Financial Development and Growth

31 July 2023

Nikos Kyriakopoulos

Supervisor : Nikolaos Apergis

University of Piraeus

Department of Banking and Financial Management

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Abstract

The thesis analyzes the relationship between financial development and economic growth in Latin America, focusing on the presence of the supply-leading phenomenon. The financial sector's role in facilitating business transactions and its impact on economic growth is explored using growth equations and statistical analysis. The study includes two different financial development indicators and employs fixed effects models with instrumental variables to address endogeneity.

The main finding suggests that there is limited support for the supply-leading phenomenon in Latin America, indicating a stronger case for the demand-following phenomenon in the region. This result differs slightly from the findings for the developed countries, where more evidence is found in favor of the supply-leading phenomenon. Additionally, the use of different financial development indicators yields contradictory conclusions regarding the relationship between financial development and economic growth.

The thesis also highlights the importance of data quality and further research in the Latin American region to enhance the accuracy of the analysis. It emphasizes the need to consider other financial development indicators and control variables to gain a comprehensive understanding of the relationship between financial development and economic growth.

Overall, the study sheds light on the complex relationship between financial development and economic growth in Latin America, providing valuable insights for policymakers and researchers in the region.

Chapter 1 Introduction

The financial sector plays a critical role in a country's overall development, despite often being overlooked. It facilitates essential transactions such as bill payments, but its significance extends to more complex functions like business transactions and investments, which can significantly impact economic growth (Levine, 1997).

The global financial crisis in 2008 brought the importance of the financial sector to the forefront. Governments intervened with substantial buyouts to prevent further market disasters and their potential spillover effects on domestic and international economies (Ivashina & Scharfstein, 2008). This demonstrated that neglecting the financial sector could have detrimental consequences for a country's economy. Hence, the development of the financial sector is crucial in mitigating negative effects and supporting economic growth, particularly for developed countries that experienced recessions following the crisis (Reinhart & Rogoff, 2009).

There are inherent differences between developing and developed economies, and it is essential to understand how these differences might affect the relationship between financial development and economic growth. In this study, the focus is on developing countries in Latin America, a region that has witnessed significant economic growth in recent years due to improved macroeconomic policies and positive external conditions (Sosa, Tsounta & Kim, 2013). The financial sector in Latin America has also seen considerable improvements (Torre, Ize &

Schmukler, 2011). Thus, it becomes relevant to explore whether financial development adds value to the growth of their economies.

By studying the relationship between financial development and economic growth in Latin America, this research aims to provide insights into the significance of the financial sector for the region's development. Understanding the dynamics of this relationship can help policymakers in Latin American countries make informed decisions to foster economic growth and stability. Additionally, analyzing the differences in this relationship between developing and developed economies can contribute to a broader understanding of the role of financial development in shaping global economic outcomes.

The relationship between economic growth and financial development is based on the fundamental functions of the financial sector that influence capital accumulation and technological advancements. The financial sector's facilitation of business transactions contributes to economic growth (Levine, 1997). The development of the financial sector involves improving its core functions and reducing barriers set by governments that may hinder transactions in the economy (McKinnon, 1973). Patrick's theory (1966) is commonly used to describe the expected causal relationship between economic growth and financial development, with the concepts of supply-leading and demand-following phenomena explaining the direction of the causality.

Numerous studies have examined the relationship between financial development and economic growth, leading to varying findings. Some studies have identified bidirectional causal relationships, indicating that economic growth and financial development mutually influence each other (Luintel & Khan, 1999; Khalifa Al-Yousif, 2002). However, other studies have produced conflicting results, with some suggesting a positive role of financial development in economic growth (Odedokun, 1994; Dawson, 2008), while others found no significant effect (Demetriades & Hussein, 1996; Shan, 2005). Some researchers, such as Xu (2000) and Ghirmay (2005), argued that the impact of financial development on economic growth cannot be ignored, as it remains a vital factor in shaping economic outcomes.

Given the mixed evidence from previous studies, this research aims to provide further insight into the relationship between financial development and economic growth, specifically in the context of Latin American countries. By analyzing the causal relationship through fixed effects and instrumental variables, and considering two different financial development indicators, this study seeks to contribute to the understanding of how financial development influences economic growth in this specific region. The findings can inform policymakers about the significance of the financial sector in promoting economic growth in Latin America and potentially offer lessons for other developing regions.

The results of this study provide important insights into the relationship between financial development and economic growth in Latin America. The analysis used a panel regression approach with fixed effects models and instrumental variables to address the issue of endogeneity. By controlling for country-specific effects and using different financial development indicators, this research aimed to obtain more robust and reliable results.

The findings suggest that there is no statistically significant impact of financial development on economic growth in Latin America, regardless of the financial development indicator used. This indicates that the development of the financial sector may not have a significant direct influence on the growth of these economies. These results are consistent with some previous studies that also found no significant relationship between financial development and economic growth in the region (Blanco, 2009).

However, the analysis also revealed some support for the supply-leading phenomenon in certain models, particularly when using specific instrumental variable sets. This suggests that in some cases, financial development may have a positive impact on economic growth in Latin America, possibly through facilitating capital accumulation and technological advancements.

The study highlights the complexity of the relationship between financial development and economic growth and underscores the need for careful consideration of different indicators and methodologies. The presence of bidirectional causality and the potential endogeneity of financial development in

the growth process make it challenging to establish a clear and consistent relationship.

Overall, the research contributes to the existing literature on financial development and economic growth in Latin America, providing valuable insights for policymakers and researchers. It emphasizes the importance of further investigation into the specific mechanisms through which financial development affects economic growth in the region and calls for more refined methodologies to address endogeneity concerns.

The main findings of the study suggest that there is some evidence supporting the supply-leading phenomenon, but it is not particularly strong. On the other hand, the demand-following phenomenon received more support in the context of Latin American countries. Additionally, the developed countries showed slightly more evidence of the supply-leading phenomenon, indicating that the relationship between financial development and economic growth might vary based on the level of development of the countries involved.

One important takeaway from the study is that the choice of financial development indicators can significantly influence the results and conclusions. Hence, researchers need to carefully select appropriate indicators when investigating the relationship between financial development and economic growth to avoid potential biases in the findings.

The next chapter provides the theoretical basis for the empirical tests and summarizes previous studies related to the subject, establishing a strong foundation for the research. The third chapter describes the methodology used for investigating the relationship between financial development and economic growth, including data description and empirical specification. This chapter outlines the techniques applied to analyze the data, ensuring transparency and reproducibility of the results.

In the fourth chapter, the study presents its results, including a robustness analysis. The robustness analysis is crucial to verify the consistency and reliability of the findings under various assumptions or conditions. It helps strengthen the credibility of the study's conclusions.

Finally, in the fifth chapter, the thesis concludes and provides recommendations concerning the financial development and economic growth relationship for the Latin American region. Addressing the limitations of the study is also crucial as it enhances the understanding of potential constraints and areas for future research.

Chapter 2 Literature Review

In this section, we will explore the prominent theories and evidence commonly used to analyze the relationship between financial development and economic growth. We begin with an explanation of economic growth and the potential drivers behind it. We then delve into theories that revolve around financial development and its potential impact on economic growth. Moreover, we will pay specific attention to the context of Latin American countries.

To gain a comprehensive understanding of this relationship, we will review various research papers that have investigated the topic over time. These studies have employed different methodologies to analyze the variables involved. By highlighting these diverse approaches, we aim to provide a nuanced perspective on the subject.

Lastly, we will synthesize the most noteworthy and relevant aspects of the theories and methodologies concerning the link between financial development and economic growth. By doing so, we aim to offer insights into the potential

implications and relevance of this relationship in the context of economic development and policymaking.

Development of the Financial Sector

The financial sector is an integral part of the economic environment, providing the necessary infrastructure for various transactions. It encompasses entities such as the central bank, national banks, stock and securities markets, pension funds, and insurers, all of which play a crucial role in a country's development.

According to Ang (2008), financial institutions emerge in response to transaction and information costs in the market. The process of matching savers and borrowers can be complex and costly without reliable intermediaries. Individuals looking to invest face challenges in identifying credible investment opportunities, leading to time-consuming and expensive negotiations. This creates barriers for project leaders seeking funding for their ventures. However, financial institutions have the capacity to reduce these costs through their functions.

The main functions of the financial sector, as identified by Levine (1997), include the mobilization of savings for investments, evaluation of investment projects, resource allocation, information collection, corporate control activities, and risk management. Efficient mobilization of savings is crucial for projects dependent on access to capital. Financial institutions facilitate the evaluation of investment

opportunities, reducing costs associated with selecting viable projects and improving resource allocation. They also act as intermediaries, further reducing information collection costs and corporate control activities. Additionally, the financial sector enables risk diversification at a lower cost compared to other methods, simplifying transactions for organizations and individuals.

The common objective of these financial sector functions is to reduce costs in activities that support capital accumulation and technological advancements. The development of the financial sector involves enhancing the quality of these functions. Changes in the legal framework, including government-mandated regulatory rules, also influence the quantity and quality of financial services and institutions (Levine, 2005).

Ahmed and Ansari (1998) highlight two dimensions of financial development: financial widening and financial deepening. Financial widening refers to an increased availability of financial services and institutions in a country, while financial deepening involves higher financial services and institutions per capita or a greater ratio of financial assets to income. Financial development is also synonymous with financial liberalization, as described by McKinnon (1973). It entails minimizing distortions in the financial system, such as letting market mechanisms determine financial service prices instead of national authorities. Such distortions hinder the proper functioning of financial markets, impeding savings and capital accumulation. Financial liberalization is seen as a means to improve market transactions in the financial sector.

The financial sector's fundamental role in the economy has become increasingly apparent over the years. Its functions, particularly in reducing investment costs, directly and indirectly contribute to the overall development of the economy. A well-developed financial sector is expected to positively influence economic development, making it a key factor in fostering economic growth and prosperity.

Economic Growth

Major strategic decisions and activities in a country are driven by the goal of fostering economic growth. Extensive research is conducted to identify the determinants of sustained economic growth, which can guide stakeholders on where to invest their efforts. Economic growth is influenced by a combination of macroeconomic policies and the institutional conditions within a country's economic environment.

One widely used approach to understanding economic growth is the aggregate production function, often referred to as the neoclassical production function, introduced by Solow (1957). It represents total output (Y) as a function of technology (A) or total factor productivity (TFP), physical capital (K), and labor (L). Technological progress, represented by TFP, affects the production function in a Hicks-neutral manner, meaning it does not directly impact the marginal products of labor and capital.

To study changes in output and the contributions of physical capital and labor to economic growth, the production function is transformed into a growth rate equation. This allows for the analysis of how changes in physical capital and labor influence changes in output. The growth rate equation (3) suggests that economic growth can be partly explained by the growth of TFP, physical capital, and labor. The elasticity measures (α and β) represent how changes in physical capital and labor relate to the growth rate of the economy.

Researchers use this model to analyze the determinants of economic growth, estimating regression equations that include other variables thought to significantly impact economic growth based on theories and assumptions. These additional variables might include education levels, government involvement in the economy, trade openness, legal frameworks, and political risk.

In studies examining the importance of financial development for economic growth, the same model is employed, with the inclusion of a financial development variable (F). This variable reflects the idea that the development of the financial sector can contribute to economic growth. The model with added control variables helps capture the specific impact of financial development on economic growth while controlling for other potential factors. Equation (6), with δ representing the elasticity measure of financial development with respect to economic growth, forms the basis for empirical tests in these studies.

$$Y_t = A_t + Ak_t + BI_t + \Theta f_t \qquad (6)$$

Financial Sector Interaction with Economic Growth

The relationship between the financial sector and economic growth is based on the belief that the financial sector plays a crucial role in providing funds for capital accumulation and the development of innovative technologies. These factors are fundamental drivers of economic growth. A well-functioning financial sector contributes to economic and financial stability, while a dysfunctional one can have adverse effects on the economy, leading to destabilization, increased costs, and potential spill-over effects in times of financial crisis.

Financial development has notable effects, including a decrease in investing and saving transaction costs, which ultimately reduces the cost of capital in the domestic economy. Financial institutions assist in selecting profitable investments, minimizing moral hazard and adverse selection difficulties for companies. This results in the channeling of savings into productive investments, supporting and promoting economic growth. As a result, the development of the financial sector is encouraged as one of the drivers of economic efficiency by multinational agencies and national governments.

The direction of the relationship between financial development and economic growth can be a matter of debate. It could be either supply-leading, where financial development promotes economic growth, or demand-following, where financial development reacts to the demands of the population for financial services. The supply-leading phenomenon suggests that the financial sector stimulates growth through the establishment of financial institutions and services, which leads to increased economic transactions. On the other hand, the demand-following perspective sees the financial sector shaped by the behavior of economic growth, responding to the demands of borrowers, investors, and savers in the economy.

However, in practice, these phenomena may interact and evolve over time. An interaction between supply-leading and demand-following is expected, with supply-leading institutions initiating the growth process, but as more transactions and consumers become involved, the demand for financial services may shift. This could lead to a transition from supply-leading to demand-following, where economic growth starts driving further financial development.

Overall, understanding the relationship between financial development and economic growth is crucial for policymakers in making informed decisions on economic policies. The dynamics between the financial sector and economic growth are complex and ever-changing, requiring ongoing analysis and evaluation to ensure sustainable and inclusive economic development.

Evidence on Economic Growth and Financial Development

According to the theory, there exists a relationship between financial development and economic growth, implying that the development of the financial sector can influence the growth of the economy. Additionally, the theory proposes two potential causal directions: improved financial services provided by

financial institutions leading to economic growth or economic growth driving the development of the financial sector.

To examine and support these ideas empirically, numerous studies have been conducted. These studies aim to analyze the causal relationship and the impact financial development has on economic growth. Some researchers also adopt a long-run perspective by investigating the possibility of a cointegrating relationship between financial development and economic growth.

In recent times, there has been a shift in research methodology from using cross-sectional data to employing time series data in panel data analyses. This shift is attributed to the advantages offered by panel data, as highlighted by Levine, Loayza, and Beck (2000). Panel data analysis allows for studying the effect of financial development on economic growth over time for multiple countries. Unlike cross-sectional regressions, panel data estimations account for unobserved country-specific effects, leading to more accurate coefficient estimates.

The use of panel data also facilitates comparisons between different groups defined by income level or location, providing a more comprehensive understanding of the relationship between financial development and economic growth across diverse economic contexts. This approach helps to uncover potential differences in the impact of financial development on economic growth in various income groups or regions.

Overall, empirical studies using panel data analysis have contributed valuable insights into the relationship between financial development and economic growth. They offer a nuanced understanding of the causality and impact of financial development on economic growth, supporting the notion that a well-developed financial sector can indeed foster economic growth and development.

Evaluation financial development

In the relevant studies, the choice of financial development indicators varies depending on the countries and regions under investigation. One crucial consideration is the type of financial system prevalent in each country, whether it is a market-based or bank-based financial system. This distinction guides researchers in selecting appropriate financial development indicators for their analysis.

For example, in countries with market-based financial systems, researchers may include indicators that capture the development of stock and bond markets, in addition to the conventional indicators measuring the performance of bank-based systems. Tailoring the choice of indicators to the specific characteristics of the financial system ensures a more accurate representation of financial development in each country.

The number of financial development indicators selected also varies across studies. Some researchers argue that a single variable is sufficient to capture the expected impact of financial development on the economy. They might focus on a specific indicator that they believe best represents financial development in the context of their research.

However, others argue that relying solely on one indicator might not adequately capture the complexity and nuances of financial development in a country. Hence, they opt to use multiple indicators and aggregate them into one comprehensive indicator, providing a more comprehensive assessment of financial development.

Moreover, some researchers explore the possibility that different financial development measurement variables could yield varying results. Therefore, they

use multiple indicators to test how the choice of indicators may influence their findings.

Two common financial development indicators used in various studies are the amount of credit in the economy and the relative amount of liquid liabilities. These indicators measure the depth and size of the financial sector. In some cases, these indicators are chosen as the sole representation of financial development in a country (Gregorio & Guidetti, 1995; Khadraoui & Smida, 2012).

In summary, the choice of financial development indicators in studies is influenced by factors such as the type of financial system, researchers' preferences, and the complexity of the financial development concept. Researchers may opt for a single indicator, multiple indicators, or a combination of indicators to measure and assess the impact of financial development on economic growth accurately.

Relationship between financial development on economic growth

In various relevant studies, researchers estimate equations to assess the impact of financial development on economic growth. The financial development variable is included as an independent variable in these equations, allowing researchers to analyze its significance in influencing economic growth, the dependent variable. Across different studies with diverse sample sizes, methodologies, and time spans, the hypothesis of financial development having no impact on economic growth is widely rejected.

For example, Odedukon (1994) conducted growth equations using Ordinary Least Squares (OLS) and Generalized Least Squares methods for data from 71 least developing countries over the period 1964-1989. He found a positive relationship between financial development and economic growth. Financial development was found to be equally important as other determinants of growth, such as trade

openness and investment share of the economy, contradicting the belief that financial development's contribution to economic growth is insignificant.

Khan and Senhadji (2003) observed the impact of financial development on economic growth for 159 developing and industrial countries from 1960 to 1999. They used OLS for cross-section data and Two Stage Least Squares (TSLS) for panel data. Their findings supported the positive influence of financial development on economic growth. They also cautioned that the choice of financial development indicators might yield varying effects on economic growth.

Dawson (2008) took a different approach and employed three growth equations based on Solow's theory. Each equation included different financial development measurement variables. The results, obtained through panel data estimations for 44 developing countries spanning 1974-2001, showed that financial development indeed impacts economic growth. The equations with growth rates of credit and the share of credit in the economy were found to be empirically superior.

Khadraoui and Smida (2012) used panel data for 70 developing and developed countries between 1970 and 2009, estimating equations with OLS and the generalized method of moments. They employed five different measures of financial development, including credit level, liquid liabilities, market capitalization, and financial system assets to GDP. Despite the diverse choice of indicators, their results consistently supported the positive impact of financial development on economic growth.

In conclusion, multiple studies using various methodologies and indicators consistently demonstrate the positive impact of financial development on economic growth. The evidence overwhelmingly supports the notion that a well-developed financial sector contributes significantly to economic growth and development.

Asia's Financial Development

In this section, we focus on analyzing key aspects of financial development in developing Asia. Our exploration begins with a comparison of financial depth between developing Asian countries and those of the Organisation for Economic Co-operation and Development (OECD). Financial depth is measured by traditional indicators such as the bank credit to GDP ratio, which indicates the size of the financial sector relative to the overall economy. Additionally, we examine the financial structure using indicators like the ratio of bank credit to stock market capitalization, which sheds light on the relative importance of banks and stock markets in financing the economy.

Furthermore, we investigate the trends in financial depth and structure across different subregions of developing Asia over time. This analysis will provide insights into the varying patterns of financial development within the region.

To gain a deeper understanding of financial access, we compare major developing Asian countries with industrialized nations. Financial access refers to the ease with which individuals and businesses can access financial services and products. By comparing these countries, we can identify any disparities in financial inclusion and assess the accessibility of financial services for different segments of the population.

Finally, we turn our attention to the relationship between financial development and economic growth in developing Asia. We aim to explore how financial development has impacted economic growth over time, and whether there have been changes in this correlation since the Asian financial crisis. Understanding this relationship is essential for policymakers and stakeholders in their efforts to foster economic growth through targeted financial development strategies.

By examining these stylized facts of financial development in developing Asia, we seek to provide valuable insights into the region's financial landscape and its implications for economic growth and stability.

Chapter 3 Methodology

In the study investigating the supply-leading phenomenon in Latin America, the research follows a specific empirical specification. The starting point for the analysis is the Solow growth model, which is a well-known economic model used to understand the relationship between economic growth and factors such as capital accumulation and technological progress.

The Solow growth model typically considers factors like capital, labor, and technological progress to explain economic growth in the long run. The study may have extended or modified this model to fit the specific context of Latin American economies and to capture the supply-leading phenomenon.

Next, the study defines and selects specific financial development indicators to measure the level of financial development in the Latin American countries under investigation. Financial development indicators could include measures like the ratio of private credit to GDP, the number of bank branches per capita, or the size of the stock market, among others. These indicators are important because they can reflect the efficiency and depth of the financial system, which might influence the supply-leading phenomenon.

Apart from financial development indicators, the study incorporates other relevant variables that could potentially affect the supply-leading phenomenon in Latin America. These variables might include measures of infrastructure development, human capital, trade openness, political stability, and other macroeconomic factors that could influence the relationship between supply and demand in the region.

To analyze the data and test for the supply-leading phenomenon, the study employs a fixed effects model. The fixed effects model is a statistical method used to control for time-invariant variables or unobservable heterogeneity that might exist across the different countries in the sample. This helps isolate the specific effects of the variables of interest, such as financial development indicators and other relevant variables, on the phenomenon under investigation.

Additionally, the study extends the fixed effects model by using instrumental variables to address potential endogeneity issues. Endogeneity arises when the independent variables in the model are correlated with the error term, leading to biased and inconsistent parameter estimates. By introducing instrumental variables, the study aims to establish a causal relationship between the financial development indicators and the supply-leading phenomenon more robustly.

The choice of instrumental variables is crucial to ensure they are strongly correlated with the endogenous variables (financial development indicators) but not directly related to the dependent variable (supply-leading phenomenon). These instruments help identify the causal effect of financial development on the supply-leading behavior in Latin American economies.

Overall, the empirical specification, data, and estimation methods used in the analysis are carefully designed to provide rigorous evidence for the supply-leading phenomenon in Latin America, accounting for potential confounding factors and endogeneity issues.

Empirical Specification

The chosen approach of using a fixed effects model with instrumental variables to study the relationship between financial development and economic growth is a thoughtful and rigorous method to address potential issues that commonly arise in such analyses. Let's further examine the rationale behind this approach:

Preference for Fixed Effects Model: The decision to opt for a fixed effects model is driven by the need to control for country-specific effects. Each country may have unique characteristics and unobservable factors that can influence both financial development and economic growth. By using fixed effects, the analysis focuses on within-country variations over time, helping to isolate the impact of financial development on economic growth while holding constant country-specific factors.

Instrumental Variables to Address Endogeneity: The use of instrumental variables is motivated by the desire to control for endogeneity in the relationship between financial development and economic growth. Endogeneity occurs when financial development and economic growth are mutually determined, leading to potential biases in the estimation. Instrumental variables help address this issue by providing a way to identify the causal direction of the relationship.

Identification of Supply-Leading Phenomenon: The primary objective of this research is to find evidence of the supply-leading phenomenon, which suggests that financial development leads to economic growth. By using a fixed effects model with instrumental variables, the study aims to establish a causal link between financial development and economic growth while controlling for other factors that could influence the relationship.

Causality Inference: The instrumental variables approach allows researchers to draw more robust conclusions about the direction of causality between financial

development and economic growth. By addressing endogeneity concerns, the study can better determine whether financial development drives economic growth or vice versa.

In summary, the choice of using a fixed effects model with instrumental variables demonstrates a careful and methodical approach to analyze the relationship between financial development and economic growth, with the ultimate goal of providing evidence for the supply-leading phenomenon in the context of Latin American economies. This approach helps control for country-specific effects and endogeneity, thus contributing to the reliability and validity of the study's findings.

$$Y_t = B_1 K_t + B_2 I_t + B_3 F_t + B_4 G_t + B_5 Tot + e_t \quad (7)$$

Equation (7) represents the econometric model used to analyze the relationship between economic growth and several explanatory variables, including the growth rate of physical capital, the growth rate of labor, the growth rate of financial development, the growth rate of government involvement in the economy, the growth rate of a country's trade openness, and the error term capturing the unexplained part of economic growth.

To summarize the components of the equation:

Economic Growth (Growth of Output): The dependent variable, denoted as "", represents the growth rate of economic output or economic growth. It measures the percentage change in output over a specific time period.

Explanatory Variables: The equation includes five explanatory variables, which are expected to influence economic growth:

Growth Rate of Physical Capital (""): This variable represents the percentage change in physical capital over time, which includes assets such as machinery, equipment, and infrastructure.

Growth Rate of Labor (""): It denotes the percentage change in the labor force or the number of workers over a given time period.

Growth Rate of Financial Development (""): This variable represents the percentage change in financial development indicators, which were chosen for the study.

Growth Rate of Government Involvement in the Economy (G): It captures the percentage change in the government's role and interventions in the economy, such as government spending and fiscal policies.

Growth Rate of Trade Openness (TO): This variable represents the percentage change in a country's trade openness, which is typically measured by the ratio of total trade (exports plus imports) to GDP.

Solow Residual (TFP): The Total Factor Productivity (TFP) is considered as part of the residual in the growth equation. It captures the unexplained contributions of other sources of economic growth that cannot be explicitly identified or measured. In this context, the Solow Residual (TFP) represents the part of economic growth that is not accounted for by the specified explanatory variables.

Error Term: The error term (ε) captures the unexplained part of economic growth that cannot be explained by the included variables. It includes the Solow Residual (TFP) and represents the influence of other factors or sources of growth that are not explicitly considered in the model.

By estimating this econometric model using fixed effects and instrumental variables, the study aims to investigate the relationship between economic growth and the specified variables, while accounting for country-specific effects and controlling for endogeneity. The inclusion of control variables for government involvement in the economy and trade openness allows for the examination of their impact on economic growth, providing valuable insights into the relationship between these variables and economic performance in Latin American economies.

Data

Sample and Data Source:

- The sample consists of 18 countries classified as Latin American countries by the World Bank, and an additional 18 countries classified as OECD (developed) countries.
- The time frame for the study is from 1980 to 2011.
- All the annual data used in the analysis were collected from the World Bank databases, ensuring a reliable and consistent data source.

Economic Growth Measurement:

- Economic growth is measured using the growth rates of two indicators: real GDP per capita and real GNI per capita.
- Gross National Income (GNI) is used as a complementary measure of income alongside GDP. It includes receipts from abroad for investment owned by the domestic population minus receipts owed to foreigners from their investment in the domestic economy. GNI is considered more comprehensive and suitable for comparing countries' income levels.

- However, the use of GNI might be limited by data availability for some countries in the sample.

  By employing data from reliable sources such as the World Bank databases and measuring economic growth using both real GDP per capita and real GNI per capita, the study aims to ensure robustness and comparability of its findings. The inclusion of both Latin American and OECD countries allows for a comparison between developing and developed economies, providing insights into the relationship between financial development and economic growth in different contexts.

Choice of Financial Development Indicators:

- The literature review indicates that different studies use different measurements of financial development, and these indicators can have an impact on the study results.
- To capture the level of financial sector development comprehensively and allow for a comparison of the indicators, the study uses two different financial development indicators.

Consideration of Developing Countries:

- The sample countries in the study are considered developing countries, and they predominantly have bank-based financial systems.
- This consideration influenced the choice of financial development indicators to suit the characteristics of these economies.

First Financial Development Indicator: Growth Rate of the Ratio of Broad Money to GDP (G_M2):

- Broad money includes various monetary aggregates and represents the total money supply in an economy, including cash and deposits.

- The ratio of broad money to GDP reflects the extent of monetization in the economy, indicating the degree to which money is used for payments and saving purposes.
- The use of broader monetary aggregates, such as G_M2, is preferred over narrower versions (e.g., M1) as it captures the functions of the financial sector more comprehensively.
- G_M2 also represents the financial deepening of the economy, indicating the expansion of financial services in the country.
- The inclusion of bank deposits that finance credit in G_M2 makes it a measure of financial intermediation in the economy, reflecting the role of the financial sector in channeling funds from savers to borrowers.

By using both G_M2 and another financial development indicator, the study aims to provide a more comprehensive analysis of the relationship between financial development and economic growth in the context of developing countries with bank-based financial systems. These indicators help capture different aspects of financial sector development, enhancing the understanding of how financial development influences economic growth in the sample countries.

Second Financial Development Indicator: Growth Rate of the Ratio of Domestic Credit to the Private Sector to GDP (G_DCPS):

The second financial development indicator, G_DCPS, is a crucial measurement of financial sector activity in developing Asia. It specifically focuses on domestic credit allocated to the private sector as a percentage of GDP. This ratio highlights the role of financial intermediaries in facilitating the flow of funds from savers to borrowers within the private sector.

G_DCPS excludes credit provided to the public sector, which means it represents actions carried out by private market participants. By excluding credit to the public sector, the ratio directly reflects the

financial sector's impact on economic growth, as any increase in G_DCPS directly influences the level of investments in the private sector.

The importance of G_DCPS lies in its role in reducing investment costs for the population, which, in turn, encourages higher levels of investments in productive activities. By enabling domestic credit to be widely used for financing local companies' investments, G_DCPS enhances productivity and contributes significantly to economic growth.

It is worth noting that while G_DCPS represents only one aspect of the financial sector's activity, specifically the provision of credit to the private sector, it remains a valuable measurement of financial development, especially in developing countries. In these economies, access to domestic credit is essential for promoting local investments and driving economic growth.

By using G_DCPS alongside the first financial development indicator, G_M2, this study aims to provide a comprehensive understanding of how different aspects of financial sector development influence economic growth in developing Asian countries. By considering these two indicators, we can gain valuable insights into the specific ways in which financial development impacts economic development, particularly in the context of developing economies that heavily rely on domestic credit to stimulate productive investments and drive economic progress.

Explanatory Variables:

- The study includes several other explanatory variables to account for factors that influence economic growth.
- Physical capital and labor are included in line with the Solow growth model, which highlights their significant roles in economic growth.
- Additionally, the government's involvement in the economy (G_GOV) and a country's trade openness (G_TO) are included to capture some of the unexplained part of economic growth.

Physical Capital (G_INV):

- G_INV represents the growth rate of physical capital and is measured as the growth rate of the share of gross capital formation in GDP.
- Capital accumulation is a crucial determinant of economic growth, and G_INV serves as a proxy for the investment in physical capital.
- An increase in physical capital is expected to have a positive relationship with economic growth due to several reasons:
    - It leads to an increase in the level of output by enhancing productivity through better machines and technologies in the production process, resulting in lower production costs and higher production levels.
    - The productivity gains contribute to economic growth, as more output can be generated with the same amount of labor.
    - Higher investment in physical capital stimulates economic activity and fosters innovation, both of which contribute to economic growth.

Labor (G_POP):

- G_POP represents the growth rate of the labor force and is measured by the growth rate of the population level.
- Labor is a fundamental factor in the production process, and its growth rate is expected to have a negative relationship with economic growth due to the diminishing returns to labor.
- An increase in the growth rate of the labor force implies that available physical capital must be spread among more individuals, potentially leading to reduced output per capita and slower economic growth.

    By including these explanatory variables in the analysis, the study aims to account for the influence of physical capital, labor, government involvement, and trade openness on economic growth, providing a more comprehensive understanding of the determinants of economic growth in the sample countries.

Indeed, capital accumulation, represented by the growth rate of physical capital (G_INV), is a fundamental driver of economic growth. In summary, the growth rate of physical capital (G_INV) serves as a key indicator of capital accumulation, which significantly contributes to economic growth. Investment in physical capital not only enhances productivity but also impacts labor productivity, ultimately leading to increased output and overall economic growth.

The growth rate of labor (G_POP) is another crucial factor that significantly impacts economic growth. As the labor force increases, the available physical capital must be distributed among more individuals, potentially leading to a decrease in labor productivity and output per capita. Therefore, the relationship between labor growth and economic growth is expected to be negative, especially when measured on a per capita basis.

Indeed, national governments play a crucial role in shaping the economic environment and can significantly impact economic growth. the growth rate of government involvement in the economy (G_GOV) is used as a control variable to account for the impact of government decisions and policies on economic growth. Excessive regulations, unfavorable taxation policies, and certain government spending practices can have a negative effect on economic growth, while well-targeted policies can stimulate productivity and foster economic expansion.

The growth rate of the degree of a country's openness to trade (G_TO) is the last control variable chosen in the study. the growth rate of a country's openness to trade (G_TO) is included as a control variable to capture the positive influence of engaging in international trade on economic growth. Trade openness can lead to increased efficiency, productivity, and access to a broader range of goods and services, contributing to economic growth. However, it is essential for policymakers to consider the potential impact on the domestic distribution of income and implement measures to ensure that the benefits of trade are shared more inclusively across the economy.

Next, I describe the two estimators, fixed effects and fixed effects with instrumental variables,   used in the analysis.

In the analysis of the impact of variables over time, a Fixed Effects (FE) model is used. The FE model is appropriate for analyzing relationships between explanatory variables and a dependent variable within a cross-section, in this case, a country. The sample in this analysis consists of several cross-sections, specifically 18 countries.

The Fixed Effects model addresses the issue of individual characteristics specific to each cross-section (country) that could potentially influence the dependent variable (economic growth). These individual characteristics may introduce bias to the dependent variable and the coefficient estimates if they are not accounted for.

To correct for this bias, the Fixed Effects model introduces fixed effects in the Ordinary Least Squares (OLS) estimation. The inclusion of fixed effects helps to control for individual country-specific factors that might affect economic growth, allowing for more accurate estimation of the relationships between the independent variables (the growth rates of the five variables) and the dependent variable (economic growth).

The equation (7), which includes economic growth as the dependent variable and the growth rates of the five variables as independent variables, is transformed to include the fixed effects. This results in equation (8), which enables a more robust analysis of the impact of the explanatory variables on economic growth, considering the unique characteristics of each country in the sample.

$$Y_{it}=a_i+X_{it}B+E_{it} \quad (8)$$

The intercept term<a_i> is varies per cross-section but not per time. It captures all observable and unobservable time-invariant differences across the individual countries. is the dependent variable economic growth. is a vector of the explanatory variables which include the growth rate of the financial development indicators, growth rate of broad money as share of GDP (G_M2) or the growth rate of the ratio of the domestic credit to the private sector as share of GDP (G_DCPS). The vector includes also the growth rates of the other explanatory variables, growth rate of physical capital (G_INV), growth rate of labor (G_POP), the growth rate of the 30 government's involvement in the economy (G_GOV) and

the country's openness to trade (G_TO). Equation (8) is supposed to serve for analyzing the impact of financial development on economic growth. However, finding evidence for the supply-leading phenomenon necessitates one more adjustment in order to be certain that the estimation is capturing the desired relationship from financial development influencing economic growth and not the opposite. This is possible when correcting for endogeneity with instrumental variables.

Instrumental variables

In the analysis of the impact of variables over time, a Fixed Effects (FE) model is used. The FE model is appropriate for analyzing relationships between explanatory variables and a dependent variable within a cross-section, in this case, a country. The sample in this analysis consists of several cross-sections, specifically 18 countries.

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Using instrumental variables (IVs) in the Two-Stage Least Squares (TSLS) estimation method is indeed a valid approach to address endogeneity and estimate the growth equation based on the supply-leading phenomenon. By employing IVs, the analysis can focus on the causal impact of financial

development on economic growth while controlling for potential reverse causality and other endogeneity issues.

Selecting appropriate IVs is a critical step in the estimation process. Weak or invalid instruments can lead to inefficient estimates and compromise the validity of the results. Lagged values of the explanatory variables are a common choice in the literature for IVs. Using lagged values as instruments helps ensure that they are exogenous, as they are not directly influenced by the current error term and are theoretically related to the current explanatory variables.

In our study, using three different instrument sets can provide robustness checks and strengthen the validity of the results. Different instrument sets can capture various aspects of exogeneity and help to address potential weaknesses in the IVs.

Overall, by employing the TSLS estimation method with appropriate IVs, you can obtain consistent and unbiased coefficient estimates for the growth equation, thereby gaining insights into the relationship between financial development and economic growth and ruling out the influence of endogeneity. This approach enhances the reliability of the findings and contributes to a better understanding of the role of financial development in promoting economic growth in the sample countries.

The equation (7), which includes economic growth as the dependent variable and the growth rates of the five variables as independent variables, is transformed to include the fixed effects. This results in equation (8), which enables a more robust analysis of the impact of the explanatory variables on economic growth, considering the unique characteristics of each country in the sample.

Chapter 4 Results

In this section, I present the results of the estimations examining the relationship between financial development and economic growth in the Latin American countries. Before delving into the regression analysis, I provide some descriptive statistics to shed light on the financial development and economic growth trends in these countries.

Next, I proceed with the estimation of different growth equations using instrumental variables (IVs) to address endogeneity. The IVs are carefully selected to ensure their exogeneity and validity. Similar estimations are also conducted for the developed countries, providing a benchmark for the Latin American countries' performance.

To enhance the robustness of the findings, alternative measures of economic growth and different instrument sets are utilized in the estimations. This allows for a comprehensive analysis of the relationship between financial development and economic growth while ensuring the validity and reliability of the results.

Overall, this section aims to provide a thorough examination of the impact of financial development on economic growth in the Latin American countries, considering various methodological approaches and benchmarking against

developed countries. The results obtained will contribute to a deeper understanding of the determinants of economic growth in the region and potentially inform policy decisions aimed at promoting economic development.

Table 1: Growth percentages Latin America

	G_dcps	G_M2	G_gdp	G_gni	G_inv	G_pop	G_to	G_gov
Mean	0.009	0.016	0.011	0.011	-0.001	0.017	0.011	0.003
Maximum	1.175	0.827	0.151	0.142	1.006	0.035	1.094	1.513
Minimum	-1.110	-1.298	-0.164	-0.256	-0.895	-0.009	-0.558	-0.854
Std.Dev	0.191	0.171	0.043	0.052	0.172	0.008	0.132	0.134

* Note: This table includes the summary values including the mean and standard deviation of the growth rate of the ratio of domestic credit to the private sector to GDP (G_DCPS), the growth rate of the ratio of broad money to GDP (G_M2), the growth rate of real Gross Domestic Product per capita (G_GDP), the growth rate of real Gross National Income per capita, the growth rate of physical capital (G_INV), the growth rate of labor (G_POP) and the growth rate of government's involvement in the economy (G_GOV). These values are calculated from the common sample of 18 Latin American countries.

Table 1 shows that most of the variables have positive mean growth percentages in both the developing and developed country samples, indicating overall positive growth trends. However, the growth percentages are relatively small, with values less than one percent per year. Notably, physical capital does not show any growth in either sample.

Among the variables, the growth of labor exhibits the highest mean growth percentage, suggesting a consistent increase in the labor force over time. Regarding the financial development indicators, G_M2 shows the highest mean growth percentage, implying a steady increase in the ratio of broad money to GDP. For the developed countries, both financial development indicators (G_M2 and G_DCPS) display higher mean growth percentages compared to the Latin American countries.

These descriptive statistics provide an overview of the growth patterns in the variables, setting the stage for the subsequent regression analysis. The findings

highlight the importance of considering the different growth trajectories of the variables when examining their impact on economic growth and financial development.

Exploring the possibility of an existing linear relationship between financial development and economic growth is crucial for understanding their potential impact on each other. Calculating correlation values and testing their statistical significance can provide valuable insights into the strength and direction of the relationship.

By examining the correlation between financial development indicators (G_M2 and G_DCPS) and economic growth (G_GDP) for both the developing and developed country samples, researchers can determine if there is a significant association between these variables. A positive correlation coefficient would suggest that higher financial development is associated with higher economic growth, while a negative correlation coefficient would imply the opposite. On the other hand, a correlation coefficient close to zero would indicate a weak or negligible relationship.

Conducting such correlation analyses is a necessary preliminary step in assessing the potential causal relationship between financial development and economic growth. However, it's important to note that correlation does not imply causation, and further analysis, such as regression models with proper control variables and instrumental variables, is needed to establish a causal relationship.

In summary, exploring the correlation between financial development indicators and economic growth can help researchers identify potential patterns and associations, but additional analyses are required to establish causality and understand the underlying dynamics between these variables.

Table 2: Correlation Matrix Growth Rates Latin America

	G_dcps	G_M2	G_gdp	G_gni	G_inv	G_pop	G_to	G_gov
G_dcps	1							
G_M2	0.582***	1						
G_gdp	0.100**	0.036	1					
G_gni	0.123***	0.086*	0.908***	1				
G_inv	0.100**	0.107**	0.461***	0.401***	1			
G_pop	-0.031	-0.005	-0.158***	-0.189***	-0.027	1		
G_to	0.007	0.043	-0.001	-0.155***	0.255***	-0.056	1	
G_gov	0.311***	0.297***	0.057	0.076	0.055	-0.020	-0.020	1

Note: *, **, ***, reflects significance at the 10%, 5% and 1% level.

The analysis of the correlation statistics suggests the following findings regarding the linear relationship between financial development, trade openness, government involvement, physical capital growth, labor growth, and economic growth in both developing and developed countries:

1. Financial Development and Economic Growth: Both financial development indicators show a positive correlation with economic growth (G_GDP) in both developing and developed countries. However, the correlation is weak, indicating that the relationship is not very strong. Only the growth rate of domestic credit to the private sector to GDP (G_DCPS) has a statistically significant correlation with economic growth, suggesting that this indicator has a more meaningful impact on economic growth.

2. Trade Openness and Government Involvement: The growth of the country's openness to trade (G_TO) and the growth rate of the government's involvement in the economy (G_GOV) show no statistically significant linear relationship with economic growth in Latin American countries. However, in developed countries, both indicators have a highly statistically significant linear relationship with economic growth, suggesting that trade openness

and government involvement have a more pronounced impact on economic growth in developed economies.

3. Physical Capital and Economic Growth: There is evidence of a statistically significant positive linear relationship between the growth rate of physical capital (G_INV) and economic growth in both developing and developed countries. This finding highlights the importance of capital accumulation (investment) in driving economic growth in both groups of countries.

4. Labor and Economic Growth: The growth rate of labor (G_POP) shows a statistically significant negative linear relationship with economic growth in both developing and developed countries. This finding aligns with the Solow growth model, which suggests diminishing returns to labor and highlights the role of labor in influencing economic output.

In summary, the analysis reveals mixed results regarding the strength and significance of the relationships between the explanatory variables and economic growth in both developing and developed countries. While financial development indicators and physical capital growth are positively associated with economic growth in both groups, the impact of trade openness and government involvement appears to differ significantly between developing and developed countries. Additionally, the negative relationship between labor growth and economic growth is consistent across both groups of countries.

Fixed Effects

The estimations based on equation (9) were performed, and the results are presented in Table 3. Three models were estimated: two basic estimations, each including one of the financial development indicators, and the third one including both financial development indicators.

For the models using data from Latin American countries, it was found that financial development had no statistically significant impact on economic growth. None of the financial development indicators showed statistical significance.

However, it is worth noting that the growth of physical capital had a statistically significant positive impact on economic growth in all three models for both developing and developed countries. This finding underscores the importance of capital accumulation (investment) in driving economic growth in both groups of countries.

Additionally, an increase in the growth of labor had a statistically significant negative impact on economic growth for both developing and developed countries. This finding is consistent with the notion of diminishing returns to labor, as suggested by the Solow growth model.

The growth of a country's openness to trade was not statistically significant in both developing and developed countries, indicating that the impact of trade openness on economic growth was not statistically supported in the models.

Interestingly, the growth of the government's involvement in the economy had no statistically significant impact on the growth of developing economies. However, it had a highly statistically significant negative impact on the growth of developed economies. This suggests that government involvement may have a more pronounced negative effect on economic growth in developed countries compared to developing countries.

Overall, the results highlight the significance of physical capital growth and the potential negative impact of labor growth on economic growth in both developing and developed countries. However, financial development indicators did not show statistically significant relationships with economic growth in the models for either group of countries.

Table 3: FE Latin America, G_GDP as the dependent variable

G_dcps	0.007		0.015
	(0.05)		(1.07)
G_M2		-0.007	-0.015
		(-0.50)	(-1.01)

G_inv	0.122	0.123	0.122
	(6.85)	(7.10)	(6.94)
G_pop	-2.271	-2.276	-2.261
	(-6.94)	(-3.39)	(-3.38)
G_gov	0.002	0.008	0.005
	(0.14)	(0.63)	(0.32)
G_to	-0.048	-0.049	-0.047
	(-1.48)	(-1.56)	(-1.46)
	(-1.48)	(-1.56)	(-1.46)
R2	0.28	0.28	0.31
F-statistic	10.53	10.56	10.16
DW-statistic	1.36	1.35	1.36
N	538	541	538

Based on the results presented and the failure to reject the hypothesis of financial development growth having no impact on economic growth, it appears that the development of the financial sector in both Latin American countries and developed countries has no statistically significant influence on economic growth. This suggests that the relationship between financial development and economic growth is weak and not statistically supported in the models.

The lack of statistically significant impact of financial development on economic growth is not encouraging for the investigation of the supply-leading phenomenon. It is important to consider potential reasons for these results, such as endogeneity in the equations, which could introduce bias and affect the statistical significance of the coefficients for the financial development indicators.

Endogeneity arises when there is a bidirectional causality between the variables, meaning that not only can financial development influence economic growth, but economic growth can also influence financial development. This endogeneity can lead to biased coefficient estimates and difficulty in establishing a clear causal relationship between financial development and economic growth.

Addressing endogeneity issues in the estimation is crucial for obtaining more robust and reliable results. Techniques such as instrumental variable (IV) regression or dynamic panel data models that control for endogeneity can be

employed to improve the validity of the estimates and explore the potential supply-leading phenomenon more effectively.

It is also important to consider other factors that may influence the relationship between financial development and economic growth, such as institutional factors, regulatory environment, and political stability. These factors may interact with financial development and impact its effect on economic growth.

Overall, while the current results indicate a lack of statistically significant impact of financial development on economic growth, further investigation using more sophisticated econometric techniques and considering additional factors is necessary to better understand the relationship between financial development and economic growth in both developing and developed countries.

Table 4: FE-IV (1) Latin America, G_GDP as the dependent variable

G_DCPS	0.139		0.138
	(1.20)		(1.33)
g_m2		-40	-128
		(-0.72)	(-2.31)
G_INV	0.123	0.111	0.122
	(2.96)	(3.11)	(3.25)
G_POP	-1.472	-1.937	-1.326
	(-1.57)	(-2.02)	(-1.44)
G_GOV	0.019	0.084	0.132
	(0.23)	(1.28)	(1.80)
G_TO	-151	-144	-128
	(-0.73)	(-1.16)	(-0.70)
F-statistic	3.21	2.89	3.47
DW-statistic	1.94	1.60	1.89
N	497	502	497

Based on the results from the FE-IV estimations, it is observed that there is no support for the supply-leading phenomenon in Latin America. The financial

development indicators, G_DCPS and G_M2, do not have statistically significant coefficients in any of the estimations, suggesting that financial development is not leading economic growth in the region. Instead, the results indicate that the growth of physical capital has a consistently statistically significant impact on economic growth for both developing and developed countries in Latin America.

Moreover, in the developed countries, there is only slight support for the supply-leading phenomenon, with one out of the three models showing a statistically significant positive coefficient for the G_DCPS financial development indicator. This implies that in developed countries, financial development may have a statistically significant impact on economic growth, leading to higher GDP per capita.

However, regardless of the level of development, the role of physical capital accumulation is consistently and significantly important for economic growth. This indicates that investment in physical capital is a crucial factor in enhancing output and fostering economic growth in both developing and developed countries in Latin America.

The lack of statistically significant impact of financial development on economic growth in Latin America may be attributed to various factors, such as non-well-functioning financial institutions and organizations, hindering the smooth functioning of business transactions and obstructing investments and technological advancements that could drive economic growth.

In conclusion, while the results show no evidence of the supply-leading phenomenon in Latin America, they highlight the importance of physical capital accumulation for economic growth in both developing and developed countries. To gain a deeper understanding of the relationship between financial development and economic growth in the region, further research and analysis of additional factors are warranted. Additionally, addressing potential endogeneity

issues and employing robust econometric techniques can help enhance the validity of the findings.

Robustness Analysis

The analysis of using GNI growth as the dependent variable in the FE and FE-IV estimations provides some interesting insights. In the case of the Latin American countries, using GNI growth as the dependent variable instead of GDP growth results in statistically significant positive correlation coefficients between G_GNI and both financial development indicators (G_DCPS and G_M2). This is in contrast to the previous analysis with GDP growth as the dependent variable, where only one of the financial development indicators (G_DCPS) showed a statistically significant linear relationship.

For the developed countries, there are no drastic changes in the results when using GNI growth as the dependent variable. Similar to the previous analysis, there is a statistically significant linear relationship between financial development and economic growth, with one financial development indicator showing a negative impact and the other showing a positive impact.

These findings suggest that using different measures of economic growth (GNI growth instead of GDP growth) can lead to some variation in the results regarding the relationship between financial development and economic growth in Latin America. It also emphasizes that the choice of the dependent variable can influence the conclusions drawn from the analysis.

Regarding the instrument sets used in the FE-IV estimations, the results may vary depending on the specific instruments chosen. Different instrument sets may

capture different aspects of financial development, which could affect the estimated coefficients. Therefore, it is essential to carefully select appropriate instruments to address potential endogeneity issues and obtain robust results.

Overall, while there are some differences in the results with the use of different measures of economic growth and instrument sets, the main conclusion remains consistent: there is no strong evidence to support the supply-leading phenomenon in Latin America. The impact of financial development on economic growth is not statistically significant, and the growth of physical capital continues to play a consistently significant role in fostering economic growth in both developing and developed countries in the region. Further analysis and robustness checks can provide a more comprehensive understanding of the relationship between financial development and economic growth in Latin America.

Table 5: FE Latin America, G_GNI as the dependent variable

G_DCPS	0.015		0.013
	(0.83)		(0.65)
G_M2		0.016	0.005
		(0.58)	(0.27)
G_INV	0.140	0.141	0.140
	(5.81)	(5.98)	(5.77)
G_POP	-3.098	-3.122	-3.102
	(-3.34)	(-3.43)	(-3.33)
G_TO	-120	122	120
	(-2.86)	(-2.98)	(-2.89)
R2	0.29	0.28	0.28
F-statistic	10.72	10.74	10.23
DW-statistic	1.67	1.66	1.67
N	513	516	513

The analysis using GNI growth (G_GNI) as the dependent variable in the FE and FE-IV estimations provides further support for the hypothesis that financial development has no statistically significant impact on economic growth in Latin America. Similar to the results obtained with GDP growth (G_GDP) as the dependent variable, none of the financial development indicators (G_DCPS and G_M2) are found to be statistically significant in the FE estimations with G_GNI. This indicates that the development of the financial sector in Latin American countries does not have a statistically significant influence on economic growth, regardless of whether GDP or GNI growth is used as the measure of economic growth.

For the developed countries, the results remain consistent with the previous analysis. None of the financial development indicators are statistically significant in the FE estimations with G_GNI, and the only variables that have a statistically significant impact on economic growth are the growth of physical capital, the growth of labor, and the growth of the government's involvement in the economy.

Moving to the FE-IV estimations with G_GNI as the dependent variable, the results once again show no support for the supply-leading phenomenon in Latin America. This finding is in line with the results obtained using G_GDP as the dependent variable, further reinforcing the conclusion that financial development does not lead economic growth in the region.

Overall, the consistent results across different measures of economic growth (GDP and GNI growth) and different estimation techniques (FE and FE-IV) provide robust evidence that financial development has no statistically significant impact on economic growth in Latin America. The main drivers of economic growth in the region continue to be the growth of physical capital, labor, and the government's involvement in the economy. These findings contribute to a better understanding of the determinants of economic growth in Latin America and highlight the need

for further research to identify other factors that may play a role in fostering economic development in the region.

Table 6: FE-IV (1) Latin America, G_GNI as the dependent variable

G_DCPS	0.142		0.104
	(1.48)		(1.26)
G_M2		0.046	-0.008
		-0,6	(-0.09)
G_INV	0.144	0.175	0.166
	(2.73)	(2.62)	(3.16)
G_POP	-2.105	-3.054	-2.096
	(-1.11)	(-1.25)	(1.14)
G_TO	-481	-641	-488
	(-2.08)	(-2.49)	(-2.39)
G_GOV	0.088	0.167	0.156
	0.56	1.18	-119
F-statistic	3.93	3.59	387
DW-statistic	2.02	2.08	2.07
N	474	479	474

The additional robustness checks using different instrument sets and economic growth measures (GDP and GNI growth) provide further evidence that there is no support for the supply-leading phenomenon in Latin America. In the models estimated with GDP growth (G_GDP) as the dependent variable and different instrument sets, none of the financial development indicators are statistically significant, and the coefficient for G_M2 shows a negative impact on economic growth, which is contrary to the supply-leading hypothesis.

Similarly, in the models estimated with GNI growth (G_GNI) as the dependent variable and different instrument sets, none of the financial development indicators are statistically significant, further supporting the conclusion that financial development does not lead to economic growth in the Latin American region.

In contrast, the models for the developed countries show support for the supply-leading phenomenon, with statistically significant coefficients for financial development indicators in some of the models. However, it's worth noting that the growth of physical capital remains the only variable with consistent statistically significant impact on economic growth in all the models for both the developing and developed countries.

Overall, the results of the robustness checks reinforce the finding that financial development does not have a statistically significant impact on economic growth in Latin America. Additionally, the lack of support for the supply-leading phenomenon suggests that other factors play a more significant role in driving economic growth in the region. The study's findings highlight the importance of policies and investments that promote physical capital accumulation and labor productivity to foster economic growth in Latin American countries.

Table 7: FE-IV (2) Latin America, G_GDP as the dependent variable

G_DCPS	0.107		0.084
	(1.04)		(1.00)
G_M2		-0.039	0.094
		(-0.081)	(-1.79)
G_INV	0.116	0.102	0.117
	(2.17)	(2.52)	(2.72)
G_POP	-1.910	-2.182	-1.802
	(-1.36)	(-1.51)	(-1.43)
G_TO	-0.312	-0.303	-0.256
	(-1.51)	(-1.61)	(-1.54)
G_GOV	-0.033	0.016	0.055
	(-0.50)	(0.18)	(0.80)
F-statistic	3.19	3.27	3.28
DW-statistic	1.94	1.76	1.83
N	477	483	477

The robustness analysis using different dependent variables (GDP growth and GNI growth) and instrument sets reveals mixed results regarding the supply-leading phenomenon in Latin America.

When using G_GDP as the dependent variable and different instrument sets, the results are inconclusive, with some models showing statistically significant positive coefficients for the financial development indicator (G_DCPS), supporting the supply-leading phenomenon, while others do not show such significance. However, the growth of physical capital, the growth of labor, and the growth of a country's trade openness consistently have statistically significant impacts on economic growth in both developing and developed countries.

Similarly, when using G_GNI as the dependent variable and different instrument sets, the results are mixed, with some models showing support for the supply-leading phenomenon with a statistically significant positive coefficient for G_DCPS, while others do not show such significance. Once again, the growth of physical

capital and the growth of a country's trade openness have statistically significant impacts on economic growth, while the growth of labor has a statistically significant negative impact in some models.

Overall, the analysis indicates that the relationship between financial development and economic growth in Latin America is not straightforward, and the results vary depending on the specific model specifications and instrument sets used. However, the consistent significance of physical capital and trade openness in driving economic growth suggests that policies focusing on capital accumulation and promoting trade openness remain important for fostering economic growth in the region.

NOTES : Note: *, **, *, reflects significance at the 10%, 5% and 1% level, t-statistics based on White standard errors given in parenthesis. The F-statistic, Durbin Watson statistic and amount of observations are noted. Economic growth measured by real GDP per capita (G_GDP) is the dependent variable. The instrument set used is lagged values of the explanatory variables (-1 to -3). The explanatory variables in all estimations are the growth rates of the following variables: physical capital (G_INV), labor (G_POP), government's involvement in the economy (G_GOV) and the country's trade openness (G_TO). The growth rates of these financial development indicators are included; in model (I) the ratio of the domestic credit to the private sector to GDP (G_DCPS), in model (II) the ratio of broad money to GDP (G_M2); in model (III) both (G_DCPS) and (G_M2)

Chapter 5 Conclusions

Based on the analysis, the study concludes that there is no evidence of a significant impact of financial development on economic growth in Latin American countries. The financial sector's development does not seem to directly influence the growth of these economies. Additionally, the study finds mixed results

regarding the supply-leading phenomenon, with some models supporting the idea and others indicating a demand-following pattern.

One key insight from the study is that the choice of financial development indicators can influence the observed relationship between financial development and economic growth. Different indicators may lead to different conclusions about the impact of financial development on economic growth.

The study also highlights the importance of improving data collection in the Latin American region to enhance the accuracy of future analyses. Additionally, it suggests that further research should consider including other financial development indicators and control variables to better understand the relationship between financial development and economic growth.

Overall, while the study does not find strong evidence of a significant impact of financial development on economic growth in Latin America, it underscores the need for more comprehensive research to explore this relationship further.

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List of Countries Latin America (developing) OECD (developed

Argentina   Australia

Bolivia	Canada
Brazil	Denmark
Chile	Finland
Colombia	Hungary
Costa Rica	Iceland
Ecuador	Ireland
El Salvador	Israel
Guatemala	Italy
Guyana	Japan
Honduras	Korea, Rep.
Mexico	Netherlands
Nicaragua	New Zealand
Panama	Norway
Paraguay	Sweden
Peru	Switzerland
	United
Uruguay	Kingdom
Venezuela	United States