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Lo Stato di Diritto condiziona l'effetto dell'Integrazione Commerciale sulla Sofisticazione delle Esportazioni?

Evidenza da Panel e il Caso Cileno

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Riassunto

In che modo lo Stato di diritto modella l'effetto dell'integrazione commerciale sulla sofisticazione delle esportazioni? Questa tesi esplora tale questione utilizzando un approccio con dati panel cross-country e stime System GMM. I risultati empirici rivelano una significativa interazione negativa tra l'integrazione nel mercato globale e le forti istituzioni legali nelle economie ricche di risorse. Invece di guidare automaticamente il cambiamento strutturale, diritti di proprietà sicuri e un profondo accesso al mercato esterno agiscono come ottimizzatori finali dei vantaggi comparati esistenti, generando in definitiva un profondo lock-in istituzionale.

Il caso cileno illustra perfettamente questa dinamica. La completa liberalizzazione economica avviata durante la dittatura ha stabilito un quadro legale altamente prevedibile e forti diritti di proprietà. Sebbene queste istituzioni abbiano garantito con successo alti rendimenti sul capitale allocato alle risorse naturali, esse hanno rafforzato l'esatta struttura di mercato preesistente. Poiché gli incentivi di mercato hanno reso le operazioni sulle materie prime altamente redditizie su scala globale, il costo opportunità relativo di impegnarsi in incerte scoperte imprenditoriali per la manifattura complessa è diventato proibitivamente alto. I risultati suggeriscono che, per i paesi ricchi di risorse, l'espansione del libero scambio sotto un forte stato di diritto ottimizza naturalmente la produzione corrente piuttosto che forzare un potenziamento industriale artificiale.

Abstract

How does the Rule of Law shape the way trade integration affects export sophistication? This thesis explores this question using a cross-country panel data approach with System GMM estimations. The empirical results suggest a significant negative interaction between global market integration and strong legal institutions in resource-abundant economies. Rather than automatically driving structural change, secure property rights and deep external market access act as the ultimate optimizers of existing comparative advantages, ultimately generating an *institutional lock-in.*

The Chilean case perfectly illustrates this dynamic. The comprehensive economic liberalization initiated during the dictatorship established a highly predictable legal framework and strong property rights. While these institutions successfully secured high returns on capital allocated to natural resources, they reinforced this exact market structure. With market incentives making primary commodity operations highly profitable on a global scale, the relative opportunity cost of engaging in uncertain entrepreneurial discovery for complex manufacturing became prohibitively high. The findings suggest that, in resource-rich economies, stronger institutions may reinforce existing specialization rather than promote diversification.

Acknowledgments

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across Lombardy together gave me beautiful memories that I will always hold dear.

How lucky I am to have something that makes saying goodbye so hard.

A distinct privilege of this double degree was the opportunity to go abroad with my best friend from the master's program. Andrea is truly my other half, and when we jokingly say we share a single brain cell, I mean it. Nothing I have achieved in this research would have been possible without her constant proofreading, our evenings sharing a coffee or an aperitivo, traveling around together, or simply enjoying doing nothing. Her friendship is, by far, the most valuable thing this degree has given me.

Alongside Andrea, this master's program gave me two other immense friendships. I am incredibly grateful to Ejona, who by pure chance happened to be from Pavia. The warmth she and her family showed me made this year abroad feel so much better. I will never be able to thank her, her mom, her sisters, and her dad enough for making me feel entirely at home. I also want to thank Johannes, who was always available for studying, proofreading, or just sharing an evening playing Wizards. Thank you for always bearing my South American energy.

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Back home in Chile, the emotional support given by Paulina and Martin was key. Several times during these two years I felt down, and just a call to gossip with Pauli or talk nonsense with Martin would instantly cheer me up. Pauli, I do not think there is anyone else I would cross the Atlantic for just to attend their wedding. Thank you both for making it feel like that four-

hour time zone difference was not even there. A very special thanks goes to Anto, my biggest enemy, who came to be with me last year. That month together was one of the highlights of my time here; even though I would hate to admit it, I love you to bits. The same gratitude goes to Inés. Her warmth, and that of her family, made the first Christmas I spent far away from my own family one to truly remember. *Un millón de gracias a ti, a tus padres, a tu hermana y su familia.*

And to close, the most important people out there: my parents. This work, alongside everything I have done, is for them, for I am who I am thanks to them. *Me faltarían páginas para escribir sobre ustedes. Son todo lo que tengo, y son lo mejor de mí. Soy quien soy gracias a ustedes: una perfecta unión de la emocionalidad del papá, y el pragmatismo de la mamá. Estoy acá gracias a todo el apoyo incondicional que me han dado. Los amo, más que a nada, y este logro es tan de ustedes como mío. Gracias.*

Finally, I want to leave a few closing words for my future self. This document is a reminder of everything I experienced and the person I became during these last two years. Between the travels, the challenges, and the life built across two countries, this journey has been deeply transformative. Most surprisingly, pouring my energy into this project made me fall in love with writing and researching all over again. Whenever I look back at these pages in the years to come, I hope I remember the courage it took to take that first step and the absolute joy of the adventure that followed.

Javier A. Ávila Parada

Dresden, May 2026

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Chapter 1

Introduction

1.1 Context and Motivation

Chile presents an intriguing case for the study of trade and institutions. The country's modern economic trajectory began with a radical shift toward economic liberalization in the mid-1970s, when the dictatorship initiated a comprehensive program of market-oriented reforms. These reforms included unilateral tariff reductions that brought average tariffs down from over 100% in 1973 to 10% by 1979 (Edwards, 1994), coupled with the privatization of state-owned enterprises and financial sector deregulation. This early opening laid the groundwork for what would become one of the world's most extensive networks of free trade agreements.

Following its return to democracy in 1990, Chile pursued an aggressive strategy of bilateral and regional trade integration. The country signed its first major FTA with Canada in 1997, followed by agreements with Mexico (1999), the European Union (2003), the United States (2004), and China (2006). This strategy continued unabated over subsequent decades, with Chile becoming a founding member of the Pacific Alliance in 2011 and joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in 2023. Today, despite being a relatively small economy, Chile has signed or is negotiating Free Trade Agreements (FTAs) with over 60 economies, covering nearly two-thirds of global GDP (Subsecretaría

de Relaciones Económicas Internacionales (SUBREI, 2025)).[1]

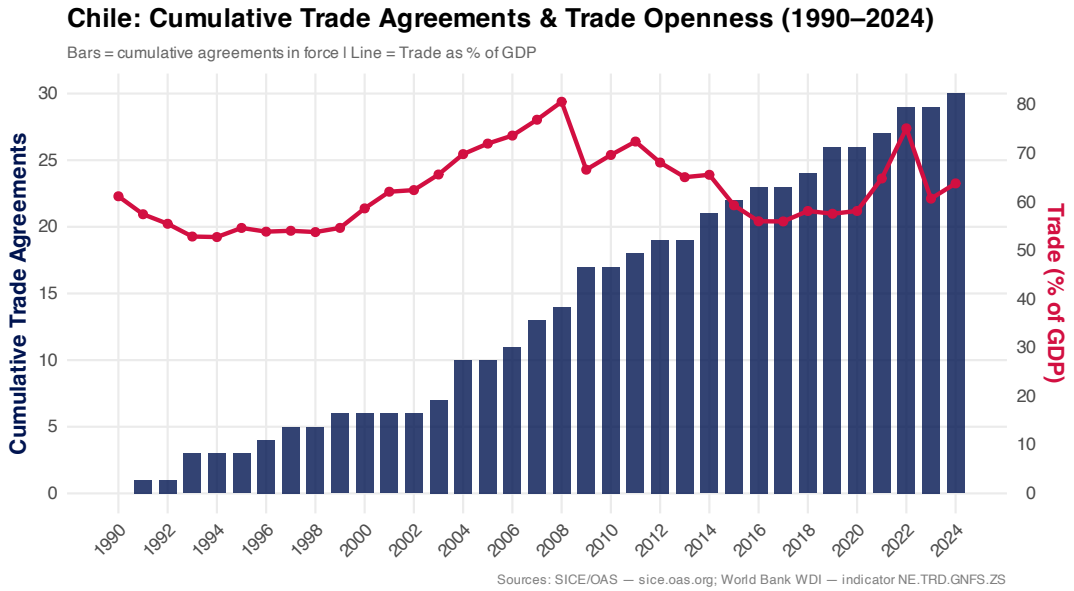

Figure 1.1: Cumulative FTAs vs Trade as % of GDP

This FTA expansion strategy, rooted in the economic liberalization policies initiated during the dictatorship and consolidated under democratic governance, transformed Chile into one of the most open economies globally. The number of FTA partners expanded dramatically: from zero agreements in the mid-1990s to over 30 active agreements by 2025, encompassing major economic blocs including MERCOSUR (1996), EFTA (2004), China (2006), Japan (2007), and the European Union (2003) (SUBREI, 2025). By the first semester of 2025, 96% of Chile's total trade occurred with FTA partners, underscoring the centrality of these agreements to the country's economic model.

However, preferential access is not equivalent to productive upgrading: an increasingly relevant channel runs through integration into global value chains (GVCs), where firms can access higher-quality intermediate inputs, embedded technologies, and learning opportunities that are difficult to replicate in isolation (Ndubuisi and Owusu, 2021). Stronger GVC participation is associated with higher export quality and faster catch-up toward the global quality fron-

[1]Referred to as SUBREI throughout the thesis.

tier. However for commodity-oriented economies the results imply strong heterogeneity in the mechanism: developed countries benefit through both backward linkages (foreign value added embodied in exports) and forward linkages (domestic value added embodied in third-country exports), whereas developing countries' quality upgrading is primarily associated with backward participation.

Simultaneously, Chile ranks among the highest in Latin America on the World Governance Indicators (WGI) for Control of Corruption, Rule of Law, and Regulatory Quality (**?**), reflecting a stable and disciplined institutional framework that emerged through decades of gradual institutional consolidation following the transition to democracy. From an institutional economics perspective, the quality of domestic institutions is a key determinant of national prosperity, as it shapes incentives for investment, innovation, and production (Acemoglu and Robinson, 2004). Within this framework, strong economic institutions that secure property rights and ensure contract enforcement are seen as necessary (though not sufficient) conditions for the development of more complex and sophisticated productive structures (Levchenko, 2007). A related empirical nuance is that Ndubuisi and Owusu (2021) includes Rule of Law as a standard control in export-quality regressions yet finds a weak direct association once fixed effects and other covariates are accounted for, which is consistent with the idea that institutions may matter more by conditioning the payoffs to integration than by mechanically shifting outcomes one-for-one.

The Chilean case therefore poses a clear paradox: sustained and unusually deep trade integration has expanded *de jure* access to most of the world economy, and domestic institutions are comparatively credible, yet export upgrading has remained limited and commodity dependence persists. As seen in Figure 1.2, trade has not evolved at the same clip as the FTAs have. The pattern becomes even sharper when the export composition itself is examined. Figure 1.2 plots the cumulative number of FTAs against constant exports of low value-added goods: rather than declining as market access deepened, low-complexity exports have remained stubbornly elevated throughout Chile's integration process, tracing a trajectory that runs against the standard

expectation that preferential access translates into productive upgrading.

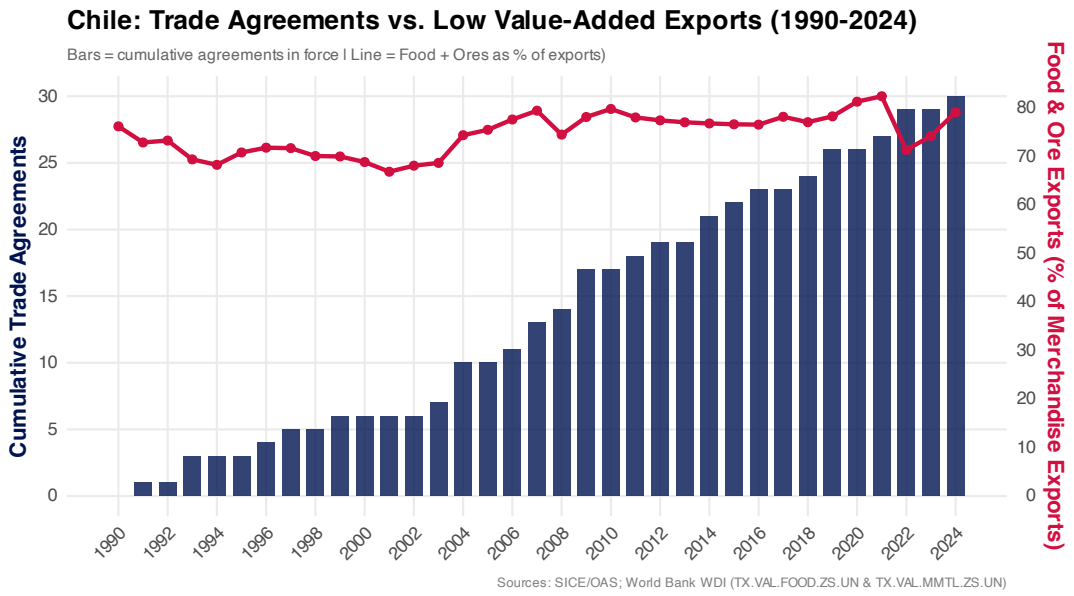

Figure 1.2: Trade Agreements vs Food & Ore Exports as proxy for Low Value Added Exports

In this thesis, I investigate whether the constraint lies in the effective transmission of FTAs into upgrading incentives and realized preference use, or whether domestic institutional and regulatory frictions raise the risk and irreversibility of long-horizon investments, thereby weakening the gains from integration. Empirically, I formalize this puzzle by testing whether the effect of international integration on export sophistication is conditional on the strength of the Rule of Law, as a widely used proxy for the institutional quality of a country (Hausmann et al., 2007).

1.2 Methodological Approach

To address this research question, the thesis employs a dynamic panel data framework. Because export sophistication is a *path-dependent* process and institutional structures evolve gradually, a System Generalized Method of Moments **(SGMM)** estimator is utilized. This econometric approach is particularly well-suited to handle the persistent nature of trade structures and the

potential endogeneity between market integration and institutional quality.

The core of the analysis rests on the premise that formal trade access is insufficient without the correct domestic incentives. Secure property rights and predictable enforcement are necessary to unleash the entrepreneurial market discovery process required for complex production. When institutional frictions or rigidness elevate the risks of capital accumulation, entrepreneurs will naturally gravitate toward less complex, resource-extractive activities regardless of tariff reductions. By interacting a International Integration Index (IIX) with institutional variables, this empirical strategy effectively isolates how the Rule of Law conditions the payoffs of economic liberalization, testing whether a robust institutional environment is the missing catalyst for structural productive change in Chile.

1.3 Structure of the Thesis

The remainder of this work is structured as follows. Chapter 2 establishes the theoretical framework, detailing the conceptual logic and the main working hypotheses regarding the interplay between trade integration and domestic institutions. Chapter 3 reviews the relevant literature on export upgrading and institutional economics to position this research within the broader academic debate. Chapter 4 describes the data and operationalizes the variables, paying particular attention to the construction and validation of the International Integration Index (IIX). Chapter 5 outlines the empirical methodology and model specifications. Finally, Chapter 6 presents the econometric results, discusses robustness checks, and offers concluding remarks on the implications of the Chilean export upgrading paradox and the overall effects.

Chapter 2

Research Framework

This thesis studies Chile as a case where deep external market access through trade agreements coexists with persistent export concentration first sector industries. The framework allows for complementarity between domestic institutions and international integration in shaping firms' incentives and capacity to upgrade exports.

2.1 Research Question

Main Research Question. How do Chile's domestic institutions, especially Rule of Law, and its extensive Free Trade Agreement network interact to shape export sophistication, and under what conditions does this interaction reinforce path dependence in the country's productive structure?

- **Secondary Question 1:** Is this interaction broadly consistent across economies, or does its effect vary depending on structural conditions such as resource abundance and export composition?
- **Secondary Question 2:** Which dimensions of trade integration matter most for export sophistication, and is the relevant channel better captured by the legal depth of agreements or by the economic size of partner markets?

- **Secondary Question 3:** What do these findings imply about the ability of economic liberalization to generate structural transformation in Chile?

2.2 Conceptual logic and mechanisms

The guiding premise is that export upgrading is an entrepreneurial discovery process, driven by Schumpeterian creative destruction and carried out under dispersed information and genuine uncertainty (Schumpeter, 1942; Melitz, 2003). Firms experiment with new products, inputs, and markets, and only a subset of these experiments becomes scalable and persistent (Melitz, 2003). In this setting, trade agreements can lower external frictions to exchange, in particular border-related barriers such as tariffs and other trade costs (Viner, 1950; Balassa, 1961). However, domestic institutions shape whether private actors can coordinate complex production plans over time through secure property rights, contract enforcement and predictable dispute resolution (North, 1990; Acemoglu and Robinson, 2004).

A further piece of the logic is that upgrading often depends on access to high-quality intermediates and embedded know-how that are obtained through GVC linkages: in cross-country evidence, deeper participation in GVCs is associated with higher export quality and faster catch-up to the quality frontier, with developing countries' gains occurring mainly through backward participation (Ndubuisi and Owusu, 2021).

This yields three channels linking institutions and trade integration to export sophistication:

- **Capital formation channel:** Stronger Rule of Law and contract enforcement reduce regime uncertainty and the expected cost of expropriation or arbitrary enforcement, thereby lowering the risk premium required for long-horizon investments associated with complex exports (North, 1990; Acemoglu and Robinson, 2004), such as specialized capital, skills, and R&D.

- **Entrepreneurial entry and reallocation channel:** When entry, experimentation, and

scaling are less exposed to discretionary regulation and uneven enforcement, resources can be reallocated toward higher-valued uses through competition, selection, and the Schumpeterian discovery of new, more productive business plans (Schumpeter, 1942; Melitz, 2003).

- **Market-access utilization channel:** Deeper integration expands market opportunities, but actual utilization depends on firms' capacity to meet standards, finance working capital, and maintain long-term commercial relationships under enforceable contracts (Balassa, 1961; North, 1990).

Causal Mechanism and Direction

The mechanism can be understood as a firm-level allocation problem between safe, established sectors and risky, new activities. Trade integration expands market opportunities, while institutional quality reduces uncertainty. In resource-rich economies, this combination may increase the relative attractiveness of existing sectors, raising the opportunity cost of entrepreneurial discovery.

In this framework, institutional quality is treated as a pre-determined domestic constraint that shapes firms' feasible contracting set and expected payoffs, while FTAs operate as external shocks to market access and demand (North, 1990; Balassa, 1961). A stronger Rule of Law reduces transaction costs and increases the predictability of enforcement, thereby securing the expected returns to investment.

This predictability may encourage capital to flow toward activities with established returns. At the same time, trade integration expands the scale at which these activities can operate. The interaction between the two does not necessarily induce diversification; instead, it may reinforce existing patterns of specialization.

This effect is expected to be particularly relevant in resource-abundant economies. In such

contexts, strong institutions can make large-scale investments in primary sectors more secure, increasing the opportunity cost of reallocating capital toward more uncertain, discovery-driven activities associated with higher export complexity (Acemoglu and Robinson, 2004).

2.3 Operationalization and scope

Export upgrading is proxied by the Trade dimension of the Economic Complexity Index (ECI), which captures the sophistication embedded in countries export structures. Domestic institutional quality is proxied primarily through the WGI Rule of Law indicator, with the V-Dem Rule of Law index used as an alternative measure for robustness. International integration is captured through the International Integration Index (IIX), a policy-based measure that combines the depth of preferential trade agreements with the economic weight of partner markets. The empirical analysis covers the period 1998-2023, reflecting the availability of the ECI and the main institutional and trade variables used in the panel estimations.

2.4 Working Hypotheses

1. Institutional quality is expected to condition export upgrading primarily through the *Rule of Law*, rather than through broader governance measures.

2. The effect of trade integration on export sophistication is expected to depend on the domestic institutional environment, with a stronger lock-in effect in resource-rich economies.

3. In countries combining high institutional quality and strong natural resource endowments, deeper integration is expected to reinforce existing comparative advantages rather than induce diversification into more complex exports.

2.5 Expected Results

My hypotheses imply that deeper international integration affects export sophistication through the institutional environment. In resource-rich economies, stronger Rule of Law is expected to raise the opportunity cost of shifting away from established commodity sectors, making export upgrading less likely. This effect should be especially strong in countries that combine high institutional quality with abundant natural resources, which helps explain Chile's paradoxical persistence in low-complexity exports.

Chapter 3

Literature Review

3.1 Institutions and Exports Upgrading

A common insight in this literature is that institutional quality shapes the payoff structure faced by firms and entrepreneurs, and thereby conditions the pattern of specialization that emerges from decentralized market decisions. Acemoglu and Robinson (2012) develop this logic in a long-run development setting: when property rights are insecure or contract enforcement is weak, the expected return to relationship-specific and technologically complex activities falls. As a result, resources are reallocated toward simpler production processes or toward rent-seeking activities that remain privately profitable under weak constraints. Conversely, when the Rule of Law is sufficiently predictable, longer-horizon and sunk investments become more attractive. This predictability secures the returns on entrepreneurial risk and tilts a country's revealed comparative advantage toward more complex goods and tasks, ultimately driving wealth creation.

This foundational relationship between a sound legal framework and economic prosperity is visually captured by figure (3.1), which plots the Rule of Law Index against the log of GDP per capita for 2024. The positive cross-sectional association is clear. Countries that guarantee strong contracting environments and protect private property cluster at the higher end of the income

spectrum. In contrast, nations with weak institutional constraints remain at lower income levels, as the lack of predictable rules deters the capital accumulation necessary for sustained economic progress.

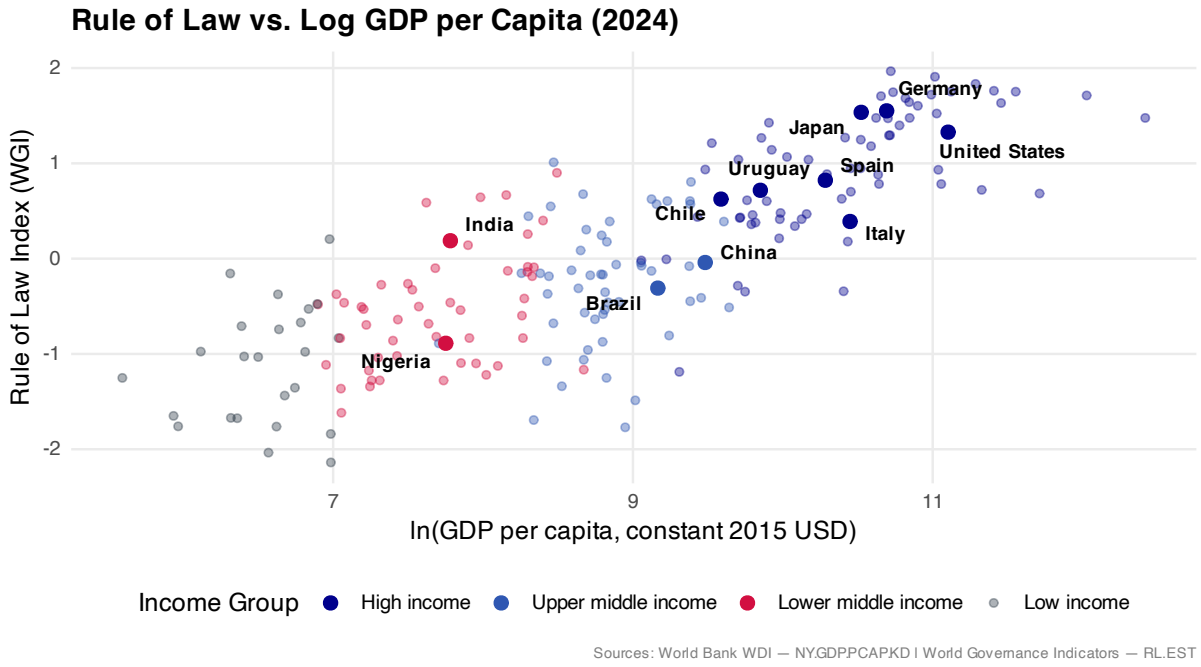

Figure 3.1: Rule of Law vs log GDP Percap

While this visual correlation is strong, the direction of causality in this mechanism runs fundamentally from institutions to specialization and growth. This is conceptually distinct from a separate claim sometimes made in policy debates: that increased trade exposure will itself strengthen institutions. Nicolini and Paccagnini (2011) caution against treating that feedback as automatic or general. Using bilateral trade flows over thirty years and an institutional-quality proxy based on Freedom House indicators, they show that apparent "*trade causes institutions*" patterns are not stable across country pairs. Rather than implying a systematic institutional payoff from integration, their results support a more disciplined interpretation. In what follows, institutional quality is treated as a baseline feature of the contracting environment that shapes how market agents respond to international price signals, rather than an outcome that can be

reliably upgraded through trade alone.

3.2 Institutions, incentives and patterns of specialization

Institutions matter because they shape the environment in which firms choose what to produce, how much to invest, and how far to extend their productive horizon.(Acemoglu and Robinson, 2012) When legal protection is fragile, entrepreneurs tend to favor activities that require little sunk capital and can be reversed quickly, whereas credible rules make it easier to commit resources to more demanding forms of organization. Over time, this difference affects the composition of the economy by steering specialization toward either simpler routines or more sophisticated lines of production.

This logic also helps explain why export upgrading is uneven across countries. Where the institutional setting reduces arbitrary interference and lowers the cost of transacting, firms are better positioned to enter more complex activities and accumulate the capabilities needed for higher-value exports. (Hausmann et al., 2007) argue that export sophistication is closely tied to the productive capabilities embedded in a country's export basket, which is consistent with the view that institutional conditions shape long-run upgrading rather than short-run outcomes alone.

Yet this process remains inherently uncertain. Moving into more complex sectors requires experimentation, error, and the willingness to commit resources before the relevant knowledge is fully available (Schumpeter, 1942). As (Hayek, 1945; Kirzner, 1997) suggest, entrepreneurs operate with dispersed and incomplete information, so institutional order does not command upgrading directly. Its role is more limited but also more important: it supplies the stable legal framework that makes such discovery possible for private actors.

Contract enforcement, input quality and production upgrading

A complementary strand of the literature examines how institutional quality shapes firms incentives to upgrade product quality by affecting access to intermediate inputs, technology, and stable trading relationships. The underlying mechanism is that quality upgrading typically involves relationship specific investments, multi period contracting, and reputational commitments whose expected returns depend on the credibility of contract enforcement. Where institutions are stronger, firms can sustain more complex supplier relationships and longer-horizon investment in higher quality varieties; where they are weaker, upgrading is discouraged by holdup risk and greater reliance on short-term contracting (Levchenko, 2007; Essaji and Fujiwara, 2012). In this sense, institutional quality operates as part of the contracting environment that conditions how firms respond to competitive and price signals when choosing whether to move up the quality ladder.

This mechanism has been formalised in frameworks where quality is an endogenous firm decision. Khandelwal (2010) develops a demand–based measure of product quality that allows quality to vary across firms within narrowly defined goods, a methodology later applied in a trade-liberalization setting by Khandelwal et al. (2013). These contributions treat quality upgrading as a margin that responds to changes in the competitive and policy environment, while remaining conditioned by the institutional context in which firms procure inputs, coordinate suppliers, and maintain export relationships.

Empirical work using these tools shows how institutional frictions interact with upgrading incentives in concrete settings. Studying Mexican manufacturing, Verhoogen (2008) finds that increased trade exposure leads more productive plants to upgrade the quality of both outputs and inputs, with associated wage premia for skilled workers. Although institutions are not the primary object of analysis, the mechanism hinges on firms' capacity to sustain longer and more complex contracts with suppliers and export buyers. In agricultural food markets, Curzi et al. (2014) show that greater import competition accelerates quality upgrading for varieties close

to the global frontier, while laggard varieties adjust more slowly; their interpretation highlights how predictable rules and standards allow leading firms to respond to competitive signals rather than rely on protection.

Contracting institutions also matter through firms' organizational choices, particularly when upgrading requires multi-stage production and relationship-specific investments. Nicolini (2019) examines offshoring within multinational boundaries and shows that institutional quality in host countries is especially important in more contract-intensive industries. Stronger institutions are associated with higher volumes of intra-firm trade in intermediate goods shipped for further processing, while effects are much weaker for goods shipped for resale. This pattern is consistent with the idea that institutions bind most tightly when production is fragmented and sequential inputs must be disciplined through enforceable contracts, thereby enlarging the feasible set of upgrading strategies based on fragmentation and intra-firm sourcing.

Finally, foreign direct investment (FDI) provides a further channel linking institutional quality and upgrading. Using sector-level data, Borensztein et al. (1998) find that attracting FDI in targeted sectors raises the quality of host-country exports, consistent with technology transfer and stricter quality requirements imposed by multinational buyers. Their results are strongest where basic investor protections are credible, reinforcing the view that secure property rights and low policy risk act as preconditions for beneficial capital inflows, rather than substitutes for them.

3.3 Natural resources, institutions and upgrading constraints

A further institutional channel emerges in resource rich economies, where rents from primary exports can weaken incentives to develop more complex goods if institutions encourage rent-seeking over productive experimentation. Sachs and Warner (1995) famously document a negative association between natural resource abundance and sustainable growth, arguing that easy rents can crowd out learning-intensive activities when governance is weak. Subsequent main-

stream work has generally hypothesized that strong legal institutions can discipline the use of these rents and automatically create the space needed for private upgrading into complex manufacturing.

However, when viewed through the lens of capital allocation and classical liberal economics, strong institutions in resource rich environments can generate a profound structural lock-in effect. As secure property rights and predictable enforcement lower the risk of expropriation, they provide the exact legal architecture required to safely and massively scale up highly profitable primary exports on a global level. Because the Rule of Law secures the high returns of established resource extraction, the relative opportunity cost of reallocating capital away from these sectors becomes prohibitively high. Entrepreneurs have little financial incentive to abandon safe, highly profitable commodity operations to engage in the genuinely uncertain Schumpeterian discovery required for complex manufacturing.

In the export quality literature, while Shapiro (2025) show that countries with stronger legal and contractual institutions are more likely to develop comparative advantage in complex manufacturing rather than remain locked into resource-based exports, even when endowments would allow the latter. Their findings imply that institutional quality can tilt the balance between staying as an upstream commodity supplier and developing downstream processing or related complex activities. For Chile, this theoretical pivot is crucial to understanding its paradox. The persistent concentration in copper and agricultural exports alongside a robust Rule of Law does not indicate an institutional failure to drive diversification. Rather, it reflects a highly efficient market response to relative prices. The secure property rights consolidated after the country's economic liberalization simply optimized the allocation of capital toward its most globally competitive sectors, rationally anchoring the economy to its natural resource base. (Sossdorf, 2024)

Critiques on Institutional Economics

A recurring concern in the institutional economics tradition is that it can be read too **monistically**, as if a single latent factor called "*institutional quality*" were an all-purpose explanation for development outcomes. Rodrik (2004) argues that while institutions matter, the binding constraints to growth and structural transformation differ across countries and periods, so a universal institutional "recipe" is unlikely to be reliable in applied work. This non-monism implies that the relevant institutional margin for export upgrading may be narrower and more context-dependent than broad governance indices suggest, especially when the outcome of interest is a specific form of structural change such as movement into more complex exports.

A second, closely related critique concerns **endogeneity**. Institutional quality is not plausibly exogenous to development outcomes: countries that successfully diversify may also accumulate state capacity, strengthen legal enforcement, and improve measured governance, producing reverse causality. Moreover, widely used institutional proxies may partly reflect outcomes or correlated determinants, like human capital or administrative capacity, which complicates causal interpretation and can inflate the apparent explanatory power of "institutions" in cross-country regressions (Glaeser et al., 2004). Together, non-monism and endogeneity suggest caution in interpreting reduced-form correlations between institutional indices and export sophistication as evidence of a uniform, one-way institutional channel.

The empirical strategy of this thesis is motivated by two well-known limitations of institution-centered explanations: endogeneity and heterogeneity. On the one hand, institutional quality may be jointly determined with export upgrading, since successful diversification can itself strengthen state capacity and improve measured governance, which complicates causal interpretation, as just mentioned by Glaeser et al. (2004). On the other hand, Rodrik emphasizes a non-monistic perspective in which development outcomes reflect country-specific binding constraints and context-dependent mechanisms, rather than a single institutional "master variable" that operates uniformly across cases (Rodrik, 2004).

Accordingly, the analysis is designed to evaluate institutions as an important component of the incentive and contracting environment, while avoiding the inference that institutions alone are sufficient to explain patterns of export sophistication. (Rodríguez and Rodrik, 1999) The empirical implementation therefore prioritizes strategies that are consistent with these concerns and that allow the role of domestic legal certainty and external integration to be assessed in a way that is disciplined by the data rather than by an a priori institutional narrative.

3.4 Trade Integration and the Conditions for Export Upgrading

While the previous subsection examined how institutional quality shapes firms incentives to invest, specialize, and upgrade in a largely domestic sense, integration into global markets introduces an additional layer to this mechanism. Trade exposure expands firms' opportunity sets, but whether these opportunities translate into upgrading depends on the institutional environment in which exporters operate.

Institutions as Mediators of Firms' Responses to Trade Exposure

A complementary line of research emphasises that the effects of trade integration on firms' upgrading choices are fundamentally mediated by domestic institutional conditions. In this perspective, trade does not operate as an automatic engine of sophistication, but rather as a competitive environment in which firms' responses depend on the quality of contracting, regulation, and policy credibility. When rules are predictable, exporters can sustain longer relationships, access higher-quality inputs, and invest in reputation-dependent markets; when institutions are weak, the same exposure may instead reinforce short-termism or low-quality specialisation. This view echoes the broader argument that markets function as discovery processes whose outcomes depend on the incentive structure surrounding entrepreneurial experimentation (Hausmann et al.,

2007; Rodrik, 2004).

This disconnect between mere trade exposure and institutional readiness is evident in the global cross-section. Shown in figure (3.2) [1], a high volume of trade relative to GDP does not imply a strong contracting environment. Many economies are deeply integrated into global trade flows yet operate under severe institutional deficits. In such environments, upgrading under trade exposure is less about price signals in isolation, and more about whether firms operate in an institutional environment that allows those signals to be acted upon.

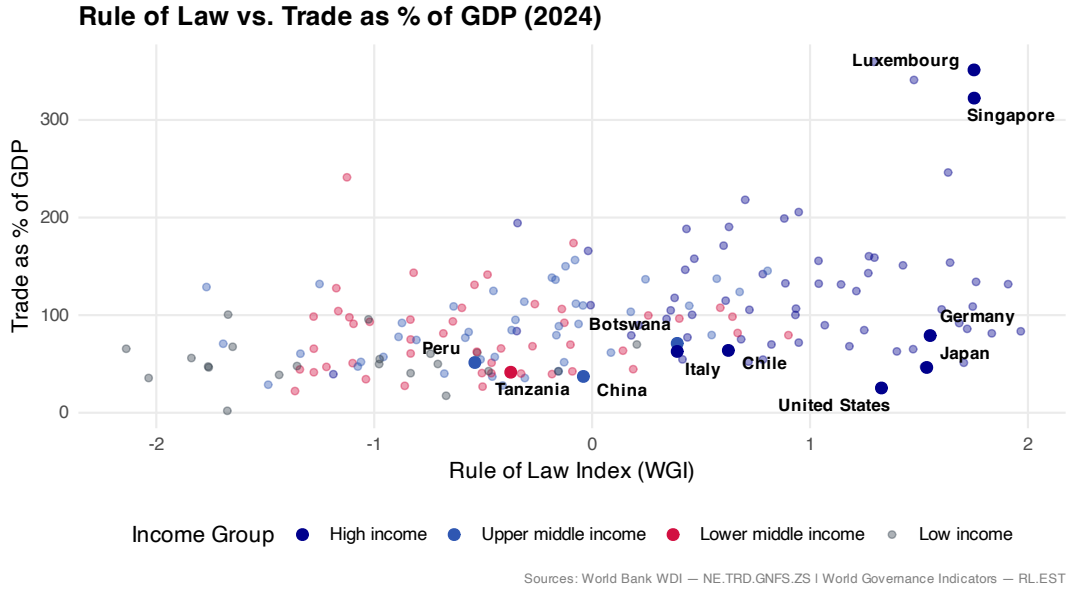

Figure 3.2: Rule of Law vs Trade as % of GDP

From this standpoint, integration into global markets expands firms opportunity sets, but does not determine their strategic choices. Moving into higher-quality segments typically requires relationship specific investments, reputational commitments, and the accumulation of capabilities whose expected returns hinge on credible enforcement. Where institutional arrangements reduce holdup risk and policy arbitrariness, firms can coordinate longer-horizon upgrading strategies; where such credibility is missing, the same exposure may induce defen-

[1] Trade (% of GDP) is computed as the sum of exports and imports divided by GDP. Since this measure captures gross flows rather than value added, small open economies and entreprenurial trade hubs frequently exceed 100%.

sive behaviour, reliance on low-quality niches, or retreat to simpler production forms. The *institutional–comparative-advantage* logic highlighted in Section 3.2 therefore extends naturally to the trade margin: institutions do not "*cause*" upgrading directly, but they delimit the feasible contracting space in which competitive pressures are translated into product and process innovation.

Heterogeneous Upgrading Outcomes Under Trade Integration

Firm and sectorial evidence from emerging economies illustrates this conditionality in practice. Studying Colombian manufacturing, Iacovone and Javorcik (2010) show that firms preparing to enter export markets undertake anticipatory investments in product quality and managerial upgrading, but these responses are concentrated among firms able to secure relatively stable buyer relationships and input contracts. Similarly, Atkin et al. (2017) document that access to demanding foreign buyers in Egyptian rug production leads to significant improvements in quality only when agreements are embedded in arrangements that mitigate relational risk. In both cases, upgrading emerges as a relational process: trade exposure creates opportunities, yet their realisation depends on institutional and contractual structures that sustain repeated exchange.

Trade liberalisation can also reshape the distribution of upgrading across firms in ways consistent with institutional frictions. Bustos (2011), analysing Argentine firms during MERCOSUR integration, finds that tariff reductions encouraged more productive firms to adopt new technologies and increase export quality, while less productive firms displayed minimal adjustment. The asymmetry suggests that firms better positioned to navigate financial and contracting constraints are those capable of transforming trade opportunities into upgrading outcomes. In a related context, Fan et al. (2018) report that Chinese exporters engaged in processing trade exhibit stronger quality upgrading in regions with better local governance and lower policy uncertainty, reinforcing the notion that institutional environments condition how far firms can

move up the quality ladder.

Evidence from supplier–buyer networks further highlights the interaction between institutional credibility and participation in global value chains. Giovannetti and Marvasi (2015) show that integration into international production networks raises firm-level learning and product sophistication primarily when relationships are embedded in mechanisms of credible enforcement; where monitoring and dispute-resolution arrangements are weak, firms tend to remain confined to lower value-added tasks despite nominal integration. Taken together, these contributions support a cautious interpretation of the trade–upgrading nexus: rather than assuming a uniform causal pathway from openness to sophistication, they suggest a conditional hypothesis in which trade exposure generates heterogeneous incentives whose realisation depends on domestic institutional quality. This perspective motivates the empirical approach adopted in the next subsection, where institutional certainty is treated explicitly as an interacting factor shaping the link between export complexity and economic performance.

3.5 Research Gap and Positioning

The existing literature has advanced our understanding of how trade, technology, and institutional environments shape export upgrading, but it does so largely through general, cross-country narratives rather than through country-specific paradoxes. Studies on China's digital transformation, for example, show that diffusion of digital infrastructure and platform technologies can raise export sophistication and productivity (Deng et al., 2024; Ma and Kang, 2025), while work on African value chains highlights the importance of coordination failures, capability bottlenecks, and governance arrangements in determining firms' ability to move up the ladder Ado et al. (2025). These findings echo earlier contributions on industrial upgrading within global commodity chains Gereffi (1999), where upgrading is understood as the outcome of decentralised firm strategies operating within broader institutional constraints.

A parallel literature has stressed that upgrading responses are heterogeneous across sectors

and regions. Jarreau and Poncet (2012) show that the gains from export sophistication in China accrue mainly to domestic producers, while Fieler et al. (2018) and Whitfield et al. (2020) emphasise that input linkages, firm capabilities, and buyer–supplier relationships condition the quality effects of liberalisation. Large integration initiatives such as the *Belt and Road* have further illustrated that new infrastructure and trade corridors do not translate automatically into higher-value specialisation (Baniya et al., 2020), but rather interact with pre-existing institutional and productive structures.

Taken together, these strands of research point toward a common interpretation: upgrading outcomes are not driven by openness or policy shocks in isolation, but by the **incentives** with which firms experiment, learn, and reallocate resources. Yet, despite the recurring emphasis on institutional context, but a few empirical work treats institutions as background features rather than as interacting determinants of how countries respond to external integration. In Latin America, contributions on export diversification and resource dependence have noted the coexistence of strong formal macro institutions with limited productive dynamism (Larraín, 2000; Benavente, 2016), and Chilean debates have repeatedly returned to the tension between stability, natural-resource specialization, and modest diversification. However, these discussions remain largely descriptive, rather than grounded in a systematic evaluation of how institutional certainty shapes the translation of trade integration into export upgrading.

The Chilean case is analytically distinctive. Chile combines three features that, in principle, should favour export upgrading: long-run macroeconomic stability, credible legal and contractual institutions, and one of the world's most extensive networks of trade agreements. Yet its export basket remains heavily concentrated in natural resources, with only gradual movement into higher-complexity activities.

While several studies document Chile's export concentration and analyse diversification policies (International Monetary Fund, 2021; Sossdorf, 2024), they do not jointly model how institutional quality interacts with trade integration incentives to shape upgrading outcomes.

Cross-country research points to the role of institutions in diversification, but lacks a focused framework tailored to Chile's deep FTAs and institutional fabric.

This thesis positions itself in that unexplored space, treating institutional quality not as a background control, but as part of the contracting and incentive environment through which firms interpret and act upon trade opportunities. By explicitly modelling the interaction between rule of law and external integration, the analysis aims to provide a disciplined explanation of Chile's "paradox": why openness and institutional strength have not, by themselves, generated a sustained structural shift toward more complex exports, and under what conditions they might do so.

Chapter 4

Data Description

4.1 Variables

To construct the baseline country-year panel required for the empirical work, the raw data, which initially spanned from 1960 to 2024 across 137 to 266 countries at an annual frequency, underwent a standard wrangling procedure to harmonize identifiers, align temporal windows, and address missing observations. Because the primary dependent variable, the Economic Complexity Index, is only available from 1998 onward, the final effective panel strictly covers the period from **1998 to 2023.** This timeframe captures the mature phase of Chile's international integration, which builds upon the foundational economic liberalization enacted during the dictatorship. It provides a broad cross-country benchmark to observe how the institutional rules of the game interact with global market access over nearly three decades. Furthermore, to account for the gradual adjustment of entrepreneurial discovery and the delayed transmission from institutional change to export upgrading, the empirical specification incorporates lagged values of the main explanatory variables and controls. Utilizing these lag structures is standard practice in dynamic panel settings, as past realizations help capture persistence and improve identification when contemporaneous relationships are affected by complex timing and feedback (Almon, 1965; Blundell and Bond, 1998).

4.1.1 Dependent Variable

Economic Complexity Index

The Economic Complexity Index (ECI) employed by the Observatory of Economic Complexity draws from the multidimensional framework developed by Simoes and Hidalgo (2011), which measures economic complexity through three distinct dimensions: Trade, Technology, and Research. The authors construct separate metrics for each category using export data, patent applications, and scientific publications, respectively. These dimensions demonstrate robust correlation and constitute cointegrated series that generally move together.

For this thesis, I focus exclusively on the **Trade dimension** of the index. Trade complexity remains the most widely validated measure in the literature and offers comprehensive data coverage across countries and time periods. Furthermore, it directly measures the productive capabilities embedded in a country's export structure, aligning closely with the theoretical framework of this study (Stojkoski et al., 2023).

The raw data natively provides annual complexity scores starting in 1998, so this variable establishes the temporal boundary for the overall empirical panel. During the data preparation phase, country names were standardized to the *ISO3c* format to ensure accurate merging with other sources. Finally, observations lacking ECI values were filtered out. As the primary dependent variable, maintaining a complete ECI series is essential to accurately capture the realized outcomes of entrepreneurial discovery processes within global markets.

4.1.2 Independent Variables

Institutional Quality ($RoL_{i,t-1}$)

The Rule of Law indicator from the *Worldwide Governance Indicators* (WGI) serves as the core proxy for institutional quality. This variable is critical because it measures the security of private property and the predictability of contract enforcement, both of which constitute necessary conditions for complex, long-horizon market investments. By capturing the actual

functioning of property rights protection and courts rather than merely formal legal structures, the indicator directly reflects the institutional mechanisms essential for entrepreneurial discovery and export upgrading (Kaufmann et al., 2010).

Provided by the World Bank, the WGI aggregates data from 35 distinct sources spanning over 200 economies from 1996 to 2024 (World Trade Organization, 2024). To integrate this metric into the empirical framework, the raw dataset was reshaped into a long format. The cleaning procedure isolated the necessary year, country code, and estimate variables, ensuring an exact structural match with the master panel and facilitating the analysis of how secure rules of exchange influence productive capabilities over time.

To further validate the robustness of the institutional quality measure, this analysis employs the **Varieties of Democracy (V-Dem) Rule of Law Index** as an alternative proxy (V-Dem Institute, 2024). Unlike the World Bank's Worldwide Governance Indicators, which are derived from perception-based expert surveys, the V-Dem index is constructed through a rigorous Bayesian measurement model aggregating assessments from thousands of country experts across multiple dimensions of legal accountability and judicial independence. This methodological independence makes it a rigorous alternative for testing whether the institutional lock-in mechanism is specific to the WGI construction or reflects a broader structural reality.

International Integration ($IIX_{i,t}$)

The International Integration Index (IIX) is a constructed metric designed to capture the expansion of the external contracting space available to domestic entrepreneurs. By combining the institutional depth of preferential trade agreements with the economic weight of partner markets, this index provides a comprehensive measure of a country's integration into the global division of labor. The underlying data for the IIX relies on the Design of Trade Agreements (DESTA) database developed by Dür et al. (2014) to measure agreement depth, alongside partner GDP data sourced from CEPII and the World Bank to capture market size.

The raw data from DESTA and the macroeconomic sources have been extracted, filtered

to include only active treaties, and standardized using the appropriate country identifiers to ensure compatibility with the broader cross-country panel, then log-transformed. The formal mathematical construction, weighting procedures, and final operationalization of the index itself will be fully detailed and executed in the subsequent methodological chapter and Appendix (B)

Unlike standard trade openness measures (e.g. trade-to-GDP), the IIX captures policy-driven integration rather than realized trade flows. This distinction is important, as trade flows may themselves be endogenous to a country's productive structure and export composition.

Interaction Term ($RoL \times IIX$) Captures whether domestic institutional quality amplifies or constrains the effect of international integration on export sophistication. As such, it will be the main variable to study for this research.

4.1.3 Control Variables

The control variables represent general development and macroeconomic indicators necessary to isolate the effect of institutional quality and formal trade integration. All datasets used in this project, including the World Development Indicators (WDI), Worldwide Governance Indicators (WGI), Penn World Table (PWT), and DESTA, are documented with source links and fully reproducible scripts in the accompanying GitHub repository.

Log GDP Per Capita [$\ln gdppc_{i,t-1}$]

GDP per capita captures a key confounder of export sophistication: the overall development level, proxied by average productivity. Initially, log population ($\ln pop_{i,t-1}$) was also considered to proxy the extent of the internal market and the feasible range of specialization, holding institutions and external integration constant (Frankel and Romer, 1999). While controlling for both is a common theoretical approach to avoid conflating international integration with country size, empirical limitations required a different strategy.

Log population was excluded from the final System GMM specifications because its inclusion alongside log GDP per capita introduced matrix invertibility issues that prevented the

Arellano-Bond estimator from converging. Furthermore, retaining both variables in this specific dynamic panel setup induces severe multicollinearity, which artificially inflates standard errors and can obscure the true statistical significance of the core institutional variables. Thus, log GDP per capita is retained as the primary robust control for domestic economic development. The variable was sourced from the WDI, restricted to the analytical window, pivoted from wide to long format, and systematically stripped of native missing values to match the econometric model's nomenclature.

Physical and Human Capital [$K_{i,t-1}$, $L_{i,t-1}$]

Physical and human capital represent core capability constraints that co-move with institutional quality and global integration. Gross capital formation captures economy-wide investment in fixed assets, proxying the accumulated productive capacity required to execute complex, multi-stage production plans. Human capital captures the workforce capabilities and absorptive capacity needed to adopt sophisticated technologies. Physical capital data was extracted from the WDI following the standard wide-to-long cleaning procedure. However, because the WDI Human Capital Index is severely truncated to a recent window (2012 to 2023), human capital data was instead sourced from the Penn World Table version 11.0. The PWT provides a consistent cross-country series built on an accounting framework ideal for long-panel designs. The raw PWT file was imported directly by skipping title headers, and then subset to retain only the country identifiers, year, and the index itself, which was aliased as L to align with standard production function notation.

Trade Openness and Foreign Direct Investment [$Open_{i,t-1}$, $FDI_{i,t-1}$]

Foreign Direct Investment (net inflows as a percentage of GDP) and Trade Openness (trade as a percentage of GDP) capture realized integration into world markets beyond the *de jure* coverage of trade agreements. Both variables proxy the microeconomic channels through which knowledge, competitive pressure, and intermediate inputs reach domestic producers. Countries with predictable, rule-based institutions typically attract more FDI and sustain higher

trade intensity. Omitting these variables risks confounding the effect of formal institutions or treaties with broader foreign capital penetration. Both metrics were sourced from the WDI and processed through the same structural harmonization and missing-value filtering as the other macroeconomic controls.

Resource Dependence [$Res_{i,t-1}$]

Reliance on commodity rents fundamentally shapes both domestic institutions and external integration. In a resource-abundant political economy, easily taxed rents often relax fiscal constraints and tilt incentives toward rent-seeking and distributional conflict rather than productivity-enhancing innovations. This dynamic weakens rule-based institutions and crowds out long-horizon private investment (Sachs and Warner, 1995). Resource dependence was obtained from the WDI, cleaned using the standard panel harmonization procedure, and included to control for the confounding effects of commodity-driven export structures.

All datasets used in this project—including WDI, WGI, PWT, and DESTA—are documented with source links and fully reproducible scripts in the accompanying GitHub repository.

4.2 International Integration Index (IIX)

Measuring a complex concept like international integration requires more than a single variable (Gygli et al., 2019; Kaufmann et al., 2010). However, existing composite measures often blur the line between policy and outcomes. Broad indicators like the *KOF Globalization Index*, for example, bundle dozens of variables that mix actual trade flows with the policies meant to encourage them (Gygli et al., 2019). My International Integration Index (*IIX*) takes a different path. By focusing strictly on formal external commitments, it isolates the actual rules of international exchange from the trade volumes they eventually produce. This distinction is crucial for understanding how trade agreements expand the feasible contracting space for domestic entrepreneurs, rather than simply treating past trade flows as a given.

In line with classical integration theory (Viner, 1950; Balassa, 1961), the *IIX* treats integration as a multidimensional process driven by both the institutional depth of agreements and the economic weight of the partner markets. To capture this, the index brings together two main elements. First, it measures agreement depth using the Design of Trade Agreement (DESTA) dataset, which scores the substantive legal provisions and institutional anchors baked into trade treaties (Dür et al., 2014; Hofmann et al., 2017). Second, it accounts for market relevance by weighting these depth scores against the partner country's GDP. This weighting follows the *logic of gravity models* (Baier and Bergstrand, 2007; Baldwin and Jaimovich, 2012), reflecting a straightforward economic reality: integrating with a larger market creates much stronger incentives for entrepreneurial discovery, specialization, and economies of scale.

Building a custom index instead of pulling an already built indicator is a deliberate choice to isolate how formal trade treaties actually work in practice. By adjusting for the varying economic significance of different partners, the IIX provides a precise tool to test the core hypothesis of my research: that domestic institutional quality conditions the benefits of international integration. As the incomplete contracts literature demonstrates, navigating the complexities of global trade requires predictable domestic institutions (Levchenko, 2007). Without a strong Rule of Law, the long-horizon investments needed to move up the export sophistication ladder remain too risky, regardless of how many free trade agreements a country signs.

To translate the conceptual framework of the International Integration Index into a measurable variable, the index must capture both the institutional weight of trade agreements and the economic magnitude of the markets they open. Following the methodological guidelines for composite indicators (OECD and JRC, 2008), the *IIX* employs a theory-driven weighting scheme based on **gravity model** logic rather than relying on purely statistical aggregation methods.

The index for a given counry i at a year t is calculated using this specification:

$$IIX_{i,t} = \sum_{j \neq i} \left(Depth_{ijt} \times \frac{GDP_{j,t}}{GDP_{w,t}} \right)$$

The multiplicative structure of the index deliberately addresses the trade-off between institutional depth and market size, treating them as complementary forces rather than substitutes. A deep (High DESTA score) agreement with a small economy secures property rights but offers limited demand to justify the heavy sunk costs required for export upgrading. Conversely, a shallow (Low DESTA score) agreement with a massive economy provides scale but leaves entrepreneurs exposed to regime uncertainty and high transaction costs. By multiplying these terms, the *IIX* mathematically reflects the *Hayekian* premise that market competition operates as a discovery procedure (Hayek, 2002): "one that can only foster complex, long-term entrepreneurial investments when grounded in abstract, predictable rules of exchange that effectively limit arbitrary state intervention". Following this logic, the expression is built on two primary components, each selected to isolate specific mechanisms of economic integration:

Depth: Institutions

The variable $Depth_{ijt}$ quantifies the institutional *relevance* of the trade agreements between a home country i and a partner country j at a time t, utilizing the DESTA database (Dür et al., 2014). Rather than treating trade liberalization as a binary event, this variable captures the extent to which agreements discipline domestic regulatory behavior. Mechanically, the DESTA depth score aggregates the inclusion of substantive legal provisions across specific dimensions, including investment protection, intellectual property rights, trade in services, public procurement, and competition policy (Hofmann et al., 2017).

Defining integration through these specific provisions is key. Shallow agreements merely lower border taxes, leaving domestic entrepreneurs exposed to discretionary policy shifts. Deep agreements, by contrast, act as credible commitment devices that bind state actors to predictable rules and extend private property right protections internationally. Because export upgrading

requires relationship-specific contracts, technology adoption, and long horizon capital investments, it is highly sensitive to regime uncertainty. By explicitly measuring the presence of these deeper institutional anchors, the $Depth_{ijt}$ variable proxies the degree to which an agreement successfully eliminates the hold up risks and transaction costs that otherwise hinder entrepreneurs and firms from venturing into complex export sectors (Orefice et al., 2012).

GDPs: Market Relevance

The second term captures the economic weight of the partner country j, calculated as their GDP at a year t, expressed as a share of total world GDP_w. Weighting by relative market size is directly informed by the literature on Market Potential (Harris, 1954; Redding and Venables, 2004). For a relatively small economy like Chile, the economic mass of the trading partner dictates the true scale of entrepreneurial opportunity. While a deep agreement with a similarly sized nation might yield marginal efficiency gains, securing preferential access to a global economic powerhouse like the United States, China, or the European Union fundamentally shifts the domestic incentive structure (Baier and Bergstrand, 2007). It provides local firms with a vast, secure market to discover new comparative advantages, achieve economies of scale, and recover the heavy sunk costs associated with producing more sophisticated goods.

Now, normalizing the partner's GDP against total world GDP integrates the core logic of multilateral resistance (Anderson and van Wincoop, 2003). In modern gravity theory, the value of a bilateral trade relationship is not determined *in a vacuum*. It depends on how that partner's absolute size compares to all other potential markets globally. By dividing by world GDP, the formula accounts for this relative market position. When a small economy signs a treaty with the EU, the index mathematically captures this as a reduction in trade frictions with a massive, specific fraction of global demand. This scaling ensures the IIX accurately measures the actual percentage of the world market that has been opened to domestic firms under predictable, rule-based institutional conditions.

4.2.1 Construction

Constructing the International Integration Index requires harmonizing dyadic (country-country pairs) trade agreement data with macroeconomic indicators. To ensure reproducibility, the full R scripts used for data cleaning, merging, and index calculation are available in the project's GitHub repo

The institutional depth component is sourced directly from the DESTA database (Dür et al., 2014; Hofmann et al., 2017), which provides a panel of active treaties and their respective depth scores. The macroeconomic data required for the market relevance weight is extracted from the World Bank's World Development Indicators (WDI), specifically capturing the GDP of individual partner countries alongside the global aggregate.

The construction process follows a straightforward data wrangling procedure. First, the DESTA dyadic dataset is filtered to retain only active agreements for a given year. Next, the WDI GDP data is merged onto the DESTA panel by partner country and year. The depth score of each active agreement is then multiplied by the partner's corresponding share of world GDP. Finally, these weighted scores are added by home country and year. This collapses the dataset into the continuous country-year panel variable required for the empirical estimations.

4.2.2 Index Validation

To confirm that the *IIX* accurately captures the theoretical mechanisms outlined above, it is useful to examine its mechanical behavior using Chile's trajectory as a baseline. The index is programmed to measure the cumulative stock of active agreements rather than treating them as isolated yearly events. Once a treaty enters into force, its weighted depth is carried forward. This creates a cumulative *"staircase"* effect over time, directly reflecting the permanent expansion of the secure contracting space available to domestic economic agents.

The calculated panel data for Chile perfectly illustrates the intended multiplicative trade-off between institutional depth and market size. Between 1998 and 2002, despite Chile possessing

several active regional trade agreements, its *IIX* score remained relatively low and flat, hovering around 0.28. Mechanically, while these early treaties provided some institutional certainty, the partner economies represented a small fraction of global demand. They offered a limited expansion of the opportunity set for large-scale entrepreneurial discovery.

The mathematical logic of the index becomes empirically apparent between 2003 and 2006. When the deep trade agreement with the European Union entered into force in 2003, Chile's *IIX* surged from 0.28 to 1.98. The following year, the agreement with the United States pushed the index to 4.21. A subsequent upward step occurred in 2006 with the integration of China, bringing the index to 4.58.

This non-linear jump is exactly what the formula was designed to capture. Because the agreements with the US and the EU combined maximum institutional depth (high DESTA scores) with massive shares of total world GDP, their product mathematically dominates the index. By penalizing shallow agreements with small economies and heavily weighting deep institutional anchors with global powerhouses, the empirical output confirms that the *IIX* **avoids the pitfalls of simple treaty-counting metrics**. It successfully quantifies the exact proportion of the global market that has been secured under predictable rules, providing a highly precise variable for the subsequent econometric estimations.

As detailed in the Appendix (B), the *IIX* was subjected to three structural validations: tests for distributional normality, unit roots, and serial correlation. While the index exhibits severe right-skewness, non-stationarity, and high autoregressive persistence, standard mechanical corrections like first-differencing are purposefully avoided. First-differencing would incorrectly imply that economic liberalization only impacts export complexity in the specific year a treaty is signed. Instead, viewed through the Austrian lens of entrepreneurial discovery (Kirzner, 1997), trade agreements provide a persistent expansion of the secure contracting space (North, 1990). By applying a log-transformation and retaining the variable in lagged levels, a standard econometric approach for capturing the phased and enduring impact of trade agreements

(Baier and Bergstrand, 2007), the model corrects for the distributional skew while accurately capturing the ongoing institutional stock that entrepreneurs rely upon to coordinate long-term investments. Finally, the high serial correlation inherent to structural institutional variables is addressed using country-level clustered standard errors (Bertrand et al., 2004), allowing for robust statistical inference without stripping the index of its theoretically vital persistence.

Table (A.1) is available in appendix A to show the cleaned variables ready for modelation.

Chapter 5

Methodology

5.1 Model Specification

The analytical strategy of this research relies on a quantitative design grounded in causal inference and implemented through a dynamic panel framework with country and time fixed effects. This choice follows directly from the central argument of the thesis: export upgrading is best understood as a gradual process of capability accumulation and entrepreneurial discovery, rather than as an automatic outcome of trade opening alone (Melitz, 2003; Hausmann et al., 2007). Within that framework, the empirical objective is to estimate whether domestic institutional quality conditions the extent to which international integration translates into a more sophisticated export basket (Acemoglu and Robinson, 2012; North, 1990; Levchenko, 2007; Ndubuisi and Owusu, 2021). Put differently, the model tests whether stronger rule-based institutions, make it more feasible for firms to undertake the long-horizon investments associated with more complex exports.

To capture this mechanism, the empirical strategy models the Export Complexity Index (ECI) as a function of institutional quality, the intensity of international integration, and, most importantly, their interaction. The baseline specification is:

$$
\begin{aligned}
ECI_{i,t} =& \beta_1 ECI_{i,t-1} + \beta_2 RoL_{i,t-1} + \beta_3 ln(IIX_{i,t-1}+1) \\
&+ \beta_4 \left(RoL_{i,t-1} \cdot ln(IIX_{i,t-1}+1)\right) + \gamma' \mathbf{X}_{i,t-1} + \varepsilon_{i,t}
\end{aligned}
\tag{5.1}
$$

In this specification, $ECI_{i,t}$ is the dependent variable and captures the degree of export sophistication achieved by country i in year t (Hausmann et al., 2014; The Observatory of Economic Complexity, 2024). $RoL_{i,t-1}$ is the main institutional variable and proxies the predictability of the domestic contracting environment, particularly through the protection of property rights and the enforceability of contracts (Kaufmann et al., 2010; North, 1990; Levchenko, 2007). $\ln(IIX_{i,t-1}+1)$ captures the depth and economic relevance of a country's trade agreements by combining the institutional content of those agreements with the economic weight of partner markets (Dür et al., 2014; Hofmann et al., 2017; Baier and Bergstrand, 2007). The interaction term is the central coefficient of interest, since it tests whether the effect of deeper international integration on export complexity is stronger where the Rule of Law is more credible (Levchenko, 2007; Ndubuisi and Owusu, 2021). $\mathbf{X}$ is the vector of controls that include PIB per capita, foreign direct investment, trade openness and resource availability, as defined in the prior section.

While unobserved time-invariant heterogeneity and common global shocks are central econometric concerns, country fixed effects and time fixed effects are not explicitly included as static parameters in the primary dynamic specification. Instead, the chosen dynamic panel methodology (detailed in the subsequent chapter) intrinsically corrects for these structural characteristics through its internal instrumentation. However, to establish a methodological benchmark, the initial test run of the model is estimated using a standard Two-Way Fixed Effects (TWFE) framework, which explicitly incorporates these parameters. Across all specifications, explanatory variables enter with a one-period lag. This temporal structure is maintained to reduce simultaneity concerns and to better reflect the gradual discovery process through which in-

stitutional constraints and external integration are transmitted into complex export outcomes (Nickell, 1981; Blundell and Bond, 1998).

5.2 Methodological choice

The empirical strategy is designed to match the nature of the research question. Rather than estimating the effect of a single trade agreement or an isolated institutional reform, this thesis examines whether export upgrading responds to the interaction between two slow-moving processes: the credibility of domestic institutions and the depth of international integration. Because both evolve gradually and their effects unfold over time, the empirical approach must capture persistence, cross-country heterogeneity, and dynamic adjustment rather than a one-off treatment effect (North, 1990; Levchenko, 2007; Ndubuisi and Owusu, 2021).

To address this, the analysis relies on a dynamic panel framework with country and time fixed effects. This approach is appropriate for three main reasons. First, export complexity is inherently persistent: productive capabilities, supplier networks, and accumulated know-how evolve gradually, making current export sophistication a function of its past values (Hausmann et al., 2007, 2014; Stojkoski et al., 2023). Second, the key explanatory variables—Rule of Law and international integration—vary both across countries and over time, allowing panel methods to exploit this variation while controlling for unobserved country-specific characteristics and common global shocks. International integration is measured using a policy-based index (IIX), which captures formal access to foreign markets through trade agreements and their depth. Unlike standard openness measures such as trade-to-GDP ratios, which reflect realized trade flows and may be endogenous to a country's productive structure, this measure is better aligned with the theoretical mechanism, which operates through changes in market access and investment incentives.

Third, the core hypothesis is explicitly interactive. The argument is not simply that better institutions or deeper integration independently increase export complexity, but that the effect

of integration depends on the credibility of the domestic contracting environment (Acemoglu and Robinson, 2012; North, 1990; Levchenko, 2007). A dynamic specification is therefore necessary to capture both the persistence of export structures and the conditional nature of the relationship.

A static panel model would be too restrictive in this context. Pooled OLS would ignore unobserved heterogeneity, while a standard fixed effects estimator, although an improvement, becomes biased once a lagged dependent variable is included, as shown by Nickell (1981). This issue is particularly relevant here, given the cumulative nature of export upgrading. For this reason, fixed effects estimates are treated as a benchmark rather than the preferred specification.

The main results are therefore estimated using System GMM. This estimator is well suited to panels with persistent dependent variables, fixed effects, and potentially endogenous regressors. In this setting, both institutional quality and international integration are unlikely to be strictly exogenous: countries that successfully diversify may subsequently strengthen institutions or deepen integration, creating feedback effects and reverse causality (Glaeser et al., 2004; Rodrik, 2004; Blundell and Bond, 1998). By using internal instruments based on lagged levels and differences, System GMM provides a more structured way to address these concerns than static estimators alone (Arellano and Bover, 1995; Blundell and Bond, 1998). At the same time, the implementation follows the guidance of Roodman (2009) by restricting the number of instruments and relying on standard diagnostic tests to ensure validity.

While this approach mitigates key econometric challenges, it does not fully eliminate endogeneity, particularly for slow-moving institutional variables. The results should therefore be interpreted as conditional associations consistent with the proposed mechanism, rather than as definitive causal estimates.

Rejected Methodologies

The choice of SGMM also reflects a deliberate rejection of other empirical designs that are less suited to the structure of the problem. **Difference-in-Differences** and **event-study** approaches are powerful when the researcher can identify a relatively sharp treatment, a plausible control group, and a meaningful pre-treatment period against which parallel trends can be assessed (Bertrand et al., 2004). That logic fits many policy evaluations, but it fits this case only imperfectly. Chile's integration strategy did not occur through one decisive liberalization episode with a clear econometric treatment date. Rather, it unfolded through a sequence of agreements of varying depth, signed with partners of very different economic weight, while institutional consolidation also evolved gradually over time (Edwards, 1994; SUBREI, 2025). Moreover, it is hard to pinpoint an exact free trade agreement or policy for any country that would have a powerful enough shock that can be extrapolated to other economies. In that context, the treatment is not binary, and collapsing it into a simple before-and-after comparison would discard the very variation the thesis is trying to explain.

For similar reasons, the **Synthetic Control Method** is informative only in a narrower, complementary sense. Synthetic control is most convincing when a single unit experiences a well-defined intervention at a known point in time and the researcher wishes to construct a transparent counterfactual trajectory (Abadie et al., 2015). That could be useful for illustrating one particularly consequential agreement in Chile's trade history, but it is less appropriate as the main identification strategy for this thesis. The object of interest here is not the isolated effect of one treaty, but the cumulative interaction between the depth of external integration and the quality of domestic institutions across a long horizon. A synthetic control exercise may therefore serve as a supplementary case-based illustration, but not as the principal econometric framework.

Finally, the methodology also avoids relying on a pure gravity setup as the main model. **Gravity models** are the standard tool for estimating the trade effects of agreements, and they strongly inform the construction of the *IIX* through the weighting of agreement depth by partner

market size (Baier and Bergstrand, 2007; Anderson and van Wincoop, 2003; Larch and Yotov, 2024). However, the outcome of interest in this thesis is not bilateral trade flows, but export sophistication at the country-year level. A gravity equation is therefore useful for motivating the design of the integration index, but it is not the correct primary framework for testing whether institutional quality conditions export upgrading.

The methodological framework developed in this chapter establishes the empirical architecture of the thesis. By justifying the baseline specification and the transition to a dynamic panel approach, this strategy provides a robust method to capture the path-dependent nature of export sophistication. Rather than relying on a single treatment shock or a narrow counterfactual design, the *System GMM* estimator is explicitly chosen to handle the inherent endogeneity of economic liberalization and institutional quality. With the estimators defined and the data structured, the analysis now turns to the empirical results. The following chapter applies these models to uncover how the institutional rules of the game influence market discovery. Specifically, it tests the central theoretical puzzle: whether institutional consolidation unconditionally enables productive upgrading, or if it paradoxically locks in the existing comparative advantage of resource-rich economies.

Chapter 6

Empirical Results

This chapter presents the econometric findings of the thesis. The analysis is structured sequentially to demonstrate how the relationship between economic liberalization, institutional quality, and export sophistication evolves as the empirical models become more rigorous. By separating the statistical findings from their broader theoretical implications, this chapter establishes the empirical foundation of the research. The theoretical interpretation of these results, particularly regarding institutional lock-in and the specific trajectory of Chile, will be explored in depth in the subsequent Discussion chapter. Here, the focus remains strictly on the data and the models.

A Note on Scale and Coefficient Interpretation

The Economic Complexity Index is a standardized measure with a global mean of zero and a standard deviation of approximately one, ranging from roughly -3 to $+2.5$ in this panel. Coefficients on the interaction term should therefore be read against this scale: a coefficient of -0.0145 is not a negligible effect, but rather a recurring annual drag on a country's position within the global distribution of productive knowledge.

The bilateral trajectories of Chile and South Korea illustrate this concretely. In 1998, both countries occupied broadly similar institutional positions. As shown on graph (6.1) over the following two decades, Chile deepened its trade integration aggressively while its ECI declined

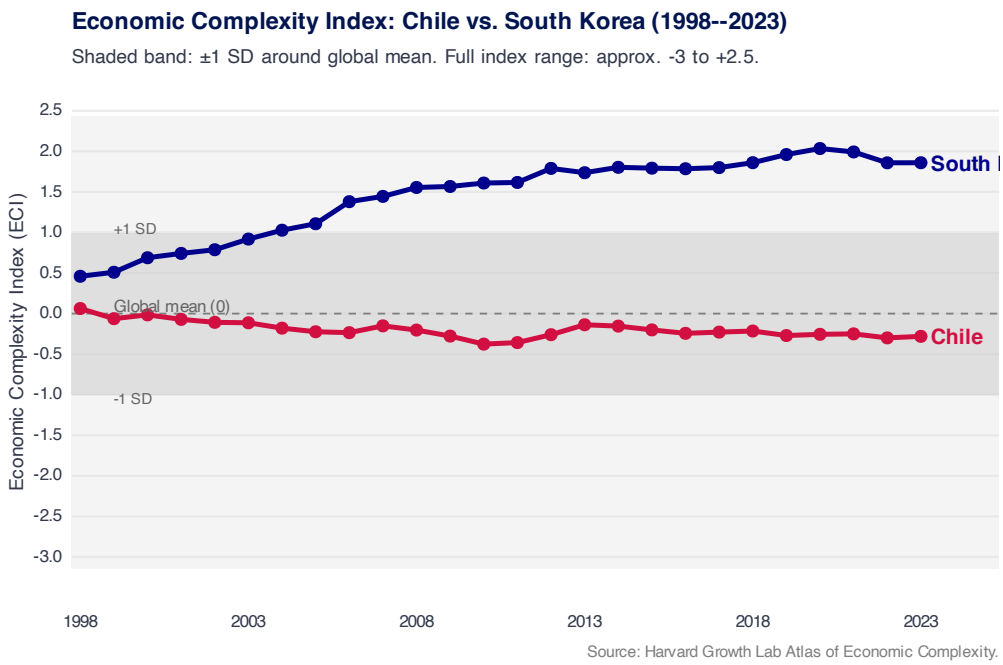

Figure 6.1: Scale of the Economic Complexity Index

from $+0.06$ to -0.28. Korea built productive complexity first and only then accumulated comparable integration depth, reaching an ECI of $+2.03$ by 2020. The gap between the two countries widened by more than two full standard deviations in the global complexity distribution. The interaction coefficient, compounded annually, is precisely calibrated to account for a non-trivial share of that divergence.

6.1 Baseline Two-Way Fixed Effects Model

Before deploying the dynamic System GMM estimator, it is standard empirical practice to establish a baseline using a Two-Way Fixed Effects (TWFE) model. This initial step serves a vital methodological purpose. First, it provides a benchmark against which the more complex dynamic panel models can be evaluated. Second, the fixed effects framework isolates within-country variation by controlling for unobserved, time-invariant heterogeneity. In the context

of economic complexity, these unobservable factors are substantial. They include slow-moving cultural attitudes toward entrepreneurship, deeply rooted legal traditions, and fixed geographical endowments that dictate initial comparative advantages.

By including year fixed effects, the baseline model also absorbs global shocks. These include international financial crises, commodity super-cycles, or global waves of economic liberalization that might simultaneously affect the export matrices of all economies within the sample.

Table 6.1 presents the results of this baseline specification. The dependent variable is the Economic Complexity Index (ECI), modeled alongside its own first lag to account for the highly path-dependent nature of productive capabilities.

Table 6.1: Baseline Results: Two-Way Fixed Effects

Variable	**Estimate (Std. Error)**
Lagged ECI ($t-1$)	0.7728***
	(0.0308)
ln(IIX)	0.0219
	(0.0136)
RoL	0.0026
	(0.0222)
ln(GDP per capita)	0.0570*
	(0.0298)
Resources	-0.0028**
	(0.0011)
Trade Openness	0.0003*
	(0.0002)
FDI	0.0007
	(0.0005)
ln(IIX) $\times$ RoL	**-0.0221***
	(0.0131)
R-Squared	0.664
Adj. R-Squared	0.664
F-statistic	561.073

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

The TWFE estimates provide the first empirical hint of the theoretical *puzzle* at the core of my research. The coefficient for the lagged dependent variable is **positive and highly significant** (0.772, $p < 0.01$), confirming that export sophistication is an overwhelmingly cumulative process. The existing productive matrix heavily determines the boundaries of future entrepreneurial discovery.

More importantly for the central hypothesis, the interaction term between international integration and the Rule of Law ($\ln IIX \times RoL$) emerges as **negative and statistically significant at the 10 percent level** (-0.022, $p < 0.1$). Even in this relatively naive specification, the data suggests a friction: as the institutional rules of the game become more consolidated, the marginal benefit of trade integration on economic complexity begins to diminish. Furthermore, the standalone coefficient for the Rule of Law is statistically indistinguishable from zero (0.002, $p > 0.9$). This indicates that institutional quality alone does not automatically generate destructive creativity or complex productive structures.

While these baseline results align with the initial hypothesis, the TWFE model suffers from severe econometric limitations when applied to this specific research question and data structure. As demonstrated by Nickell (1981), the inclusion of a lagged dependent variable in a fixed-effects framework introduces a mechanical correlation between the transformed lagged dependent variable and the transformed error term. This mathematical property, commonly known as *Nickell bias*, guarantees inconsistent and biased estimates, particularly in macroeconomic panels characterized by a relatively short time dimension.

Furthermore, the TWFE specification assumes that institutional quality and trade integration are strictly exogenous and this theorically *problematic*. The rules of the game and the structure of the economy evolve endogenously. A highly complex export sector might demand better contract enforcement, leading to reverse causality where economic structure dictates institutional form rather than the other way around.

Therefore, while the TWFE model reveals a crucial negative interaction, these coefficients

cannot be interpreted as *strictly causal.* They merely establish a correlational foundation. To address the endogenous nature of institutions, the persistence of the dependent variable, and the mechanical bias of dynamic panels, the analysis must transition to the Generalized Method of Moments (GMM) framework. As Roodman (2009) comprehensively details, the System GMM estimator is specifically designed for panels with a short time dimension and a large number of individuals, where independent variables are not strictly exogenous. By utilizing internal instruments, the System GMM approach provides the appropriate econometric architecture to resolve the limitations of the baseline specification and isolate the true marginal effect of institutional consolidation.

6.2 Core System GMM Specification

Moving beyond the static constraints of the baseline model, the analysis proceeds to the System GMM estimator. Table 6.2 (Column 2) presents the Core SGMM specification. This naive model restricts the covariate matrix strictly to the variables of theoretical interest: lagged economic complexity, international integration, institutional quality, and their interaction, alongside time fixed effects to capture global economic cycles.

Estimating a core model before introducing a full suite of macroeconomic controls is a necessary methodological step. It ensures that the primary theoretical variables behave as expected and that their statistical significance is not an artificial byproduct of collinearity with other developmental indicators.

Table 6.2: Core - System GMM

Variable	**Estimate (Std. Error)**
Lagged ECI ($t-1$)	1.1641***
	(0.0212)
ln(IIX)	0.0061*
	(0.0035)
RoL	-0.1066***
	(0.0146)
ln(IIX) $\times$ RoL	**-0.0244*** **
	(0.0035)
Intercept	0.0348***
	(0.0101)
Wald Test	217,509***
AR(1) test	-6.1408
p-value	(0.0000)
AR(2) test	-1.1113
p-value	(0.2664)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.
AR(1) and AR(2) are Arellano-Bond tests for serial correlation.

The results from the Core SGMM model **strongly support the central hypothesis of this research.** The most critical finding is the interaction term between trade integration and the Rule of Law ($\ln IIX \times RoL$). The dynamic estimation not only confirms the negative direction observed in the baseline model but increases its statistical significance substantially (-0.024, $p < 0.01$). This provides robust evidence that the friction between institutional consolidation and trade integration is a structural reality, not merely a statistical artifact of dynamic panel bias.

This negative interaction reveals a profound mechanism regarding how the rules of the game shape entrepreneurial action (North, 1990). A robust legal framework fundamentally alters the incentives opened by economic liberalization. When institutions are highly credible, property rights are secure, and long-term contracts are strictly enforced, the transaction costs for all industries plummet. However, for established commodity or low-complexity exporters, these

strong institutions provide the perfect legal architecture to expand their current, highly profitable operations securely on a global scale. The certainty provided by the Rule of Law drastically lowers the risk profile of the existing comparative advantage. Consequently, the relative opportunity cost of abandoning these established sectors to experiment with uncertain, Schumpeterian discovery in complex manufacturing becomes prohibitively high (Acemoglu and Robinson, 2004; Schumpeter, 1942). External integration therefore reinforces the dominance of these incumbent sectors. The institutional framework does not stifle entrepreneurship; rather, it acts as an anchor, making the existing productive matrix so legally secure and profitable that structural transformation is disincentivized.

Additionally, the standalone coefficient for the Rule of Law in this reduced specification is negative and highly significant (-0.107, $p < 0.01$). This further challenges the assumption that institutional quality automatically generates economic upgrading. Without the continuous competitive pressures of a fluid market, rigid institutional frameworks might simply protect the *status quo*, strongly suggesting that institutional constraints bind differently depending on the structure of the economy (Rodrik, 2004).

Crucially, the estimation satisfies the fundamental econometric requirements for a dynamic panel model. As reported at the bottom of Table 6.2, the Arellano-Bond test for first-order serial correlation strongly rejects the null hypothesis ($z = -6.141$, $p < 0.001$), which is mathematically expected given the first-differenced equation structure. More importantly, the test for second-order serial correlation fails to reject the null hypothesis ($z = -1.111$, $p = 0.266$). This lack of AR(2) correlation provides critical evidence that the internal instrumentation strategy is valid and that the error terms are correctly specified. A comprehensive discussion of these diagnostic tests, alongside the manual calculation of the Wald statistic, is provided in Appendix (C).

However, the Core SGMM model presents a specific structural diagnostic that requires attention. The coefficient on the lagged dependent variable ($\beta = 1.164$, $p < 0.01$) highlights

an intense degree of path dependency. A coefficient slightly above unity in a macroeconomic panel suggests dynamic instability within this specific restricted specification. This indicates that without controlling for structural endowments, the productive matrix appears almost entirely inertial.

This behavior is expected in a *naive* model estimating a highly persistent variable like export complexity. It strongly suggests the presence of omitted variable bias. Factors such as the overall accumulation of wealth, the inherent pull of natural resource abundance, and the sheer scale of global trade openness are likely influencing the trajectory of the Economic Complexity Index. To ensure that the negative interaction between institutions and integration is not being driven by these unobserved structural forces, the analysis must proceed to the fully specified System GMM model.

6.3 Full System GMM Specification

To ensure the robustness of the core findings and address the dynamic instability observed in the naive specification, the analysis expands to the fully specified System GMM model. Table 6.3 introduces the complete vector of macroeconomic controls

($\mathbf{X} = [Res_{i,t},\ Open_{i,t},\ FDI_{i,t},\ \ln gdppc_{i,t}]$). While the Core model relied on two-way fixed effects to absorb both country-specific heterogeneity and common time shocks, the inclusion of a full set of year dummies in a System GMM framework can severely exacerbate the *instrument proliferation* problem documented by Roodman (2009), as each dummy variable generates an additional column in the instrument matrix.[1] To preserve the integrity of the instrument matrix while still controlling for global time trends, the Full SGMM replaces the set of year dummies with a single continuous linear time trend ($Year_t$), centered on the year 2000. Unlike year dummies, which consume one degree of freedom and one instrument column per year, this

[1] In practice, the two-way fixed effects specification with year dummies failed to converge under the System GMM estimator until the instrument matrix was reduced by replacing the year dummies with a linear time trend.

trend variable operates as a single continuous regressor, efficiently capturing the evolution of global export complexity over the sample period without inflating the instrument count.

Individual fixed effects are retained to account for all time-invariant country-specific characteristics.

$$\begin{aligned} ECI_{i,t} =& \beta_1 ECI_{i,t-1} + \beta_2 RoL_{i,t-1} + \beta_3 ln(IIX_{i,t-1}+1) \\ &+ \beta_4 \left(RoL_{i,t-1} \cdot ln(IIX_{i,t-1}+1)\right) + \gamma' \mathbf{X}_{i,t-1} \\ &+ \delta\, Year_t + \alpha_i + \varepsilon_{i,t} \end{aligned} \tag{6.1}$$

The inclusion of these controls successfully resolves the omitted variable bias suspected in the earlier estimation. The coefficient on the lagged dependent variable stabilizes at a theoretically sounder value of 1.051 ($p < 0.01$). While export sophistication remains a deeply cumulative process, the estimation is no longer artificially inflating the inertia of the productive matrix. Furthermore, the model passes the necessary econometric diagnostics. As detailed in Appendix (C), the Arellano-Bond test for second-order serial correlation confirms that the error terms are correctly specified, validating the internal instrumentation strategy.

Crucially, the central thesis finding survives the inclusion of these structural controls. The interaction between trade integration and the Rule of Law remains negative and highly significant (-0.014, $p < 0.01$). This confirms that the conditional relationship between external market access and institutional quality is a robust empirical reality. Even when accounting for wealth, resource abundance, and foreign capital inflows, the **institutional lock-in effect persists.**

Examining the raw coefficients reveals a clear mechanism. The standalone effect of international integration ($\ln IIX$) is statistically indistinguishable from zero (0.007, $p > 0.1$), indicating that signing trade agreements does not automatically induce an upgrading of the export matrix. Concurrently, the standalone coefficient for the Rule of Law is negative and highly significant

Table 6.3: Full Identification - System GMM

Variable	**Estimate (Std. Error)**
Lagged ECI ($t-1$)	1.0511***
	(0.0176)
ln(IIX)	0.0066
	(0.0043)
RoL	-0.0290***
	(0.0098)
ln(GDP per capita)	0.0005
	(0.0007)
Resources	0.0006
	(0.0004)
Trade Openness	0.0001***
	(0.0000)
FDI	-0.0001
	(0.0003)
Year	-0.0011***
	(0.0003)
ln(IIX) $\times$ RoL	**-0.0145*** **
	(0.0036)
Observations	137
Wald Test	205,947***
AR(1) test	-5.8566
p-value	(0.0000)
AR(2) test	-0.9942
p-value	(0.3201)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.
AR(1) and AR(2) are Arellano-Bond tests for serial correlation.

(-0.029, $p < 0.01$). This directly challenges the conventional assumption that institutional maturity operates as an unconditional catalyst for economic upgrading.

These results illustrate how the rules of the game govern market discovery. Economic liberalization expands the opportunity set for entrepreneurs, but the institutional framework dictates the relative risk and transaction costs of exploring those new opportunities (North, 1990). The

highly significant negative interaction term demonstrates that as the Rule of Law strengthens, the marginal benefit of trade integration on export complexity diminishes. A robust legal environment perfectly secures property rights and enforces long-term contracts for existing, highly profitable sectors. For resource-rich economies, this means the institutional framework heavily reduces the risk profile of remaining a commodity exporter. Consequently, the relative opportunity cost of abandoning established industries to venture into complex, unproven manufacturing remains prohibitively high.

The behavior of the control variables further contextualizes this dynamic. The coefficient for natural resource rents is positive but effectively zero (0.001, $p > 0.1$), suggesting that resource abundance alone does not mechanically suppress complexity once institutions and trade are accounted for. Similarly, foreign direct investment shows a statistically insignificant effect on the Economic Complexity Index. This implies that capital inflows are likely flowing into incumbent sectors rather than financing structural transformation.

Before formalizing the theoretical implications of these estimates, it is necessary to confirm that the negative interaction between trade integration and institutional quality is not a statistical artifact of the specification or sample composition. The following section subjects the model to a series of robustness checks. These tests evaluate the stability of the core mechanism by decomposing the integration index into its distinct legal and economic components, excluding highly resource-dependent economies from the sample and using an alternate measure for institutional quality. Establishing this empirical resilience is a required step before calculating the exact institutional threshold and applying the findings to the Chilean trajectory in the subsequent discussion.

Chapter 7

Robustness Checks

Before formalizing the theoretical implications of these estimates, it is necessary to confirm that the negative interaction between trade integration and institutional quality is not a statistical artifact of the baseline specification, the construction of the integration index, or specific sample outliers. The following robustness checks stress-test the Full SGMM model across three dimensions: decomposing the International Integration Index (IIX) into its constituent parts, restricting the sample to exclude highly resource-dependent economies, and using an alternate measure for institutional quality.

7.1 Decomposing the Integration Index

The International Integration Index ($\ln IIX$) is a composite metric capturing both the legal depth of trade agreements and the economic weight (GDP) of partner markets. A critical theoretical question is whether the institutional lock-in effect is driven primarily by the enforceable legal commitments embedded within deep FTAs, or by the sheer gravitational pull of exposure to massive global demand.

To isolate these mechanisms and rigorously stress-test the baseline findings, the Full SGMM model is re-estimated by replacing the composite $\ln IIX$ with its two constituent sub-components:

$\ln IIX\_depth$ (capturing only the cumulative legal depth of signed agreements) and $\ln IIX\_market$ (capturing only the relative GDP of FTA partners). The results, presented in Table 7.1, not only confirm the robustness of the core hypothesis but offer profound theoretical nuance regarding the nature of path dependency.

Table 7.1: Robustness Check: Decomposition of the IIX

Variable	**Full Model (1)**	**Depth Only (2)**	**Market Only (3)**
Lagged ECI ($t-1$)	1.0511***	1.0548***	1.0567***
	(0.0176)	(0.0177)	(0.0180)
ln(IIX)	0.0066	-0.0211***	0.0235**
	(0.0043)	(0.0051)	(0.0111)
RoL	-0.0290***	-0.0259**	-0.0311***
	(0.0098)	(0.0110)	(0.0094)
ln(IIX) × RoL	**-0.0145*** **	**-0.0121** **	**-0.0345*** **
	(0.0036)	(0.0049)	(0.0082)
ln(GDP per capita)	0.0005	0.0029***	0.0000
	(0.0007)	(0.0007)	(0.0008)
Resources	0.0006	0.0006	0.0006
	(0.0004)	(0.0004)	(0.0004)
Trade Openness	0.0001***	0.0001**	0.0001***
	(0.0000)	(0.0000)	(0.0000)
FDI	-0.0001	0.0000	-0.0001
	(0.0003)	(0.0003)	(0.0003)
Year	-0.0011***	-0.0007**	-0.0012***
	(0.0003)	(0.0003)	(0.0003)
Wald Test	205,947***	204,772***	210,455***
AR(1) *p-value*	(0.0000)	(0.0000)	(0.0000)
AR(2) *p-value*	(0.3201)	(0.3196)	(0.3214)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Both components yield a negative, statistically significant interaction with the Rule of Law. However, the magnitude of the effect diverges. When institutional quality interacts solely with the legal depth of FTAs (Column 2), the lock-in effect is negative and significant (-0.0121,

$p < 0.05$). Yet, when institutional quality interacts with the massive market size of trade partners (Column 3), the negative coefficient nearly triples in magnitude (-0.0345, $p < 0.01$).

This finding fundamentally refines the mechanism of institutional lock-in and path dependence. The legal architecture of deep FTAs provides the necessary baseline of certainty to protect capital. However, it is the sheer scale of external market demand that most violently distorts entrepreneurial incentives. Access to wealthy consumer markets for primary commodities guarantees such high, risk-free returns under conditions of legal certainty that the opportunity cost of structural transformation becomes *economically irrational.* The combination of secure property rights and access to massive global demand functions as the ultimate deterrent to Schumpeterian discovery; it perfectly insulates the status quo from the necessity of creative destruction.

Furthermore, the behavior of the control variables across these decompositions further validates the theoretical framework. Notably, when isolating the market size of trade partners (Column 3), the coefficient for domestic GDP per capita collapses to zero. This suggests that once an economy with strong institutions plugs directly into the massive aggregate demand of the developed world, its own internal market size ceases to be a relevant driver of complexity. The economy becomes an export-oriented enclave, structurally decoupled from domestic demand dynamics.

Finally, the econometric integrity of both robustness models is unequivocally confirmed by the post-estimation diagnostics. Both the Depth Only and Market Only specifications return massive, highly significant Wald test statistics, confirming the overall explanatory power of the models. Crucially, the Arellano-Bond tests for autocorrelation behave exactly as required for a valid System GMM estimation: both models exhibit strong first-order autocorrelation (AR(1) $p < 0.01$) but zero evidence of second-order autocorrelation (AR(2) $p > 0.31$). This confirms that the internal instruments remain valid, and the profound lock-in effects observed in the decomposition are not statistical artifacts, but structural economic realities.

7.2 No Resource Rich Countries

To verify the structural boundaries of the observed path dependency, the Full SGMM model is re-estimated on a restricted sample ($N = 98$) that excludes the top quartile of countries by natural resource rents as a percentage of GDP. The results, presented in Table 7.2, reveal a critical condition for the institutional lock-in effect: when highly resource-dependent economies are removed, the interaction term between trade integration and the Rule of Law ($\ln \mathrm{IIX} \times \mathrm{RoL}$) **completely loses its statistical significance** (-0.0047, $p > 0.10$).

This null result profoundly *sharpens* the core Austrian mechanism of the thesis. Deep FTAs and strong contract enforcement do not spontaneously hinder economic complexity in a vacuum. Rather, they provide the perfect binding legal architecture that allows capital to permanently flow toward the most immediate, secure, and globally demanded asset class. If a developing economy lacks a massive, highly profitable natural resource endowment, securing property rights and integrating into global markets does not inherently raise the opportunity cost of structural transformation to prohibitive levels.

The institutional lock-in effect is therefore structurally conditional on the presence of extreme comparative advantage. Schumpeterian discovery and creative destruction are only choked off when the institutional framework perfectly secures an *overwhelmingly lucrative status quo.* In economies like Chile, where the primary commodity sector offers astronomical, risk-free returns under conditions of legal certainty, the transition to unproven, complex manufacturing becomes economically irrational for the individual firm.

The findings demonstrate that strong institutions, combined with deep external market access, act as the ultimate **optimizers** of existing endowments. Where those endowments are overwhelmingly concentrated in primary commodities, the traditional prescriptions for development: institutional strengthening and trade liberalization (Kaznacheev, 2017; Hodler, 2023) do not catalyze structural transformation; they efficiently lock the productive matrix in place.

Table 7.2: Robustness Check: No Resource-Rich Countries

Variable	**Full Sample (1)**	**Non-Resource Rich (2)**
Lagged ECI ($t-1$)	1.0511***	1.0718***
	(0.0176)	(0.0254)
ln(IIX)	0.0066	0.0038
	(0.0043)	(0.0054)
RoL	-0.0290***	-0.0482***
	(0.0098)	(0.0143)
ln(IIX) × RoL	**-0.0145*** **	**-0.0047**
	(0.0036)	(0.0043)
ln(GDP per capita)	0.0005	-0.0008
	(0.0007)	(0.0012)
Resources	0.0006	0.0053**
	(0.0004)	(0.0020)
Trade Openness	0.0001***	0.0001**
	(0.0000)	(0.0001)
FDI	-0.0001	0.0001
	(0.0003)	(0.0004)
Year	-0.0011***	-0.0017***
	(0.0003)	(0.0004)
Countries	137	98
Wald Test	205,947***	114,096***
AR(1) *p-value*	(0.0000)	(0.0000)
AR(2) *p-value*	(0.3201)	(0.3010)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

7.3 Alternative Dependent Variable

A potential vulnerability of the baseline specification is that the negative interaction between trade integration and institutional quality may be an artifact of the specific construction of the World Bank's Worldwide Governance Indicators (WGI). The WGI Rule of Law index is derived primarily from perception-based expert surveys, which may introduce systematic measurement

bias correlated with both trade openness and economic complexity. To test whether the institutional lock-in mechanism survives under a methodologically independent measure of legal institutional quality, the Full SGMM model is re-estimated replacing the WGI Rule of Law with the **Varieties of Democracy (V-Dem) Rule of Law Index** (V-Dem Institute, 2024).

The V-Dem index is constructed through a *Bayesian Item Response Theory measurement model*, aggregating assessments from thousands of country experts across multiple dimensions of legal accountability, judicial independence, and constraints on executive power. This approach is methodologically distinct from the WGI in both its data collection strategy and its aggregation method, making it a genuinely independent test of the institutional quality mechanism.

Table 7.3: Robustness Check: V-Dem as Dependent Variable

Variable	**WGI RoL (1)**	**V-Dem RoL (2)**
Lagged ECI ($t-1$)	1.0511***	1.0173***
	(0.0176)	(0.0147)
ln(IIX)	0.0066	0.0382*
	(0.0043)	(0.0196)
RoL (V-Dem)	-0.0290***	-0.0242**
	(0.0098)	(0.0118)
ln(IIX) × RoL	**-0.0145*** **	**-0.0575** **
	(0.0036)	(0.0268)
ln(GDP per capita)	0.0005	0.0030***
	(0.0007)	(0.0010)
Resources	0.0006	-0.0002
	(0.0004)	(0.0004)
Trade Openness	0.0001***	0.0001***
	(0.0000)	(0.0000)
FDI	-0.0001	-0.0003
	(0.0003)	(0.0002)
Year	-0.0011***	-0.0010***
	(0.0003)	(0.0003)
Observations	137	137
Wald Test	205,947***	175,438***
AR(1) *p-value*	(0.0000)	(0.0000)
AR(2) *p-value*	(0.3201)	(0.3191)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

The results, presented in Table 7.3, supports the robustness of the core finding. The interaction term between trade integration and the V-Dem Rule of Law ($\ln \text{IIX} \times \text{RoL}_{\textit{V-Dem}}$) remains negative and statistically significant (-0.0575, $p < 0.05$). Remarkably, the magnitude of the coefficient nearly quadruples relative to the WGI baseline, suggesting that the V-Dem index—by more precisely capturing the depth of legal institutional constraints—actually reveals a stronger lock-in effect than the perception-based WGI measure. Both the Wald test ($175,438$, $p < 0.01$)

and the Arellano-Bond AR(2) test ($p = 0.3191$) confirm the model's validity.

This finding carries a precise implication. The lock-in mechanism does not merely reflect subjective perceptions of institutional quality; it is driven by the objective depth of legal constraints, judicial independence, and the actual enforceability of contracts. It is precisely when the legal architecture of the State is most genuinely developed that the combination of deep FTAs and strong institutions most aggressively raises the opportunity cost of structural transformation. The stronger the legal foundation securing existing operations, the more rational it becomes for the individual firm to remain in the established productive matrix.

7.4 Summary of Robustness Checks

Taken together, the battery of robustness checks confirms that the negative interaction between deep trade integration and institutional quality is neither a statistical artifact nor a phenomenon driven by superficial trade agreements. Instead, it reflects a deeply embedded structural mechanism of capital allocation.

As demonstrated in Table (7.1), the decomposition of the IIX into its constituent dimensions reveals that the lock-in effect is fundamentally driven by the *market size* of FTA partners rather than mere legal depth. Access to vast, high-income markets is what provides the necessary demand to sustain astronomical returns in the primary sector, thereby locking capital out of complex manufacturing.

Furthermore, this dynamic is not a universal pathology of developing nations. As Table (7.2) shows, excluding the top quartile of resource-dependent economies causes the interaction term to completely lose statistical significance (-0.0047, $p > 0.10$). This boundary condition confirms that the *Austrian lock-in* effect strictly requires an extreme comparative advantage. The opportunity cost of abandoning the primary sector is only rendered prohibitive when strong institutions secure a massive, highly profitable natural resource endowment.

Finally, Table (7.3) proves that this mechanism is not an artifact of the World Bank's

perception-based governance indicators. When substituting the WGI measure with the methodologically independent V-Dem Rule of Law index, the negative interaction aggressively strengthens (-0.0575, $p < 0.05$). This result suggests that the lock-in effect operates precisely through the **objective** depth of legal constraints and judicial independence. The stronger the actual legal foundation securing existing commodity operations, the more economically irrational it becomes to pursue Schumpeterian entrepreneurship in unproven manufacturing frontiers.

The consistency of these empirical results across different model specifications, subsamples, and institutional metrics warrants a fundamental theoretical pivot. If strong institutions and deep external integration are the precise conditions under which structural transformation stagnates in resource-abundant economies, the standard development consensus requires urgent reconsideration. The following section turns to this discussion, situating the econometric findings within a broader framework and drawing their implications for the political economy of development in Chile and similar countries.

Chapter 8

Discussion

8.1 Detailed Results Analysis

In appendix (E), table (E.1) provides a comprehensive summary of the empirical estimations, tracing the relationship between international integration, the Rule of Law and export sophistication across multiple specifications. A comparison between the baseline Two-Way Fixed Effects model (Column 1) and the dynamic System GMM models (Columns 2 and 3) highlights the importance of accounting for*path dependence.* In the TWFE specification, the lagged Economic Complexity Index (ECI) coefficient is artificially compressed at 0.7728. Once the System GMM estimator corrects for dynamic panel bias (Nickell, 1981), the autoregressive coefficient stabilizes at 1.0511 in the Full model, confirming that export structures are **highly persistent and evolve gradually.**

The central empirical finding of this research is the highly significant, negative interaction between trade integration and domestic institutions. In the Full SGMM specification, while the isolated effect of the International Integration Index ($\ln(\text{IIX})$) is a positive yet small (0.0066), the interaction term ($\ln(\text{IIX}) \cdot \text{RoL}$) yields a coefficient of -0.0145, significant at the 1 percent level. This robust negative interaction indicates that the capacity of trade integration to drive export upgrading is strictly conditioned by the quality of the domestic legal framework. Specif-

ically, as the Rule of Law strengthens, the marginal effect of deeper international market access on export sophistication diminishes and eventually turns negative.

To better understand these findings, it is useful to return to the broader logic that guides my research. Export upgrading is not a mechanical response to openness, but a process of *discovery* in which firms compare expected returns across alternative uses of capital, labor, and entrepreneurial effort. Trade integration enlarges the set of feasible opportunities, yet it does not determine which opportunities will be selected. That outcome depends on the incentive structure generated by domestic institutions and on the relative profitability of existing productive activities.

This is why stronger institutions do not necessarily translate into higher export sophistication. Secure property rights and predictable contract enforcement reduce uncertainty and support long-horizon investment, but they also make established activities more attractive to preserve. In an economy where natural resources already provide a strong source of rents, the combination of legal certainty and deeper market access may reinforce specialization in sectors where returns are already visible and comparatively safe. In that sense, the negative interaction term does not indicate a failure of institutions. Rather, it shows that institutions *can* improve the efficiency of allocation while still preserving the economy's existing comparative advantages. The relevant margin is not whether firms can invest, but whether the payoff structure gives them a reason to move into new and more complex activities.

The control variables are consistent with this interpretation. Trade openness enters with a positive and statistically significant coefficient in the preferred specifications, which suggests that broader integration is associated with higher export sophistication in general. FDI is also positive in the dynamic models, indicating that foreign capital can support upgrading when it complements domestic capabilities. At the same time, the resource variable remains meaningful, which is consistent with the idea that endowments shape the direction in which integration channels productive effort. These controls do not alter the main result. Instead, they reinforce

the view that integration matters, but its effect depends on the underlying structure of incentives.

Diagnostic tests confirm the credibility of the dynamic identification strategy. Across the Core and Full SGMM models, the Arellano-Bond tests for AR(2) autocorrelation return p-values well above the 0.10 threshold, namely 0.2664 and 0.3201, which indicates the absence of second-order serial correlation in the first-differenced residuals. The Wald tests for joint significance are also strongly significant, confirming the overall explanatory power of the model.

Interaction Sign Flip Threshold

The negative interaction coefficient from the Full SGMM specification (Column 3, Table E.1) $\beta_{\ln(\text{IIX})\times\text{RoL}} = -0.0145$ uncovers what is arguably the research's most important conclusion: deeper trade integration can undermine export sophistication precisely when institutions are strongest. This counterintuitive non-linearity (explored in greater depth in the heterogeneity subchapter) is precisely quantified by the marginal effect:

$$\frac{\partial \text{ECI}}{\partial \ln(\text{IIX})} = \beta_{\ln(\text{IIX})} + \beta_{\ln(\text{IIX})\cdot\text{RoL}} \cdot \text{RoL},$$

where $\beta_{\ln(\text{IIX})} = 0.0066$ and $\beta_{\ln(\text{IIX})\times\text{RoL}} = -0.0145$ from the Full SGMM specification (Column 3, Table (E.1)). Setting this derivative equal to zero and solving for the threshold value of Rule of Law yields:

$$\text{RoL}^* = -\frac{\beta_{\ln(\text{IIX})}}{\beta_{\ln(\text{IIX})\times\text{RoL}}} = -\frac{0.0066}{-0.0145} \approx 0.46.$$

Figure 8.1 plots this marginal effect across the empirical range of Rule of Law values, confirming statistical significance with the zero line crossed exactly at the calculated threshold. The plot reveals a stark institutional divide: nations with weaker institutions like Venezuela, Bolivia, and Mozambique enjoy positive marginal effects, while advanced economies such as the USA and Germany cluster deeply in the negative zone, and so does Chile.

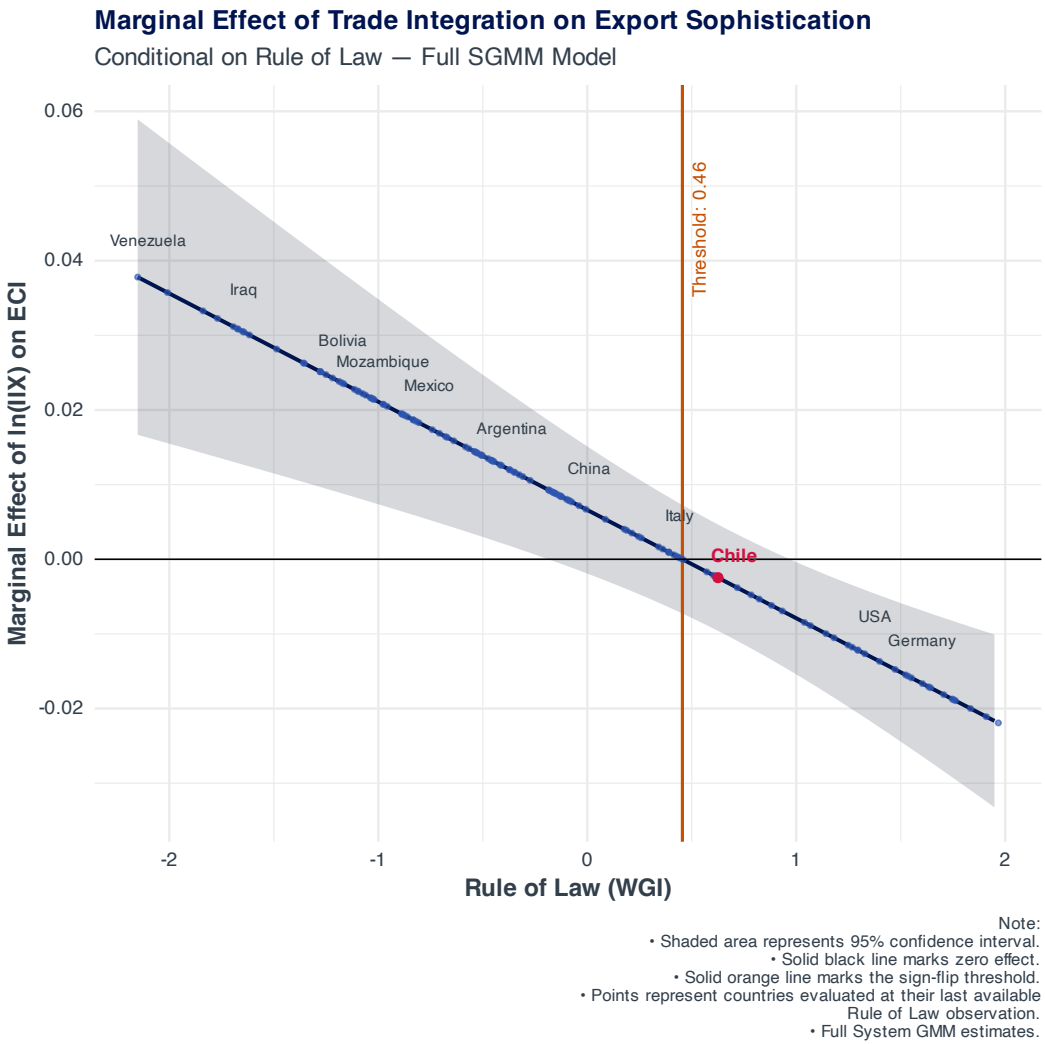

Figure 8.1: Sign Flip Threshold

This non-linearity has important implications for the entrepreneurial discovery process. Below the threshold, where institutional uncertainty is higher, trade integration provides a strong signal for experimentation and diversification. The risk premium associated with new activities is already elevated, so the expansion of market opportunities acts as a catalyst for discovery. Above the threshold, however, the incentive structure reverses. Secure property rights lower the expected cost of maintaining established activities, while simultaneously raising the relative opportunity cost of abandoning them. In resource-rich economies that operate above this

threshold, the result is not market failure, but rather an efficient optimization of the existing structure of comparative advantage.

To illustrate this divergence more explicitly, Figure 8.1 projects the Full SGMM marginal effects across a cross section of economies evaluated at their most recent Rule of Law scores. A clear bifurcation emerges between emerging markets with weaker institutional frameworks: such as Brazil, Mexico, and China; which remain in the positive region (blue bars), and nations with robust institutional environments that cross into the negative institutional lock-in zone (red bars).

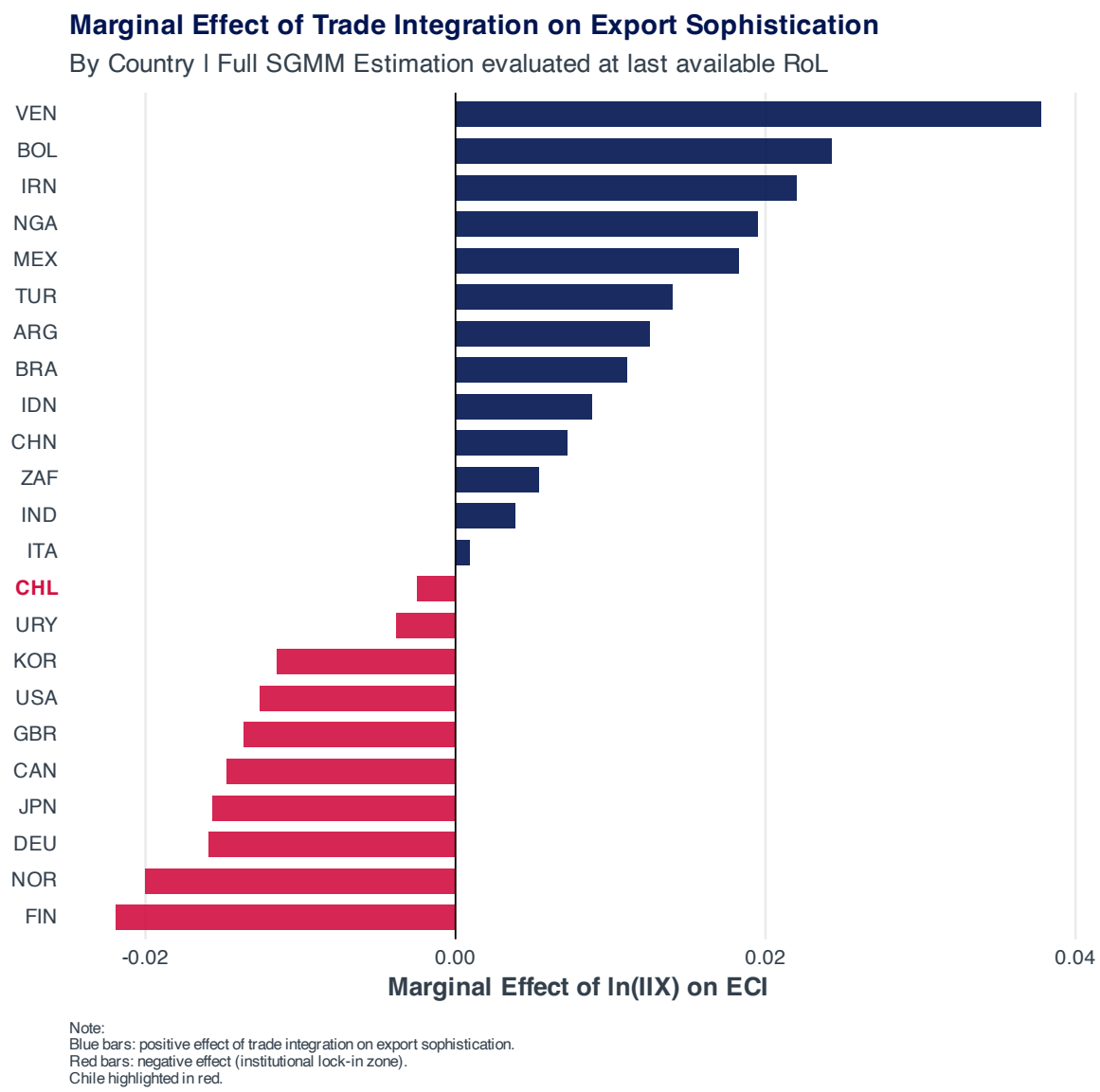

Figure 8.2: Marginal Effect Range

Crucially, both figures expose a glaring anomaly in the global distribution: Chile sits firmly alongside advanced, highly industrialized economies in the negative lock-in zone, despite lacking their sophisticated productive matrix. Chile's strong institutions (RoL $\gg 0.46$) combined with deep trade agreements have securely channeled capital toward resource extraction's high returns, optimizing the existing comparative advantage while allowing complexity to stagnate. The threshold calculation proves that strong institutions do not inherently destroy capabilities;

rather, they secure the returns to whatever capabilities already exist. In Chile's case, capital simply flows to its highest value use in extraction, protected by a solid institutional framework. To properly test this precise mechanism and understand how it operates beyond the panel average, the next section takes a closer look at country differences to study the heterogeneity of the effect.

8.2 Structural Heterogeneity

The baseline dynamic specifications establish a robust negative interaction between trade integration and institutional quality, but the interpretation of this result depends on whether the mechanism is general or conditional. The theoretical direction of this thesis suggests that the relationship should be structurally heterogeneous. In other words, the negative interaction should not be read as a universal feature of strong institutions, but as a conditional outcome that depends on the productive environment in which trade integration occurs.

The first dimension of heterogeneity that can be credibly identified is structural, namely the distinction between resource-abundant and non-resource-abundant economies. Column 7 of Table 16 restricts the sample by excluding resource-rich countries. Once this is done, the interaction term $\ln(\text{IIX}) \times \text{RoL}$ falls to -0.0047 and loses statistical significance. This result is central to the interpretation of the model. It indicates that the negative effect is not a generalized property of institutional quality itself. Rather, it emerges when strong institutions operate in environments where natural resources already provide a secure and highly profitable destination for capital.

Figure 8.2 summarizes this structural divergence. The visual contrast makes clear that the lock-in effect is concentrated in the part of the sample where resource abundance and legal certainty coexist. In economies without such endowments, stronger institutions do not appear to systematically convert trade integration into a drag on export sophistication. This is consistent with the broader idea that institutions do not independently determine productive structure.

Instead, they shape how safely and profitably market actors can respond to the opportunity set created by trade openness.

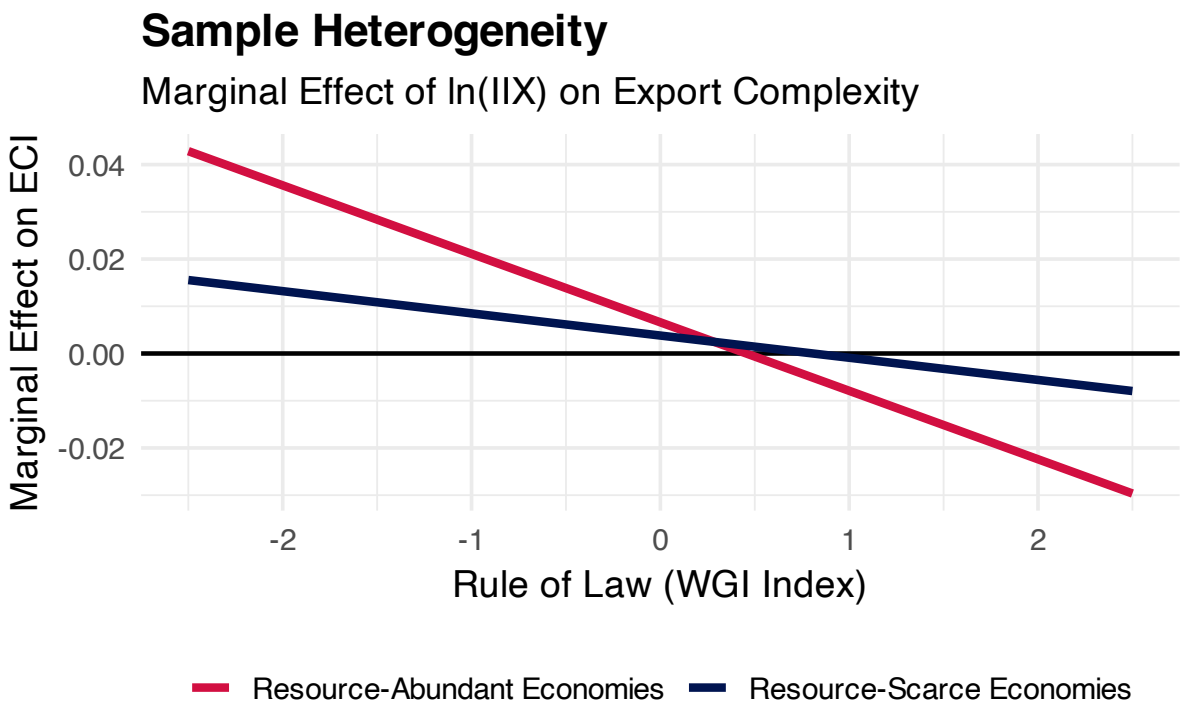

Figure 8.3: Instrument Heterogeneity

A second heterogeneity exercise was initially intended to complement this result by separating developed from developing economies. That comparison would have been useful because it could further distinguish whether the mechanism is primarily one of endowments or one of income level and productive maturity. However, the System GMM specification could not be estimated reliably for the developed-country subsample because the number of observations became too limited for a stable dynamic panel identification without falling into instrument proliferation errors. For that reason, the discussion remains focused on the structural heterogeneity that the data can support directly.

This limitation is worth stating explicitly because it also clarifies the scope of the claim. The evidence presented here is sufficient to show that the interaction between trade integration and

the Rule of Law is conditional on resource intensity. It is not sufficient to claim that the same mechanism operates identically across all stages of development. That broader comparison remains a useful avenue for future research, ideally with a longer panel or a more targeted dataset for advanced economies.

Even with that restriction, the structural heterogeneity result is highly informative. It supports the interpretation that the main issue is not institutional quality in the abstract, but the incentive structure that institutions stabilize. Where natural resource rents are large, stronger property rights and more predictable enforcement secure the returns to those sectors and raise the opportunity cost of entrepreneurial experimentation elsewhere. Where such rents are absent, the same institutional improvements need not generate the same lock-in dynamic.

8.3 The case for Chile

To fully grasp the implications of the empirical threshold, it is necessary to examine the specific trajectory of the Chilean economy. Chile presents a highly unusual combination of deep integration into global markets, robust domestic institutions, and a stubbornly concentrated export basket. This makes the country the ultimate testing ground for the theoretical framework developed in this thesis.

The current economic architecture of Chile is the result of a radical structural transformation. A comprehensive program of economic liberalization was initiated during the dictatorship in the 1970s, which dismantled protectionist barriers, deregulated financial markets, and established a rigid legal framework designed to protect private property and enforce contracts. When the country returned to democratic governance in 1990, successive administrations chose to consolidate these market institutions. They utilized this stable domestic foundation to launch an aggressive strategy of international integration. As a result, Chile expanded its network from zero Free Trade Agreements in the early 1990s to over 30 active agreements by the present day, effectively securing preferential market access to economies that represent the vast majority of

global GDP.

Standard models of structural change often presume that such a drastic reduction in trade frictions, combined with a highly predictable Rule of Law, should naturally catalyze a transition toward higher value added and more complex manufacturing. However, the Chilean experience sharply contradicts this expectation. While Figure 1.2 illustrates this paradox internally, Figure 8.3 places the Chilean experience in a comparative global context. The scatter plot maps the long term change in the Economic Complexity Index against the average Rule of Law for a selection of developing and emerging economies. Standard development narratives assume a positive linear relationship, where stronger legal frameworks invariably yield more sophisticated productive structures.

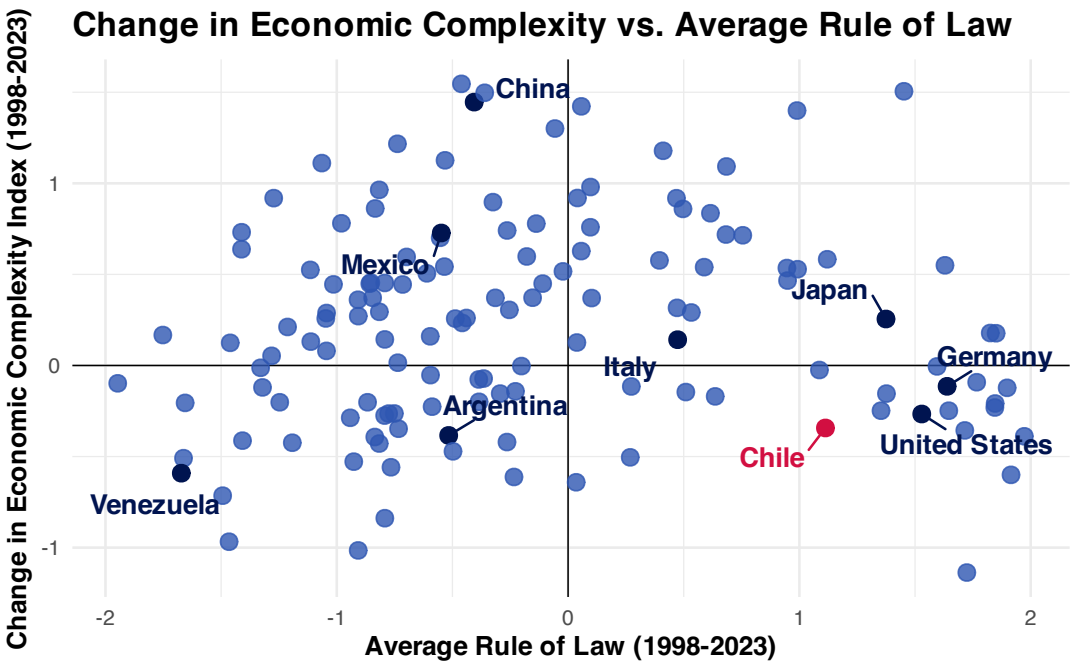

Figure 8.4: Peer Comparison

However, the visual evidence reveals a starkly different reality. Economies with moderate to weak institutional constraints, such as Vietnam or Mexico, occupy the upper left quadrant, exhibiting rapid export upgrading. Conversely, Chile is isolated in the lower right quadrant.

Despite possessing the most secure contracting environment and the strongest property rights in the sample, its export sophistication has remained entirely stagnant over three decades of deep international integration.

This comparative anomaly is precisely what the empirical threshold and heterogeneity analysis in Section 8.2 predict. Because Chile is endowed with massive natural resources and operates far above the 0.46 Rule of Law threshold, its institutional strength does not catalyze Schumpeterian discovery. Instead, it anchors the economy. The deep penetration of FTAs provided massive external demand, and the rigid legal framework guaranteed the returns on extracting those resources. For a local entrepreneur, the opportunity cost of abandoning secure commodity rents to compete with Asian manufacturing was rendered economically irrational. Chile's position in the lower right quadrant is therefore the hallmark of a highly efficient market allocating capital to its safest and highest yielding use.

Opportunity Cost of Discovery

The isolated position of Chile in the global context is not a symptom of institutional failure, but rather the hallmark of a highly efficient market operating under secure property rights. To understand this, it is necessary to evaluate export upgrading as a process of entrepreneurial discovery. Moving into complex manufacturing requires entrepreneurs to navigate genuine uncertainty, incur sunk costs, and coordinate localized supply chains. The decision to undertake this risky discovery process depends entirely on its relative opportunity cost.

Following its economic liberalization, Chile did not merely lower tariffs; it systematically signed Free Trade Agreements with the largest economic blocs in the world, including the United States, the European Union, and China. This unprecedented expansion of market access in a short amount of time acted as a massive demand shock for the country's natural endowments. In an environment where the Rule of Law is weak, the sheer size of external demand might not be enough to attract long-horizon capital, as the risk of expropriation or arbitrary

taxation remains high in the region. However, because Chilean institutions rigidly protect private property and enforce contracts, the returns on mining, forestry, and agriculture became incredibly secure.

For an entrepreneur or international investor allocating capital, the economic calculus is straightforward. The expected risk-adjusted return of scaling up existing primary commodity operations to feed the Asian market vastly outweighs the uncertain returns of experimenting in non-traditional, complex manufacturing. The rigorous domestic institutions effectively removed the risk from the commodity sector, thereby raising the opportunity cost of structural transformation to prohibitive levels.

This mechanism is directly supported by the structural heterogeneity established earlier in Table E.1. In the baseline full model, the net pull of integration on complexity for a country with Chile's institutional certainty is strictly negative. Furthermore, when the integration index is isolated to capture only the market size of FTA partners, this negative interaction deepens significantly. This confirms that the gravitational pull of massive foreign demand is the primary driver of the lock-in effect.

Crucially, as the restricted sample demonstrated, this dynamic strictly requires vast natural endowments. If Chile lacked its massive mineral wealth, its secure contracting environment and open trade policy would likely operate as traditional trade theory predicts, facilitating the complex contracting required for manufacturing. However, given the presence of abundant resources, economic liberalization allowed the price mechanism to function perfectly, directing capital away from uncertain Schumpeterian discovery and toward its most efficient, highest-yielding use.

Crucially, when the sample is restricted to exclude resource-abundant economies, the marginal effect evaluated at this same high institutional level ceases to be negative. This structural heterogeneity indicates that strong institutions do not inherently stifle export sophistication. If an economy lacks massive mineral endowments, a secure contracting environment and open trade

policy operate exactly as traditional trade theory predicts, facilitating the complex contracting required for manufacturing. However, given the presence of vast natural resources, economic liberalization allowed the price mechanism to function perfectly, directing capital away from uncertain Schumpeterian discovery and toward its most efficient, highest-yielding use.

To fully validate this opportunity cost mechanism without relying on hypothetical scenarios, the theoretical framework can be applied to comparative real world cases drawn directly from the sample. Appendix D, specifically Table D.1, details the "Chilean neighborhood", a data subset isolating all countries with an average natural resource endowment matching Chile ($\approx$ 8.0% of GDP). An examination of this neighborhood reveals that countries with this level of resource intensity are overwhelmingly characterized by weak institutional frameworks.

To isolate the effect of institutions, Figure (8.3) maps the trajectory of export sophistication for Chile alongside two carefully selected peers from Table D.1: Bolivia and Norway. Bolivia serves as the negative institutional baseline. It shares a nearly identical resource endowment (7.89%) but operates with a severely weak Rule of Law (average -0.93), characterized by expropriation risk and regulatory volatility. Norway serves as the positive institutional baseline. It shares the same high resource intensity (8.06%) but operates with an extremely secure Rule of Law (average 1.91), representing a fully developed, high income economy.

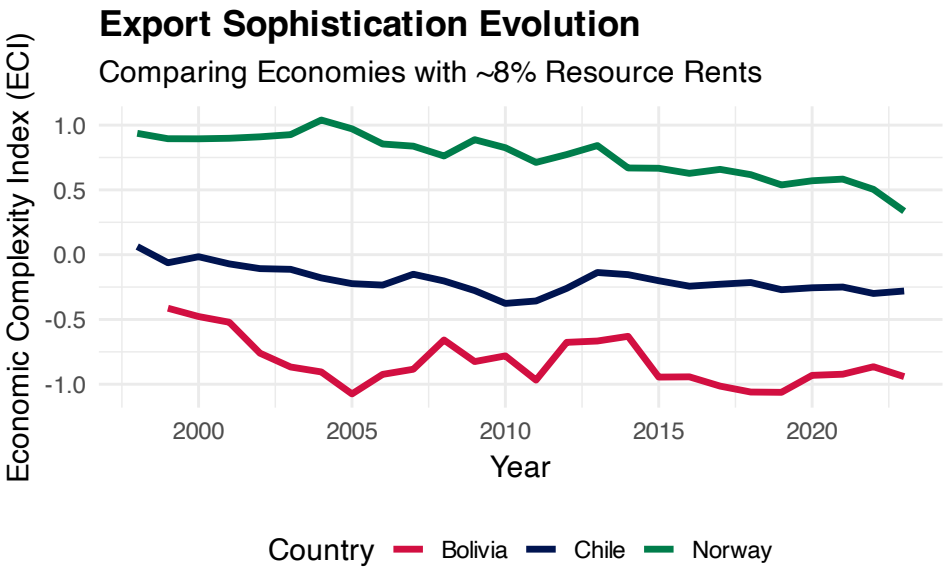

Figure 8.5: ECI and Institutional Lock-Down

Calculating the conditional marginal effect of trade integration for these three cases using the parameters from the Full SGMM specification (Column 3) yields starkly different results:

- **Bolivia (Low RoL):** $0.0066 + (-0.0145 \times -0.93) \approx +0.0201$
- **Chile (High RoL):** $0.0066 + (-0.0145 \times 1.11) \approx -0.0095$
- **Norway (Very High RoL):** $0.0066 + (-0.0145 \times 1.91) \approx -0.0211$

The econometric model demonstrates that for an economy with weak property rights, trade integration maintains a positive marginal pull on export complexity. However, for a heavily resource endowed economy with rigid institutional certainty, the marginal effect of further integration becomes decisively negative.

The evolutionary paths of these three economies perfectly illustrate this institutional anchor mechanism. In Bolivia, weak property rights generate a massive risk premium for capital intensive resource extraction. Because the institutional environment cannot credibly secure massive

sunk investments over decades, capital does not crowd into the resource sector to an exclusionary degree. Without the gravity of a perfectly secure resource sector monopolizing domestic resources, entrepreneurial capital is forced to seek returns in peripheral, marginally more complex activities, resulting in the upward drift in export complexity observed in Figure 8.3.

Conversely, Chile and Norway share a remarkably similar structural trajectory, breaking the mold of standard development narratives. Despite Norway being a wealthy European nation and Chile an emerging Latin American economy, both possess rigid legal frameworks that provide absolute security for long horizon investments. For Norway, this institutional consolidation is perfectly illustrated by the offshore oil sector. As Stefanski et al. (2025) demonstrate, a landmark 1985 Norwegian Supreme Court ruling eliminated sovereign hold up risk by prohibiting retroactive changes to petroleum licensing terms. Shielded from arbitrary expropriation, capital aggressively flowed into advanced, sunk cost extraction technologies like Enhanced Oil Recovery rather than diversifying into new sectors. In Chile, the foundational rules of the game established through the sweeping economic liberalization initiated during the dictatorship provided the exact same institutional certainty, protecting massive copper and agricultural operations. **For entrepreneurs in both Oslo and Santiago, the opportunity cost of abandoning highly secure, massively profitable resource rents to compete in complex manufacturing was economically irrational.**

Ultimately, the Chilean paradox is resolved not by assuming a failure of its trade policy or a defect in its institutions. By aligning with the Norwegian experience, the Chilean case demonstrates the supreme efficiency of its market. Secure property rights performed their exact economic function: they directed capital toward its safest and highest yielding use, securely anchoring the economy to its existing comparative advantage.

8.4 Limitations and comment on Policy Design

While the empirical results and the theoretical framework robustly explain the interaction between institutional quality and trade integration, several limitations must be acknowledged.

First, the analysis relies on highly aggregated macroeconomic indicators. The *Economic Complexity Index* provides a valuable macro-level proxy for the knowledge intensity of an economy, but it inherently masks firm level heterogeneity. Similarly, the *International Integration Index* measures the national scope and depth of market access, but it cannot capture how differently sized firms utilize these Free Trade Agreement preferences. Future research utilizing firm level customs data could provide a more granular view of how institutional certainty affects the specific investment decisions of individual exporters.

A further necessary qualification concerns the economic magnitude of the estimated coefficients. The Economic Complexity Index operates on a standardized scale ranging approximately from -3 to 3. Within this bounded scale, the calculated marginal effects, such as the -0.0145 interaction coefficient, are nominally small. In strictly quantitative terms, these marginal shifts alone do not dictate massive instantaneous transformations of a national productive structure. However, the analytical value of these results lies in the **direction** of the signs rather than their absolute numerical weight. The negative interaction term reveals the underlying behavioral trajectory of capital allocation. For future policy design, understanding that strong institutions structurally tilt market incentives *away* from diversification in resource abundant economies is far more relevant than the raw magnitude of the coefficient.

Third, the Rule of Law index captures the general security of the contracting environment and the protection of private property, but it does not account for targeted domestic industrial policies. The models do not capture specific government interventions, such as sector specific tax breaks, credit allocations, or localized subsidies, which might artificially alter the opportunity cost of capital for certain industries. While the theoretical framework emphasizes the

primacy of general rules and market pricing over specific interventions, acknowledging the potential distortive effects of unobserved industrial policies is necessary for a complete picture of export dynamics.

Finally, while the System GMM estimator is specifically designed to address the dynamic panel bias and internal endogeneity that plague macroeconomic datasets, institutional quality remains a deeply complex and slow moving variable. Finding a perfectly exogenous external instrument for institutional evolution over a thirty year period remains a persistent challenge in the cross country literature. The diagnostic tests confirm the internal validity of the specified models, but the results should be interpreted as capturing highly persistent structural relationships rather than instantaneous causal shocks.

Chapter 9

Conclusion

This research set out to answer a primary question: *Does the Rule of Law condition the effect of trade integration on export sophistication?* Through the application of cross-country panel data and System GMM estimations, the empirical results provide a definitive affirmative answer. However, the nature of this conditionality fundamentally challenges conventional, linear development narratives. The findings reveal a highly significant, negative interaction between global market integration and strong legal institutions in resource-abundant economies. Rather than acting as an automatic catalyst for structural change and industrial upgrading, the combination of secure property rights and deep external market access serves as the ultimate optimizer of an economy's existing comparative advantages.

This leads directly to the secondary research question: *How does this mechanism explain the Chilean paradox of extensive free trade agreements and strong institutions alongside persistent commodity export dependence?* The empirical results demonstrate that Chile is not an anomaly or a failure of policy, but rather a textbook manifestation of rational market behavior operating under specific institutional constraints. The comprehensive economic liberalization initiated during the dictatorship established a highly predictable legal framework and an unwavering commitment to private property. These secure property rights, combined with unparalleled access to global markets through extensive trade integration, drastically lowered the risk profile

of capitalizing on the country's massive natural resource endowments.

By making primary commodity operations exceptionally secure and globally profitable, the institutional framework dramatically increased the opportunity cost of reallocating capital toward complex, unproven manufacturing sectors. The market functioned exactly as it should: as an efficient mechanism that directed resources toward their most highly valued and secure uses. Consequently, the persistence of Chile's commodity dependence is not a failure of its institutions or its free-market trade policy. Instead, it is evidence of a profound institutional lock-in where the rules of the game make entrepreneurial discovery in alternative, high-risk sectors economically irrational compared to the safe returns of the established productive matrix.

9.1 Theoretical and Policy Implications

From a theoretical standpoint, these findings emphasize the danger of treating institutional quality monistically. The prevailing assumption that securing property rights and opening borders will inevitably result in industrial upgrading ignores the fundamental, microeconomic mechanics of opportunity cost and subjective valuation. Institutions do not inherently dictate what a country produces; they simply delimit the secure contracting space in which competitive pressures operate. When an economy possesses a dominant, natural comparative advantage, strong legal certainty perfectly secures the returns on those specific assets, naturally anchoring the productive matrix to its most efficient current state.

For policy design, this dynamic presents a stark reality regarding the inherent limits of state-led structural transformation. If the overarching goal of a nation is to maximize wealth creation, respect private property, and ensure economic efficiency, the current framework is operating optimally. However, if policymakers seek to artificially induce export sophistication to mitigate long-term commodity volatility, they must recognize that macroeconomic stability and trade agreements alone are insufficient to overcome the immense gravitational pull of secure resource rents.

9.2 Limitations and Final Remarks

It is important to acknowledge the limitations of this methodological approach. The use of aggregated, macroeconomic indices like the Economic Complexity Index and the Rule of Law indicator inherently abstracts away from firm-level heterogeneity and specific sectoral dynamics. Furthermore, while the System GMM estimator effectively addresses endogeneity and dynamic panel bias, it cannot fully capture the granular knowledge transfers that occur within specific global value chains. Future research should aim to bridge this gap by utilizing micro-level customs data to observe exactly how individual entrepreneurs adjust their product portfolios in response to shifting institutional incentives.

Ultimately, any attempt to foster new areas of comparative advantage must not rely on weakening the very property rights that generated current prosperity, nor on retreating from the undeniable benefits of global economic integration. Instead, policy must focus strictly on reducing the microeconomic barriers to entrepreneurial discovery. This involves drastically lowering the regulatory costs of firm entry, minimizing bureaucratic friction for innovative ventures, and allowing unhindered price signals to freely guide capital toward new, high-value niches. As this thesis demonstrates, free trade under a strong rule of law optimizes what an economy does best today; it is up to the unhindered entrepreneurial process to discover what it might do tomorrow. As F.A. Hayek profoundly noted, we must rely on competition as a discovery procedure: a process for uncovering facts which, without resort to it, would not be known to anyone, or at least would not be utilized.

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Appendix A

Descriptive Statistics Table

Table A.1: Descriptive Statistics

	Observations		Countries	Year		Descriptive Stats			
Dependant Var	**Total**	**Missing**	**Count**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
ECI	3101	0	137	1998	2023	0	0.996	-3.145	2.442
Independent Var									
ln IIX	2947	154	132	1998	2023	1.182	1.433	0	7.199
RoL	3075	26	136	1998	2023	-0.049	1.022	-2.332	2.125
Control Var									
K	2886	215	129	1998	2023	24.228	7.478	0	76.782
L	2783	318	121	1998	2023	2.634	0.66	1.154	3.986
ln_gdp_percap	3053	48	135	1998	2023	8.757	1.341	5.796	11.491
resources	2783	318	135	1998	2023	7.971	11.916	0	75.366
trade_openness	2931	170	130	1998	2023	83.04	51.668	2.474	442.62
FDI	3028	73	134	1998	2023	4.124	7.124	-40.108	105.636
Robustness Check									
V-Dem Index	5394	0	137	1998	2023	0.541	0.304	0.07	0.998

Appendix B

IIX Econometric Validation

This appendix documents the econometric validation of the International Integration Index (IIX). Three formal tests are conducted to ensure the index possesses the statistical properties required for use in subsequent panel regression models: construct validity through correlation analysis and a distributional properties assessment.

B.1 Construct Validity: Correlation Analysis

Following established methodological guidelines for composite indicators (OECD and JRC, 2008), construction validity is assessed through correlation analysis to confirm that the index captures unique, non-redundant variation beyond simple treaty counting. Pearson correlations between four integration metrics were run:

- **IIX**: The full index combining depth and GDP weighting.
- **IIX_depth_only**: Unweighted mean DESTA depth across active agreements.
- **IIX_market_only**: Unweighted sum of partner GDP shares (depth ignored).
- **total_active_ftas**: Raw count of active trade agreements per country-year.

As reported in Table B.1, the full IIX exhibits moderate, but not redundant, correlation with its component measures.

Table B.1: Correlation Matrix: IIX and Component Measures

	IIX	**Depth Only**	**Market Only**	**FTA Count**
IIX	1.000	0.479	0.796	0.787
Depth Only	0.479	1.000	0.226	0.220
Market Only	0.796	0.226	1.000	0.765
FTA Count	0.787	0.220	0.765	1.000

The correlation of **0.479** between IIX and unweighted depth, and **0.796** with market weighting alone, demonstrates that the index is **not** a mechanical replication of either component. The relatively low correlation between depth and market access (0.226) further proves that these are distinct dimensions of integration. The multiplicative structure of the IIX successfully aggregates them, capturing their complementary role in expanding the feasible contracting space.

B.2 Distributional Properties and Data Transformation

The distribution of the IIX across the global sample exhibits substantial right-skewness. This reflects the empirical reality that deep institutional integration is highly concentrated among a small set of economies with extensive FTA networks and access to large markets.

This left-skewed distribution, common in gravity-based trade metrics, motivates the use of a natural logarithm transformation, $\ln(\text{IIX} + 1)$, in the primary econometric specifications to linearize marginal effects and appropriately handle zero-values (Santos Silva and Tenreyro, 2006). The additive constant of 1 accommodates the zero values that occur for countries with no active deep trade agreements. This transformation ensures that coefficient estimates reflect the typical country experience rather than being driven by extreme global outliers.

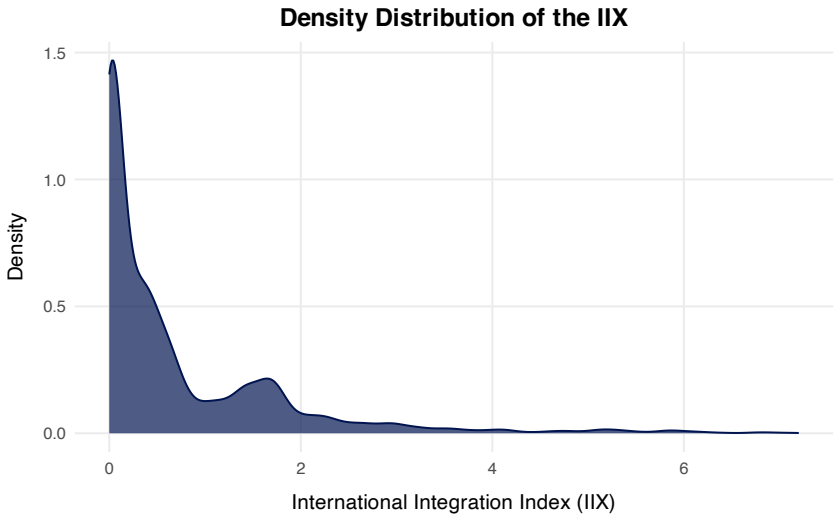

Figure B.1: Density Distribution of the International Integration Index

B.3 Time-Series Persistence and Model Selection

Standard panel unit root tests (e.g., Fisher-type ADF or Levin-Lin-Chu) rely on autoregressive models that assume continuous stochastic variation. However, mechanically, the IIX behaves as a policy-driven step function: it remains completely flat (zero variance) for several years, experiences a discrete upward jump when a new treaty enters into force, and then plateaus again.

Because the data generating process lacks the continuous stochastic "noise" required for standard autoregressive matrix inversion, traditional unit root tests fail to compute. From an econometric standpoint, this confirms that the IIX should not be modeled as a standard autoregressive macroeconomic variable. Instead, the IIX represents a highly persistent structural state variable.

This persistence justifies the use of panel estimators that accommodate invariant or slowly-changing structural variables. Consequently, the empirical strategy must rely on models that can handle highly persistent policy shocks without relying on continuous year-to-year variation, such as fixed effects estimators with robust standard errors or dynamic panel models tailored

for structural breaks.

Appendix C

Main Model Econometric Validation

This appendix presents the full diagnostic evaluation of the two System GMM specifications estimated in Chapter 6. The diagnostics address three distinct concerns: the validity of the internal instrumentation strategy, the absence of second-order serial correlation in the error terms, and the joint significance of the estimated coefficients. Together, these tests constitute the standard battery of post-estimation checks required to validate a dynamic panel GMM framework (Roodman, 2009). All underlying estimation code, raw diagnostic outputs, and replication scripts are publicly available in the project Github repo, allowing for full independent verification of the results reported here.

C.1 Core Model Validation

Instrument Validity and Proliferation

Table C.1: Instrument Structure – Core SGMM

	Core SGMM
Instrument Columns	33
Number of Countries	137
Instruments-to-Countries Ratio	0.24
Proliferation Threshold	1.00

The instrument-to-country ratio of 0.24 is well below the critical threshold of 1.0, confirming that instrument proliferation is not a concern in this specification (Roodman, 2009).

Arellano-Bond Serial Correlation Tests

Table C.2: Arellano-Bond Autocorrelation Tests – Core SGMM

Test	z-statistic	p-value	Interpretation
AR(1)	-6.141	< 0.001	Expected by construction
AR(2)	-1.111	0.266	No second-order correlation

Wald Test for Joint Significance

Table C.3: Wald Test for Joint Significance – Core SGMM

	Chi-square	p-value
Wald Test	217,509	< 0.001
Degrees of Freedom	29	–

C.2 Full Model Validation

Instrument Structure

A critical challenge in estimating the System GMM model on a $T = 26$ panel is the proliferation of internal instruments. When initially specified with a full set of year dummy variables, the instrument matrix expanded to the point of complete computational failure. The model would not run at all due to severe dimensionality issues associated with the unbalanced nature of the panel.

To resolve this failure and strictly prevent proliferation bias Roodman (2009), the instrument matrix was collapsed (`collapse = TRUE`), and the year dummies were replaced with a continuous linear time trend (`year_num`). As shown in Table C.4, this strategy successfully restricted the instrument count to just 18 columns.

Table C.4: Instrument Structure – Full SGMM

	Full SGMM
Instrument Columns	18
Number of Countries	137
Instruments-to-Countries Ratio	0.13
Proliferation Threshold	1.00

This yields a conservative instrument-to-country ratio of 0.13, providing robust protection against proliferation bias and ensuring the reliability of the subsequent diagnostic tests.

Arellano-Bond Serial Correlation Tests

Table C.5: Arellano-Bond Autocorrelation Tests – Full SGMM

Test	z-statistic	p-value	Interpretation
AR(1)	-5.857	< 0.001	Expected by construction
AR(2)	-0.994	0.320	No second-order correlation

Wald Test for Joint Significance

Table C.6: Wald Test for Joint Significance – Full SGMM

	Chi-square	p-value
Wald Test	205,947	< 0.001
Degrees of Freedom	9	–

Coefficient Stability Across Specifications

Table C.7: Coefficient Stability Across GMM Specifications

Specification	$\ln IIX$	RoL	$\ln IIX \times RoL$
SGMM Core	0.006	-0.107***	-0.024***
SGMM Full	0.007	-0.029***	-0.014***

*** $p < 0.01$

The interaction term $\ln IIX \times RoL$ remains negative and statistically significant across both specifications. The moderation from -0.024 to -0.014 is expected, as the Full model correctly assigns variance previously captured by the institutional variable to resource endowments and income levels. The sign, direction, and significance of the central finding are entirely stable across specifications.

C.3 A Note on the Hansen-Sargan Test

The one-step Sargan test rejects the null of valid overidentifying restrictions ($\chi^2(9) = 26.316$, p = 0.0018). To assess whether this reflects heteroskedasticity rather than genuine instrument failure, the model was re-estimated using the two-step estimator, whose Hansen J-statistic is robust to heteroskedasticity. The statistic falls to $\chi^2(9) = 18.533$ (p = 0.0295), suggesting that heteroskedasticity accounts for part of the one-step rejection. Nonetheless, the Hansen test still rejects at the 5% level, and this limitation is acknowledged.

The Arellano-Bond AR(2) test, however, fails to reject the absence of second-order serial correlation ($z = -0.994$, p = 0.320), directly supporting the validity of `lag(ECI, 2)` as an instrument. Following Roodman (2009), the AR(2) condition is treated as the more fundamental validity criterion, and the rejection in both overidentification tests is interpreted as a finite-sample limitation of the Blundell-Bond estimator on short dynamic panels.

Table C.8: GMM Diagnostic Tests – Full SGMM Model

Test	Statistic	Distribution	df	p-value
Sargan Test (one-step)	26.316	χ^2	9	0.0018
Hansen Test (two-step)	18.533	χ^2	9	0.0295
AR(1) Test	-5.857	z	–	< 0.001
AR(2) Test	-0.994	z	–	0.3201

Appendix D

Chilean Neighborhood

Table D.1: Countries with similar Resource Intensiveness

Country	Avg. Resource Intensity	Avg. Rule of Law
Malaysia	9.55	0.411
Malawi	9.55	-0.202
Sierra Leone	9.30	-0.908
Mali	9.29	-0.766
Sudan	9.07	-1.330
Tajikistan	9.05	-1.250
Niger	8.69	-0.588
Egypt	8.54	-0.264
Norway	8.06	1.910
Chile	**7.97**	**1.110**
Bolivia	7.89	-0.927
Laos	7.74	-0.853
Vietnam	6.96	-0.360
Zimbabwe	6.86	-1.490
Syria	6.82	-0.738
Indonesia	6.82	-0.553
Peru	6.77	-0.595
Madagascar	6.69	-0.867
Kyrgyzstan	6.65	-1.050
Cameroon	6.54	-1.110

Appendix E

Complete Output Table

Table E.1: Summary of Empirical Results: Baseline, Dynamic Identification, and Robustness

Variable	Baseline (1)	Core (2)	Full (3)	IIX Depth (4)	IIX Market (5)	V-Dem (6)	No-Resource Rich (7)
Lagged ECI ($t-1$)	0.7728***	1.1641***	1.0511***	1.0548***	1.0567***	1.0173***	1.0718***
	(0.0308)	(0.0212)	(0.0176)	(0.0177)	(0.0180)	(0.0147)	(0.0254)
ln(IIX)	0.0219	0.0061*	0.0066	-0.0211***	0.0235**	0.0382*	0.0038
	(0.0136)	(0.0035)	(0.0043)	(0.0051)	(0.0111)	(0.0196)	(0.0054)
RoL	0.0026	-0.1066***	-0.0290***	-0.0259**	-0.0311***	-0.0242**	-0.0482***
	(0.0222)	(0.0146)	(0.0098)	(0.0110)	(0.0094)	(0.0118)	(0.0143)
ln(IIX) × RoL	**-0.0221***	**-0.0244*****	**-0.0145*****	**-0.0121****	**-0.0345*****	**-0.0575****	**-0.0047**
	(0.0131)	(0.0035)	(0.0036)	(0.0049)	(0.0082)	(0.0268)	(0.0043)
Controls							
ln(GDP per cap)	0.0570*	—	0.0005	0.0029***	0.0000	0.0030***	-0.0008
Resources	-0.0028**	—	0.0006	0.0006	0.0006	-0.0002	0.0053**
Trade Openness	0.0003*	—	0.0001***	0.0001**	0.0001***	0.0001***	0.0001**
FDI	0.0007	—	-0.0001	0.0000	-0.0001	-0.0003	0.0001
Year / Time	—	Yes	-0.0011***	-0.0007**	-0.0012***	-0.0010***	-0.0017***
Diagnostics							
Observations / N	2,423	137	137	137	137	137	98
Wald Test	561.07	217,509	205,947	204,772	210,455	175,438	114,096
AR(1) p-value	—	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
AR(2) p-value	—	(0.2664)	(0.3201)	(0.3196)	(0.3214)	(0.3191)	(0.3010)

Notes: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. SE in parentheses.

Economic Complexity Index is the dependent variable for all models.

(1) is TWFE; (2)-(7) are System GMM.