	
	CCA Sample	Global Sample	CCA Sample	Global Sample
Governance gap (GG)	**0.023*** **	**0.021*** **	**0.023*** **	**0.009*** **
Deposit Insurance (DI) [I]	0.057***	0.012***	0.036***	0.004
Interaction GG x DI	0.021***	0.008***	0.014***	0.003***
Inflation Targeting (IT) [I]	0.080***	0.041***	0.028**	0.027***
Interaction GG x IT	0.049***	0.023	0.027**	0.012***
Fiscal Rule (FR) [I]	0.036**	0.017***	0.007	0.003
Interaction GG x FR	0.017**	0.004***	0.005	0.001
Controls	Yes	Yes	Yes	Yes
Observations	176	3,372	176	3,372
Countries	8	159	8	159

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' estimates.

Note: Full estimates including control variables available upon request.

Pivotal role of governance

We extend the baseline model to explore the differentiated impacts on financial inclusion of the underlying components of the composite confidence index, as well as their synergies and interactions:

$$FI_gap_{i,t} = \psi Gov_gap_{i,t} + \sum_{k=1}^{m} \lambda_k \, Gov_gap_{i,t} \text{ x } POL_{i,t,k} + \sum_{k=1}^{m} \mathrm{Z}_k \, POL_{i,t,k} + \sum_{k=1}^{n} \theta_k X_{i,t,k} + n_i + \varepsilon_{i,t} \qquad (2)$$

where $FI_gap_{i,t}$ is the financial inclusion gap in country *i* and year *t,* as defined in the previous section, $Gov_gap_{i,t}$ is the gap between the first principal component of the six governance indexes and its global average;[8] $POL_{i,t,k}$ is a vector of *k* binary variables equal to 1 in periods of reliance on inflation targeting, fiscal rules and deposit insurance schemes and zero otherwise, and $X_{i,t,k}$ is a vector of *k* control variables.[9]

In the model, the overall effects of governance, policy rules and deposit insurance on financial inclusion are impacted by their mutual interactions. The overall effect of a change in the governance gap is given by the partial derivative: $\psi + \sum_{k=1}^{m} \lambda_k \, POL_{i,t,k} \; (k = 1 \ldots 3)$. In this expression, the direct effect of governance is amplified by the presence of inflation targeting, fiscal rules and deposit insurance schemes. Likewise, the overall effect of inflation targeting, fiscal rules and deposit insurance is each equal to $\mathrm{Z}_k + \lambda_k Gov_gap_{it}$ where the governance gap can take positive or negative values. As in the previous section, we use the Hausman Taylor instrumental variable estimator, treating financial inclusion, the governance gap and the policy dummies as endogenous variables. We address endogeneity in more detail in Annex I.

All underlying drivers of confidence show robust positive direct effects on financial inclusion (Table 2). If we abstract from the interaction terms, an improvement in the governance gap of 1 standard deviation would reduce the average CCA financial institution gap by about 22 percent. Likewise, a commensurate and simultaneous improvement in CCA countries' reliance on inflation targeting, fiscal rules and deposit insurance schemes would narrow the CCA financial institution gap by about 50 percent. Importantly, the CCA countries show greater sensitivity to confidence effects relative to their global peers. Confidence effects also appear to matter more for the financial institution development gap rather than the overall financial development gap.

The overall effects of inflation targeting, fiscal rules and deposit insurance frameworks on financial inclusion vary with the level of governance. While large positive governance gaps would bolster the credibility and effectiveness of these frameworks, with positive implications for financial inclusion, large negative governance gaps could hamper their ability to support financial inclusion. The estimates suggest that the overall effects of inflation targeting, fiscal rules and deposit insurance schemes on financial inclusion would be positive when the governance gap exceeds the -1.6, -2.1 and -2.7 thresholds, respectively, and negative otherwise.[10]

Fitting the model to different governance dimensions shows that financial inclusion appears particularly sensitive to enhancements to the rule of law, regulatory quality, and control of corruption (Figure 3). In addition, across the interactions of governance with policy rules and financial safety nets, we find strong synergies between the rule of law and inflation targeting; government effectiveness and fiscal rules; and control of

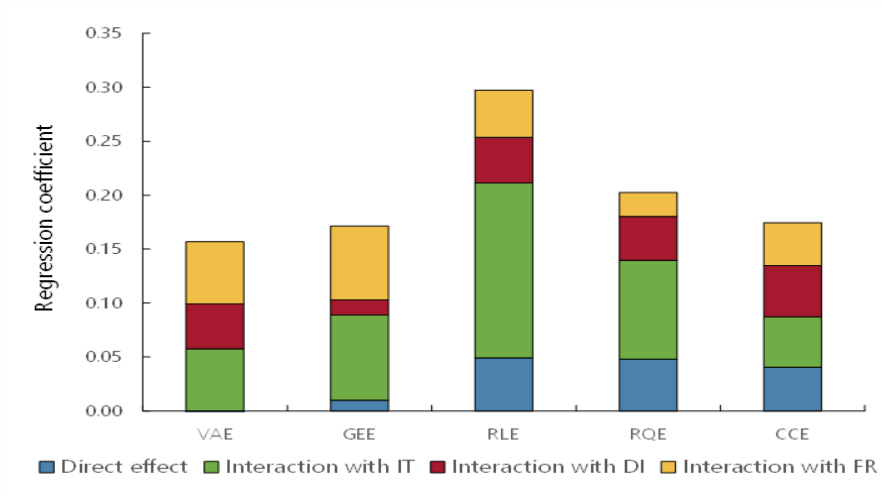
[8] The financial inclusion and governance gaps are positive (negative) if their levels are above (below) the global average.

[9] Control variables include detrended GDP per capita (PPP), inflation, a banking crisis dummy, the trade openness index (exports and imports over GDP), and the Chinn-Ito capital account liberalization index which is defined as a country average to satisfy the requirement of the Hausman-Taylor specification for at least one time-invariant variable. Similar results are obtained when real GDP growth, the change in the UN human development index and the financial literacy ratio (S&P Global Financial Literacy Survey) are added as additional controls.

[10] The 2021 governance levels in Armenia, Azerbaijan, Georgia, and Kazakhstan appear to be above these thresholds. While governance levels in most CCA countries appear above the deposit insurance threshold, further improvements in governance gaps of about 0.5 standard deviations on average would be required in the other CCA countries to ensure that the introduction of inflation targeting and fiscal rules would have positive effects on financial inclusion.

corruption and deposit insurance. Accordingly, progress in these governance areas could be particularly effective in reinforcing the positive effects of policy rules and deposit insurance on financial inclusion.[11]

Figure 3. Impact on Financial Inclusion by Governance Dimension



Source: Authors' estimates.

Note: VAE: Voice and accountability; GEE: Government effectiveness.
RQE: Regulatory quality; RLE: Rule of law; CCE: Control of corruption.
IT: Inflation targeting; DI: Deposit insurance; FR: Fiscal rule.

Extensive robustness analysis and innovative case studies confirm our key findings. The robustness analysis in Annex I addresses endogeneity and shows that the structural confidence indicators discussed above can explain a large fraction of the variability in a market-based country risk indicator for CCA countries. Furthermore, using a panel smooth transition regression, we find that the impact of structural enhancements to depositor protection on financial inclusion is an increasing function of the level of governance (Annex II). Lastly, we employ innovative case studies based on synthetic control methods to assess the treatment effects of inflation targeting and fiscal rules on financial inclusion in CCA countries. The results show that inflation targeting and fiscal rules have had positive causal impacts on financial inclusion in CCA countries with relatively small governance gaps (Armenia, Georgia and Kazakhstan) but limited effects otherwise (Annex III).

IV. Building Supportive Institutions

Our empirical analysis suggests that governance and transparency reforms are essential to foster confidence and financial inclusion in CCA countries, particularly in the following key areas:[12]

[11] For example, regulations that ensure central bank independence are an important pre-condition for inflation targeting.

[12] There are other development policies that aim to foster financial inclusion for example by promoting micro-finance and digital banking, but they should not be viewed as substitutes for institution building (Mishkin (2007).

- *Strong and equal property rights.* Strong property rights are central to gaining access to collateral and obtaining credit (La Porta and others, 1997; Mishkin, 2007). Having a legal ownership over a productive asset is key to securing a legitimate claim on its economic returns. However, securing property rights can be expensive and time consuming and legal frameworks may not provide equal property rights for all genders and income levels. Therefore, reducing the cost and number of procedures for obtaining legal titles to property and removing restrictions on property ownership, including for women and low-income households, is crucial for promoting financial deepening. Expanding the range of acceptable collateral is also important to broaden access to bank credit.

- *Sound regulatory frameworks and robust financial safety nets.* Reliable enforcement of contracts is central to supporting lending and investment (Mishkin, 2007). It is also essential to maintain confidence in the banking system by establishing strong banking regulations and effective risk-based supervision and macroprudential oversight (Khandelwal and others, 2022). Poor lending practices can result in misallocation of credit due to connected lending and excessive risk-taking and contribute to banking crises and credit retrenchment. Well-designed bank resolution and depositor protection systems, on the other hand, are critical to ensure proper protection of creditor and depositor rights (Mercedes and others, 2018).

- *Adequate control of corruption.* Corruption is a barrier to financial inclusion as it hinders proper protection of property rights and erodes public confidence in the legal system (Mishkin, 2007; Evans, 2020). Corruption discourages borrowing by low-income households, and stifles competition by increasing the cost of obtaining credit and establishing a business. Corrupt government practices can result in financial repression with adverse effects on confidence, lending to the private sector and financial stability. Strong corporate governance is critical to strengthen control of corruption at the bank and firm level.

- *Transparent policies and institutions.* Transparent policy rules are key to maintaining prudent policies and confidence in macro-financial stability. Well-designed inflation targeting regimes underpinned by central bank independence can promote financial deepening by ensuring low inflation and adequate real returns to creditors and depositors (Boyd and others, 2001; Khan and others, 2006). Transparent, rules-based fiscal frameworks, on the other hand, can limit the scope for deficit bias and distorted incentives, fiscal dominance and financial repression, and reduce public borrowing costs and the crowding out of private investment (Grembi and others, 2016, Brändle and Elsener, 2018). Putting in place strong accounting and disclosure practices and effective credit bureaus is crucial to reducing firm-level informational asymmetries.

V. Conclusion

The paper highlights the importance of public confidence in macro-financial stability for fostering financial inclusion. For CCA countries, the confidence channel of financial inclusion appears especially strong and sensitive to the level of governance and reliance on transparent policy rules and robust financial safety nets. Good governance promotes confidence and financial inclusion not only directly but also indirectly by improving the credibility and effectiveness of inflation targeting, fiscal rules and deposit insurance schemes.

These findings have important policy implications for CCA countries aiming to deepen financial inclusion. Past episodes of macro-financial distress have had adverse repercussions to confidence in the region, especially in weak institutional environments. In this context, it is paramount to strengthen the institutional framework by establishing credible and effective risk-based supervision and macroprudential oversight supported by strong regulatory and bank resolution frameworks, reliable enforcement of creditor and depositor rights, and control of

corruption. Strong central bank governance and fiscal transparency are also essential to ensure that inflation targeting regimes and fiscal rules have positive confidence-building effects and, in turn, on financial inclusion.

Annex I. Robustness Analysis

We conduct robustness analysis to determine whether governance, policy transparency and financial safety nets matter for investor risk perceptions towards the CCA region. While confidence is not directly observable, investor risk perceptions are revealed in market-based indicators such as the risk spread of sovereign bonds held by international investors. However, using the sovereign spread directly as a confidence measure in the financial inclusion model in Section III could raise endogeneity concerns as financial deepening has been shown to matter for financial stability (Sahey and others, 2015) and through this channel could affect investor risk perceptions. Instead, we explore whether the structural confidence indicators can help explain fluctuations in the sovereign spread. Our identification assumption is that a country's level of governance and degree of reliance on policy rules and financial safety nets would be largely unaffected by the sovereign spread.

The results indicate that governance, policy transparency and depositor protection are key drivers of investor risk perceptions toward the CCA region. Improvements in the structural confidence indicators help mitigate investor risk perceptions, both for CCA countries and the global sample (Annex Table 1). Importantly, these indicators appear to explain more than 50 percent of the variability in CCA sovereign spreads, compared to 8 percent for the global sample.[13] The results are statistically significant and robust to controlling for additional macroeconomic variables such as GDP growth, inflation, and lagged sovereign spreads.[14]

We conduct further analysis to ascertain the direction of causality between governance and financial inclusion. Existing research suggests that the causality could run in both directions under certain conditions, with financial development catalyzing institutional development (Miletkov and Wintoki, 2012; Khalid and Shafiullah, 2021). In this school of thought, advancing financial development beyond a certain threshold would cause the benefits of securing property rights to exceed their costs, incentivizing corresponding legal reforms. Moreover, financial development relaxes a country's borrowing constraints, thereby promoting competition and better governance.

[13] Sovereign spread data are available at monthly frequency for six out of the eight CCA countries starting from 2012. The governance series were however available only at annual frequency and up to 2021 which severely limited the number of observations.

[14] The risk of omitted variable bias is mitigated by the fact that our structural confidence indicators reflect relatively stable country characteristics and are less likely to be correlated with conjunctural drivers of investor risk perceptions.

Annex Table 2. Granger Causality Tests

1. H0: Financial Inclusion Does not Granger-Cause Governance

```
Dumitrescu & Hurlin (2012) Granger non-causality test results:
------------------------------------------------------------
Lag order: 1
W-bar =          1.1993
Z-bar =          0.3985   (p-value = 0.6902)
Z-bar tilde =    0.0883   (p-value = 0.9296)
------------------------------------------------------------
H0: gap_fi_m does not Granger-cause gap_gov_m.
H1: gap_fi_m does Granger-cause gap_gov_m for at least one panel (id).
```

2. H0: Governance Does not Granger-Cause Financial Inclusion

```
Dumitrescu & Hurlin (2012) Granger non-causality test results:
------------------------------------------------------------
Lag order: 1
W-bar =          4.0702
Z-bar =          6.1403   (p-value = 0.0000)
Z-bar tilde =    4.5819   (p-value = 0.0000)
------------------------------------------------------------
H0: gap_gov_m does not Granger-cause gap_fi_m.
H1: gap_gov_m does Granger-cause gap_fi_m for at least one panel (id).
```

Source: Authors' estimates.

Annex Table 1. Institutional Determinants of the Sovereign Spread

(Dependent variable: natural logarithm of the sovereign spread)

	CCA Sample		Global Sample	
	Hausman Taylor	Fixed Effects	Hausman Taylor	Fixed Effects
Governance gap	**-0.432****	**-0.469***	**-0.449*****	**-0.505*****
Deposit Insurance[1]	-0.885***	-0.881***	-0.339*	-0.874***
Inflation Targeting[1]	-0.507*	-0.700**	-0.288*	-0.359
Fiscal Rule[1]	-0.365*	-0.420*	-0.170	-0.312**
Observations	41	41	733	742
Countries	6	6	89	90
R squared	NA[2]	0.529	NA[2]	0.080

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' estimates.
1/ Time-varying binary variables equal to 1 in periods of reliance on deposit insurance, inflation targeting and fiscal rules.
2/ Measures of fit not available for the Hausman-Taylor model.
3/ Sovereign spread data sources from Bloomberg and the IMF Sovereign Debt Monitor Database.

Granger-causality tests confirm that the causality in CCA countries runs unidirectionally from governance to financial inclusion. The results of the Dumitrescu and Hurlin panel test indicate that financial inclusion does not Granger-cause governance while governance Granger-causes financial inclusion in the CCA sample (Annex

Table 2).[15] This finding is consistent with assertions in the literature that financial development needs to reach a certain threshold to have a positive impact on institutional quality (Miletkov and Wintoki, 2012).

Annex II. Governance and Depositor Protection

Methodology

To delve deeper into the relationship between deposit insurance and financial inclusion, we construct a novel index of deposit insurance quality. The index is based on annual surveys conducted by the International Association of Deposit Insurers (AIDI) and quantifies the structural enhancements in depositor protection in each CCA country over the period 2011-2021.[16]

Building on the deposit insurance literature, we investigate how the impact of enhanced depositor protection on financial inclusion varies at different governance levels. While depositor protection matters for maintaining public confidence in the banking system, especially in turbulent times, in lax institutional and regulatory environments it can have the opposite effect of eroding confidence by incentivizing banks to take additional risks. As discussed in Section II, the data for CCA countries reveal the existence of two country regimes with low- and high levels of governance and financial inclusion, respectively.

Accordingly, we employ a panel smooth transition regression model with varying coefficients to explore how changes in the level of governance would affect the responses of financial inclusion to structural enhancements to depositor protection. Specifically, we estimate the following model:

$$FI_{i,t} = \alpha + \delta\, DI_index_{i,t} + \beta\, DI_index_{i,t} * F\left(GOV_{i,t}\right) + \gamma\, GOV_{i,t} + \sum_{k=1}^{n} \theta_k X_{i,t,k} + n_i + \mu_t + \varepsilon_{i,t} \qquad (3)$$

where $DI_index_{i,t}$ denotes the deposit insurance index, $FI_{i,t}$ represents the financial inclusion index, F(.) is a logistic transition function that varies between 0 and 1, allowing for a smooth/gradual transition from the weak governance regime to the strong governance regime, and $GOV_{i,t}$ is a composite governance index derived from the six dimensions of governance using principal component analysis as defined in Section III.

The impact of deposit insurance reforms on financial inclusion is captured by the partial derivative of equation (3) with respect to the deposit insurance index as defined in equation (4). This impact increases from δ (in the weak governance regime where F=0) to δ+β (in the strong governance regime where F=1).

$$\frac{\partial FI_{i,t}}{\partial DI_index_{i,t}} = \delta + \beta * F(GOV) \qquad (4)$$

We find a positive correlation between deposit insurance reforms and financial inclusion which is an increasing function of the level of governance. Accordingly, as governance reforms progress, the marginal impact of a 1-

[15] Given that the Granger causality test is not employable on binary variables, we use logit models to investigate whether the decision to introduce inflation targeting, fiscal rules and deposit insurance schemes may be affected by the financial inclusion gap and find insignificant results.

[16] The index covers the following deposit insurance characteristics: type of deposit insurance system, deposit insurance legal structure, types of deposit insurance member banks/institutions, types of deposit products eligible for coverage, and coverage. These characteristics are broken down into 22 sub-components which are assigned equal weights.

point improvement in the deposit insurance index on financial inclusion would increase from 0.19 points to 0.39 points (Annex Table 3).

Annex Table 3. Marginal Effect of Enhancements to Depositor Protection

	Financial inclusion index
Deposit insurance index	**0.1992***
	(1.8578)
Deposit insurance index X F(Governance; γ, c)	**0.2034****
	(2.5064)
Governance	0.0453***
	(3.0828)
Controls	Yes
Location parameter (Threshold)	1.5593
t statistics in parentheses	
* p<0.05, ** p<0.01, *** p<0.001	

Source: Authors' estimates.

Note: The governance and deposit insurance indexes are standardized to vary between 0 and 1, and the estimates are therefore not comparable to previous analyses based on non-standardized values.

Annex III. Case Studies

An impact evaluation approach using the synthetic control method

In this section, we employ innovative case studies to examine how the adoption of rules-based policy frameworks (RBPF) affect financial inclusion in CCA countries. The case studies are based on the synthetic control method, initially developed by Abadie and Gardeazabal (2003), and subsequently extended by Abadie, Diamond, and Hainmueller (2010 and 2015). The rationale for using this method lies in its ability to statistically infer the causal impact of policy interventions—specifically in this case, the adoption of inflation targeting and fiscal rules—on financial inclusion. The method assesses treatment effects using a data-driven approach. In our case, the *treatment* is the adoption of an inflation targeting or fiscal policy rule.

We consider a sample of $C+1$ countries and define $c=1$ as the treated country and $c=2$ to $c=C+1$ as the pool of comparator countries which did not adopt RBPF. If we assume that all countries have observations for the same years $y=1,\ldots,Y$, and that the sample includes pre-treatment years Y_0 and post-treatment years Y_1, then $Y=Y_0+Y_1$. The treated country implements RBPF during years Y_0+1 to Y.

Under this methodology, the counterfactual is represented by a *synthetic control* calculated as a weighted average of the countries in the comparator pool. The vector of weights is selected to minimize the deviations between the characteristics of the treated country and the *synthetic control* group (Abadie et al., 2015). This aims to ensure that the sole disparity between the treated country and the synthetic control in the post-treatment period would be the implementation of the treatment.

We define $FI_{c,y}^{C}$ as the level of financial inclusion if country *c* in year *y* was not subject to treatment. This value serves as the counterfactual and is calculated as the weighted average of the predicted financial inclusion of comparator countries. Further, we define $FI_{c,y}^{1}$ as the level of financial inclusion in country *c* if it undergoes treatment during the years $Y_0 + 1$ to Y. If $FI_{c,y}^{C} \neq FI_{c,y}^{1}$, this suggests that the treatment affects financial inclusion. Thus, the impact of the treatment (policy rule), denoted by $\alpha_{c,y}$, is equal to:

$$\alpha_{c,y} = FI_{c,y}^{1} - FI_{c,y}^{C}$$

Inflation targeting

We investigate the impact of inflation targeting on financial inclusion in the three CCA countries that have already adopted an inflation targeting regime, namely Armenia (2006), Georgia (2009), and Kazakhstan (2015). The comparator group includes countries with adequate data availability from the CCA and Eastern Europe that did not have inflation targeting regimes during the estimation period: Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Albania, Bulgaria, Belarus, Croatia, Northern Macedonia, and Ukraine. We use as predictors of financial inclusion its lagged value, GDP growth volatility, CPI inflation, GDP per capita, the trade openness index, the Chinn-Ito capital account openness index, the broad money-to-GDP ratio, the composite governance indicator, the deposit insurance dummy and the fiscal rules index, the banking crisis dummy and the UN human development index. Our dataset spans the period 1995-2021.

The estimates indicate that the adoption of inflation targeting has had a positive effect on financial inclusion in CCA countries. This effect is likely underpinned by the relatively small governance gaps in the three inflation targeting countries. Importantly, the impact of inflation targeting on financial inclusion is not immediate but takes effect with a lag of four to six years (Annex Figure 2). Once present, the impact shows strong persistence. This pattern can be attributed to the need for inflation targeting regimes to gain credibility, including through governance reforms, before meaningfully affecting confidence and financial inclusion.

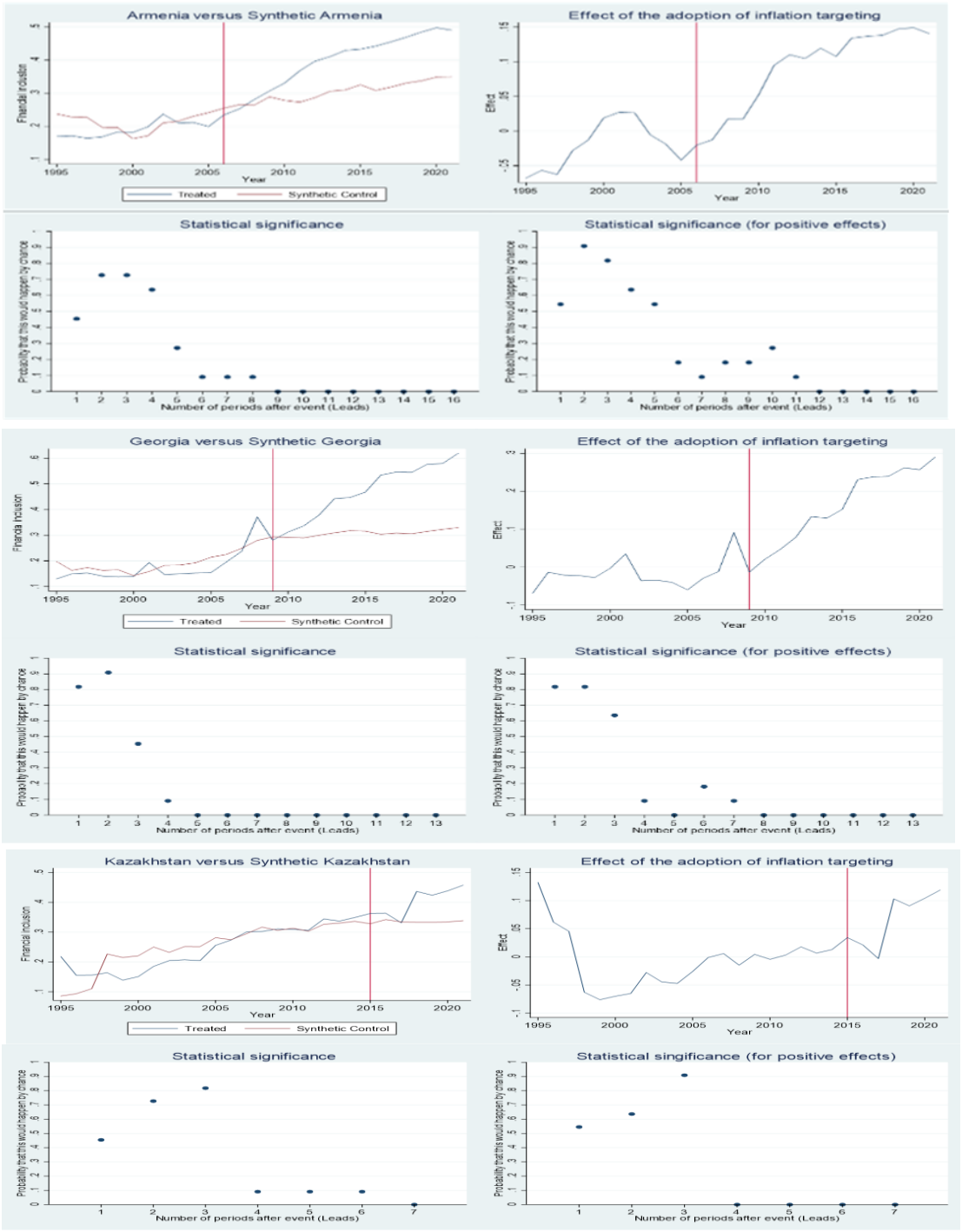
Fiscal rules

We evaluate the treatment effect of adopting fiscal rules on financial inclusion for CCA countries that have implemented such rules, namely Armenia (2002), Azerbaijan (2019), Georgia (2013), Kazakhstan (2013), and Turkmenistan (2015). The comparator group includes CCA and Eastern European countries that have not introduced fiscal rules for which we have sufficient data availability to conduct the analysis: Kyrgyzstan, Tajikistan, Uzbekistan, Albania, Belarus, Moldova, Northern Macedonia, Turkey, and Ukraine. We use as predictors of financial inclusion its lagged value, detrended GDP growth, CPI inflation, GDP per capita, the trade openness index, the Chinn-Ito capital account openness index, the broad money-to-GDP ratio, the composite governance indicator, the deposit insurance and inflation targeting dummies, the banking crisis dummy and the UN human development index. Our dataset spans the period 1995-2021.

The treatment effect of fiscal rules on financial inclusion is positive and statistically significant in Georgia, Armenia, and Kazakhstan and insignificant in Azerbaijan and Turkmenistan (Annex Figure 3). These results are consistent with the econometric analysis (Section III) which suggests that strong institutional governance and transparency are an important pre-condition for ensuring that fiscal rules have a positive effect on financial inclusion. Governance and transparency are relatively strong in Georgia, Armenia and Kazakhstan and relatively weak in Azerbaijan and Turkmenistan[17]. In fact, the short transmission lag (1 year) from fiscal rules to financial inclusion in Georgia could be attributed to its positive governance gap during this period. In contrast,

[17] In the case of Azerbaijan, the fiscal rule was introduced in 2019 and there is a limited number of observations to assess its impact. It is worth noting that the significance of its effect on financial inclusion has improved over the evaluation period.

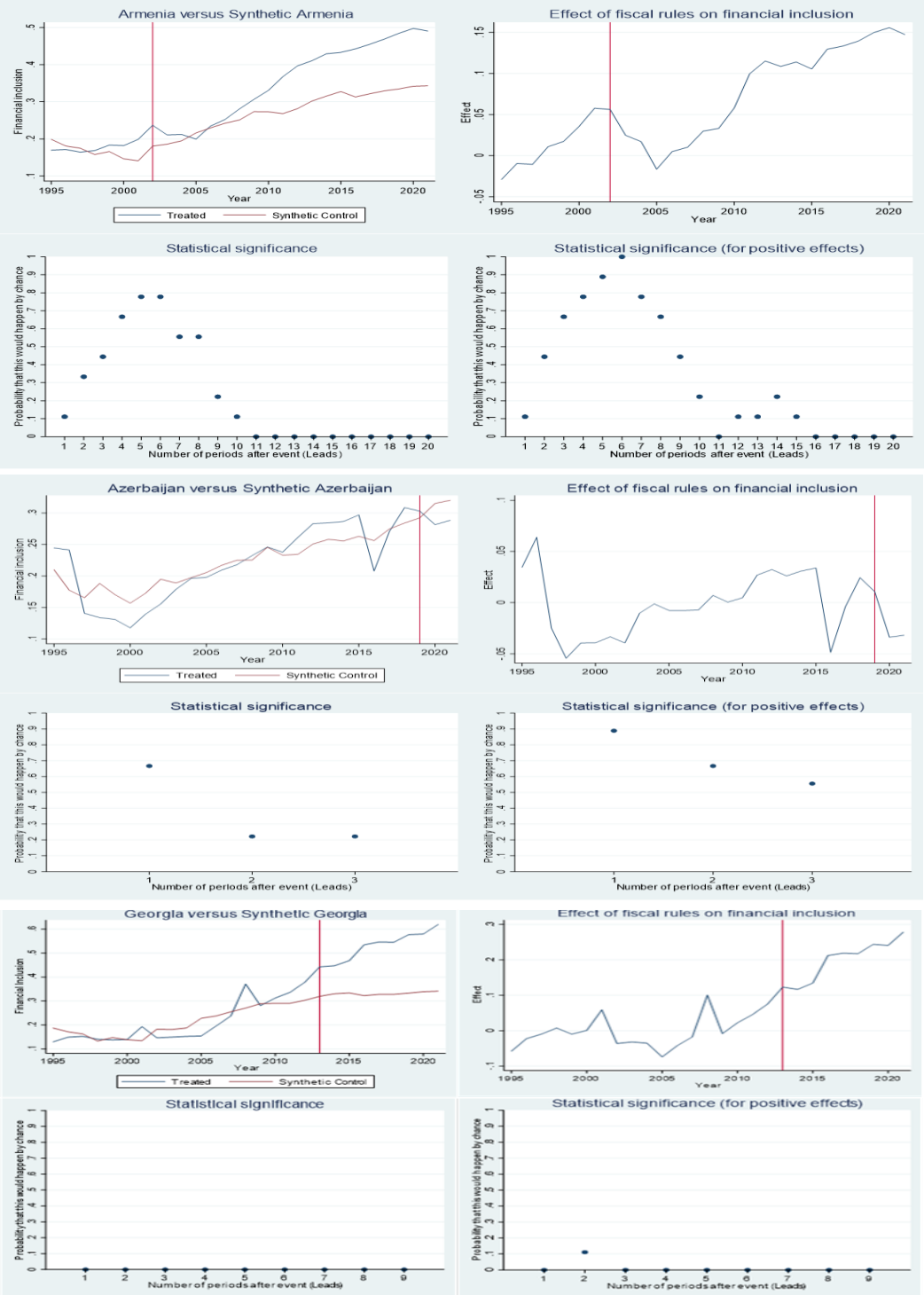
Annex Figure 2. Treatment Effects of Inflation Targeting on Financial Inclusion



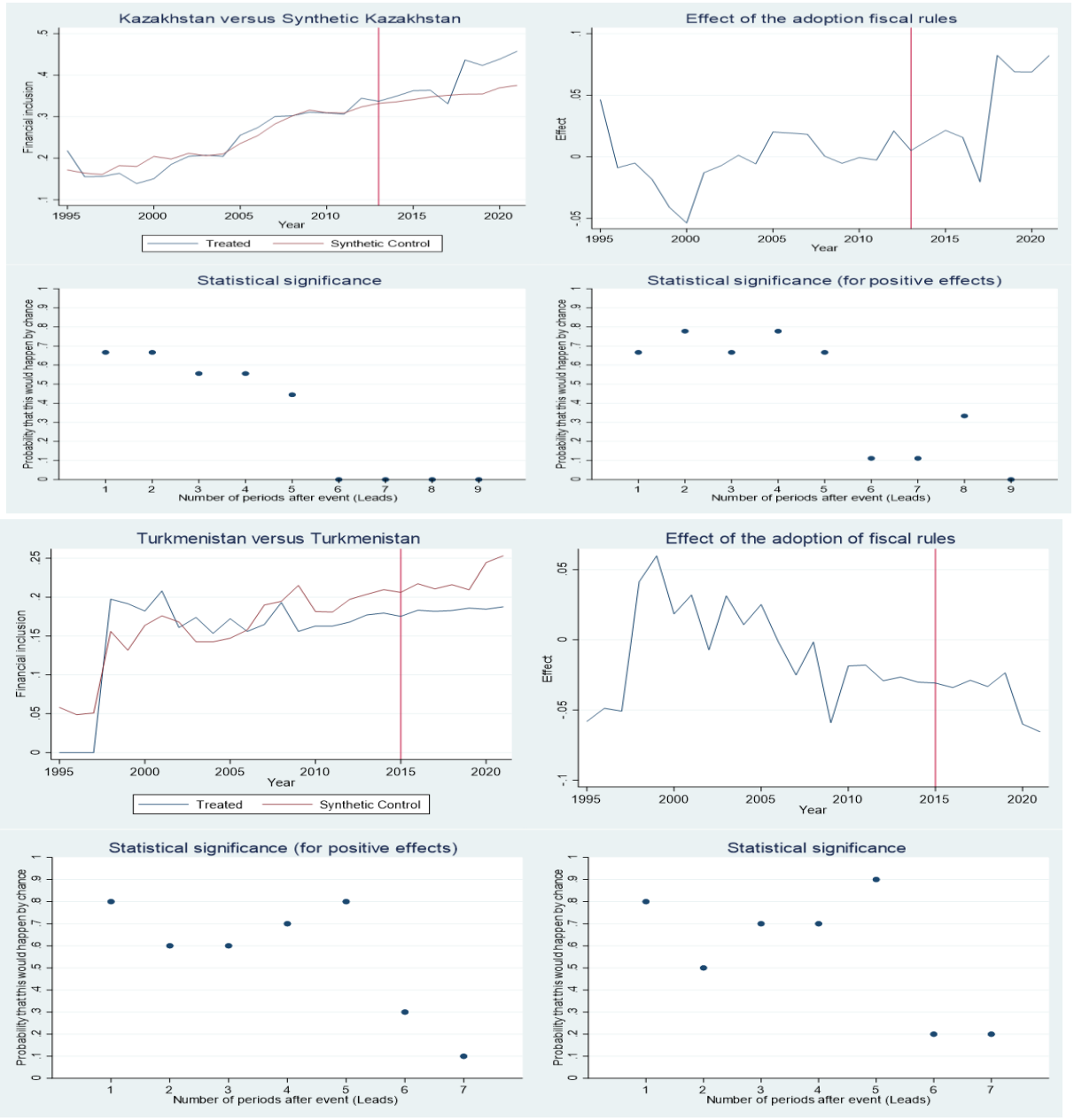
Source: Authors' estimates.

Armenia introduced a fiscal rule back in 2002 and had to implement significant governance reforms over the next 10 years before being able to reap the benefits of fiscal rules for financial inclusion.

Annex Figure 3. Treatment Effects of Fiscal Rules on Financial Inclusion



Annex Figure 3. Treatment Effect of Fiscal Rules on Financial Inclusion (concluded)



Source: Authors' estimates.

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