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DEVELOPING ECONOMIC RESILIENCE: CHILE'S EXPERIENCE MANAGING EXTERNAL SHOCKS

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Abstract

Chile is no stranger to volatile cycles of growth and downturns, as has been common in most of Latin America. In the aftermath of the Asian-Russian crises, it seemed as though outsized vulnerability to external shocks would continue. Despite these challenges, today Chile has positioned itself as a model in the region for sustained growth and institutional credibility. This thesis examines the evolution of Chile's economic policies and frameworks post the Asian-Russian financial crises, particularly on how the development of currency-trust and country-trust, two measures of investors' confidence formulated by Caballero, Cowan, and Kearns (2005), have enhanced the nation's resilience against volatile capital inflows and external shocks. By examining and comparing Chile's response to adverse periods over time, this analysis assesses the effectiveness of key institutional and policy developments—including the adoption of a floating exchange rate, a credible inflation-targeting regime, and a structural balance fiscal rule—in mitigating both real terms of trade shocks and financial shocks. The findings suggest that these policy measures have improved Chile's economic stability and resilience against external shocks, showcasing the potential benefits of such a framework for other nations dealing with similar vulnerabilities.

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1 Introduction

Managing external vulnerability is a top priority for any country, especially small and open economies such as Chile. Given increasing global financial integration, strong institutional frameworks and effective monetary policy become essential to effectively manage volatility, particularly in response to global shocks and reversals of capital inflows. In this thesis, I examine Chile's development of what Caballero, Cowan, and Kearns (2005) describe as two interrelated dimensions of investor confidence: "currency-trust" and "country-trust" in the period after the Asian-Russian financial crises of 1997 and 1998. The significance of this paper lies in its contribution to understanding the impact of investor confidence on mitigating the consequences of sudden stops, and the policy mix associated with this confidence. This paper seeks to evaluate the long-term effects of the recommended strategies on Chile's economic stability, particularly how the nation has progressed in developing a stable currency environment and a trustworthy financial system after the Asian-Russian crises. Additionally, the paper will explore Chile's economic performance during significant global crises, including the Global Financial Crisis and the Covid-19 pandemic, to provide insights into the effectiveness of its financial stability strategies.

The paper first examines Chile's performance during the Asian-Russian crises, providing a baseline for the improvements made since the period. Despite Chile's growth during this time, it was not immune to the painful shocks resulting from both the devaluations in East Asia and Russia's sovereign default. The crises highlighted the vulnerabilities in Chile's economic structure, leading to a severe economic downturn and exposing the limitations of its existing policy frameworks. Cowan & De Gregorio (2007) explain what happened in Chile during the Asian-Russian crises, stating that capital outflows from banks and pensions, along with a contractionary monetary policy and the defense of the peso all combined to create an environment without liquidity. These factors led to a reversal in the current account, further reducing consumption after the decline in the terms of trade. Ultimately, Chile's external vulnerability was exacerbated by its own policy choices, which amplified capital flow reversals and the negative impacts of the external shocks. In the years following this time, Chile has implemented important measures to improve its economic stability and mitigate the impact of future shocks.

Section 2 begins with how Chile has developed currency-trust, which refers to the confidence foreign investors place in holding a country's currency-denominated assets. It indicates that investors believe the central bank will manage the currency effectively to avoid detrimental exchange rate fluctuations. A critical step in building it was through the adoption of the floating exchange rate regime in 1999 and the commitment of the Central Bank of Chile (CBCh) to an inflation targeting regime. These two factors have combined to improve currency-trust as well as resilience to external shocks. The credible monetary policy framework, characterized by a commitment to inflation targeting, has been crucial in anchoring inflation expectations. The anchoring of expectations has reduced the pass-through of exchange rate fluctuations to domestic inflation, enabling a more stable economic environment. Conversely, the flexible exchange rate regime supports the Central Bank's inflation targeting efforts by absorbing external shocks, thus preventing those shocks from translating directly into domestic price pressures. Despite the possibility for price and financial instability that can threaten floating exchange rate frameworks, Chile has managed to keep these in check in large part due to policy credibility and strong financial market regulations. These changes combined have

resulted in greater flexibility in policy response to external shocks. In addition, the development of a deep and liquid foreign currency derivatives market has allowed for better management of currency risk. I find that domestic pension funds have contributed to the development of the market. Acting as a natural counterparty due to their substantial foreign asset holdings, they have played an increasingly important role due to the relaxing of regulatory requirements on foreign investment limits. This market has provided a mechanism for hedging against exchange rate volatility, reducing the systemic risk associated with sudden stops by improving the ability of firms to hedge their currency exposure.

Section 3 examines the development of country-trust, which encompasses investors' broader confidence in the country's overall commitment to financial obligations, governance, the financial system, and economic stability. I find that Chile has implemented many of the policy recommendations suggested by Caballero et al. (2005) and in turn has positioned itself to better deal with external vulnerability. Lessons learned from the rescue of the Chilean financial system in the early 1980s set Chile on a course towards financial discipline by implementing more conservative financial regulation and a more resilient economic framework. These reforms were essential not only for restoring investor confidence but also for ensuring long-term economic stability and resilience against future financial shocks. One of the main avenues through which Chile has accomplished this is through a focus on financial discipline by prioritizing fiscal surpluses and prudent debt management. In 2001, Chile formalized this discipline by adopting a fiscal rule, which called for an annual structural surplus. The rule, specific to Chile in that it accommodates for the volatility of its main export Copper, promotes savings in good times and finances deficits in bad times. The savings generated accumulate in a sovereign wealth fund, and have played a large role in mitigating the effects of economic crises through financing fiscal deficits.

Along with fiscal measures, the financial system has improved greatly since the late 1980s, both in terms of stability and depth. Helped by the credible inflation targeting regime and floating exchange rate, economic conditions have remained stable and attractive to foreign investors. For domestic firms, the growth in financial institutions has provided access to relatively inexpensive private long-term credit, with pension funds playing a major role. Large relative to neighboring countries, Chilean pension funds have grown considerably in the last 30 years thanks to a continued relaxation of investment rules, resulting in a steady inflow of funds for investment to the Chilean private sector. Overall, Chile's improved macroeconomic framework, flexible exchange rate regime, prudent fiscal policy, and adequate regulatory oversight have all contributed to building solvent financial institutions. These elements, alongside a two-year inflation-targeting framework and strong financial supervision, have helped in absorbing external shocks and maintaining economic stability (Costa 2022).

Section 4 analyzes the effects of these improvements during the Global Financial Crisis and the Covid-19 pandemic. The findings suggest that enhancements in currency-trust and country-trust have helped to mitigate the impact of both real and financial shocks in these periods. Chile's enhanced fiscal and monetary frameworks have enabled the implementation of more countercyclical monetary policies without the need to defend the exchange rate amidst real terms of trade shocks. The use of countercyclical fiscal policy, particularly through withdrawals from the ESSF, has helped Chile manage the impact of the crises more effectively.

Changing dynaimics of capital flows in Chile have also helped to manage the negative effects of recent crises. Gross capital outflows have grown substantially thanks to the relaxation of regulatory limits on pension funds foreign asset limits as well as fewer capital controls, and have played an offsetting role to reversals of gross capital inflows. The result has been an increase in financial

adjustment as opposed to real adjustment through the current account. This shift has limited the negative impacts typically associated with sudden stops, such as balance of payments crises, currency instability, and broader economic disruptions. Furthermore, asset price adjustments and increased FX volatility under a flexible exchange rate regime have discouraged arbitrage and encouraged the repatriation of capital by residents, helping to smooth net capital flows. Banks have also played a role by increasing their capital intermediation during crises, thus reducing the incidence of sudden stops.

Caballero et al. (2005) argue that the fear of sudden stops was rooted in concerns over the additional economic destabilization that sudden stops could inflict on top of already severe external shocks. Over the past 25 years, however, Chile has improved its ability to mitigate the effects of both global shocks and volatile capital inflows. The results illustrate the impact that developments in both currency-trust and country-trust can have on a small, open, and financially integrated country like Chile. I begin the analysis of these developments by summarizing the recommendations of Caballero et al. (2005) and placing them in the context of Chile's experience during the Asian-Russian crises.

1.1 The Asian-Russian Crises in Chile

During the 1990s, Chile was experiencing an unprecedented period of growth and disinflation, which was interrupted by the East Asian financial crisis beginning in mid-1997 and the Russian financial crisis that followed in 1998. The two events had far-reaching effects on the global financial system and significantly impacted Latin America. Beginning with the devaluation of the Thai baht in July of 1997, the loss of investor confidence soon spread. A rapid outflow of capital in the region ensued, leading to the devaluation of several Asian currencies and major stock market declines. Kaminsky & Reinhart (1998) note the impact on the currency and equity markets surpassed that of the devastating "tequila" effects after the 1994 devaluation of the Mexican peso. Around the world, countries such as Argentina, Brazil, and Russia suffered sharp declines in equity prices and episodes of speculation against their currencies.

The Russian financial crisis (a.k.a. The Ruble Crisis) was characterized by a severe devaluation of the Russian ruble and a default on the country's debt. According to Dungey et al. (2002), the international bond markets experienced a period of stability in the first half of 1998; however, later that year, Russia widened the trading band of the ruble and announced a de facto devaluation resulting in a shock to markets. Additionally, Russia planned to restructure all official domestic currency debt obligations maturing at the end of 1999 and imposed a 90-day moratorium on the repayment of private external debt. The devaluation led to a large increase in the price of imports, contributing to an immediate and steep rise in inflation. The default caused a loss of confidence among international investors, leading to a withdrawal of foreign capital, which exacerbated the financial turmoil.

Both the East Asian and Russian financial crises underscored the vulnerabilities associated with capital inflow volatility, weak financial regulatory frameworks, and the challenges of managing external shocks in a global financially integrated landscape. Chile was not immune to the contagion effects of these crises, despite its increasing stability and growth during the early and mid-1990s. In the wake of the Asian-Russian crises, Chile suffered a severe downturn. Terms of trade and external demand deteriorated, and annual growth fell 8 percentage points below the average of the previous decade to -1 percent by 1999 (Caballero et al. 2005).

1.2 Summary of Fear of Sudden Stops: Lessons from Australia and Chile

Caballero et al. (2005) explore ways of overcoming external vulnerability by drawing lessons from a comparison of the responses of Chile and Australia to the Asian-Russian financial crises. Chile is a unique country in Latin America relative to many peers due in part to its well developed institutions and macroeconomic stability, which the authors note that, along with its reliance on commodity exports, made it a suitable comparison to Australia. The similarities provide a framework to analyze the significantly worse economic response in Chile during the period. The crises highlighted the vulnerabilities in Chile's economic structure, leading to a severe economic downturn and exposing the limitations of its existing policy frameworks and susceptibility to sudden stops in capital flows.

They argue that understanding sudden stops and the strategies to mitigate them requires recognizing and differentiating two intertwined aspects of investor confidence: currency-trust and country-trust. Currency-trust refers to the confidence foreign investors place in holding a country's currency-denominated assets. It indicates that investors believe that the central bank will manage the currency effectively to avoid detrimental exchange rate fluctuations. Country-trust encompasses the broader confidence investors have in the country's overall commitment to financial obligations, governance, the financial system, and economic stability. Caballero et al. (2005) explain that understanding these dimensions is important for assessing how nations can prevent the worst of financial shocks, specifically sudden capital inflow reversals. While they contend lack of country-trust is the fundamental problem behind sudden stops, lack of currency-trust plays a significant role in diminishing a country's ability to deal with them and real external shocks.

The authors give insight and provide context for Chile's action in their monetary policy and exchange rate policy. Steps taken by the Central Bank of Chile (CBCh) at the time included minimizing the nominal devaluation and reigning in the current account deficit through contractionary monetary policy. Concurrently, the CBCh intervened in the FX market, showing its reluctance to let the exchange rate play a stabilizing role suggested by traditional open-economy models, typical of an economy commonly described as 'fear-of-floating'.[1] The actions of policymakers played a large role in the difference in relative outcomes of Chile and Australia, but the actions were a direct result of the environment that Chile (among other Latin American nations) found itself in. While Australia had little concern for a sudden stop, Chilean authorities were extremely worried by that possibility, and the underlying fear of a sudden stop played a key role in determining this policy. A sharp reversal in net capital flows could lead to a balance of payments crisis, which would be more expensive than the diminished economic output from the contractionary monetary policy implemented.

Along with the fear of capital flow reversals, another reason the authors identify for the worse outcome was that Chilean banks did not have access to a developed currency derivatives market to protect themselves from exchange rate fluctuations. Banks are inherently leveraged institutions which exposes them to various risks. While banks are able to handle idiosyncratic credit risks, managing exchange rate risk is more challenging. If the banking sector lacks the ability to decouple exchange rate risk from credit risk, then banks will play less of a role in intermediating capital after real shocks. A way to combat this is a well-developed currency derivatives market which allows banks to hedge the foreign-currency risk. This hedging allows banks to separate their core lending activities from the uncertainties associated with exchange rate movements. Without this, Chilean banks are not able

[1] The term, coined by Calvo & Reinhart (2002), describes the reluctance of countries to allow their currencies to float freely, despite officially claiming to have flexible exchange rate systems. See Section 2.2 for further discussion.

to hedge exchange rate risk so they refrain from intermediating foreign funds and thus remove any potential absorption and smoothing of economic shocks.

The authors explain that these ingredients that Chile lacked are the result of an absence of investor confidence, specifically the lack of country-trust and currency-trust. As the authors note, credibility cannot be bought. Thus, the recommendations they provide for improving country-trust and currency-trust are long-term in outlook.

For the development of currency-trust, the recommendations include the fostering of a clean inflation history and maintaining an exchange rate that is not unduly influenced by the government. As the authors note, if a country has a history of inflation eroding the value of investments, foreign investors are much less likely to trust its currency. The second recommendation is the development of a deep currency derivatives market. In addition to the market allowing domestic agents to spread foreign-currency risk, a well-developed FX derivatives market provides an additional means for foreigners to take on pure local-currency risk.

Country-trust is developed through a combination of a clean sovereign default history, a healthy domestic banking sector, and the establishment of stable, transparent institutions. The authors emphasize the role of demonstrating a consistent commitment to repaying debt, especially foreign debt, as foundational to building trust with foreign investors. Central to this trust is the quality and stability of the financial system, underscored by the development of a resilient banking sector. Australia's experience is cited as a prime example, where trust has been developed by weathering external shocks without resorting to default and maintaining a history of sound, reliable institutions. Transparent legal and accounting frameworks further solidify this trust, ensuring that foreign investors have confidence in the country's fiscal and monetary policies. Thus, country-trust is enabled through a mix of fiscal responsibility, banking stability, and institutional integrity, elements that collectively foster a conducive environment for international investment and economic resilience.

The aftermath of the crises highlighted the need for Chile to address the weaknesses in its financial architecture, specifically the lack of currency-trust and country-trust, which amplified the crises impact. The steps taken by Chile in the subsequent years reflect a concerted effort towards their development, resulting in improvements in economic resilience and stability. Sections 2 and 3 explore the measures Chile has implemented to develop a more stable and trustworthy economic environment, focusing on developments in monetary policy, financial regulation, and institutional frameworks.

2 Development of Currency-trust

Currency-trust is developed with a sound history of inflation performance and an exchange rate that is not unduly influenced by the government. These ingredients ensure investors can be confident that their investments will not be undermined by currency manipulations and adverse exchange rate fluctuations. Since the Asian-Russian crises, Chile has made significant strides in these areas. They have maintained low and stable inflation for the better part of three decades as well as successfully overcome the 'fear-of-floating' that has constrained other emerging markets in establishing a free-floating exchange rate regime. In addition, the growth of the currency derivatives market has created further channels to spread currency risk. These successes, collectively contributing to a more stable

economic environment, are interconnected and have reinforced each other. As a result, this strengthened foundation of currency-trust has played a crucial role in supporting long-term economic growth and stability.

In this section, the paper explores the developments in policy mix through which Chile has enabled these successes and the resulting currency-trust that has developed. Specifically highlighted are the increased credibility of the Central Bank of Chile (CBCh), the importance of maintaining a low exchange rate pass-through, the development of the FX derivatives market that has helped agents reduce their currency risk, low liability dollarization, and deeper financial markets. The combined effect of these developments has resulted in greater flexibility in policy response to external shocks.

2.1 Inflation Performance and Exchange Rate Framework

As shown in Figure 1, for most of Chile's history up until the Asian-Russian crises, inflation performance had been anything but encouraging. Indeed, historical data from the period starting in 1925, the year the Chilean Central Bank was established, up until 2000, indicates an average annual inflation rate of 43 percent, with a standard deviation of 93 percent. Persistent inflation was a central issue in Chile's public discourse and a key part of the economic agenda since the 1940s. The situation reached its peak in the early 1970s, when inflation rates soared to unprecedented levels, averaging close to 300 percent annually and reaching a high of nearly 600 percent in 1973. Although inflation came down, significant inflation persisted into the early 1990s. However, in the past thirty years, Chile has dramatically improved its inflation record, hovering around 3 percent.[2] This stability in inflation has been unprecedented in Chile and has contributed to significant macroeconomic stability.

While there were many reasons for the persistent high inflation in Chile until the 1990s, in 1989, a major step towards fighting inflation and monetary policy independence was taken by granting autonomy to the Chilean Central Bank (CBCh). Costa (2022) explains that the autonomy of the Central Bank laid the institutional foundation for a framework that, over the last 30 years, has allowed for independent monetary policy aimed at price stability, isolated from the risk of fiscal dominance. This institutional framework mandates the CBCh to guarantee the stability of the currency and is reinforced by the prohibition of direct financing of the Treasury.

The CBCh began publishing inflation forecasts during this period and, along with a floating band exchange rate target, inflation began to gradually decline. Meeting the set annual inflation targets established a nominal anchor for the economy, gradually enhancing the monetary policy's credibility by demonstrating a commitment to reducing inflation. Over time, this process started to anchor agents' expectations, further stabilizing inflation. The result was a decrease in inflation from 27 percent in 1990 to less than 3 percent a decade later. The decision to reduce inflation gradually was based on the understanding that a more aggressive approach could incur substantial real costs in an economy with persistent inflation, such as Chile's. Additionally, the Central Bank had to build its reputation ensuring agents believed that the bank would meet inflation expectations if it was to have an effect on the mechanisms for determining prices and wages (CBCh 2020).

During this period, however, the average policy horizon was less than a year, which constrained the effectiveness of monetary policy. While the credibility of monetary policy was improving, the management of inflation was still constrained by the need for the CBCh to manage the exchange rate.

[2]For a complete overview of inflation dynamics and determinants over time in Chile, see CBCh (2020) and Caputo & Saravia (2018).

Indeed, an independent monetary policy needs a flexible exchange rate in order to absorb the effects of negative shocks (Arenas & Griffith-Jones 2023). In light of lessons learned during the Asian-Russian crises (namely the limited capacity for monetary policy to smooth negative shocks), in 1999, the move to a floating exchange rate was adopted, as well as an inflation-targeting regime with a 3 percent inflation target over a two-year horizon.

The shift to a free-floating exchange rate regime in Chile marked a significant policy transition, which came after nearly a decade of implicit inflation targeting. De Gregorio & Tokman (2004) explain that prior to this shift, Chile attempted to navigate between two nominal anchors: the exchange rate band and the inflation target. However, it became clear that holding onto both anchors was counterproductive; it weakened the credibility of the inflation target and, as a result, diminished its effectiveness. The key insight derived from the Asian-Russian crises was that employing a single policy tool—specifically, the monetary policy rate—to manage these two anchors was not optimal (Costa 2022). The transition to a floating exchange rate was, therefore, not just a monetary policy adjustment but a strategic shift to enhance the Central Bank's focus on inflation targeting without the constraints imposed by maintaining a fixed exchange rate band, thereby allowing the CBCh to work to accomplish its mandate of price stability. With the commitment to inflation targeting, this became the economy's nominal anchor by providing guidance for the expectations of economic agents.

Overall, the evolution of Chile's institutional frameworks, particularly related to its credible inflation-targeting regime and the exchange rate regime, represents a significant shift in the country's economic history. Granting autonomy to the Central Bank and the subsequent adoption of a flexible exchange rate illustrate important reforms that have shifted the focus of the monetary authority on maintaining low and stable inflation. These adjustments have not only anchored inflation expectations but also improved the nation's economic stability, which is important for developing currency-trust.

2.2 Adoption of the Floating Rate Regime

The monetary policy and exchange rate frameworks implemented by Chile do not exist in isolation. They are interdependent, each influencing and reinforcing the effectiveness of the other. The credible monetary policy framework, characterized by a commitment to inflation targeting, has been crucial in anchoring inflation expectations. The anchoring of expectations reduces the pass-through of exchange rate fluctuations to domestic inflation, enabling a more stable economic environment. Conversely, the flexible exchange rate regime supports the Central Bank's inflation targeting efforts by absorbing external shocks, thus preventing those shocks from translating directly into domestic price pressures. When these work together, it is unlikely that interest rates will need to be adjusted in response to real shocks (De Gregorio & Tokman 2004). The combined results have enhanced currency-trust in Chile, as well as increased macroeconomic stability and resilience.

While the decision to adopt a floating exchange rate came with important benefits, the decision was not made easily. To successfully adopt a floating exchange rate, countries (especially emerging markets) need to overcome the 'fear-of-floating'. Coined by Calvo & Reinhart (2002) in their paper of the same name, the fear of floating is described by a situation where countries claim to maintain a floating exchange rate but demonstrate a reluctance to allow their currency to fluctuate freely in response to market forces, shown through excessive interventions by the central bank. Certain countries claim to have a de jure flexible exchange rate system in place but operate a de facto managed system with management established through both FX market intervention as well as changes in interest

rates (De Gregorio & Tokman 2004). Explanations for the fear of floating include the impact of exchange rate fluctuations on inflation (i.e., exchange rate pass-through) as well as the negative balance sheet effects such as excessive liability dollarization. Given currency-trust is developed through an exchange rate that is not unduly influenced by the government, overcoming the fear of floating has played an important role in its development.

As mentioned above, the transition to a floating exchange rate was not just a monetary policy adjustment but a shift to enhance the Central Bank's focus on inflation targeting without the constraints imposed by maintaining a fixed exchange rate band. Following the adoption of the floating rate, the immediate impact was an increase in exchange rate volatility (Figure 2). As Claro & Soto (2013) explain, to an extent, the increased volatility is to be expected when adopting a flexible exchange rate regime in a small open economy such as Chile's. Given external shocks are not rare, the exchange rate becomes the main adjusting variable through which it acts.

De Gregorio & Tokman (2004) explain that the primary concern driving interventions in a free-floating exchange rate system is the potential for price and financial instability. High exchange rate pass-through (ERPT) to domestic prices can force authorities to either abandon floating regimes for inflation control or adopt stringent monetary policies in response to significant depreciations. Moreover, the stability of the financial sector becomes jeopardized under conditions like high liability dollarization and balance sheet vulnerabilities, particularly when foreign liabilities and local assets mismatch, making economies susceptible to the destabilizing effects of rapid currency devaluations. Thus, emerging markets, facing larger shocks and greater financial sensitivity, often exhibit a greater fear of floating, prompting monetary adjustments and market interventions to mitigate the adverse effects of exchange rate volatility.

Despite these negative effects, Chile has managed to overcome both the price and financial instability that threaten floating exchange rate frameworks. As examined below, this success is attributed to a combination of factors: a low exchange rate pass-through encouraged through policy credibility, strong financial market regulations, and reduced corporate sector exposure to foreign currency helped by a developed FX derivatives market. The reduction in currency exposure began before the floating rate regime in part due to lessons learned during previous financial crises, but also through firm choices endogenous to the change in regime as well as cheaper domestic credit (De Gregorio & Tokman 2004, Albagli et al. 2020). The accomplishment underscores the improving ability to manage instability, and mitigating the effects of external shocks as shown in Section 4.

2.2.1 Price Stability and Low Exchange Rate Pass-Through

Empirical work finds that ERPT has remained consistently low in Chile. Contreras et al. (2016) estimate pass-through coefficients to prices using 131 disaggregated CPI indices from the period 2000-2015. Compiling a number of estimates of ERPT in Chile, they find that the average ERPT one year out is 0.15. This implies that a 10 percent depreciation of the nominal exchange rate would result in an increase of CPI inflation by 1.5 percent within one year's time. Using a VAR estimation, Albagli et al. (2020) document a decrease in ERPT in Chile over time. They calculate the ERPT as the ratio of the cumulative response of inflation and the cumulative response of the nominal exchange rate (NER) change to an autonomous shock of the NER over 12 months. Three sub-samples are used to show this evolution. The first sub-sample (1991-1999) corresponds to the pre-floating era before the adoption of the floating rate regime. The second sub-sample (2000-2009) corresponds to the beginning of

the floating rate regime and the lead-up to the Global Financial Crisis. Finally, the third sub-sample (2010-2019) corresponds to the decade before the Covid-19 pandemic. The results are presented in Figure 3, showing the estimated results of the actual sub-sample (red dots), and the median (blue line) and interquartile range (gray area) estimations from a block-bootstrap exercise (5,000 replications) for each-subsample. Chile's ERPT has dropped significantly and monotonically across the three sub-samples. Before the transition to a free-floating exchange rate regime, the estimated pass-through one year out was about 32 percent, which fell to 24 percent in the following decade. In the last decade, the pass-through decreased to 15 percent, consistent with Contreras et al. (2016) for the same time period.

Compared internationally, Chile's ERPT compares favorably. Carriere-Swallow et al. (2016) examine pass-through estimates for 62 countries from 2000 to 2015. They observe that, consistent with the literature, there is significant variation in the extent of estimated exchange rate pass-through across countries. Figure 4 highlights the wide range, along with Chile's pass-through estimate of 0.06 after 12 months and 0.11 after 24 months. This is lower than both the average of emerging economies and advanced economies.

Chile's lower ERPT can be attributed to the success of its improving monetary policy credibility and institutional strength. As Albagli et al. (2020) notes, credibility in the institutional and monetary policy framework play a key role in the level of ERPT a country experiences. This credibility is defined by the public's confidence in the central bank's commitment and capability to achieve its stated objectives. This trust is built when the public is convinced that the monetary authority has no incentive to deviate from its plan or to compromise it for other priorities (Bems et al. 2021). There is a large literature linking the credibility of monetary policy and ERPT, documenting the connection between strong institutions, monetary policy, and central bank independence, among others. Carriere-Swallow et al. (2016) find evidence that increased monetary policy credibility and price stability have reduced exchange rate pass-through. Alogoskoufis & Smith (1991) argue that low inflation persistence is achieved by making some form of credible commitment, putting emphasis on central bank independence and monetary institutions that put weight on price stability. Indeed, post adoption of the floating exchange rate the CBCh has been able to do exactly this.

While the effectiveness of monetary policy cannot be directly observed, it can be inferred from the degree to which the public's long-term inflation expectations are anchored (King 1995). If expectations are anchored, the impact of a decline in the exchange rate on inflation will be less significant compared to when expectations are not anchored, and individuals will become more responsive to inflation shocks in their forecasts (Albagli et al. 2020). The literature highlights a number of factors that contribute to credibility and thus anchoring, including central bank transparency, explicit inflation targets, and the quality of institutions.[3] To measure this, Bems et al. (2021) create an index measuring the extent of anchoring of long-term inflation expectations for a large sample of 45 advanced and emerging economies since 1989. The index takes into account metrics related to the extent that inflation deviates from long-term forecasts. The authors find a link between the degree of anchoring and the transparency of central bank policies. Implementing an inflation targeting regime is strongly tied to increased transparency, which involves not only setting a clear inflation target but also making additional changes to improve the quantity and quality of information available to the public. They also find that inflation expectations are more anchored in nations that have adopted an inflation targeting

[3]Refer to Bems et al. (2021) for a summary on the literature surrounding determinants of anchoring.

regime, with the stability of these expectations increasing with the age of the regime.

Additionally, They find evidence of significant heterogeneity in regards to the extent of anchoring across countries in the sample, especially when focusing on emerging economies. Figure 5 shows the average value of the anchoring index for each country in the sample from 2004 to 2017, a time in which anchoring was mostly stable both in emerging and advanced economies. While some emerging economies showed a significant lack of anchoring, Chile ranked among the highest in the emerging market group and above the advanced economies average. This was not always the case as Chile ranked close to the median relative to other emerging market economies in 1999. The upward trend in anchoring of expectations highlights the gains in monetary policy credibility post-adoption of the floating rate regime.

Factors that have helped the extent of anchoring in Chile include the release of monetary policy reports, statements and minutes of monetary policy meetings, and economic forecasts and their assumptions, among other items. Communication from the CBCh directly impacts agents' inflation expectations and thus leads to better informed expectations and more effective conduct of monetary policy. A key motivation for this is that it helps agents understand the policies that the Central Bank adopts to meet the target and, in this way, affects the process of inflation expectations formation (CBCh 2020). As for the quality of institutions, Figure 6 Panel A shows that Chile has led in regulatory quality among other emerging markets and Panel B illustrates the effect these efforts by the CBCh have had in their credibility.

Finally, the inflation-targeting regime implemented post adoption of the floating rate has made explicit the inflation target of 3 percent and its goal of maintaining this target over a two-year horizon. Assuming that the CBCh's policy is credible, expectations should be anchored at the 3 percent target. This would imply that the market trusts the decision-making of the CBCh to meet this target despite fluctuations in the inflation rate. Figure 7 illustrates that from December 2001 to December 2019 two-year ahead inflation expectations have remained mostly at 3 percent, averaging 3.03 percent over the period. In examining historical inflation data, the average annual inflation rate since the full implementation of the inflation-targeting regime of 2001 through 2019 was 3.2 percent with a majority of months within the operational range of 2 percent to 4 percent.

Overall, the increased credibility of the Central Bank of Chile and better institutional frameworks have helped to keep the exchange rate pass-through low in Chile. Over the years, the Central Bank's clear commitment to its inflation targets and improved regulatory practices have helped keep inflation expectations anchored. This has reduced the impact of changes in the exchange rate on domestic inflation, leading to a consistently low and decreasing exchange-rate pass through. These results underline the importance of transparent and consistent monetary policy and strong institutions in maintaining economic stability. Further, the strength of both the inflation-targeting and exchange rate frameworks are reinforcing. Adoption of the floating rate regime allowed the Central Bank to focus solely on price stability, which in turn has built credibility, lowered ERPT, and thus reinforced the stability of the exchange rate.

2.2.2 Financial Stability and Currency Risk

The other obstacle in overcoming the fear of floating is financial instability, with the main risk consisting of exposure to foreign currency risk. When firms hold excessive currency mismatches on their balance sheets, they become vulnerable to exchange rate fluctuations. For example, if a firm has

debt denominated in a foreign currency, any devaluation of the domestic currency can significantly increase the burden of debt repayments, potentially leading to insolvency. Important to the level of currency mismatch is the exchange rate system in place. The external insurance provided to firms given the commitment to a rigid exchange rate could induce agents to increase currency exposure. On the flip side, the increased volatility given a flexible exchange rate can discourage dollar debt in favor of peso debt. It can also incentivize firms to hedge exposure, either naturally or in the FX derivatives market. Empirical work on Chile shows that, actually, levels of currency exposure were relatively low in both financial and non-financial firms before the move to the floating rate in 1999. Banks and regulated financial institutions adjusted towards low currency exposure occurred well before 1999, following the adoption of new banking regulation as in response to the early-80s financial crisis in Chile (Albagli et al. 2020).

As for non-financial firms, Cowan et al. (2005) do indeed find balance sheet effects for non-financial firms in Chile during the period of study (1995 - 2003) with a significant decline in currency exposure after the adoption of the floating rate in 1999.[4] The authors suggest that increased exchange rate volatility alters the relative risk of foreign and domestic debt. This implies that floating exchange rate regimes reduce exposure by removing the implicit exchange rate insurance present in non-flexible regimes, thereby compelling firms to manage exchange rate risk themselves (Cowan et al. 2005). Despite this, firms matched the currency make-up of their debt with their income and assets even before the adoption of the floating rate. Currency exposure declined post-adoption, but the fact that exposure was low even before implies firms internalized the cost of mismatches regardless of the regime in place. These results confirm Caballero et al. (2005)'s analysis that currency mismatches were not a significant problem at the time, showing that unhedged dollarized liabilities were comparatively low to other Latin American economies. The findings suggest that memory is long-lasting, considering the painful financial crises experienced in the 1980s when there was high liability dollarization.

Albagli et al. (2020) extends the analysis of non-financial firm currency exposure to 2018. They document a continued decline in the distribution of firms' FX exposure. While the average currency exposure was limited prior to the regime change in 1999, the authors note that examining the broader distribution of currency exposure adds more insight. Firms in the 90th percentile had initial exposures as high as 20 percent of their total assets shortly after the float (implying their USD liabilities exceeded their USD assets by 20 percent of total assets). Conversely, firms in the 10th percentile had a negative initial exposure of around 15 percent of their total assets. They argue that from a financial stability viewpoint, it is these firms at the extremes of the distribution that are most significant. Over time, however, they document that these firms have experienced a significant and progressive decline towards low amounts of balance sheet mismatch.

Importantly, and contrary to popular belief, they argue that the majority of the decline seems to be driven by an adjustment of assets/liabilities mismatch, with net derivatives positions playing a lesser role. A larger factor may have been the overall deepening of financial markets over the period. Growth of institutional investors, especially Chilean pension funds (known as Administradoras de Fondos de Pensiones or "AFPs"), gave rise to a more developed capital market with cheaper credit. As Marcel (2019) notes, the Chilean financial sector has become one of the most developed in the

[4] Alvarez & Hansen (2017) document studies of currency mismatch in Chile: Benavente et al. (2003), Cowan et al. (2005) and Fuentes (2009) study the balance sheet effects in non-financial firms. While Benavente et al. (2003) find a slightly positive effect of devaluations on investment, Cowan et al. (2005) and Fuentes (2009) document negative balance sheet effects on investment.

emerging world, moving from being largely dominated by traditional banking to comprising several large market participants, key among them pension funds. In 1984, assets under management of non-bank investors was less than 1 percent of GDP. By 2000, it had grown to 65 percent of GDP and by 2018 almost 100 percent. The result has been much greater access to alternative sources of funding for Chilean agents. Indeed, the build up of corporate debt by institutional investors amounted to around 85 percent of total corporate bonds in 2019. As a result, reliance on banking credit of these corporations has dropped from over 90 percent of financial debt in 1986 to around 25 percent in recent years (Marcel 2019).

In summary, Chilean firms have either reduced or maintained low levels of currency exposure since the Asian-Russian crises. Despite low levels in the 1990s, the monotonic decline post-adoption of the floating exchange rate regime suggests an internalizing of risk due to the lack of implicit exchange rate insurance and increased exchange rate volatility. In addition, the deepening of financial markets has allowed for more favorable domestic financing and less liability dollarization. The financial stability as a result of these developments have helped Chile overcome the fear of floating, as well as help to cement the commitment to the floating exchange rate framework and allowing it to act as a shock absorber.

2.2.3 Exchange Rate Interventions

A question that deserves attention is to what extent exchange rate interventions have been used as a policy tool since the adoption of the floating rate regime? An excessive use of intervention is a classic sign of the fear of floating, turning a de jure floating rate regime into a de facto managed system. As shown above, a floating exchange rate will most often lead to greater exchange rate volatility, as in the case of Chile. Claro & Soto (2013) explain that regular interventions in the foreign exchange market (assuming they succeed in reducing the volatility of the currency) can create implicit insurance and encourage the growth of currency mismatches in the private sector. Additionally, they highlight that intervening in the exchange rate market may conflict with the Central Bank's other objectives, such as controlling inflation. In situations of high inflation, such interventions could signal a weaker commitment to controlling inflation, leading to unanchored expectations and making it more difficult for the Central Bank to achieve its primary objective of price stability.

It is through credible monetary policy and a developed financial market that Chile has been able to provide price and financial stability, successfully mitigating any harmful effects related to the fear of floating. That being said, while forex interventions have been few and far between, the CBCh has made clear that it reserves the right to intervene during exceptional episodes of uncertainty and volatility, under which there may be adverse economic effects of an overreacting exchange rate (CBCh 2003). Indeed, most free-floating countries have intervened in the foreign exchange market and it is not unusual.[5] Since 1999, Chile has intervened seven times. Costa (2023a) notes that three of these interventions were aimed at purchasing currency to build up reserves. The other four interventions were conducted to provide liquidity during times of significant stress in the foreign exchange market,

[5]De Gregorio & Tokman (2004) state that New Zealand and Poland are the only countries that have not intervened in the market, making them pure floaters. The US, Japan, and EU have intervened less frequently but with larger amounts. European central banks reduced interventions after the introduction of the euro in 1999. The UK and Switzerland have only intervened once since 1992, and Canada has significantly reduced its intervention activity by abandoning its previous mechanical intervention rule.

using either direct currency sales or dollar-denominated instruments.[6] These actions were taken to ensure the proper functioning of financial markets and the stability of the price formation process. For each intervention, the rationale and process was transparently communicated to the public in advance and without any conditions in regards to changes in the exchange rate (Albagli et al. 2020).[7]

2.3 Development of the Currency Derivatives Market

Another important way to develop currency-trust is through a well-developed currency derivatives market, which allows domestic agents to spread currency risk. A liquid FX derivatives market provides investors with more confidence in holding peso-denominated assets, as they believe the central bank and the financial infrastructure will manage the currency effectively to avoid detrimental exchange rate fluctuations. This increased currency-trust further supports the demand for Chilean peso assets, contributing to the overall growth and stability of the FX derivatives market.

The FX derivatives market in Chile has seen substantial growth since the Asian-Russian crises, in large part due to demand from domestic pension funds, which act as a natural counterparty to resident and foreign investors who are short the Peso. While it has played a secondary role in lowering currency exposure for non-financial firms in Chile as explained above, the growth in the market has provided banks an avenue through which to separate exchange rate risk from credit risk. This separation implies an increased willingness for banks to intermediate international capital during times of crisis, something that Chile lacked during the Asian-Russian crises (Caballero et al. 2005).

More intermediation of foreign capital implies that small firms, which are more reliant on bank credit and more sensitive to currency mismatches, can effectively access international capital through loans in their domestic currency. This allows these small firms to minimize their exposure to exchange rate volatility. Additionally, greater depth of the FX derivatives market is important for financial resilience more generally, particularly for emerging markets facing volatile capital inflows like Chile.

The development of such a market in Chile is a significant step towards reducing the need for a defense of the exchange rate, allowing for more flexible and resilient financial systems capable of withstanding the shocks of financial crises. Indeed, the increased depth and liquidity of the FX derivatives market has improved resilience to external shocks, a topic that will be explored in Section 4. Below, I show the significant growth in the FX derivatives market since the Asian-Russian crises. I highlight the factors that encouraged its growth, including the adoption of the floating rate regime and demand from AFPs.

2.3.1 Growth Since the Asian and Russian Crises

During the Asian-Russian crises, Chile's FX derivatives market was present but limited in scope. The difference in development across markets is presented in Table 1 using data from the Bank for International Settlements survey of foreign exchange and derivatives market activity. The table highlights

[6] Interventions motivated by excessive volatility occurred in 2001, 2002, 2019, and 2022. These were carried out through the sale of currencies by the CBCh. The other three interventions occurred in 2008, 2011, and 2021, with the objective of accumulating international reserves (i.e. the purchase of securities by the CBCh). Refer to Arenas & Griffith-Jones (2023) for further detail.

[7] For empirical work on the effectiveness of these interventions, Tapia et al. (2004), Larraín et al. (2019), and Jara & Piña (2023) find significant effects in the expected direction on the level and volatility of the exchange rate. In examining the 2019 and 2022 interventions, Arenas & Griffith-Jones (2023) find significant negative effects both on the level and on the volatility of the exchange rate. Arenas & Griffith-Jones (2023) for a further overview of the literature.

the growth in Chile's currency derivatives market from 2001 to 2022. Specifically, Chile's derivative turnover as a percentage of spot currency turnover, trade flows, and GDP has all increased over this period. Comparatively, Chile's 2022 derivative market is now larger than the average of its peers in Latin America. Additionally, compared to other emerging market economies, Chile has a larger market relative to its trade and GDP. This growth underscores the increasing importance and integration of derivatives in Chile's financial system. Although there is still a considerable gap compared to developed economies, Chile's progress is notable, indicating a maturing market with increasing liquidity and participation.

To further explore Chile's market compared to other emerging markets, Figure 8 compares the depth of the FX derivatives market. FX derivative market depth, a measure of how active a country's FX derivative market is relative to its size, is compared with other regions.[8] The calculation uses notional amounts traded in USD in April of each year and is annualized. While still much smaller than developed economies, the Chilean FX derivative market is large relative to its peers and has grown since the Asian-Russian crises. In 1998, the FX market in Chile was comparable to other emerging economies, but by 2022, it was nearly twice the relative size.

To assess its development compared globally, I replicate a cross-country regression used by Caballero et al. (2005). Using derivative turnover data from the Bank of International Settlements and variables that relate to the degree of financial development and openness, I estimate:

$$Fx = \alpha_0 + \alpha_1 y + \alpha_2 trade + \alpha_3 fdev + \alpha_4 emu + u \tag{1}$$

on the sample countries available from Bank for International Settlements (2022). The variables are detailed as follows:

Fx : currency derivative turnover scaled by nominal GDP
y : per capita income on a PPP basis
$trade$: ratio of exports plus imports to GDP
$fdev$: ratio of private bank lending to nominal GDP (a proxy for financial development)
emu : dummy variable indicating adoption of the euro

Figure 9 shows the fitted values of turnover compared to actual turnover. The color of the points corresponds to advanced economies (blue), emerging economies (red), and Latin American economies (green). The results highlight how Chile's derivative turnover is broadly in line with its overall level of development. Important to note is Chile's relative size compared to other important Latin American economies. The position underscores Chile's more advanced financial market and its stronger integration into the global financial system.

The estimated coefficients are shown in Table 2. In line with expectations, derivative turnover is positively correlated with income per capita, financial openness, and financial development, although the level of trade was not shown to be significant. The emu dummy, indicating whether a country has adopted the Euro, is negative. This is expected because the Euro eliminates currency exchange risk within the Eurozone, reducing the need for companies to hedge against currency fluctuations between

[8]Market depth calculated as annual transactions over GDP. Classifications for blocs were based on the International Monetary Fund's World Economic Outlook for each year of the analysis (excluding Latin America economies).

member states and naturally decreasing the demand for derivatives. While not taking into account endogeneity concerns, the positive correlations with openness, income per capita, and financial development imply that as Chile continues to grow economically and integrate more with international markets, its derivatives market is likely to expand accordingly.

Figure 10 illustrates the substantial increase in derivative use over time broken out by different agents. Panel A shows the gross positions and Panel B the net positions in FX derivatives, both from the buyer side (long) and from the seller side (short). Data on FX derivatives is sourced from the Central Bank of Chile's registry, which gathers transaction-level information reported by participants in the "Mercado Cambiario Formal" (MCF), including commercial banks and other financial institutions which must report transactions to the Central Bank within 24 hours. This dataset encompasses nearly all FX derivatives transactions in Chile since 1997, comprising over 3 million observations from more than 11,000 firms (Albagli et al. 2020).

Looking first at Panel A, we can see the large growth in notional positions traded since the Asian-Russian crises, an increase of almost ten-fold. Additionally, Panel A shows the large role the banking sector plays in the market. Banks are the largest participants and generally act as market makers, as evidenced by the substantial difference from their gross position to their net position. Foreign investors have played an increasing role, holding both long and short forward positions, which makes sense given their differing economic needs. As for pension funds, the majority position is most often short positions on foreign currency as shown in Panel B.

2.3.2 Reasons for Growth

The lack of development of the FX derivatives market in the early 2000s was attributed to multiple factors. Restricted portfolio management regulations on pension funds, low liquidity, and high trading costs were seen to play driving factors (Fernandez 2006). However, during this time, constraints began to be lifted and the adoption of the floating rate regime further increased demand to hedge foreign currency exposure.

As explained in Section 2.2, findings from Cowan et al. (2005) and De Gregorio & Tokman (2004) note the importance of the adoption of the floating exchange rate in the increased use of derivatives. They suggest that the exchange rate system and the resulting volatility encouraged firms to be more cautious in their management of currency exposure. Additionally, they compare exchange rate regimes of different countries against measures related to the development of the derivatives market. Their findings suggest that the more flexible the exchange rate regime is, the larger the derivatives market. Albagli et al. (2020) note that non-financial corporations have significantly reduced their foreign currency exposure. Because this reduction occurs shortly after the switch to the free float, they suggest that this points to firms' choices being partly endogenous to the exchange rate regime.

A main driver for the growth, however, has been the strong demand from Chilean pension funds, or AFPs. These funds invest a sizable amount of assets into foreign vehicles, and because they are required by law to hedge currency exposure, they have played an important part in the development of the market. Given that Chile is an emerging market and, post-adoption of the floating rate, has experienced a more volatile exchange rate, it is natural for residents and foreign investors to want to protect themselves from currency depreciations. As Upper & Valli (2016) explain, the desire to hedge, however, does not automatically result in liquid markets unless there is someone willing to take the other side. They note that creating a market for macroeconomic risks, such as exchange

rate and interest rate risk, can be difficult unless there are parties who are exposed to these risks in opposite ways. Because pension funds seek protection from a peso appreciation, they serve as a natural counterparty and, in turn, create attractive terms in the market. As shown in Figure 10 Panel B, the important role of pension funds in the market is evident, as at times they have been the only net supplier of US dollars in the forward market. The authors note that the importance of pension funds in the Chilean FX derivative market appears to be the exception rather than the rule compared to other countries.

FX derivative demand from AFPs has seen large increases due to the rapid growth of assets under management. In 1995 assets were equivalent to almost 40 percent of GDP, and have surpassed 75 percent in recent years (Figure 11). The difference is substantial compared to other emerging markets. While subject to regulations on types and levels of assets available to hold, these have been relaxed over time. In 1992, only 1.5 percent of assets could be invested abroad. By 2011, that number had risen to 75 percent and 100 percent for the intermediate-risk fund and most aggressive fund, respectively.[9][10] As shown in Figure 12, the growth in net foreign asset holdings by AFPs has been substantial and began to increase after the Asian-Russian crises. The situation is reversed for domestic banks and the non-financial sector, which over time, have accumulated a significant net debtor position. Chile is unique compared to other emerging markets in the fact that a non-bank financial private sector has such a large net long foreign asset position as a fraction of GDP.

While regulatory requirements have been in place on the amount of unhedged foreign currency risk is acceptable for AFPs, they have typically hedged more than the requirement. Indeed, in late 2008 AFPs had hedged almost 80 percent of their FX exposure, substantially higher than what was required by regulation (Avalos & Moreno 2013). In Section 4, I discuss the impact this had on capital flows and the mitigating effects of the Global Financial Crisis.

The AFP demand for derivatives is so large that it even can have significant negative supply shocks on the FX market. Alfaro et al. (2021) examine the regulatory change in 2012 that allowed AFPs to increase their share of non-hedged portfolios from 15 percent to 50 percent (depending on the fund type) to 50 percent. The change resulted in a temporary negative supply shock to the FX derivatives market due to the decreased sales of FX derivatives by AFPs. The decreased supply of FX derivatives resulted in banks curbing sales of long FX positions to firms. Despite this change, over time AFPs have continued to increase their positions of FX derivatives due to asset growth.

Overall, the substantial growth in managed assets of AFPs and the increased share invested abroad have resulted in a deepening of financial markets in Chile. This has had two effects: 1) lowering the cost of local credit and thereby reducing the incentives of firms to take on currency risk in their balance sheet by borrowing abroad, and 2) contributing to the development and liquidity of the hedging market through increased demand due to the sizeable foreign investments (Albagli et al. 2020). The impact of AFP growth in Chile is also seen during periods of financial stress, as examined in Section 4. The market's development has contributed to the flexible exchange rate regime absorbing part of the

[9]Each AFP offers five types of fund (A through E) giving varying degrees of asset allocations and risks. The CBCh sets the minimum and maximum limits for investment abroad for each type of fund. As of 2022 the maximum consists of 100 percent for fund type A; 90 percent for fund type B; 75 percent for fund type C; 45 percent for fund Type D, and 35 percent for fund Type E. See www.spensions.cl for details regarding AFPs. Additionally, AFPs are subject to maximum amounts of unhedged currency exposure as a result of foreign asset investments.

[10]According to Cowan & De Gregorio (2007), the logic for the gradual opening up of investment abroad by pension funds was for two main reasons: 1) lifting restrictions allowed for greater portfolio diversification, and 2) it was initially meant to encourage capital outflows in a period characterized by persistent real exchange rate appreciation.

impact of external volatility, thus contributing to the stability of rates and the availability of long-term financing (Berstein & Marcel 2019). When external shocks are felt, the resident counterparties help sustain market liquidity, and exchange rate fluctuations are less prone to contributing to systemic vulnerability.

3 Development of Country-trust

While currency-trust helps mitigate sudden stops, country-trust is noted as the underlying cause. Caballero et al. (2005) define it as the degree of confidence foreign investors have in the country, involving its ability to repay its debts, corporate governance, and its economic and financial stability. While today Chile is known as a leader in the region in terms of institutional credibility and stability, this was not always the case. It was not until 1990 when Chile re-established its democracy and in the ensuing years experienced what is termed "the Chilean miracle" due to unprecedented political and economic stability. This success is based on factors such as the institutional setting, fiscal discipline, debt management, and a tightly monitored banking system that is open to foreign investment (Cabezas B & Lahera 2000). With the passage of time, the culmination of these aspects has developed strong credibility in institutions in Chile, and has led to a level of macroeconomic stability that has developed a high degree of country-trust compared to other countries in the region. Below, I detail the aspects that enhance country-trust and provide context to its development in Chile.

3.1 Default History

The effective management of external debt directly builds country-trust and plays a key role in shaping relationships with foreign investors. Chile's history, however, has been marked by challenges that include periods of default. For example, in 1971, the government declared a moratorium on its foreign debt. This action severed Chile's access to external financing. In addition, during this time fiscal deficits were substantial due to an increase in government spending after the election of the socialist government. In 1970 the fiscal deficit was 0.5 percent of GDP and by 1973 it had risen to 23 percent of GDP. As Caputo & Saravia (2018) describe, seigniorage became the main source of funds for the government as these deficits could not be completely financed by additional public debt. The fiscal deficit was the most important component of obligations during the period and inflation became a fiscal phenomenon.[11]

Private foreign debt, as a percentage of GDP, increased significantly from 10.5 percent in 1975 to 41.8 percent in 1982. The situation came to a head in 1981 when, following a negative terms of trade shock, Chile entered a recession and experienced a devaluation that increased the strain of foreign debt (which at the time was mostly held by the private sector and intermediated by financial institutions). Because of the banking sector's role in intermediation, they accumulated large currency mismatches and became subject to extreme risk. The subsequent devaluation of the peso rendered many banks insolvent, unable to service their foreign loans, and posed a systemic risk to the entire financial system. The crisis underscored the interconnectivity between the financial health of the private sector and the

[11] For a complete overview of the monetary and fiscal history of Chile, refer to Caputo & Saravia (2018).

stability of the national economy. In response, the government had to intervene directly to prevent a total collapse, implementing rescue programs primarily through the Central Bank and the Treasury which assumed the debt obligations of the private sector. While not related to sovereign default, this intervention came at an enormous cost to the fiscal authority and the Central Bank, highlighting the substantial fiscal implications of private sector defaults. The situation demonstrated that private sector financial crises could necessitate sovereign intervention, with significant impacts on a country's fiscal health and economic policies. Additionally, the episode illustrated the need for better financial regulation and oversight to manage external debt and prevent such crises from threatening economic stability in the future.

The effects of this episode were long-lasting. It was not until 2019 that the Central Bank received the last repayment of the subordinated debt that originated in the rescue of the Chilean financial system of the early 1980s (Marcel 2019), highlighting the enormous and long-run costs associated with financial system instability. Learning from these painful experiences, Chile set out on a path of improving their financial discipline, implementing more conservative financial regulation, and working towards a more resilient economic framework. The realization that sound fiscal management and strong institutions were key to preventing future crises drove these changes. These reforms were essential not only for restoring investor confidence but also for ensuring long-term economic stability and resilience against future financial shocks.

3.2 Development of Institutions

The quality of institutions and depth of the financial system are key to developing and maintaining a strong confidence in the country for foreign investors. Even before the Asian-Russian crises, Chile was recognized for its strong institutional credibility in the region. Caballero et al. (2005) note that Chile was arguably the most advanced economy in Latin America in terms of institutional development and macroeconomic stability, hence their use in comparing it to Australia. While instability and regime change characterized Chile's experience up until the 1990s, they have been considered a model economy in the region due to solid institutions and sustainable fiscal policy since (OECD 2022). As shown in Figure 13, indicators of corruption highlight the strong position of Chile's institutions across multiple dimensions, such as perceived corruption levels, anti-corruption measures, and various integrity initiatives. Chile performs well compared to its regional counterparts, showing notable progress in enhancing integrity and transparency policies (OECD 2022).

The financial system has improved greatly since the late 1980s, both in terms of stability and its depth. Jara & Cabezas (2018) describe the banking regulation framework as similar to Basel I, however, it is more demanding in regards to the definition of capital and limits imposed. Liquidity risk exposures have been subject to conservative limits since the early 2000s are now regulated with the Basel III approach. Thus, they state that Chilean supervisory and regulatory authorities are generally more conservative in their approach regarding the banking system, an important note for stability and thus country-trust. In 2019, the General Banking Act of 1997 was amended which introduced several measures on supervision, adjusting banks capital requirements and other obligations to the framework of Basel III (Moro, Felipe and Noriega, Fernando 2024).

Chile stands out from numerous other Latin American nations due to its extensive financial markets and access to private long-term credit, in contrast to the limited financial markets prevalent in those countries (Figure 14). Important to its development has been the growth of financial institu-

tions, with pension funds playing a key role. As explained in Section 2.3, pension funds have seen large growth in assets over time and are considerably larger than its peers relative to the size of Chile. IMF (2023a) describes the impact pensions have had, explaining that the establishment of AFPs in Chile has contributed to lower financing costs for firms, provided a steady stream of funding for investment, and has acted as an important shock absorber of capital inflow reversals (see Section 4.3 for more detail on this point). The continued relaxation of pension fund investment rules has encouraged the growth of inexpensive long-term financing. The authors explain that AFP investment rules have been progressively relaxed since their inception in 1981, allowing them to invest in more diverse asset classes and increase their share of foreign assets, while still subject to risk management measures. These developments have resulted in reduced capital expenses for Chilean businesses, expanded borrowing and investment prospects, and enhanced ability to withstand economic downturns (OECD 2022). The banking system has also played an important role since the Asian-Russian crises in intermediating foreign capital to domestic agents, especially during times of shocks. The impact of this will be examined in Section 4.

Additionally, Chile continues to strengthen its institutional framework to further support its exchange rate and inflation targeting regimes. As shown in the timeline in Figure 15, Chile has continued to implement institutional building blocks to strengthen its institutional framework. The fiscal rule was later formalized in the comprehensive Fiscal Responsibility Law of 2006 that created two sovereign wealth funds (SWFs) and required adopting and implementing a fiscal policy framework that aims at fiscal sustainability based on cyclically adjusted government balances (Fuentes et al. 2021). Most recently, the Independent Fiscal Council (IFC) was established to ensure ongoing compliance and monitoring of fiscal policies.

In summary, Chile's improved macroeconomic framework, flexible exchange rate regime, prudent fiscal policy, and adequate regulatory oversight have all contributed to building solvent financial institutions. These elements, alongside a two-year inflation-targeting framework and strong financial supervision, play an important role in absorbing external shocks and maintaining economic stability (Costa 2022).

3.3 Financial Discipline

The institutional framework supporting Chile's floating exchange rate regime, credible inflation targeting, and open capital account relies heavily on prudent fiscal policy management. After lessons learned from painful financial crises, Chile's fiscal strategy has aimed to align annual budget expenses with long-term fiscal revenues, targeting a small structural surplus (Desormeaux et al. 2008). These principles helped shape the economic policies that followed the financial system rescue in 1982. To avoid future bailouts and manage the substantial obligations absorbed by the Treasury and Central Bank, Chile recognized the necessity of financial discipline. Additionally, the country's heavy reliance on copper exports, with their volatile prices, underscored the need for consistent surpluses to promote economic stability and growth. The commitment to financial discipline is a crucial aspect of country-trust, as it involves prudent debt and spending management, which fosters economic and financial stability and creates a more attractive environment for foreign investment.

In 1985, a first step towards financial discipline was taken through the creation of the Copper Revenue Stabilization Fund (CRSF). Its purpose was to stabilize government spending by managing the impact of fluctuating profits from the state-owned copper company, Codelco. Profits exceeding

a predetermined level were deposited into the CRSF and withdrawn during periods of low profits to smooth government expenditure. After the fall of the Pinochet regime, the subsequent democratic governments continued the conservative fiscal policy, resulting in a series of fiscal surpluses. This period reflected much improved fiscal balances (Figure 16), with an average fiscal surplus of 1.2 percent of GDP from 1990 to 2000 (Fuentes et al. 2021). The improved financial situation during the period allowed the level of gross debt (Figure 17) to be reduced from over 43.4 percent of GDP in 1990 to 12.2 percent of GDP in 1998, shortly before the Asian-Russian crises (Barreix et al. 2019).

Thus, long before the Asian-Russian crises, Chile began to develop financial discipline by prioritizing fiscal surpluses and prudent debt management. Building on this foundation, Chile recognized the need for a more structured approach to ensure medium-term fiscal sustainability, leading to the implementation of a fiscal rule in the early 2000s. Fiscal rules, which set numerical limits on budgetary aggregates to guide fiscal policy, have become a popular method for instilling financial discipline. When well designed and implemented, fiscal rules can help reduce inconsistency in budgetary policies over time, enhance the government's credibility in maintaining fiscal sustainability, and facilitate countercyclical fiscal management (Berganza 2012). These rules are important components of advanced fiscal institutions. Reasons to adopt a fiscal rule in Chile included strengthening fiscal solvency and sustainability, contributing to macroeconomic stabilization by reducing fiscal policy procyclicality, and making fiscal policy design and execution more resilient to corruption, political interference, and private-sector lobbying (Fuentes et al. 2021). This structured approach has helped Chile maintain economic stability and build trust with international investors.

3.3.1 Adoption of the Fiscal Rule

To formalize fiscal discipline into law, Chile adopted a fiscal rule in 2000 with the primary goal of promoting fiscal sustainability and macroeconomic stability. The rule is a budget balance rule (BBR), initially calling for a structural surplus corresponding to 1 percent of GDP each year, and takes into account cyclical deviations of domestic GDP from trend as well as deviations of the price of copper from its medium-term trend (Fuentes et al. 2021). Besides accommodating the normal business cycle, the rule is specific to Chile in the sense that it accommodates fluctuations in the price of its main export, Copper. Indeed, the design of the rule highlights the nature of the two main sources of volatility to government revenue not only in Chile but much of Latin America. One of them relating to the normal business cycle responsible for non-mining tax revenue, and the other relating to copper prices (or more generally commodity prices in the rest of Latin America) (Fuentes et al. 2021). Put simply, the rule seeks to promote savings in good times and finance deficits in bad times, helping to smooth the economic cycle while promoting stability. Chile adopted a fiscal rule under conditions typically favorable for such measures: strong fiscal health (shown through the budget surpluses and low public debt), stable and democratic governance, and monetary policy based on inflation-targeting, among other things (Schmidt-Hebbel & Soto 2017, Fuentes et al. 2021).

Savings are generated when the current price is higher than the trend price and accumulated into the two Sovereign Wealth Funds (SWFs): the Pension Reserve Fund (PRF) and the Economic and Social Fund (ESSF).[12] The PRF's objective is to accumulate savings that can be used to pay minimum pensions in the future while the ESSF's objective is to mitigate the effects of economic crises by

[12]The ESSF, established in 2007, absorbed the existing Copper Stabilization Fund that had begun in 1985.

drawing on it to finance fiscal deficits.[13]

The extent of Chile's dependence on copper revenue is evident in Figure 18 which depicts the evolution of government copper and non-copper revenue ratios to GDP. Although non-mining revenue is typically six times greater than mining revenue, the latter exhibits double the standard deviation of the former. As Fuentes et al. (2021) explain, this discrepancy reflects the significantly higher volatility of the international copper price compared to the GDP level. Furthermore, they note that when comparing the period before the 1990s to the two decades following, it becomes evident that the volatility of copper revenue has increased substantially during the fiscal rule era due to the heightened volatility of copper prices since 2001. Therefore, in retrospect, the fiscal rule has been more essential in the past two decades than it was in the 1990s.

Despite Chile's history of fiscal surpluses prior to the implementation of the fiscal rule, the introduction of this framework sought to formalize fiscal discipline so that it would not be beholden to political pressure. Given the volatility in copper prices and tax revenues, it made codifying the rule all the more important. As to why a structural surplus of 1 percent was set, Engel, Marcel and Meller (2007) identify three reasons: 1) the existence of contingent liabilities from state pensions, 2) to cover potential deficits arising from external crises, and 3) the bailout of the financial system in the 1980s created a sustained operating deficit. By addressing these issues through a structural surplus, Chile aimed to build country-trust, reassuring investors of the nation's commitment to maintaining economic stability and fiscal responsibility.

Implementing a known and transparent fiscal rule helps mitigate the effects of economic volatility by reducing uncertainty for economic agents, particularly foreign investors, about the future behavior of public finances (Caputo and Saravia, 2019). In Chile, reducing uncertainty is crucial for minimizing the volatility of gross capital inflows from foreign investors, which is essential for maintaining economic stability and growth.

3.3.2 Impact of the Fiscal Rule

Surpluses continued to be generated well into the 2000s thanks in part due to the commodity price boom. In 2006 and 2007, Chile ran fiscal surpluses of 7.5 percent and 8.2 percent of GDP, respectively, far surpassing the structural surplus target of 1 percent. Even in 2008 when the structural balance was -1 percent of GDP, the treasury ran a surplus of over 4 percent of GDP (Barreix et al. 2019). Thanks to this, the SWFs began to accumulate substantial assets (Figure 19). By mid-2008, combined the SWFs reached more than US$22.2 billion, over 12 percent of GDP (Barreix et al. 2019). The effects of the ensuing crisis in 2009 would be greatly mitigated due to the financing provided by the SWFs which I explore more in Section 4.

Gross debt during this period was reduced markedly, and Chile's financial assets increased from close to 8 percent of GDP in 2002 to over 24 percent of GDP in 2008. Empirical work indicates that the improvements in fiscal sustainability, fiscal solvency, and credibility in the initial stages of the fiscal rule resulted in reduced sovereign risk premiums (Fuentes et al. 2021). Indeed, during the 1990s Chile's sovereign risk premium steadily declined. This is reflected in Chile's sovereign debt rating (Figure 20). In 1992 S&P had a sovereign debt rating of BBB for Chile. By 2012, it reached a high of AA3 (Moody's), AA (S&P) and A+ (Fitch). Additionally, the financial market acknowledged Chile's effective fiscal policy, resulting in historically low interest rates for sovereign bonds, which

[13] See Barreix et al. (2019) for a more detailed description of the PRF and the ESSF.

set a record for an emerging country in 2012 (Barreix et al. 2019).

The fiscal rule and more generally fiscal discipline further reinforced the other changes that Chile was undergoing during the beginning of the 2000s, namely the adoption of the floating exchange rate and inflation targeting regime explained in Section 2. In the same vein as the floating exchange and inflation targeting regimes helped to allow countercyclical monetary policy, the fiscal rule has contributed to reducing fiscal procyclicality. Empirical evidence suggests that since the early 2000s, public capital expenditures have become strongly countercyclical, confirming a significant reduction in the procyclical bias of fiscal policy. This transformation is particularly evident in how fiscal policies adapted to react constructively to economic shocks, facilitating countercyclical fiscal management during adverse periods such as in 2009 and 2020. Frankel et al. (2013) also note that improvements in Chilean fiscal institutions, particularly the Autonomous Fiscal Council (CFA), have improved fiscal policy accountability, thus helping to support a move towards more countercyclical fiscal policies. Barreix et al. (2019) notes the interaction between the rule and fiscal control institutions constitute an institutional framework for fiscal discipline that encourages macroeconomic stability, transparency, and accountability.

4 Shocks and Responses: Periods of Crisis in Chile 1997-2022

What impact did the development of trust in Chile have on its performance during periods of adverse financial shocks since the Asian-Russian crises? To address this question, the Global Financial Crisis starting in 2008 and the Covid-19 pandemic starting in 2020 were analyzed. By examining Chile's performance, this analysis aims to demonstrate how the nation's ability to withstand economic shocks and capital inflow volatility benefits the overall understanding of financial resilience and policy effectiveness. The results suggest that Chile's enhanced institutional frameworks and policy measures have improved its ability to handle both real and financial shocks, and thus economic resilience.

Section 4.1 provides a comparative analysis of Chile's economic performance across the mentioned crises, aiming to identify any improvements in resilience and stability. This evaluation considers key indicators such as GDP growth, inflation rates, and employment figures among others, compared against the different crisis episodes. The improvements in trust discussed in Sections 2 and 3 are shown to have helped enhance Chile's economic resilience to the real external shocks during these adverse periods. The improved policy mix has allowed Chile to navigate the more recent crises with greater policy flexibility and effectiveness than during the Asian-Russian crises. When combined with the increased financial market depth and developed derivatives market, these factors highlight Chile's greater capacity to manage external financial volatility.

In section 4.2, the role of capital flows are examined. Specifically, it provides a more general analysis of the characteristics that have made Chile and other emerging markets more resilient to volatile capital inflows, highlighting the attributes that align with currency-trust and country-trust in more resilient countries. Emerging markets more resilient to capital inflow volatility tend to have more countercyclical fiscal policy and better monetary policies, which assist in stabilizing the economy during periods of sharp capital inflow reversals. These economies also boast better institutions that enhance governance and economic management, fostering a stable investment climate. Additionally, these countries typically have more flexible exchange rate regimes, allowing their currencies to adjust

more freely to external shocks, thereby reducing the pressure on reserves and avoiding the pitfalls of fixed exchange rate systems. Furthermore, the stability of net capital flows is a key feature of more resilient economies. This stability often stems from greater financial adjustment that reflects private sector buffering of capital inflows, rather than relying solely on official interventions. This private sector involvement includes the growth of financial instruments such as currency derivatives, which assist in managing currency risk and encouraging long-term investment strategies.

Section 4.3 provides a detailed look at the evolution of capital flows in Chile, tying in the general conclusions of Section 4.2 by highlighting how improvements in currency-trust and country-trust have changed the makeup of capital flows. The analysis reveals that Chile's dynamics have changed since the Asian-Russian Crisis, with gross outflows playing a more important role in offsetting capital inflow volatility. Compared to other Latin American nations, Chile has relatively large gross capital outflows thanks to their large pension funds and their Sovereign Wealth Fund, which provide reliable sources of domestic liquidity during crises. Additionally, the increased flexibility of the exchange rate has removed any implicit insurance to borrowers and provided asset price adjustments that incentivize residents to repatriate capital in times of distress. Banks, shown to have contributed to capital flight during the Asian-Russian crises, have since increased their intermediation of capital, helping to reduce instances of sudden stops. Combined, these factors have improved Chile's resilience to capital inflow volatility and have fostered a more stable economic environment.

4.1 Key Findings from Crisis Episodes

Since the Asian-Russian crises, Chile has experienced two major global crises: the Global Financial Crisis and the crisis caused by the Covid-19 pandemic. While different in nature, examining Chile's economic performance during each of these episodes offers insights into the resilience and adaptability of the country's economic policies and structures. Useful to the comparison is the fact that the severity of shocks in the two later crises were much larger.

Following Albagli et al. (2020), this paper examines key economic and financial indicators through a 30-quarter period (7 ½ years) of the crisis episodes. Each crisis is given a start date and examined from the preceding 10 quarters leading up to the crisis through the 20 quarters post-crisis. The start dates of each economic crisis are as follows: Q3 1997 for the Asian-Russian crises (corresponding with the attack on the Thai baht)[14], Q3 2008 for the Global Financial Crisis (corresponding with the collapse of Lehman Brothers), and Q1 2020 for the Covid-19 Pandemic (corresponding to the declaration of a Pandemic by the WHO). The analysis below illustrates that Chile's economy adjusted faster and was less affected overall during the Global Financial Crisis and the Covid-19 Pandemic than during the Asian-Russian crises, despite the unprecedented severity of the shocks and the global impact of the latter episodes. Figure 21 highlights external stress, a compact measure capturing risks to exports, the copper industry, foreign direct investment, and global financing that puts into perspective all three crises. The three crises correspond to the periods with the highest stress levels (negative being the most severe) during the timeframe (IMF 2020).[15]

During the GFC and Pandemic global economic activity dipped severely and access to lending

[14]While the Asian-Russian Crisis includes multiple shocks, for ease of comparability the attack on the Thai Baht is used.

[15]The external economic stress index (ESI) is a compact measure of the external pressure faced by a specific economy. The measure identifies key external risks based on the given economy and selects proxies to represent these risks. Refer to Flexible Credit Line—Operational Guidance Note, IMF Policy Paper, August 2018 for the specific methodology.

was limited. Figure 22 shows the severity of the shocks experienced in Chile. External demand (as measured through trading partner GDP growth) was steeper than the Asian-Russian crises and the relative decline in copper prices was much more pronounced. During the GFC, copper declined by more than 63 percent in a span of just 9 months. In addition, during the Pandemic, lockdowns and movement restrictions combined to drive down domestic consumption, which contracted by 6.8 percent (ECLAC 2021).

Outcomes

Despite the severity of the shocks experienced during the GFC and Pandemic, Chile's macroeconomic performance fared better than during the Asian-Russian crises (Figure 23). While facing larger declines in real GDP growth during the more recent crises, the bounce back was quicker and more substantial. Real GDP growth fell for six quarters and dipped below -3 percent during the Asian-Russian crises. The GFC saw real GDP growth decline for four quarters before rebounding to higher levels. While the Covid-19 pandemic caused the largest contraction in Chile's GDP in close to 40 years, the recovery was rapid, declining for two quarters before rebounding. Though GDP growth has since slowed down, it remains to be seen how Chile will grow over the coming years.

Similarly, the unemployment rate experienced sharper rises but quicker declines in the last two crisis periods. Common to most countries during the Pandemic, unemployment topped 13 percent due to lockdowns and stringent health measures, before falling rapidly as the recovery period began. During the Asian-Russian crises, unemployment exhibited a slower response but rose significantly and persisted well into the early 2000s.

Inflation continued its downward trend after the Asian-Russian crises, but spiked during both the GFC and Pandemic. The spike after the second crisis reflects in part the pass-through from the exchange rate movements (Albagli et al. 2020). As for the Pandemic, Costa (2022) notes a relevant factor behind the persistent high inflation has been high levels of private consumption in recent years.

The external current account deficit expanded shortly before all crisis periods followed by sharp reversals after the first two crisis periods and more dramatic and extended decline after the Pandemic. The difference is due in large part to pension fund withdrawals, fiscal transfers, the relaxing of Covid-19 restrictions, and the continuing effects of the terms of trade shock. All of which have led to sizable increases in imports and an increased current account deficit until the sharp reversal as of late IMF (2023b). In the last quarter of 2022 the current account deficit showed a significant decrease and it is expected to reach its historical average of 3 percent in 2024 (Costa 2022, IMF 2023b). In the case of the GFC, the less severe decline in real exports growth, combined with a rapid reduction in imports, contributed to a quicker recovery of the current account balance during this crisis. This also highlights the role of the exchange rate in facilitating the adjustment (Albagli et al. 2020). The capital flow movements related to these reversals are examined in Section 4.3.

Policy Response

Important to the relative outcomes of the crises are the policy responses. The difference between the first crisis and the later two are stark. In the late 1990s, following the negative external shock, the CBCh raised interest rates substantially (Figure 22), topping over 18 percent in 1998. Additionally, the CBCh sold close to US$3 billion in reserves over several occasions between 1997 and 1999. These moves were made to minimize the nominal devaluation of the peso and stabilize the current account

deficit, which had been increasing since mid-1997 and reached about 8 percent of GDP in 1998—a level deemed unsustainable by authorities (Cowan & De Gregorio 2007). The adverse terms of trade shock, along with the hike in interest rates and contractionary monetary policy, led to a significant decline in economic activity as shown above. The contractionary monetary policy implemented shortly after the negative shock displays the restrictive nature that comes with the institutional frameworks present during the time. The reluctance to let the exchange rate fluctuate and adjust to market forces points directly to fear of floating as mentioned in Section 2.2.

In sharp contrast, during the GFC and the Pandemic, the CBCh had essentially the opposite reaction. As liquidity began to dry up, the CBCh cut interest rates significantly to stimulate growth. Interest rates went from 8.25 percent in late 2008 to 0.5 percent in July 2009. Similarly, in 2020 interest rates were quickly lowered to 0.5 percent. With the flexible regime in place, the exchange rate acted as the shock absorber and the CBCh was able to implement countercyclical monetary policy without having to defend the exchange rate. As seen in Figure 23, the real effective exchange rate (REER) experienced a more severe initial depreciation during the GFC and pandemic but recovered more quickly. While the REER is closely tied to copper prices, the bounce back of the REER preceded the movement in copper prices during the GFC (Albagli et al. 2020).

While there were intervention episodes both during the GFC and the Pandemic, these were carried out to provide liquidity in situations where the FX market exhibited stress levels that could endanger the operation of financial markets (Costa 2023a). Previously, the central bank worked to manage the exchange rate within a band. In later episodes, and post-adoption of the floating regime, the CBCh intervened only when they believed the exchange rate differed significantly from fundamentals, and communicated their reasoning transparently in advance. Notably, during these periods the CBCh did not need to manage the exchange rate actively. The well-developed derivatives market allowed firms to manage their own currency risk effectively. Additionally, the continuous need of AFPs to hedge their foreign asset portfolios contributed to the resilience of the derivatives market. As Avalos & Moreno (2013) argue, the size and resilience of the derivatives market played an important role in mitigating the severity of the financial stress experienced by Chile during the GFC, compared to other emerging market economies with similar or larger international reserve buffers. This resilience was largely due to the proactive hedging activities of AFPs. Fiscal policy shifted towards an expansionary stance. Large stimulus packages were implemented quickly after both episodes. In January 2009, the government announced a substantial fiscal stimulus package, amounting to US$4 billion for that year, equivalent to 3 percent of GDP (De Gregorio, 2011a). Stimulus packages were announced shortly after the Pandemic hit, with two packages amounting to close to 7 percent of GDP passed within months after the initial shock.

The fiscal deficit was much larger in the more recent episodes, reflecting the willingness and ability of the fiscal authority to respond to the shocks. As Albagli et al. (2020) explain, to an extent the faster reaction of policy was made possible by the fully flexible exchange rate policy, which quieted concerns related to the impact of the fiscal expansion on the sustainability of the exchange rate regime and allowed for countercyclical monetary policy. On top of this, the deficit began to improve faster during the GFC than the Asian-Russian crises highlighting the effect of the fiscal rule. Indeed, the benefits of the fiscal rule were on full display with the large reserves available in the SWFs. Just one year after the ESSF replaced the Copper Stabilization Fund, the Global Financial Crisis hit. With the onset of the crisis in 2008, the deficit was financed by the withdrawal in 2009 of close to US$9 billion from the ESSF and the government supported the economy without the need to issue more

debt. Ocampo (2009) notes that Chile's buildup of its stabilization fund during the commodity boom before the GFC was the best example of a countercyclical fiscal policy in the region. He further notes that it was the exception rather than the rule. Although multiple countries in Latin America had fiscal responsibility laws approved after the Asian-Russian Crises, many rules were breached by countries to facilitate more spending during the boom. Indeed, during the GFC, Ocampo (2009) finds that the elasticity of real primary public sector spending to long-term GDP growth during the period was lower than one (the clear sign of a countercyclical policy) only in three countries: Chile, El Salvador and Guatemala.

In 2020-21, more large withdrawals from the ESSF were made totaling US$10.2 billion as part of Chile's effort to mitigate the economic impact of the COVID-19 pandemic. While the fund was able to generate significant assets to counteract the negative economic effects of the pandemic, there has been a large depletion of assets in recent years. New measures are needed to avoid returning down the path of gradual depletion of the funds' resources in the years before 2020 (IMF 2023a). Despite this, Chile still compares favorably to others in the region (Figure 24).

In the next section, the changing dynamics of capital flows in Chile and their improved resilience to sudden stops are discussed. The progress in mitigating the effects of volatile capital inflows underscores a shift from reactive to proactive economic management. The change has helped to dampen the adverse effects traditionally associated with sudden stops such as balance of payments crises, currency instability, and broader economic disruptions.

4.2 Resilience to Capital Inflow Volatility

Capital flows are vitally important for emerging market economies. They provide essential financing for development projects and infrastructure, as well as help fill the gap between domestic savings and investment needs. Moreover, capital inflows can bring in foreign exchange, which supports the balance of payments and stabilizes the currency. They also introduce new technologies, management expertise, and access to global markets, enhancing productivity and competitiveness. However, capital flow volatility can severely disrupt the economy by heightening vulnerabilities in the financial system and intensifying macroeconomic instability (Forbes & Warnock 2012). The transmission channel is easier understood when considering the balance of payments identity.

$$\textit{Gross inflows} = \textit{current account deficit} + \textit{gross outflows} + \textit{reserves accumulation}$$

A surge in capital inflows can be absorbed either via a real adjustment (i.e., a current account deterioration) or via a financial adjustment (i.e., offsetting capital outflows or reserves accumulation) (Benes et al. 2013). If there is significant absorption through the current account, when these inflows reverse often there is a painful real adjustment that takes place. If, however, the surge is absorbed with a financial adjustment, then there is a strong mitigation of the real effects caused by capital inflow volatility. The concern related to real effects are rooted in past experience, notably the Asian-Russian crises, where surges in capital inflows spurred excessive credit growth, enlarged current account deficits, and appreciated exchange rates in many emerging markets (Benes et al. 2013). When these inflows reversed, the adjustment was marked by severe financial disruptions as highlighted in the case of Chile in Section 4.1. During the Asian-Russian crises, many emerging markets were subject to these large reversals leading to sudden stops (a sharp decrease in gross capital inflows)

and painful real adjustments. Without access to capital during these periods, economies were unable to smooth the financial shocks and the additional negative effects of the capital flow reversals.

What type of strategies can countries implement to encourage financial adjustment and reduce the extent of real adjustment needed? And what characteristics do we see in emerging markets that are more resilient to volatile capital inflows? An analysis by Benes et al. (2013) set out to answer these questions by looking at how countries can encourage stabilizing financial adjustments that minimize the required real adjustment, given an environment of volatile capital inflows. The authors regress the current account on gross capital inflows for each country in a sample of 38 emerging market economies from 2000 to 2012. The countries are ranked based on the estimated relationship between gross capital inflows and the current account, with the median used to split the sample into two groups. The countries with large positive coefficients (i.e., for whom changes in gross capital inflows correspond with large changes in the current account deficit) are classified as less resilient to capital inflows. The countries with a lower (or negative) coefficient are classified as more resilient.[16]

In examining GDP, consumption, and unemployment, the authors find that, on average, the countries that experienced less real adjustment were the group more resilient to capital inflows (Figures 25 and 26). This implies that more resilient countries experienced a much more stabilizing financial adjustment when dealing with volatile capital inflows. Importantly, the more resilient group shared features that set them apart from emerging markets classified as less resilient. Specifically, they had 1) more countercyclical fiscal policy; 2) higher quality institutions; 3) more flexible exchange rate regimes; and 4) more stable net capital flows due to greater financial adjustment (reflected through the private sector instead of official buffering of capital inflows). This was true even though both groups of emerging markets shared similar levels and volatility of gross capital inflows. Figure 27 highlights the differences in policies, institutions, and financial adjustment between the less resilient, more resilient, and a group of small open advanced economies.[17]

The analysis shows that the more resilient and less resilient groups do not significantly differ in several dimensions: both had approximately the same share of resources and manufacturing, similar levels of real GDP per capita, and faced a similar level and volatility of gross capital inflows. This suggests that resilience is not merely a factor of economic size or structure, but rather the result of the policy mix and institutional strengths. Another important result relates to which variable financial adjustment is acting through. As shown in Formula 2, financial adjustment acts through either the private sector (i.e., gross outflows) or the public sector (i.e., reserve accumulation). Between 2007 and 2009, when there were sharp reversals in gross inflows to emerging market economies, the authors find that about 20 percent of the financial adjustment in both groups occurred through changes in reserves, and with 80 percent through changes in private flows.

The connection of the common factors exhibited in more resilient economies confirms the validity of the recommendations provided by Caballero et al. (2005) to mitigate both real and financial shocks. Resilient economies, with their more credible and flexible policy mix, are better equipped to deal with periods of financial stress. However, as the authors of the capital flow analysis point out, these results do not address causality. The characteristics relating to more resilient emerging economies may not

[16] As Benes et al. (2013) point out, the allocation of countries between the two groups contains a number of confounding variables that influence the results. Because there may exist only slight differences between a given country near the median, undue emphasis should not be placed on the specific group a country falls into. Instead, the division aims to highlight the broad characteristics exhibited by the groups of countries in relation to financial adjustments to gross capital inflows.

[17] The advanced economies include: Australia, Canada, Denmark, New Zealand, Norway, and Sweden.

explain their resilience, perhaps only that they are consequences of resilience.

In the following section, capital flow dynamics are examined in order to assess the impact currency-trust and country-trust have had on Chile's financial adjustment over time. This analysis provides deeper insights into the mechanisms that support economic stability in the face of volatile capital inflows. Focusing on Chile's experience with capital flows allows for more understanding into the improved mitigation of sudden stops.

4.3 Capital Flow Dynamics in Chile

The main findings from the analysis above suggest that the improvements in currency-trust and country-trust that Chile has made since the Asian-Russian crises should translate into increased financial adjustment, and thus less real effects due to capital inflow volatility. Figure 28 provides a long-term look at how capital flows have changed over time in relation to GDP and unemployment. This picture provides an immediate sense of the impact that changes in institutional frameworks and financial discipline have had on economic resilience. After the shocks of the late 1990s, we see gross outflows quickly matching the level of gross inflows and playing a buffering role because of the strong correlation between them.

Table 3 provides a comparison of the periods before the changes in policy mix (1980-1998) and after (1999-2022) in relation to capital flows. Up until the Asian-Russian crises, capital flows into Chile (and more generally EMEs) were defined by an absence of outflows and significant inflows. This implied that the current account, gross inflows, and net inflows all coincided (Desormeaux et al. 2008). With the wave of capital inflows funneling into Latin America during the 1990s, this meant an expanding current account deficit. In the later period, however, gross outflows have grown significantly, growing from an average of 0.4 percent in the earlier period to 7.8 percent in the later period. The result has been a decrease in the average net capital flows, despite nearly double the amount of inflows (5.3 percent of GDP versus 9.7 percent of GDP). The current account deficit and reserve accumulations have reduced in the later period, indicating that more of the financial adjustment is taking place through increased levels of gross outflows. The changes are consistent with the analysis performed in Section 4.2, where economies more resilient to volatility in capital inflows show a higher degree of countercyclical fiscal policy, more credible institutions and flexible exchange rates, as well as lower inflation. The net effect has been that Chile has been less affected by volatility in gross inflows than in previous periods.

Below is a more detailed look into the evolution of capital flows in Chile since the Asian-Russian crises, and further examines the extent of its real versus financial adjustment over time. Substantial asset growth related to pension funds, as well as the countercyclical use of the ESSF have provided large buffering gross outflows that retrench into Chile during periods of economic distress.[18] Chile seems to be unique in Latin America due to the substantial size of these assets, leading to larger gross inflows compared to other countries in the region. Additionally, the increased flexibility of the exchange rate has discouraged short-term speculative capital movements and reduced the risk of interest rate arbitrage by removing implicit insurance to borrowers. This FX volatility has acted as a natural disincentive for arbitrage and carry trades, encouraging longer-term investments. Furthermore, asset price adjustments driven by exchange rate volatility incentivize resident investors to repatriate

[18] See Caballero & Simsek (2020) for their model on "fickle" capital flows and the empirical evidence that motivates the choices of their model.

capital, counteracting the behavior of non-resident investors and smoothing net capital flows. Finally, banks have increased their intermediation of capital during times of crisis, helping to reduce instances of sudden stops.

These factors, combined with an improved policy mix that mitigates the negative effects of net capital flow volatility, have enhanced Chile's ability to mitigate capital inflow volatility and thus sudden stops. These developments have collectively improved Chile's resilience to external shocks and fostered a more stable economic environment.

4.3.1 Capital Flow Dynamics after the Asian-Russian Crises

Central to understanding Chile's experience during both the GFC and Pandemic is the behavior of gross outflows. The behavior of both gross inflows and outflows has followed a more typical behavior pattern after 2000, characterized by the common behavior of "fickle" capital flows whereby foreign investors exit when a country is in distress and domestic investors retrench by reducing their foreign investments during domestic distress. Combined with this, gross outflows in Chile have continued to grow substantially. With the reduction of restrictions on capital outflows and continued growth of outflows (especially by AFPs), capital flows began to behave more in line with advanced economies, where gross inflows and outflows offset one another, thus providing more stable net inflows and activity (Benes et al. 2013).

Looking first at the GFC, capital flows during this period can be broken up in three distinct phases based on behavior of flows as elaborated by Milesi-Ferretti & Tille (2011). The first stage of the crisis (from August 2007 to the demise of Lehman Brothers and the AIG bailout) saw reductions in capital flows primarily in banking flows among developed economies, leaving emerging economies largely unscathed. The crisis entered its second phase in the third quarter of 2008, when Lehman's collapse triggered a worldwide panic and a reduction in global capital flows. As a result, emerging markets were hit hard and experienced significant reversals. The third phase of the crisis began in the second quarter of 2009, when capital flows started to recover, particularly in Latin America. The experience of Chile largely corresponds with this description. However, as shown in Figure 29, gross outflows begin to play an important role in offsetting the gross inflow reversals, leading to more stabilized net flows. This behavior is evident during the GFC as well as in turbulent episodes after, including the worsening of the Eurozone crisis in 2011, and the taper tantrum of 2013. Despite the volatility, the effects of any gross inflow reversal were largely offset by retrenchments of gross outflows by domestic investors (Baumann & Gallagher 2015).

As for the Pandemic, Chile and other emerging markets experienced large net capital flow reversals early in 2020. Adding to the reversal for Chile was the social unrest that began in October 2019 in Chile, leading to significant outflows of portfolio investments by residents (IMF 2020). However, we see a similar story in the offsetting nature of gross outflows during the initial shock of 2020 and as the crisis developed. The large net inflows in 2021 were mainly a one-off occurrence due to the issuance of approximately USD$2.1B in government bonds as part of the Central Government's 2021 additional financing plan, as well as the repatriation of assets to cover pension fund withdrawals (Figure 30).

4.3.2 Impact of Developments in Country-trust and Currency-trust

Figure 28 highlights the change around the time of the Asian-Russian crises where gross outflows start to have a larger offsetting effect on gross inflow reversals. With the large amounts of foreign assets held by domestic investors (especially pension funds), sharp reversals by foreign investors have largely been offset by domestic investors. Because retrenchment of domestic investors increases liquidity at home, it tends to offset the financial instability and thus mitigates the impact that such reversals can have (Caballero & Simsek 2020). The changes in the size and behavior of gross outflows illustrate the developments made in institutional frameworks, financial discipline, and regulatory changes. The impact is felt not through reducing capital inflow volatility, but in buffering that volatility with retrenchments of capital and stabilizing net inflows so as to reduce the real adjustment that takes place. Below, important aspects of currency-trust and country-trust that help this mechanism operate are discussed.

Pension Fund Growth

Looking first at AFPs, we see continued substantial growth in foreign asset holdings that contribute to gross outflows. Despite the large stream of outflows due to AFPs during the Asian-Russian crises that exacerbated limited liquidity, they now play a crucial role in offsetting gross inflow reversals during times of stress, providing a stabilizing effect on the economy. A main channel through which this mechanism works relates to prudential rules in place surrounding AFPs. Regulations established by the CBCh define minimum and maximum exchange risk hedging ratios for each portfolio available for a plan participant (pension funds offer five different portfolios to choose from as noted in Section 2) in relation to the level of local currency risk.[19] As the U.S. stock market suffered during the height of the GFC, AFPs found themselves holding large excess hedging positions which they offset by repatriating funds to Chile (IMF 2020).

While being responsible in part for the domestic capital flight during the Asian-Russian crises, much of the blame was due to unfortunate timing on the part of relaxing of regulatory restrictions on AFP foreign investment holding limits. In 1992, only 1.5 percent of assets could be invested abroad. By 2011, that number had risen to 75 percent and 100 percent for the intermediate-risk fund and most aggressive fund, respectively. When coupled with the substantial growth in AFP assets (Figures 11 and 12), there was a large exodus of capital during the period. However, the change has been beneficial over time. Cifuentes & Jara (2016) use a panel probit with random effects to investigate the determinants of retrenchments in gross outflows given a sudden stop. They highlight that the existence and size of assets held abroad play a major role – the more assets held abroad, the greater the probability that a retrenchment occurs alongside a reversal of capital inflows. With the large increase in AFP foreign assets, the result has been a buffering effect.

One time withdrawals also play a role. During the Pandemic, pension funds, anticipating the need to accommodate large withdrawals sanctioned by regulators during the pandemic, proactively began liquidating foreign assets (Figure 31). This strategy was largely in response to the three significant withdrawals allowed in July 2020, December 2020, and April 2021, which amounted to over US$50 billion, representing 30 percent of the assets under management of the pension system (Aldunate et al.

[19] Cowan & De Gregorio (2007) note that the exchange rate pressures related to outflows of pension funds have been minor due to the regulatory requirement of hedging a large fraction of their currency exposure.

2023). These actions by pension funds were important in managing liquidity pressures and mitigating more severe impacts on the domestic financial system.

Compared to its peers, Chile's pension funds are the largest in Latin America relative to its GDP (Figure 32). Shortly before the GFC, pension assets in Chile amounted to over 60 percent of GDP, nearly three times that of Brazil, the next closest country (Moreno & Santos 2008). This substantial capacity for outflows and subsequent retrenchment is a key factor that differentiates Chile from other Latin American countries, where pension fund systems are less developed and hold fewer assets relative to GDP. Overall, they provide liquidity through both repatriating assets in times of domestic stress and through their role in being a large provider of domestic credit to the private sector.

Countercyclical Role of the ESSF

The ESSF, as described in Section 3, also plays an important role. Drawing on funds both during the GFC and Pandemic, it helped to stabilize the fiscal balance while providing much needed economic and social relief programs to mitigate the worst of the crises. As the vast majority of its assets are invested abroad and because of its countercyclical function, it also played a buffering role against sudden stops because of the retrenchment of capital during times of recession (IMF, 2020).

With the onset of the crisis in 2008, the deficit was financed by the withdrawal in 2009 of close to US$9 billion from the ESSF and the government supported the economy without the need to issue more debt. Ocampo (2009) notes that Chile's buildup of its stabilization fund during the commodity boom before the GFC was the best example of a countercyclical fiscal policy in the region. He notes, however, that it was the exception rather than the rule. Although multiple countries in Latin America had fiscal responsibility laws approved after the Asian-Russian Crisis, many rules were breached by countries to facilitate more spending during the boom. Indeed, during the GFC Ocampo (2009) finds that the elasticity of real primary public sector spending to long-term GDP growth during the period was lower than one (the clear sign of a countercyclical policy) only in three countries: Chile, El Salvador and Guatemala.

In 2020-21, more large withdrawals from the ESSF were made totaling US$10.2 billion as part of Chile's effort to mitigate the economic impact of the COVID-19 pandemic. The fiscal buffer helped Chile to manage the Covid-19 crisis with significant resources, help solidify its reputation for fiscal responsibility, and access lower interest rates through better debt ratings (Aguilar 2023). While the fund was able to generate significant assets to counteract the negative economic effects of the pandemic, there has been a large depletion of assets in recent years. In Chile, the government used close to 73 percent of the ESSF and an additional 13 percent from the Pension Reserve Fund (Aguilar 2023). Recent upticks in the price of Copper have boosted government revenues and levels of the sovereign wealth funds, however, new measures are needed to avoid returning down the path of gradual depletion of the funds' resources in the years before 2020 (IMF 2023a). Despite this, Chile still compares favorably to others in the region (Figure 24).

Intermediation by Banks

While Caballero et al. (2005) suggested that the inability by banks to decouple exchange rate risk from credit risk during the Asian-Russian crises was the main cause for their lack of intermediation of capital, later studies point to banks betting against the monetary authority's ability to manage the

exchange rate.[20] According to Cowan & De Gregorio (2007), Chilean residents were essentially gambling against an exchange rate policy that aimed to minimize depreciation. The policy failed to account for the significant negative external shocks that pushed the equilibrium real exchange rate upward. As a result, the existing framework incentivized investors to make one-way bets on exchange rate movements, leading to an increase in private portfolio flows (Carriere-Swallow & Garcia-Silva 2013, Benes et al. 2013). The lack of intermediation, however, has changed over time. Cowan & De Gregorio (2007) illustrate this point by examining the behavior of bank and non-bank debt inflows in a sample of countries during the 1990s. The authors calculate the average ratio of bank inflows to total debt inflows for each country over two time (1990-1996 and 2000-2003) periods, excluding the period of instability and regulatory change. Regressing the ratio of bank inflows to total debt inflows against log GDP per capita, they find that the estimated coefficient on the income variable is positive and significant, implying banks in high-income economies were playing a larger role in intermediating capital inflows. In the regression they included a Chilean dummy as well. Looking at this variable, they noted that it was negative, significant, and comparatively large. The share of bank inflows in total debt inflows was 20 percent lower than the level predicted by its income level in the period 1990–1996. When looking at the second time period, the coefficient changes to positive and significant, implying Chilean domestic banks began to intermediate foreign capital in line with their development.

The growth in intermediation has continued over time. Figure 33 examines the international investment position of banks and pension funds over time in Chile. In 1997, banks played less of a role in intermediating foreign capital, with banks having gross foreign liabilities of less than 4 percent of GDP. Over time, this has risen to over 21 percent of GDP in 2022, close to the level of Australia in the comparison by Caballero et al. (2005). Cowan & De Gregorio (2007) offer two possible explanations for the increased role in intermediation by banks. For one, the encaje, essentially a tax on short-term capital flows, had been reduced to 0 percent in 1998 and eliminated in 2001. This measure increased the effective cost of foreign borrowing, particularly for banks, which are closely monitored by regulatory authorities and found it difficult to avoid this cost. With its elimination, the cost of foreign credit for banks decreased, making it easier and cheaper for them to borrow from abroad. With lower borrowing costs, banks could intermediate more capital by increasing their lending activities, particularly benefiting small and medium-sized enterprises (SMEs) that rely on bank credit. The lifting of the encaje removed the distortions it created, allowing banks to compete more effectively with large corporations for foreign capital. Another explanation relates to the development of the derivatives market in Chile. Recall in Section 2.3 the recommendation of developing a deep currency-derivatives market to build currency-trust. When banks can decouple exchange-rate risk from credit risk through hedging, they are more likely to intermediate international inflows and lend to smaller firms and help to smooth real shocks. With the growth in the derivatives market, banks are able to lend in pesos and hedge their foreign liability position. The case of Chile suggests that resilient FX derivatives markets can supplement foreign reserves in dampening severe episodes of financial stress. Intuitively, these institutional and market arrangements insure two different risks: foreign currency funding risk, which central bank foreign reserves can address, and exchange rate risk, which can be addressed by FX derivatives markets that remain resilient during episodes of financial stress. In Chile, market resilience was enhanced by the need of AFPs holding net foreign assets to continuously roll

[20] See Cowan & De Gregorio (2007), Carriere-Swallow & Garcia-Silva (2013)

over their short hedging positions (Avalos & Moreno 2013).

It is important to note the increased role institutional investors (pension funds, mutual funds, insurance companies) have played in the increased availability of domestic credit and overall development of the financial market (beyond just the FX derivatives market as mentioned in Section 2.3). As mentioned above, dependence of capital from banks has declined in recent years due to the growth of institutional investors in Chile such as AFPs. However, the increased intermediation of inflows by banks adds another step for resilience to external financial shocks through the liquidity it provides to firms without direct access to international markets.

Flexibility of the Exchange Rate

The increased flexibility of the exchange rate has had important implications on capital flow dynamics. For one, a free-floating exchange rate regime and the resulting foreign exchange (FX) volatility have helped reduce incentives for arbitrage and carry trade. With the removal of rigidities in the exchange rate framework, any implicit insurance to borrowers disappears, and thus reduces the risk of interest rate arbitration (Cowan & De Gregorio 2007). The defense of the exchange rate during the Asian-Russian crises displayed the monetary authority's reluctance to let the exchange rate play a stabilizing role. Benes et al. (2013) explains that when a currency depreciation can be anticipated, there is a tendency toward large capital outflows from both domestic residents and nonresidents (especially under a managed rate regime). When the exchange rate was allowed to adjust freely in later crises, gross outflows helped to offset capital inflow reversals. Given the sparse use of FX interventions by the monetary authority, there is a clear commitment to maintaining a credible exchange rate regime which reduces moral hazard surrounding currency risk. This signal to financial market participants encourages hedging activity, and thus reduces currency mismatches

In addition, asset price adjustments driven by exchange rate volatility incentivize resident investors to repatriate capital, counteracting the behavior of non-resident investors and smoothing net capital flows (Marcel 2019). Cifuentes & Jara (2016), examining the conditional probability of a retrenchment by domestic investors given a sudden stop by foreign investors, highlight this mechanism. They explain that gross capital inflows generate an impact on market prices that incentivizes domestic investors to adjust their portfolios in the direction of compensating the initial shock. Additionally, they found Chile had the highest probability of having a retrenchment conditional on facing a stop (86 percent). Overall, they find evidence of the importance of exchange rate flexibility in the occurrence of a retrenchment when a sudden stop occurs.

5 Conclusion

Cowan & De Gregorio (2007) describe succinctly what happened in Chile during the Asian-Russian crises, stating that capital outflows from banks and pensions, along with a contractionary monetary policy and the defense of the peso all combined to create an environment without liquidity. These factors led to a reversal in the current account, further reducing consumption after the decline in the terms of trade. Ultimately, Chile's external vulnerability was exacerbated by its own policy choices, which amplified capital flow reversals and the negative impacts of the external shocks. This

summary gives context to the recommendations provided by Caballero et al. (2005), which discussed how Chile could develop country-trust and currency-trust to better withstand and mitigate the impacts of financial shocks and sudden stops. The recommendations highlight the importance of confidence in the currency, specifically fostering a clean inflation history and maintaining a credible exchange rate framework free to adjust to market forces. The authors also call for the development of a deep currency derivatives market to help agents manage currency risk. Additionally, developing strong and transparent institutions are important for building trust in the financial system, banking sector, and in monetary policies. These elements collectively foster a conducive environment for international investment and economic resilience.

The paper showed Chile's success in implementing these recommendations. For currency-trust, Chile has maintained low and stable inflation and overcame the price and financial instability that can threaten a floating rate exchange framework. The increasing credibility of the Central Bank has been instrumental in these endeavors, which has been demonstrated through the limited interventions since its adoption. Additionally, the development of a deep and liquid foreign exchange derivatives market has allowed for better management of currency risk. Important to its growth has been pension funds acting as a natural counterparty in the market. This market has provided a mechanism for hedging against exchange rate volatility, further reducing the systemic risk associated with sudden stops. The ability of banks and non-financial firms to hedge their currency exposures has increased their resilience to external shocks, contributing to the overall stability of the financial system.

In regards to country-trust, prudent fiscal management, formalized by the adoption of the fiscal rule, has been central to its development. Despite facing exposure to copper prices, by targeting a structural surplus and saving through sovereign wealth funds, Chile has built a buffer that can be used to stabilize the economy during periods of volatility. This fiscal discipline, coupled with transparent and stable institutions, has reassured investors of Chile's commitment to maintaining economic and financial stability. The strong regulatory framework governing the financial sector has ensured that banks remain well-capitalized and resilient, further contributing to the trust of both domestic and international investors.

In evaluating the impact of these improvements, the paper examined Chile's economic performance during the two most adverse global financial periods during the 21st century: the Global Financial Crisis and the Covid-19 pandemic. The analysis showed that the developments in currency-trust and country-trust have had a mitigating effect on both real shocks and financial shocks during both crises. For real terms of trade shocks, the improved fiscal and monetary frameworks have allowed Chile to implement more countercyclical monetary policy without having to worry about defending the exchange rate. Additionally, countercyclical fiscal policy through withdrawals from the ESSF have helped Chile weather the worst of the crises. When combined with the increased financial market depth and development of the FX derivatives market, firms have been able to hedge against currency risk more effectively, further enhancing economic stability.

The dynamics of capital flows in Chile were shown to have changed over time, with more financial adjustment taking place through large growth in gross outflows rather than real adjustments through the current account. The change has helped to dampen the adverse effects traditionally associated with sudden stops such as balance of payments crises, currency instability, and broader economic disruptions. Helped by substantial asset growth related to pension funds, as well as the countercyclical use of the ESSF, gross outflows are now playing a large buffering role that retrench into Chile during periods of economic distress. Additionally, asset price adjustments and increased FX volatility from

the flexible exchange rate have acted as a natural disincentive for arbitrage, and encouraged repatriation of capital by residents to smooth net capital flows. Banks were shown to have increased their intermediation of capital during times of crisis, helping to reduce instances of sudden stops as well.

Caballero et al. (2005) argue that the fear of sudden stops in Chile was rooted in concerns over the additional economic destabilization that they could inflict on top of already severe external shocks. Over the past 25 years, however, Chile has improved its ability to mitigate the effects of both global shocks and volatile capital inflows. The results illustrate the impact that developments in both currency-trust and country-trust can have on a small, open, and financially integrated country like Chile. While the potential for large capital inflow reversals persists, their feared impact has lessened, demonstrating a greater capacity by Chile to manage the associated risks. The analysis provides important lessons for countries that struggle with external shocks and sudden stops, chief among them being the fostering of credible institutions and financial discipline. These developments do not happen overnight, and thus a long-term, ongoing commitment to them is required.

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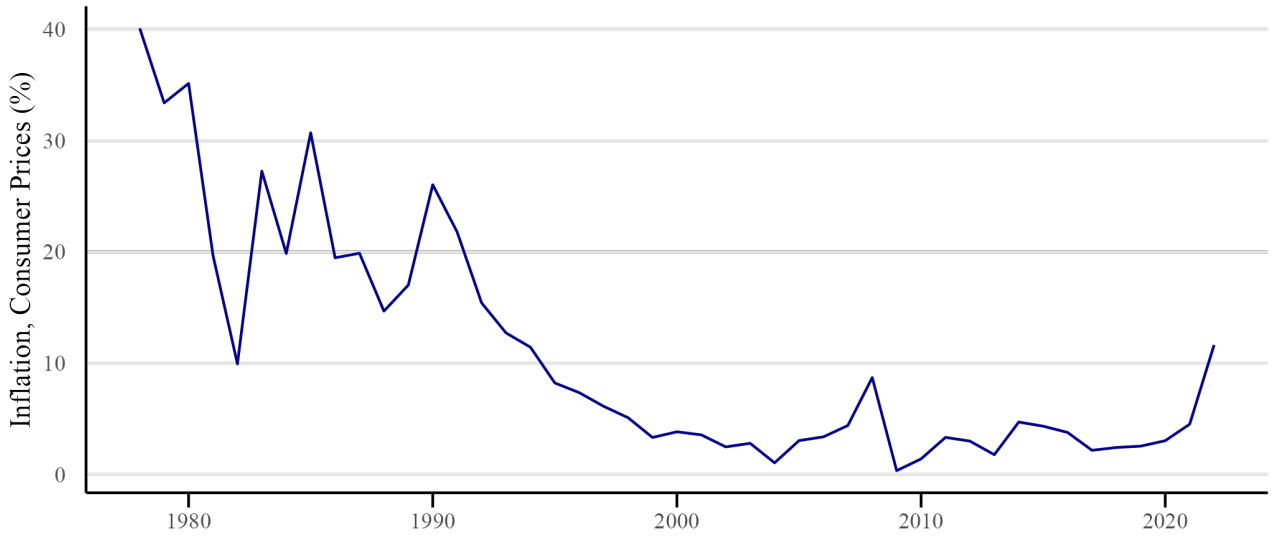
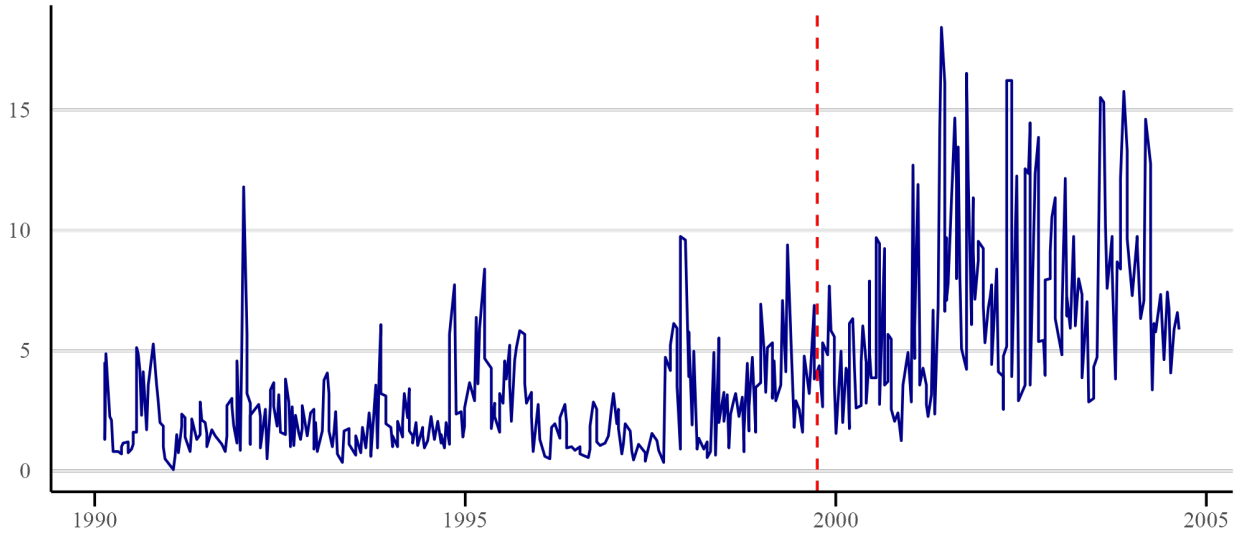
Figure 1: Inflation in Chile



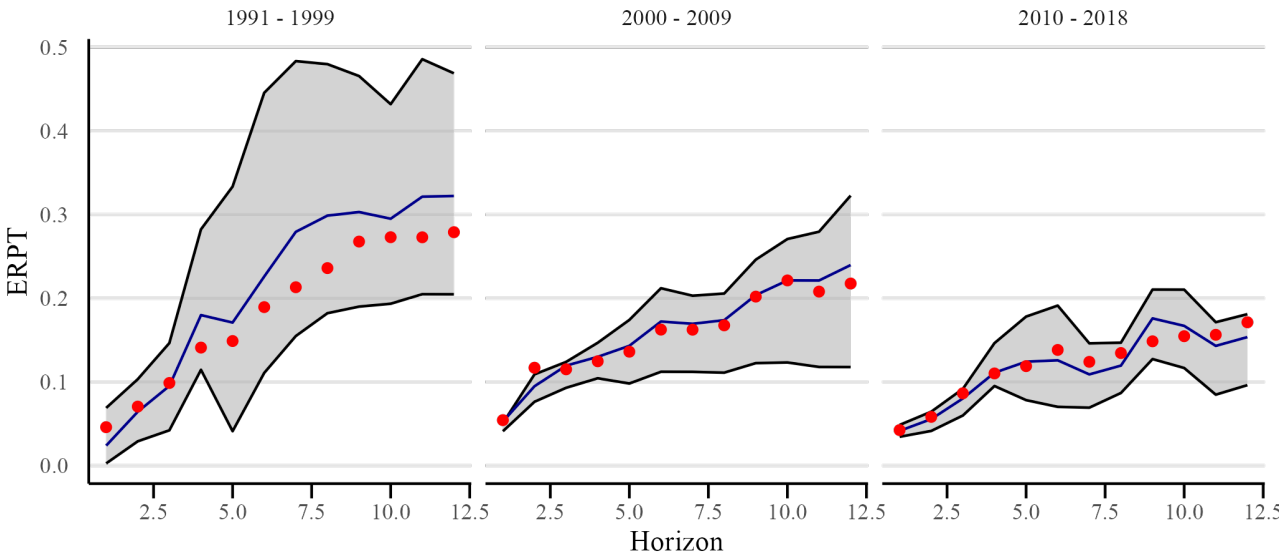
Source: World Bank.

Figure 2: Nominal Exchange Rate Volatility



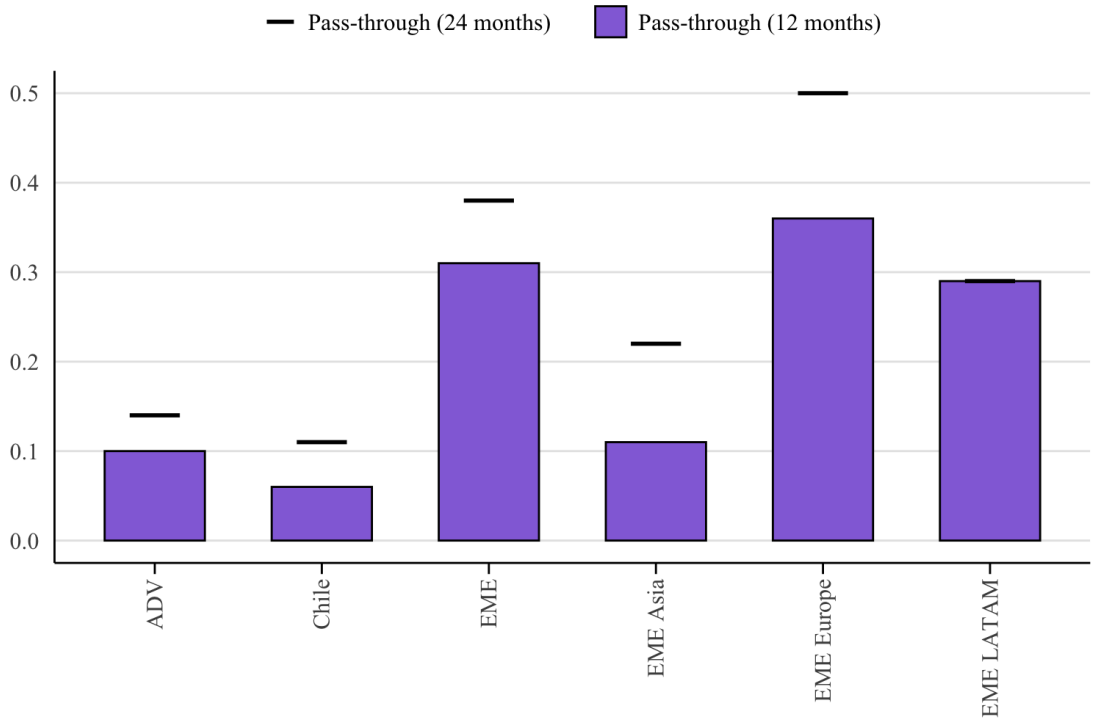
Note: Standard deviation of the observed nominal exchange rate (30 day rolling windows).
Source: De Gregorio and Tokman (2004) using data from the Central Bank of Chile.

Figure 3: Exchange Rate Pass-Through from VAR Regressions



Note: Red dots show results for the actual sub-samples; the blue line and the gray area show the median and interquartile range estimations from 5,000 block-bootstrap replications.
Source: Abagli et al. (2020) using data from the Central Bank of Chile; FRED; FAO; and Bloomberg.

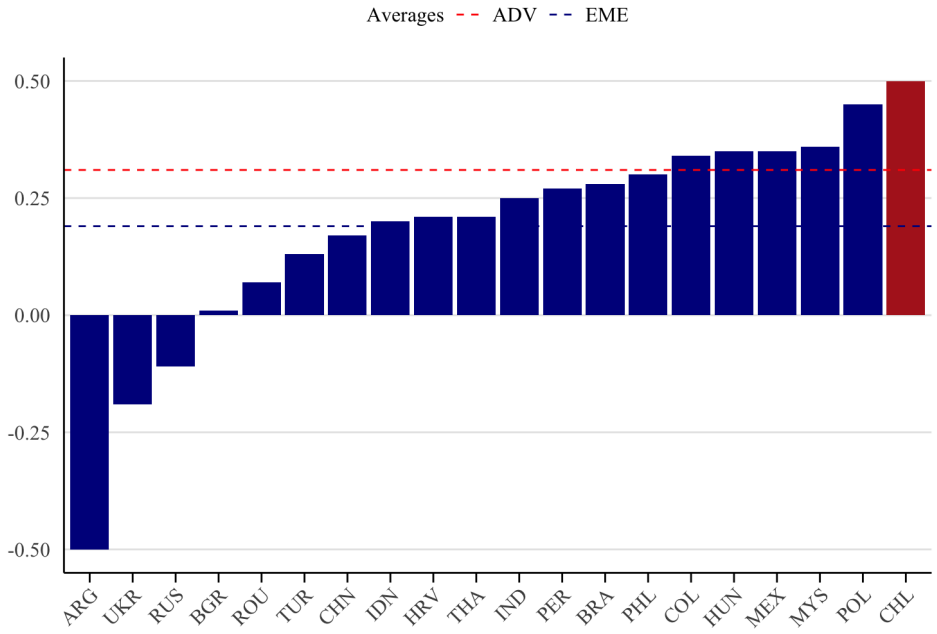
Figure 4: Exchange Rate Pass-through by Panel Group



Note: Cumulative response of headline consumer prices (in percentage points) to a one percent innovation in the nominal effective exchange rate after 12 and 24 months.
Source: Carriere-Swallow et al. (2016).

Figure 5: Index of Inflation Expectations' Anchoring—Cross-Country Heterogeneity

(Average over 2004–17)

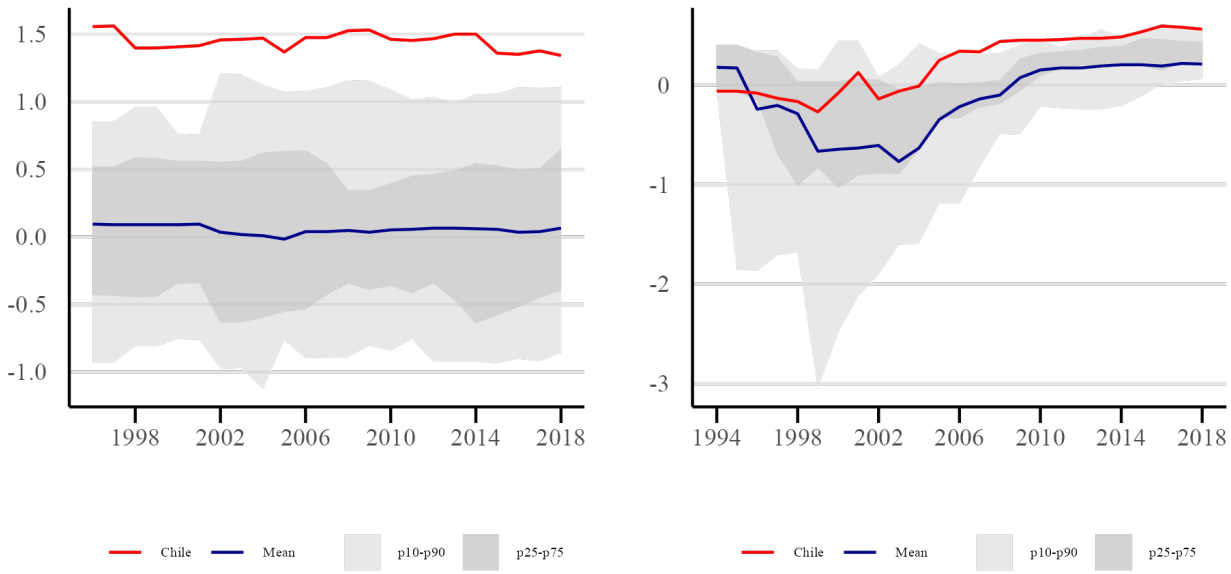


Source: Bems et al. (2021).

Figure 6: Institutions and Credibility

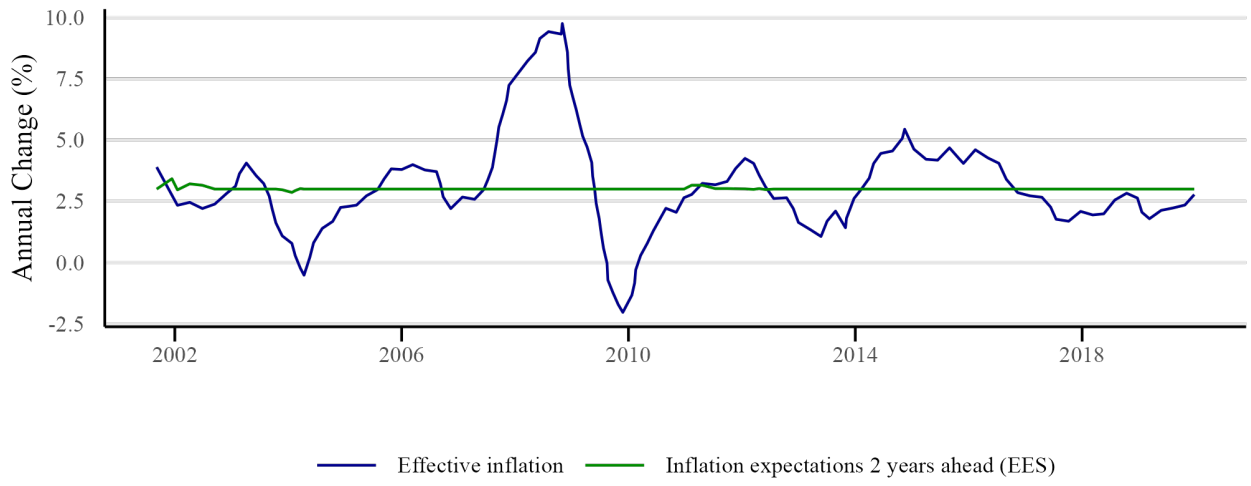
A) Regulatory Quality

B) Central Bank Credibility



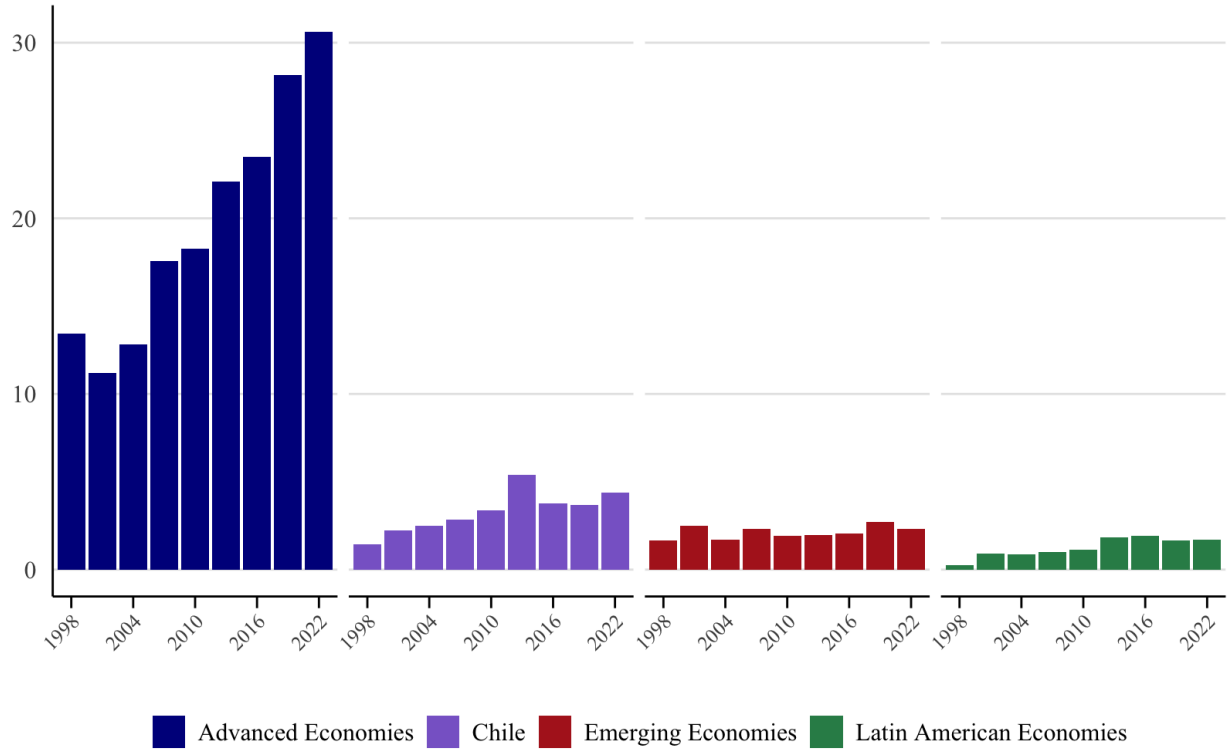
Note: Dark gray columns denote the 25th and 75th percentiles, light gray columns denote the 10th 90th percentiles, and red solid lines denote Chile.
Source: Bems et al. (2021) and Albagli et al. (2020).

Figure 7: Inflation Expectations



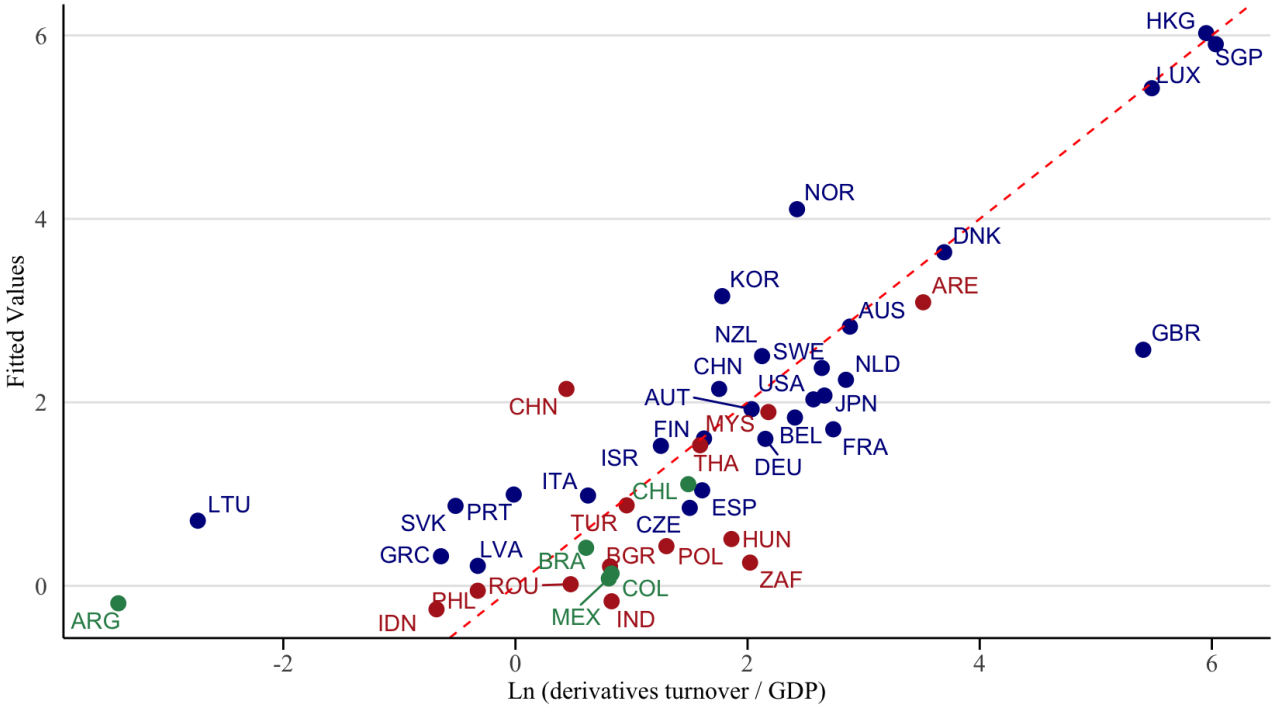
Note: Inflation expectations corresponding to the median in Economic Expectations Survey (EES).
Source: CBCh (2020) using data from the Central Bank of Chile and National Statistics Institute (INE).

Figure 8: FX Derivatives Market Depth, 1998-2022



Note: Market depth calculated as annual transactions over GDP. Classifications for blocs were based on the International Monetary Fund's World Economic Outlook for each year of the analysis (excluding Latin America economies).
Source: Author's calculation based on data from Bank for International Settlements (2022).

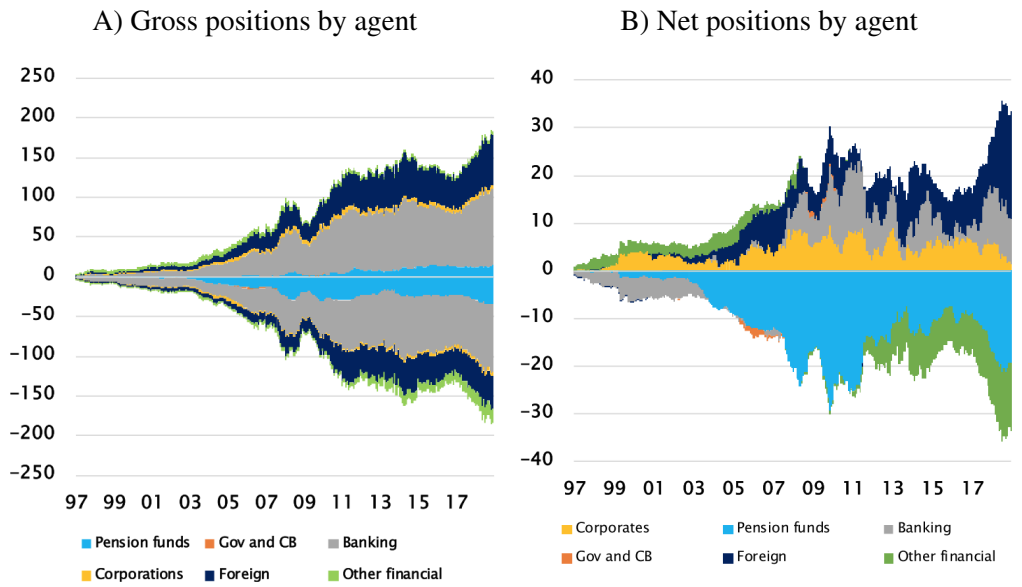
Figure 9: Actual and Predicted Derivative Usage



Note: Classifications for blocs were based on the International Monetary Fund's World Economic Outlook for each year of the analysis (excluding Latin America economies).
Source: Bank for International Settlements, World Bank.

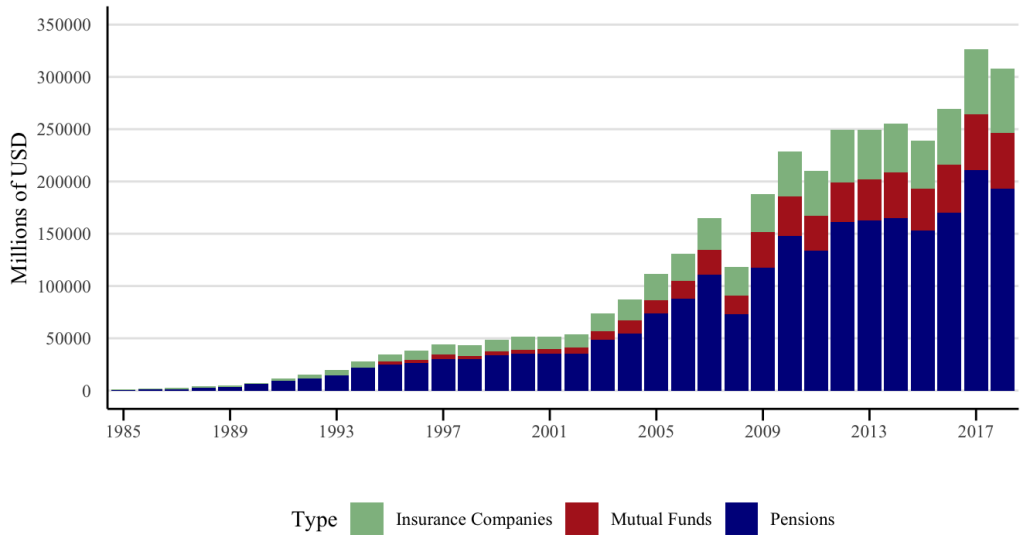
Figure 10: Main Participants in Chile's Derivatives Market

Values are in billions of USD.



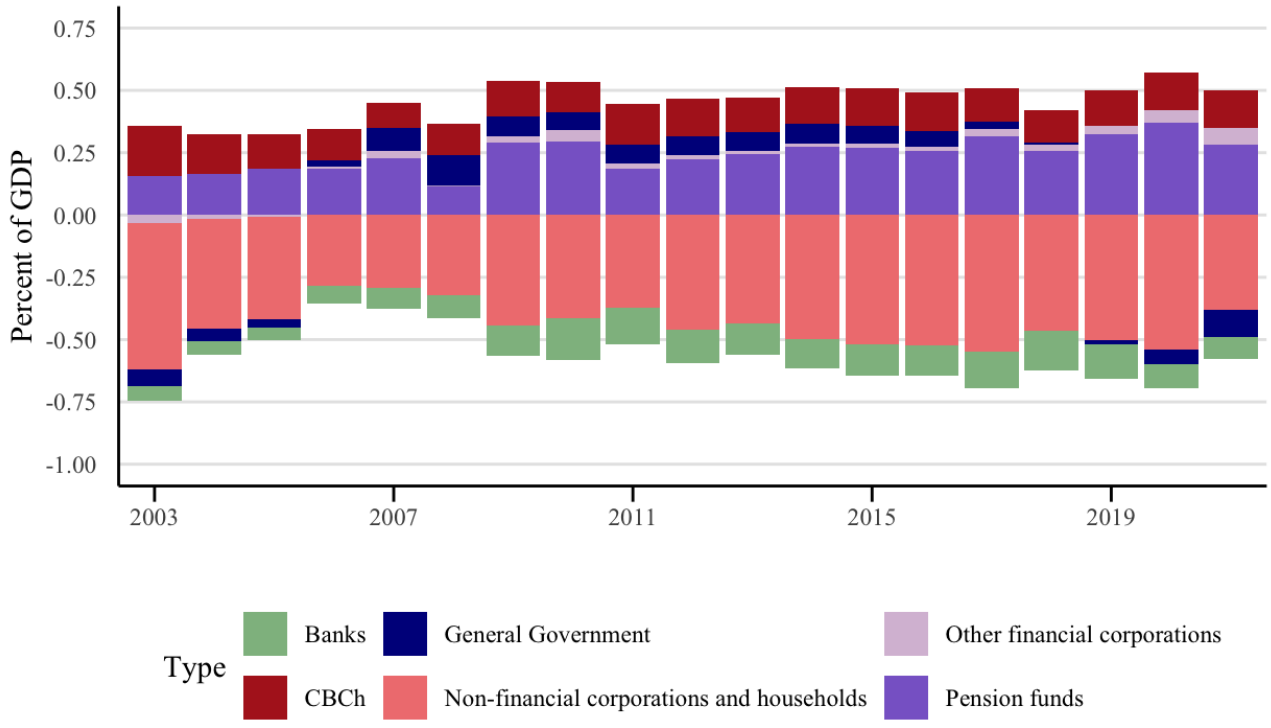
Note: Both panels show positions from the perspective of the referred agent. The net derivative position of all local agents must mirror the position of non-residents by definition.
Source: Albagli et al. (2020) using data from CBCh.

Figure 11: Total Assets Under Management by Institutional Investors



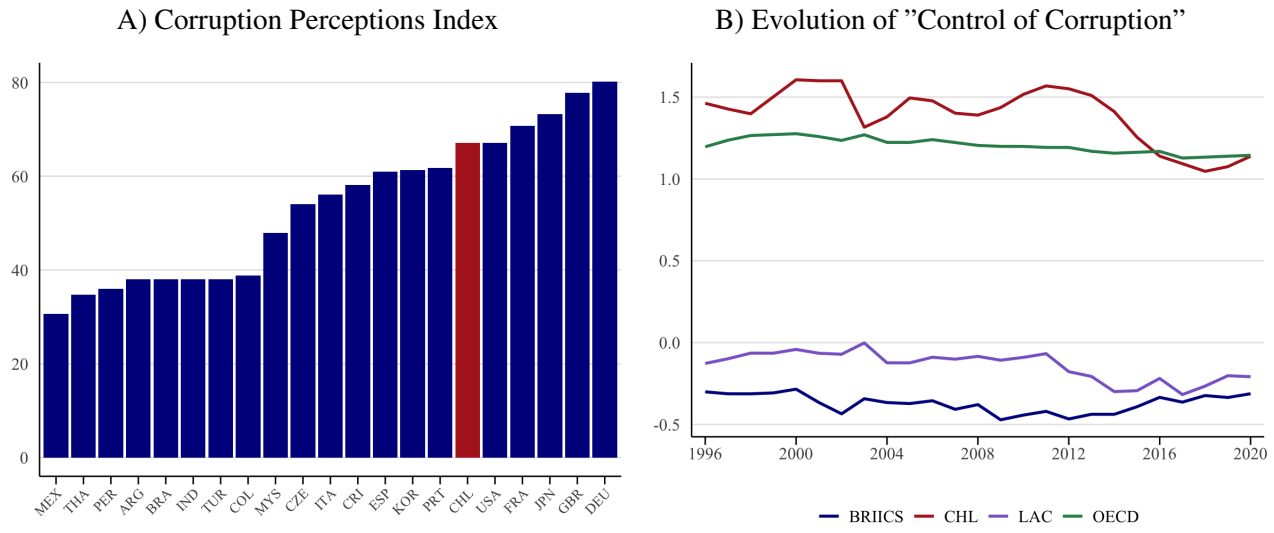
Source: Berstein and Marcel (2019) using data from Depósito Central de Valores and Bolsa de Comercio de Santiago.

Figure 12: Net International Investment Position by Institutional Sector



Source: CBCh.

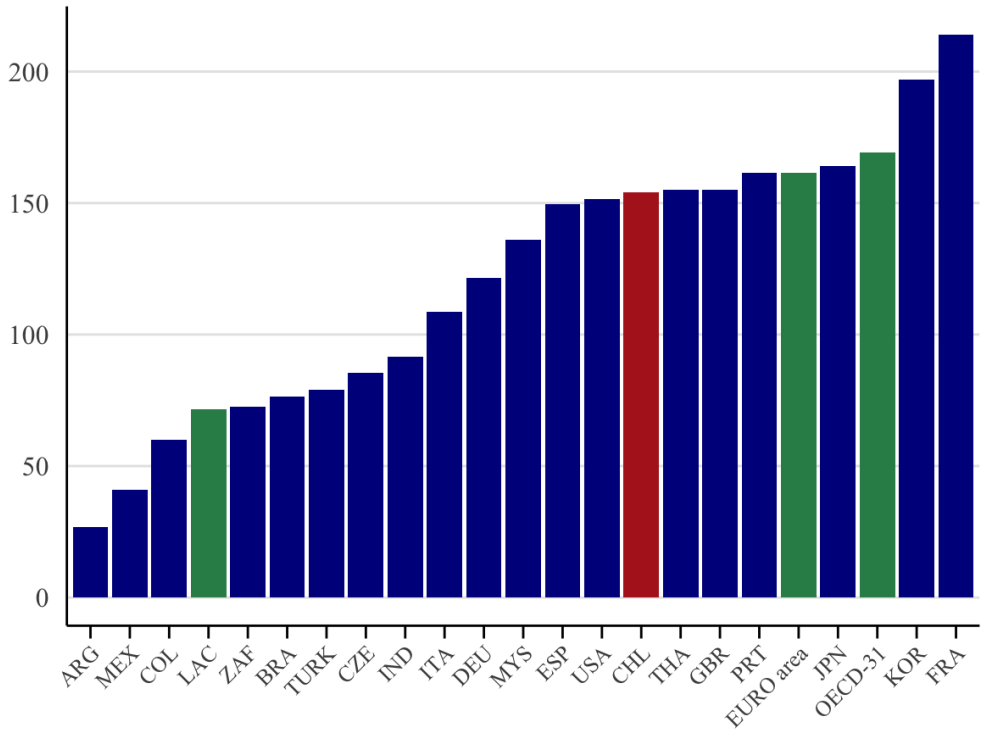
Figure 13: Corruption Indicators



Source: OECD (2022) using data from Transparency International, World Bank, and Worldwide Governance Indicators.

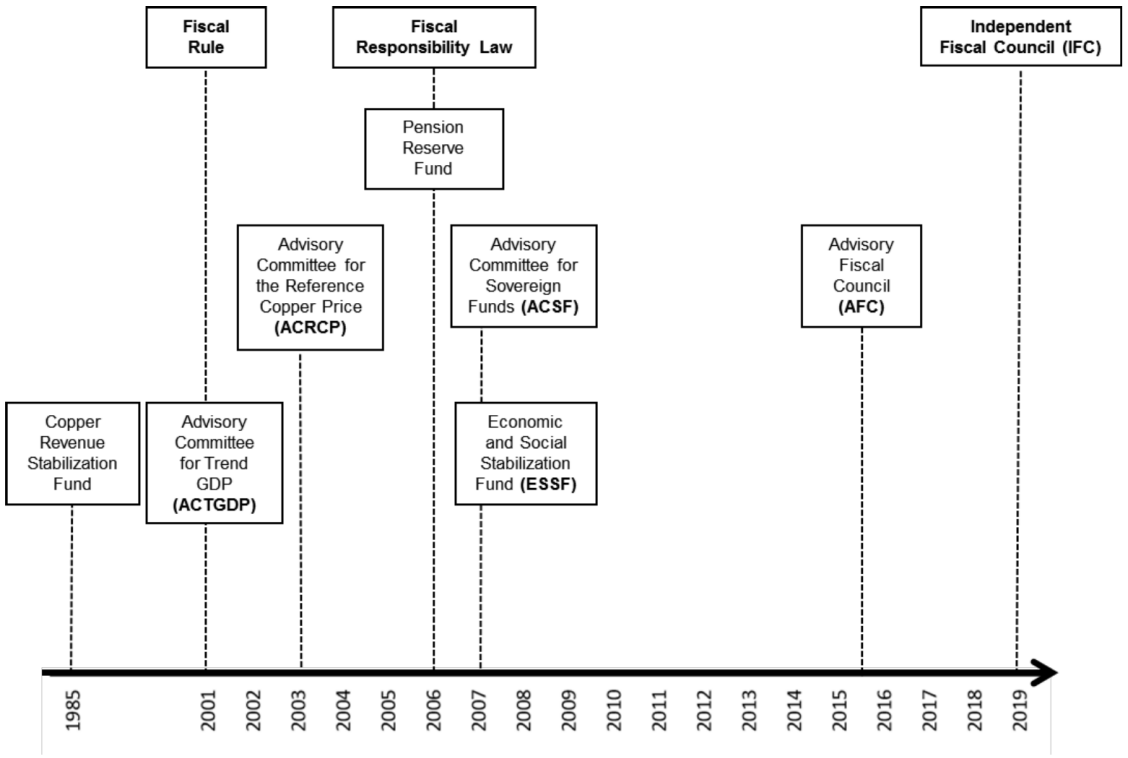
Figure 14: Total credit to private non-financial sector, 2019

(Percent of GDP)



Note: Includes financial resources provided to the private sector by financial corporations (e.g. through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment).
Source: OECD (2022) using data from International Monetary Fund.

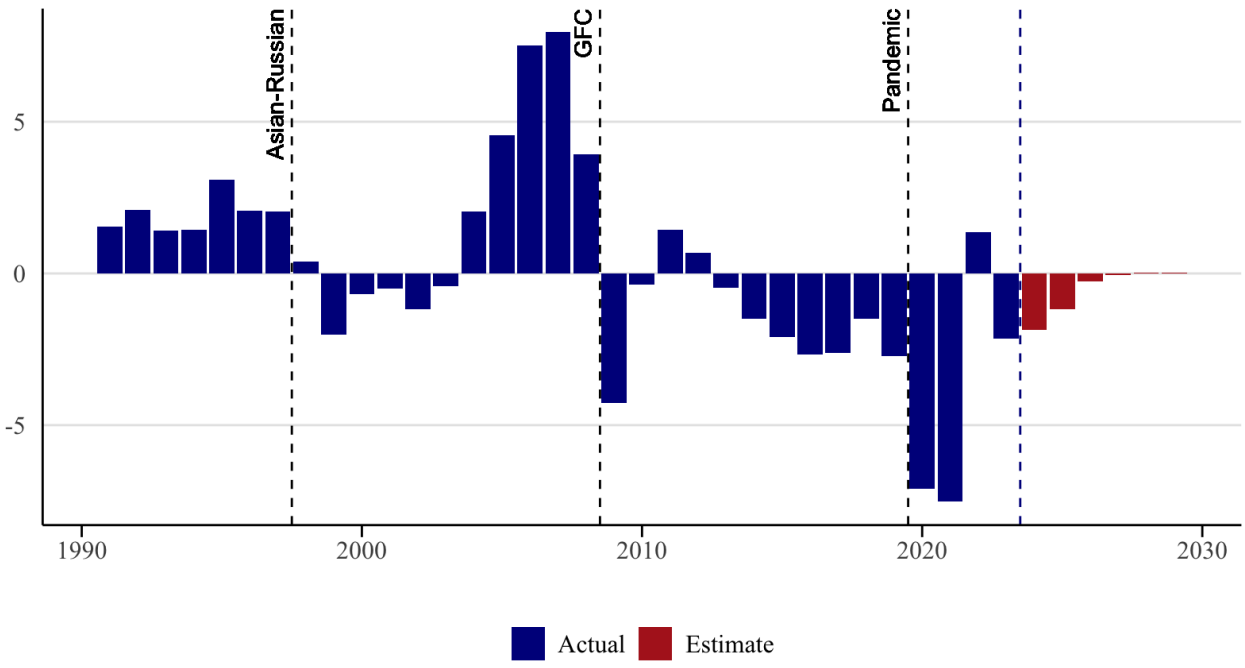
Figure 15: Development of Chile's Institutional Framework for Fiscal Policy, 1985-2019



Source: Fuentes et al. (2021).

Figure 16: Chile - Fiscal Deficit, 1990-2022

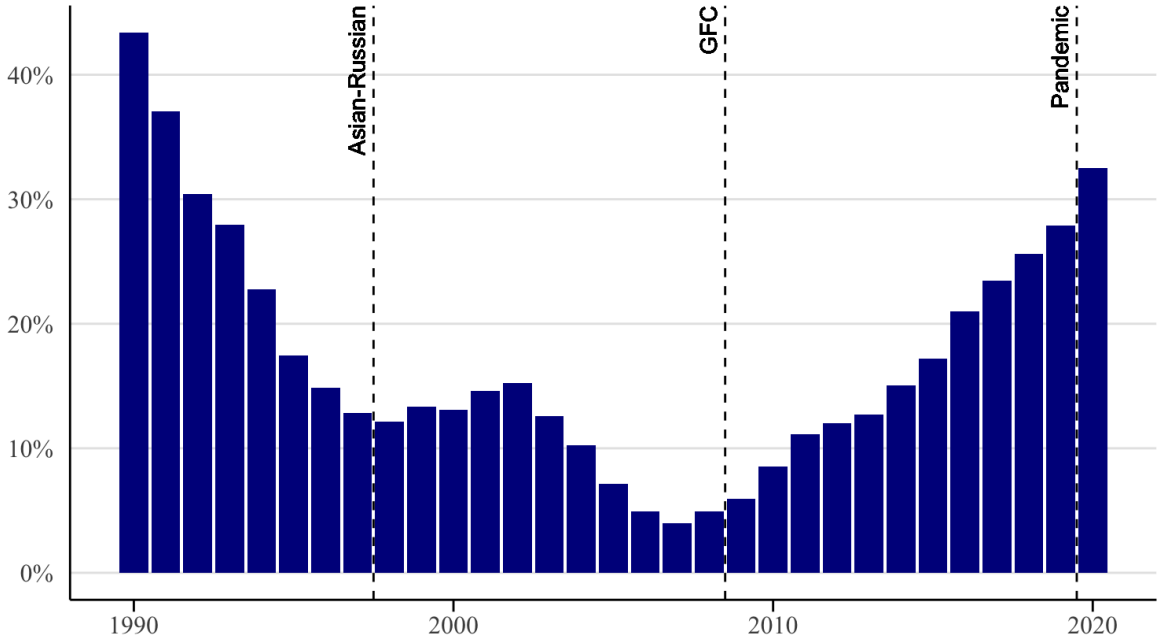
(Percent of GDP)



Source: Barreix et al. (2019), CBCh.

Figure 17: Chile - Gross Debt, 1990-2020

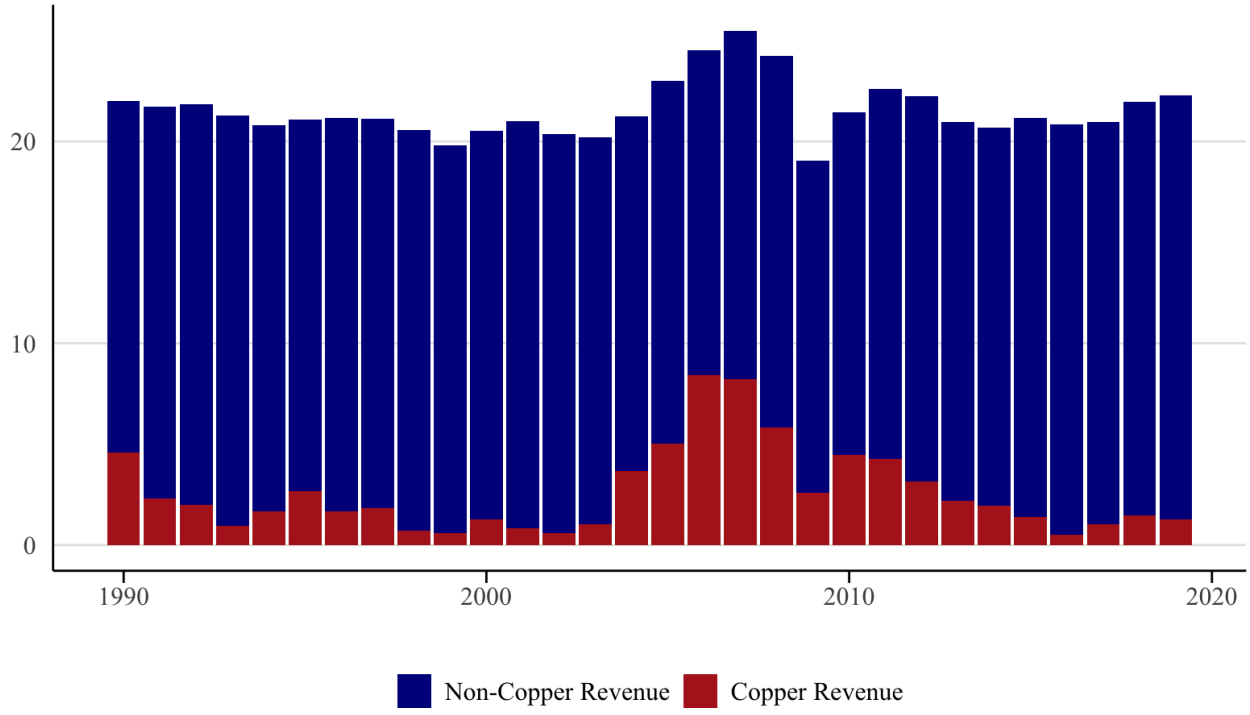
(Percent of GDP)



Source: Author's calculation based on data from the Ministry of Finance of Chile.

Figure 18: Government Copper and Non-Copper Revenue, 1990-2019

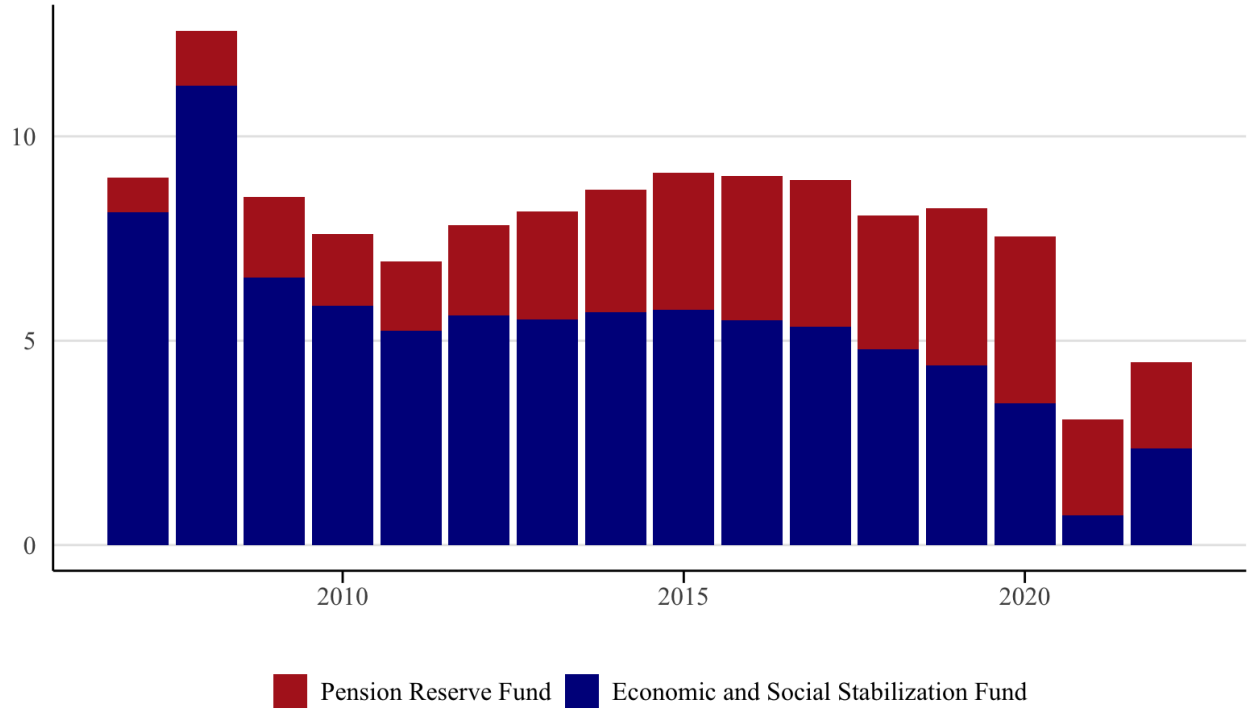
(Percent of GDP)



Source: Fuentes et al. (2021) using data from the Budget Office (MoF), Ministry of Finance of Chile.

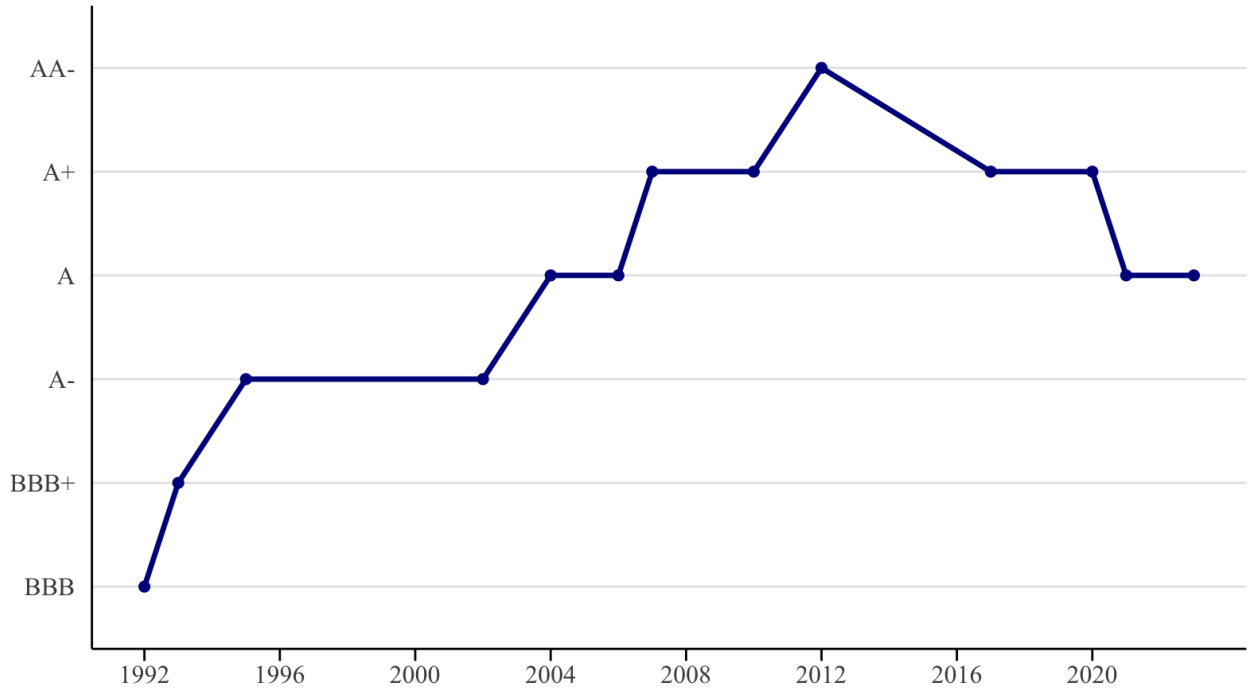
Figure 19: Sovereign Wealth Fund Assets in Chile, 2007-2022

(Percent of GDP)



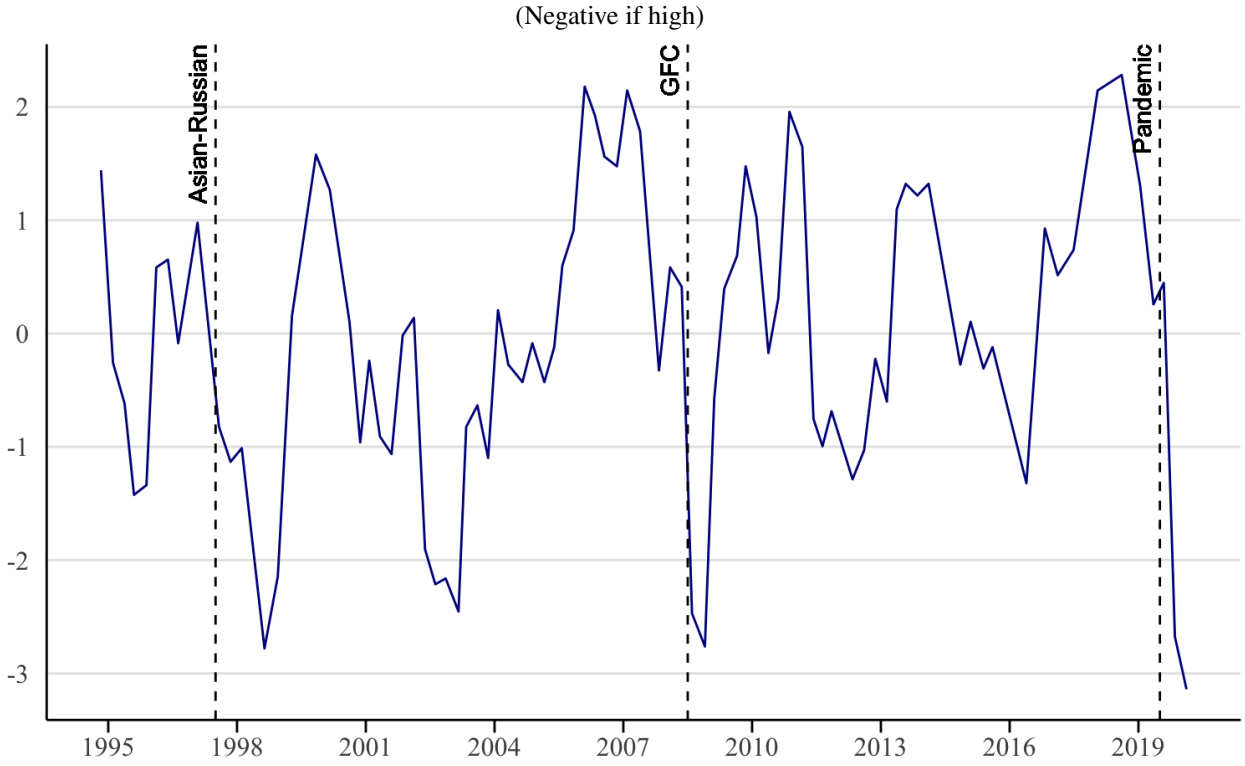
Source: Author's calculation based on data from Ministry of Finance of Chile.

Figure 20: Chile's Sovereign Debt Rating



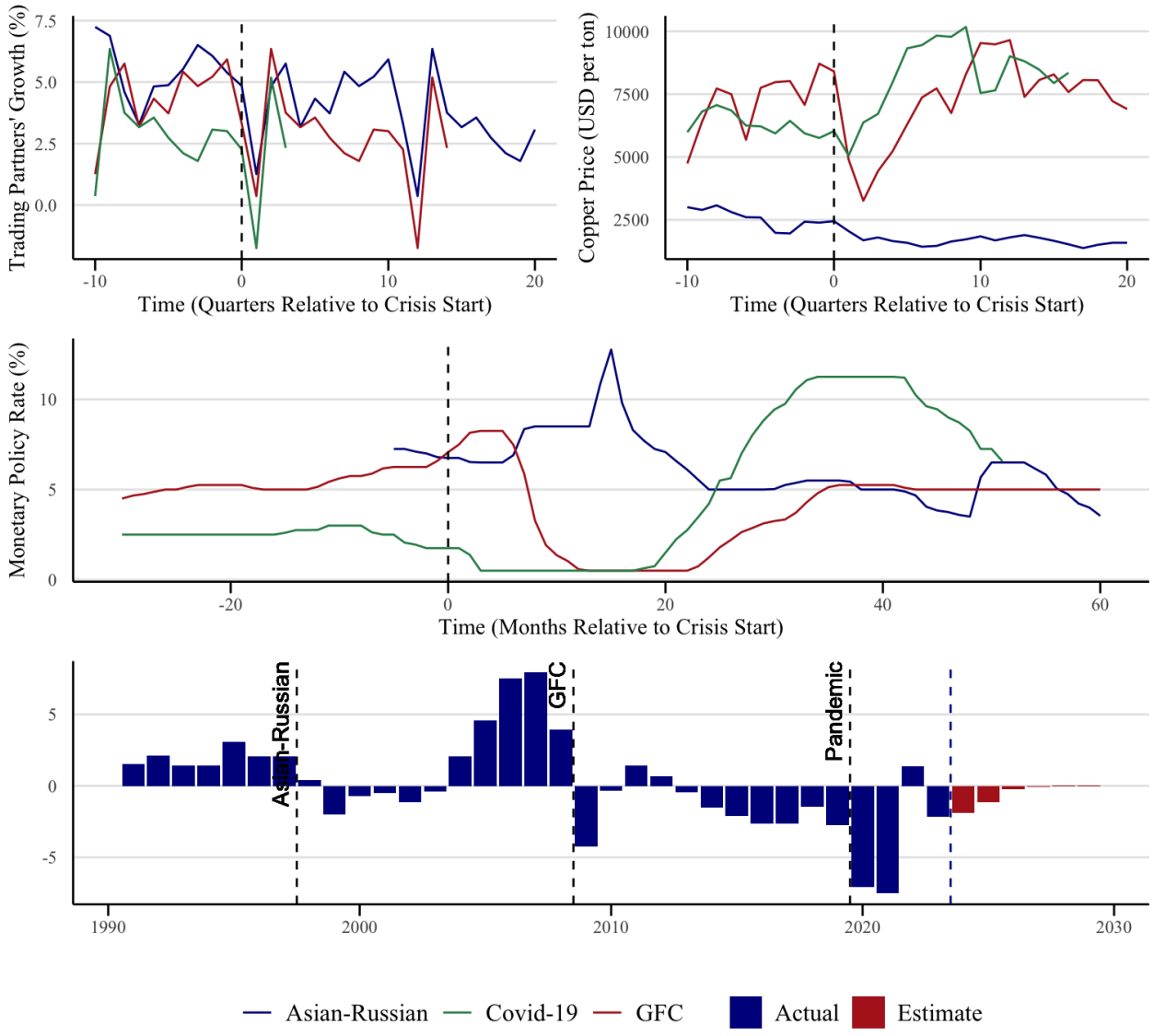
Source: S&P.

Figure 21: Chile - External Stress Index, 1995-2020



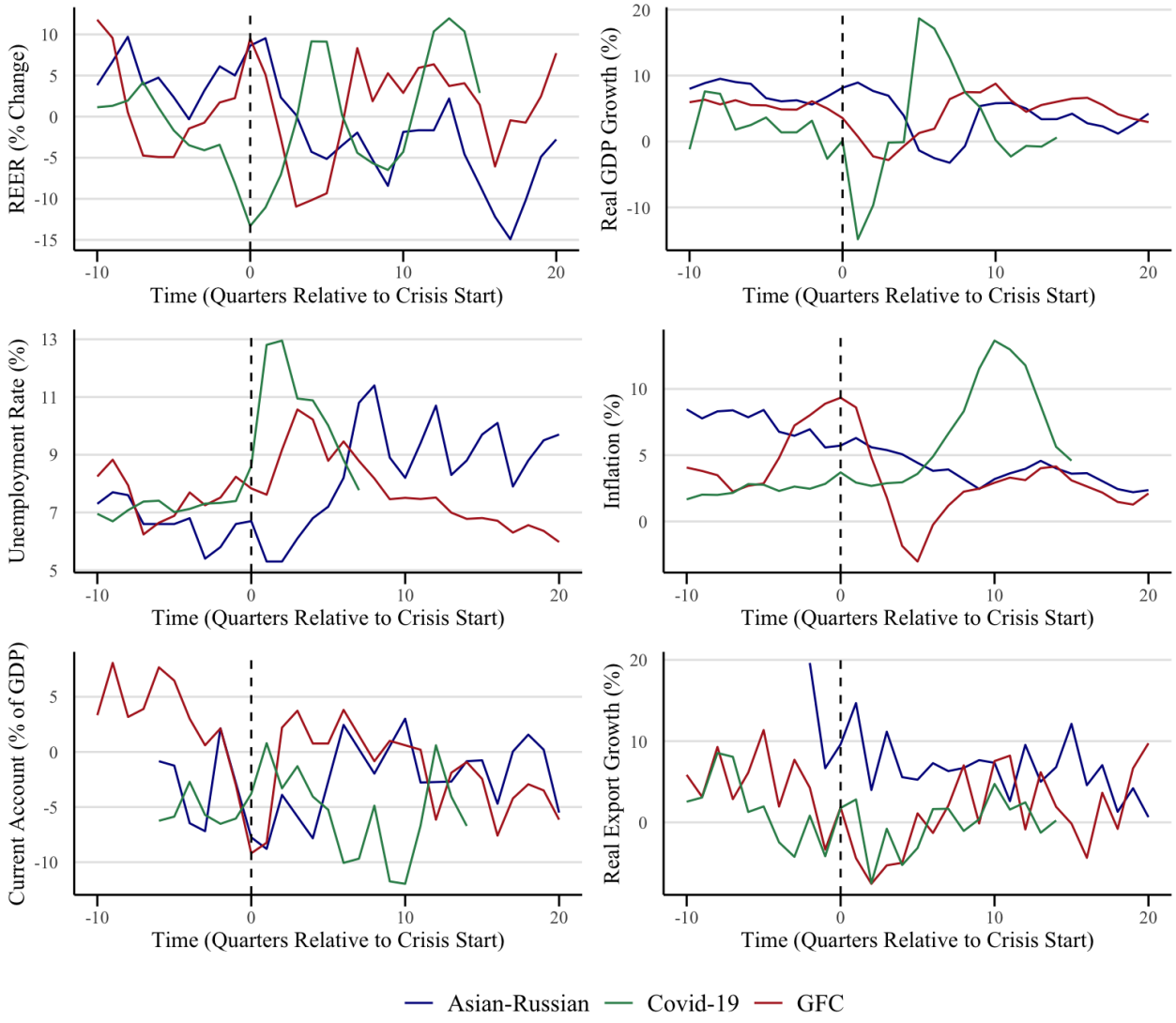
Source: IMF (2020).

Figure 22: Chile's Macroeconomic Performance in Three Crisis Episodes (1997-98 vs. 2008 vs. 2020)



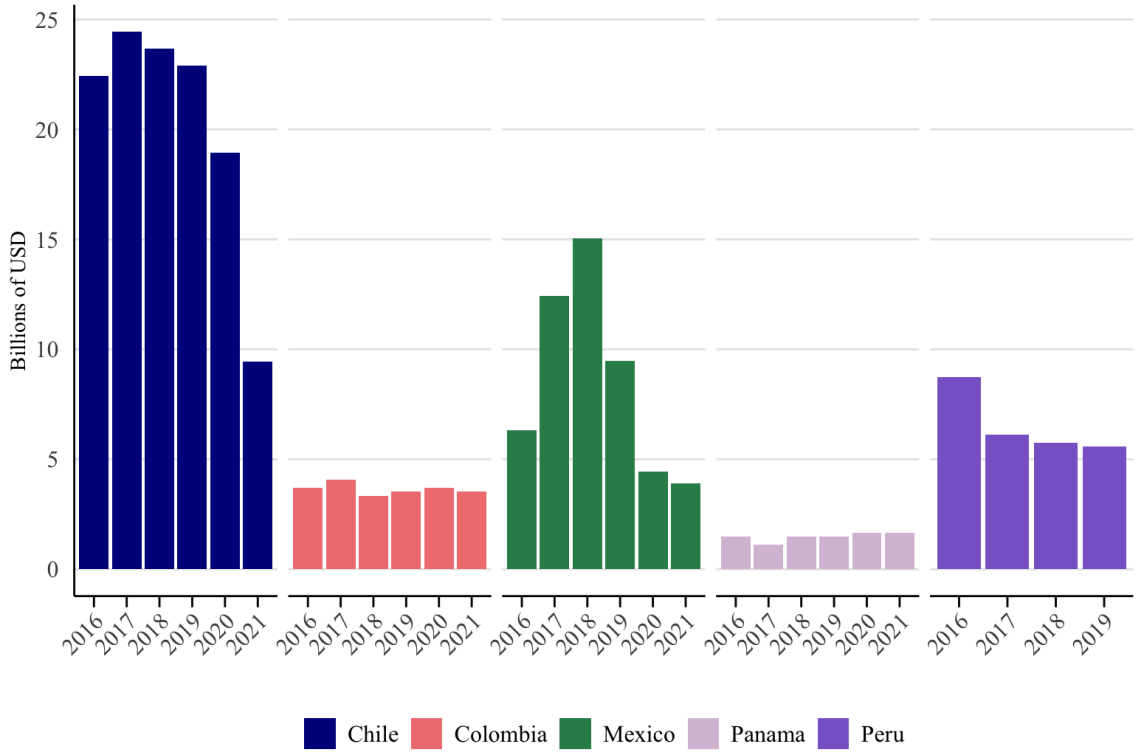
Note: Blue lines correspond to the Asian-Russian crises, red lines correspond to the Global Financial Crisis, and green lines correspond to the Covid-19 Pandemic. The vertical line marks the start of the crisis episodes.
Source: IMF World Economic Outlook database, International Financial Statistics, CBCh, and author's calculations.

Figure 23: Chile's Macroeconomic Performance in Three Crisis Episodes (1997-98 vs. 2008 vs. 2020)



Note: Blue lines correspond to the Asian-Russian crises, red lines correspond to the Global Financial Crisis, and green lines correspond to the Covid-19 Pandemic. The vertical line marks the start of the crisis episodes.
Source: IMF World Economic Outlook database, International Financial Statistics, CBCh, and author's calculations.

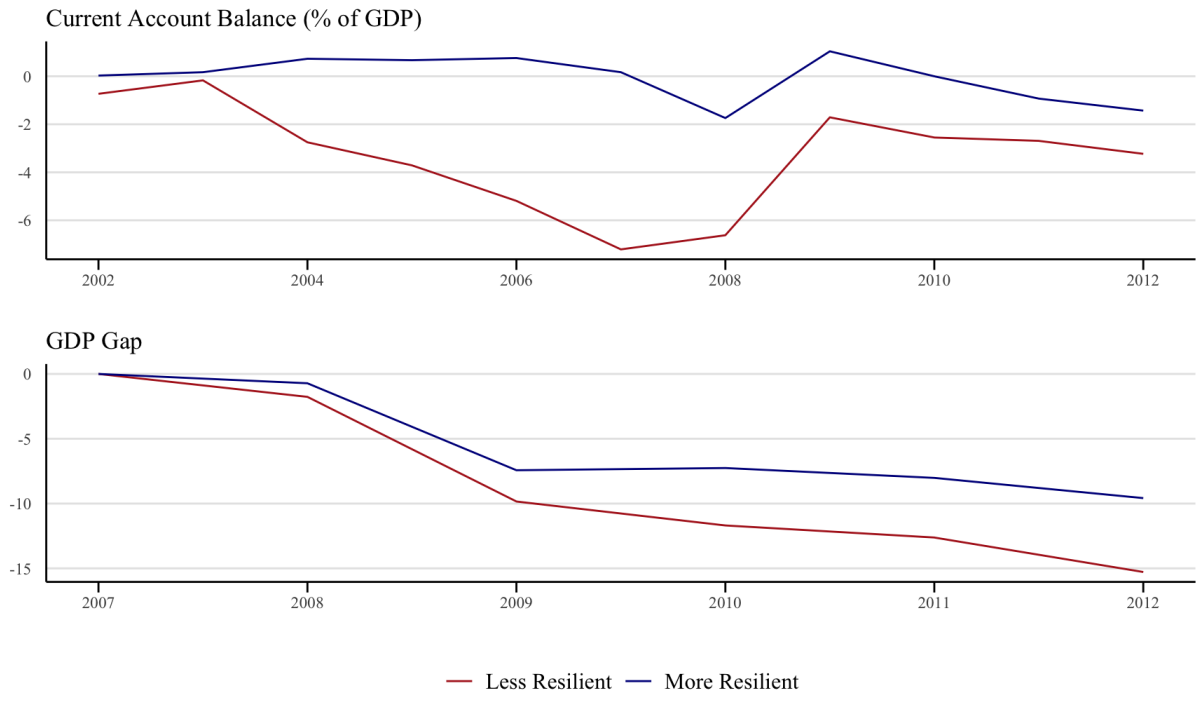
Figure 24: Sovereign Wealth Fund Assets Under Management in Latin America, 2016 - 2021



Source: Statista.

Figure 25: More Resilient vs. Less Resilient Countries - Current Account and GDP

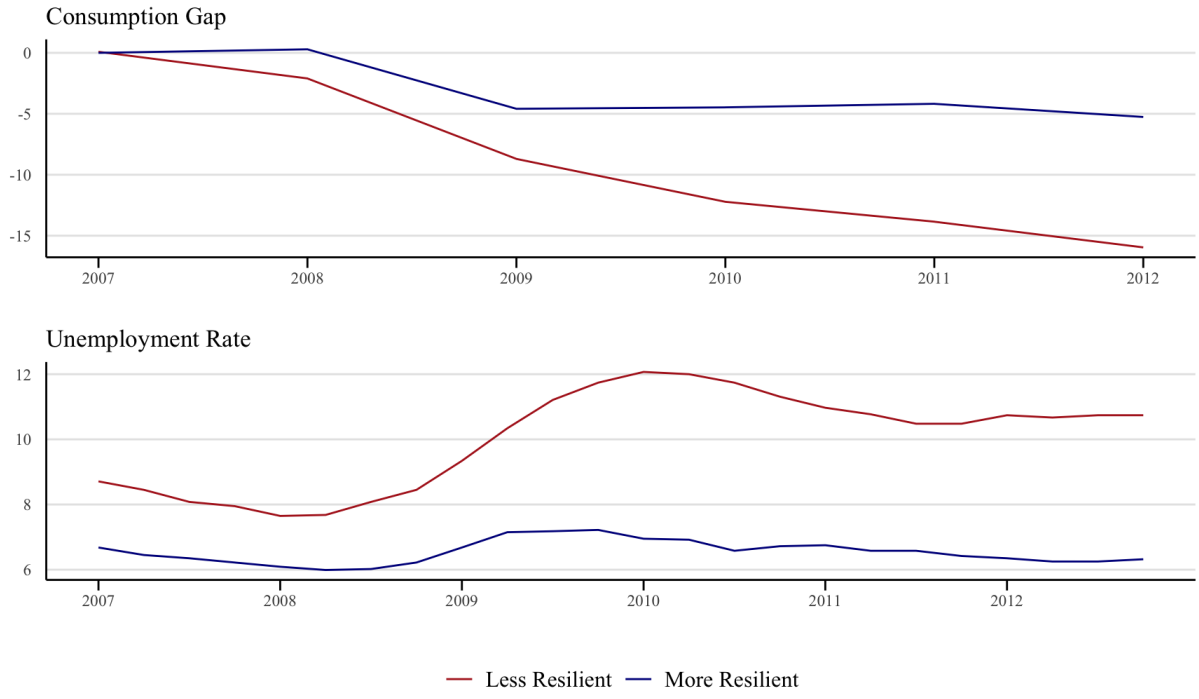
(Percent, mean)



Source: Benes et al. (2013).

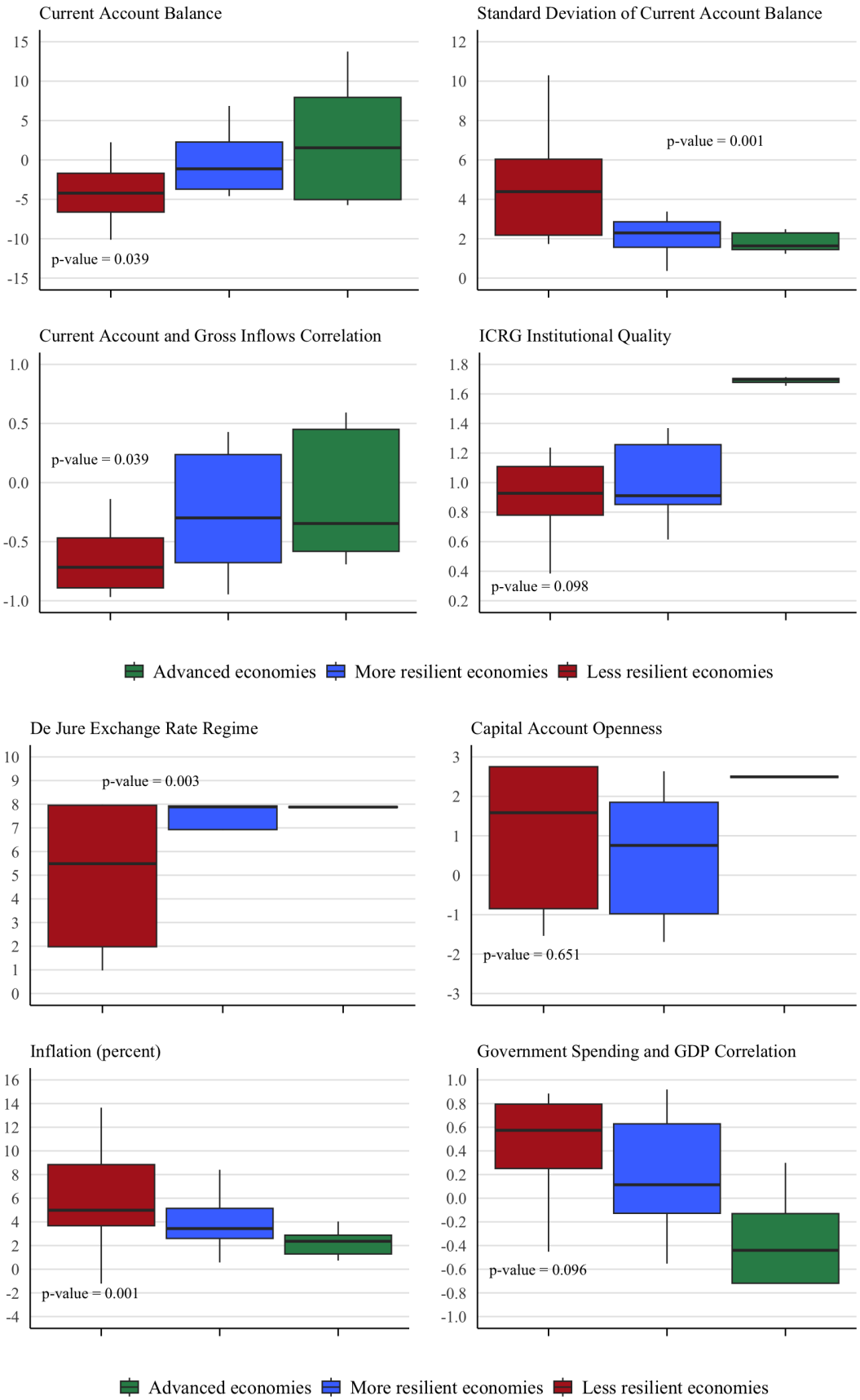
Figure 26: More Resilient vs. Less Resilient Countries - Unemployment and Consumption

(Percent, mean)



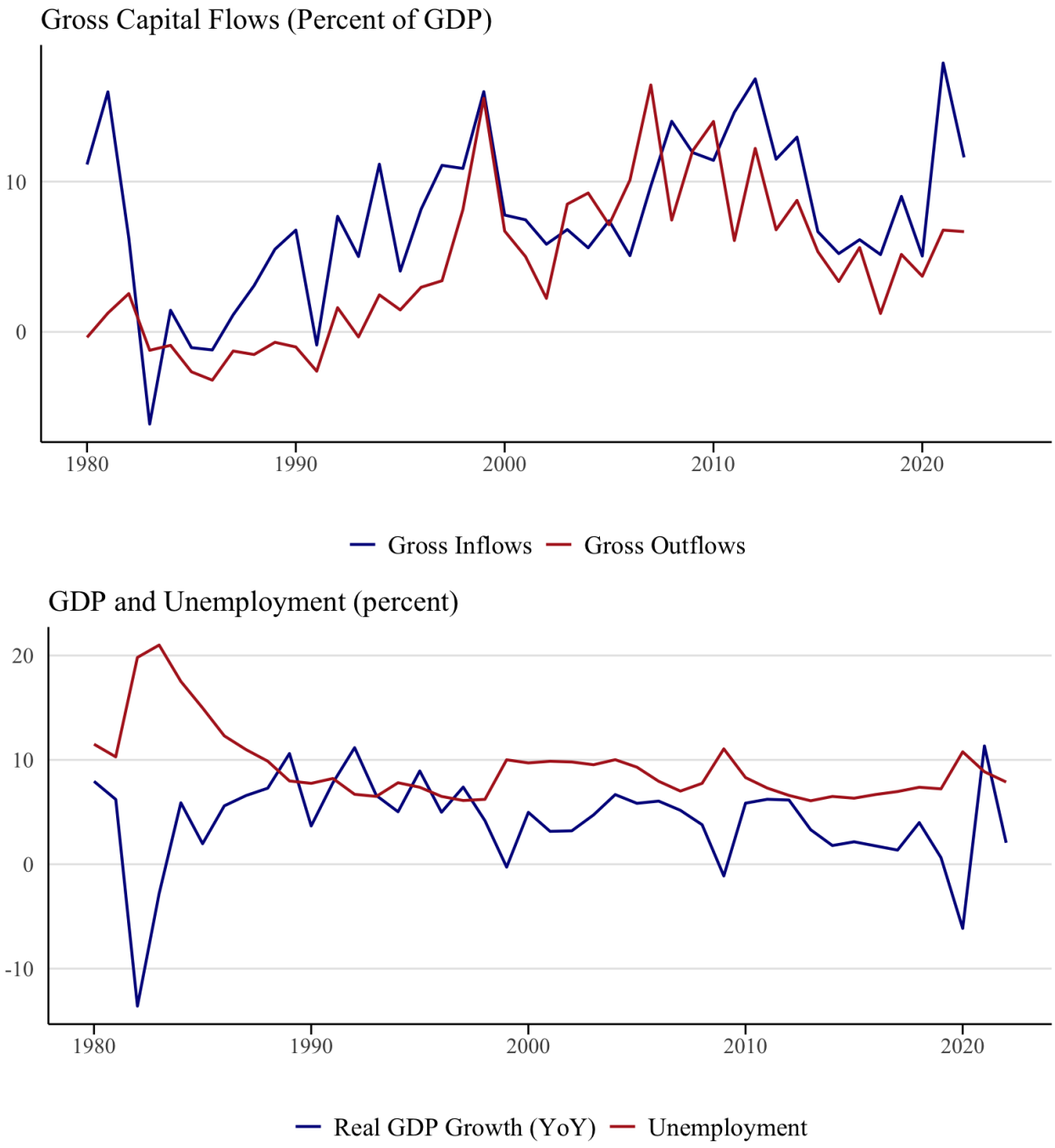
Source: Benes et al. (2013).

Figure 27: Financial Adjustment and Resilience Analysis



Note: Boxplots show the minimum, maximum, median, and lower and upper quartiles (excluding outliers). The p-value is based on the Kolmogorov-Smirnov test and indicates the significance of the difference in distributions between less resilient economies and more resilient economies.
Source: Benes et al. (2013) using data from Chinn and Ito (2006); IMF, Annual Report on Exchange Arrangements and Exchange Restrictions; PRS Group, Inc., and International Country Risk Guide (ICRG).

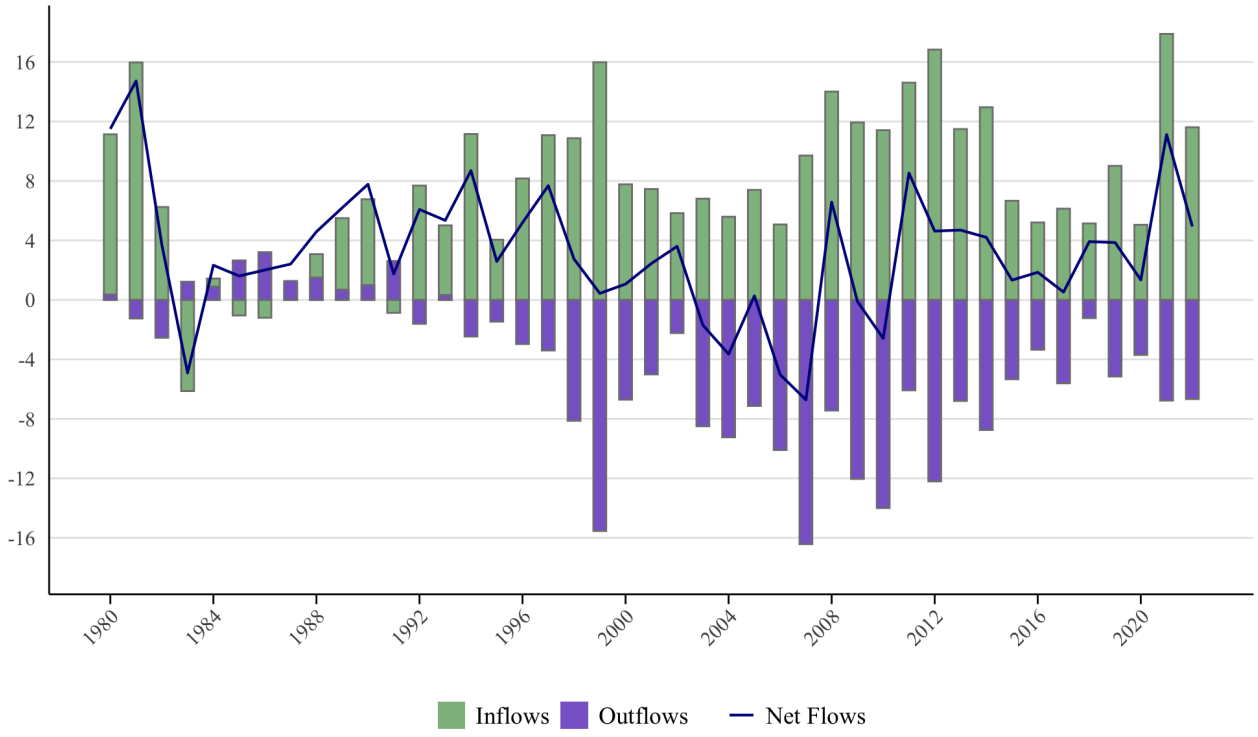
Figure 28: Long-term View of Chile - Capital Flows, GDP, and Unemployment



Source: Benes et al. (2013), International Financial Statistics, World Bank.

Figure 29: Gross and Net Capital Flows

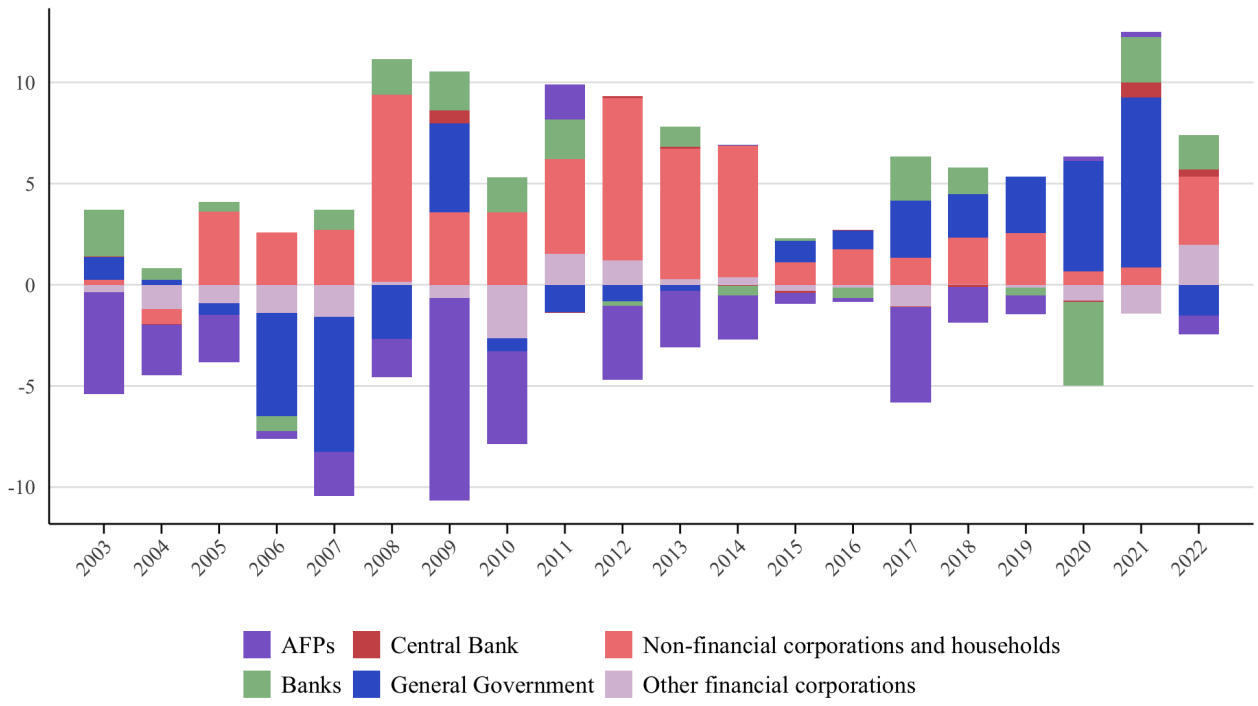
(Percent of GDP)



Source: Benes et al. (2013) and CBCh.

Figure 30: Net Capital Flows by Institutional Sector

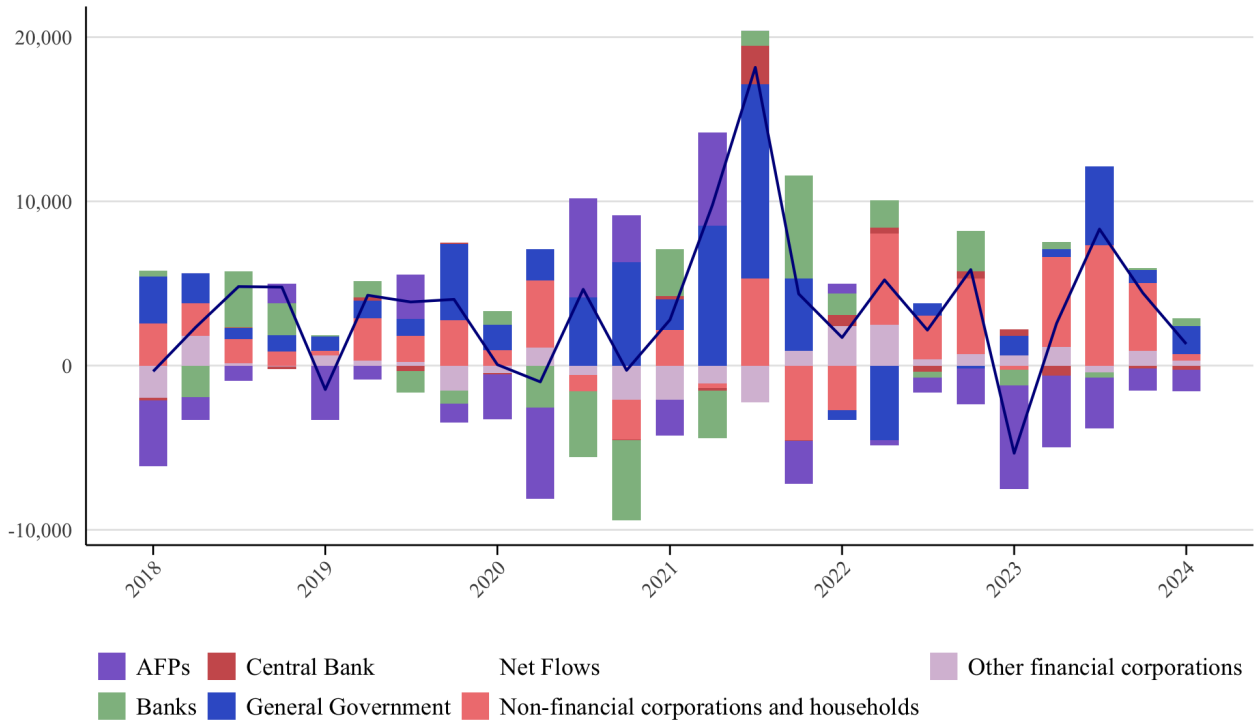
(Percent of GDP)



Source: CBCh.

Figure 31: Net Capital Flows by Institutional Sector, 2018-2024

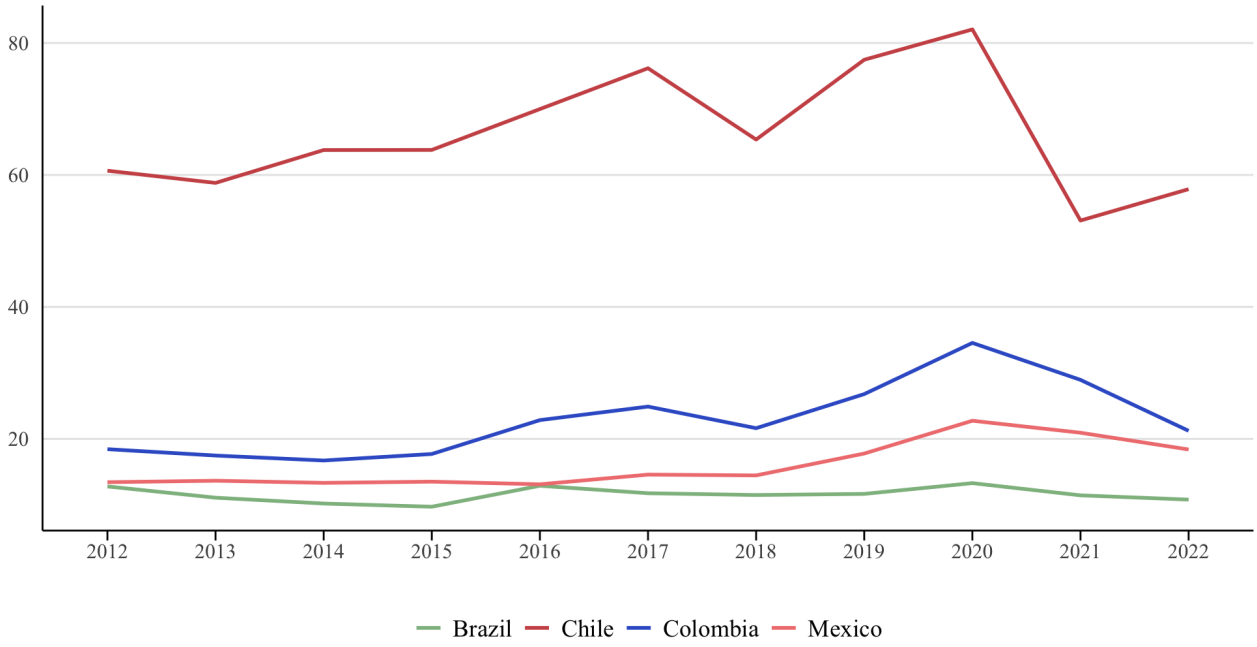
(Millions of USD)



Source: CBCh.

Figure 32: Total Pension Assets

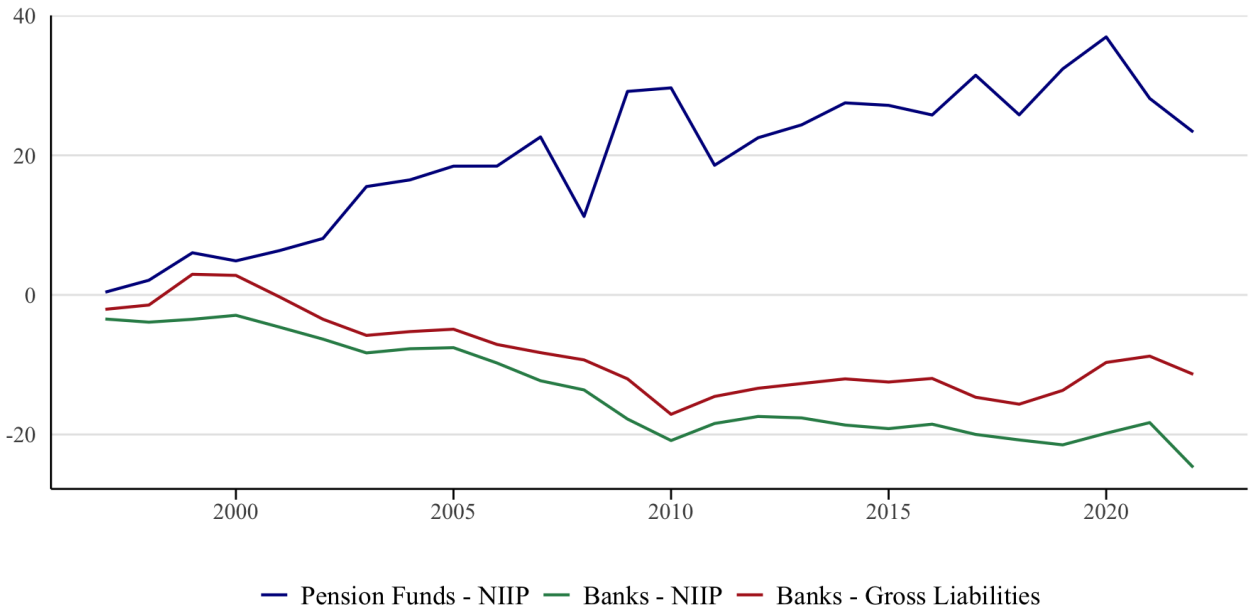
(Percent of GDP)



Source: OECD, IMF - World Economic Outlook.

Figure 33: Net International Investment Position - Pension Funds and Banks

(Percent of GDP)



Source: CBCh.

Table 1: Turnover in Derivatives Markets, 2022

Type	Chile (2001)	Chile (2022)	Latin America (2001)	Latin America (2022)	EMEs, without LA (2022)	Developed (2022)
Derivative turnover as a % of:						
Spot turnover	0.4	1.5	0.1	1.3	2.3	2.7
Trade flows	4.5	6.9	3.3	3.3	4.7	59.2
GDP	2.3	4.4	0.9	1.7	2.3	30.6

Note: Trade flows are the sum of exports and imports; capital flows are the sum of gross capital inflows and gross outflows. Total turnover corresponds to total transactions of currency derivatives contracts in the foreign exchange and over-the-counter (OTC) markets with domestic and foreign agents, net of double accounting. Derivative turnover with domestic non-financial counterparties excludes turnover between reporting agents, between reporting agents and other financial institutions, and between agents and non-financial counterparties abroad. Emerging economies are those in the lower and middle income groups from the World Bank World Development Indicators in 2022.
Source: Author's calculations based on BIS (2022); IMF International Financial Statistics; World Bank World Development Indicators.

Table 2: Derivative Regression Results

Specification	1	2
Income per capita	0.03***	0.03***
(Exports + Imports) / GDP	0.20	0.34
Private lending / GDP	1.69***	1.42***
Dummy EMU membership		-0.69*
R^2	0.66	0.64
Observations	46	46

Note: * p<0.1, ** p<0.05, *** p<0.01
Source: BIS, World Bank, IMF.

Table 3: Comparison of Capital Flows Across Time

	Period	CAD	Inflows	Outflows	Net Flows	Reserves
Average	1980-1998	4.9%	5.3%	0.4%	4.8%	1.8%
Average	1999-2022	1.8%	9.7%	7.8%	1.9%	0.6%
Standard Deviation	1980-1998	3.5%	5.5%	2.7%	4.2%	2.4%
Standard Deviation	1999-2022	3.6%	4.1%	4.0%	4.1%	2.1%

Source: CBCh, IMF, Benes et al. (2013).