

# Financial Development and Income Inequality: Evidence from Latin America, 2001-2021

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**Abstract:** Numerous studies delve into the theoretical frameworks on finance and inequality. However, there are too few empirical tests on its theoretical relations due to a lack of data to capture financial development. Additionally, due to the many social and economic dimensions of a large economy such as Brazil or Argentina, it is unrealistic to consider that labor market or political issues are the only culprits of income inequality. More research is needed to understand the dynamics of inequality. In this paper, we evaluate the influence of financial development on income inequality using nineteen countries in Latin America from 2001 to 2021. Two indicators of financial development are employed. First, I use the broader definition of money, M3, as a percentage of GDP to capture the liquid liabilities because M1 or M2 may be a poor proxy in economies with weak financial systems. Secondly, the ratio of credit to private sector to GDP is employed because financial intermediaries with higher volumes of credit are more involved in financial development, such as diversifying risk, saving mobilization, facilitating transactions, allocating funding to economic activities, and monitoring borrowers' activities. Based on the GMM estimator, our empirical findings support that better-developed financial markets reduce inequality.

**Keywords:** Latin America, Financial Development, Income Inequality.

## INTRODUCTION

Latin America is commonly thought of as a region with high income inequality. Yet, in the last three decades, significant changes have occurred in income inequality patterns and qualitative changes in the region's financial development. Almost by definition, the poor lack wealth and, therefore, need more broad access to credit to invest in human or physical capital. Thus, financial development may improve the lot of the poor and hence reduce income inequality. This paper explores recent trends in income inequality and financial development in Latin America and examines how financial development affects income inequality in Latin America.

## INCOME INEQUALITY IN LATIN AMERICA

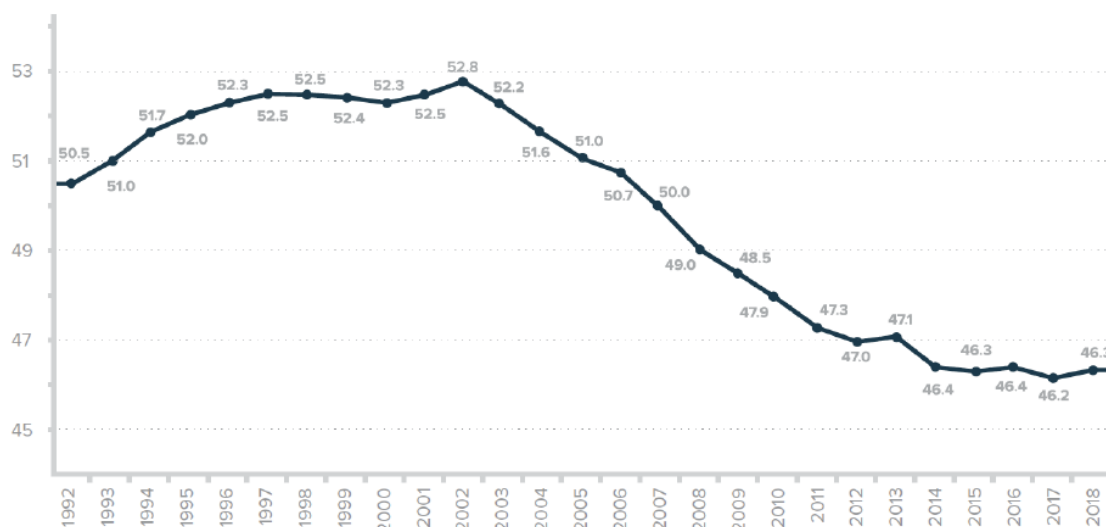
Inequality is one of the distinctive characteristics of Latin American economies and one of its major policy concerns. In this section, we outline some of the main trends in inequality in this region during the past two to three decades. We rely on one of the most authoritative and recent studies by Gasparini and Cruces (2021), authored by two foremost scholars in the field. The report is primarily based on empirical data from national household surveys for 1992-2018 covering almost 30 million Latin Americans in 18 countries in the region (Gasparini and Cruces, 2021).

The picture that emerges from this study is consistent with what has been documented in other reports (Buso and Messina, 2020; Oxfam, 2020; Barcena and Byanyima, 2016). Inequality increased in the 1990s, followed by a sustained reduction in the 2000s, and slowed down or stagnated in the 2010s (Gasparini and Cruces, 2021, pg. 4). Others, like the Inter-American Development Bank (IADB) report, extend the period of decline into 2018, stating that from "2002 to 2018, inequality declined at an average annual rate of 0.4 Gini coefficient, while the Kuznets ratio fell at an average annual rate of 1.3 points." (IADB:p.3). The average Gini coefficient fell from 52.8 to 47.0 between 2001 and 2012, which led some scholars to call this period the "golden decade" (Gasparini and Cruces, 2021). The World Bank hailed this period as "the point where, for the first time ever, the number of people in poverty is equal to the size of the middle class" (Ferreira *et al.*, 2013). This "golden decade" was followed by an apparent slowdown in the downward trend when the average Gini fell by less than one point between 2012 and 2018 (Gasparini and Cruces, 2021, p.4). Graphically, this trend is illustrated in Figure 1 in the Gasparini and Cruces report (2021) below.

It is also important to note that this trend has not been uniform, with some countries doing better than others. The best performers experienced a more significant decrease in inequality during the 2002-2012 period, while the inequality slowdown is negligible in the group of Argentina, Brazil, Chile, Paraguay, and Uruguay. (Gasparini and Cruces, 2021, pg. 5) Although the heterogeneity of results is evident, the authors

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**Figure 1:** Income inequality in Latin America. Gini coefficient, 1992-2018.

Source: Own calculations based on data from SEDLAC (CEDLAS and The World Bank).

Note: Unweighted mean of the national Gini coefficient for the distribution of the household per capita income distribution. All Latin American countries, except EL Salvador and Guatemala.

noted that Brazil and Mexico (the two largest countries in the region) experienced a less intense increase in inequality in the 1990s. The trend ended earlier than in other countries in the region, while their population-weighted Gini coefficient has been increasing since 2015 when the average in the region has remained mostly flat (Gasparini and Cruces, 2021, pg.6).

The literature on the contributing factors considers labor income, monetary transfers, other non-labor income, and demographic factors as some of the direct factors. Some studies like Lerman and Yitzaki (1985), Barros *et al.* (2006), Lustig *et al.* (2016), and Tornarolli *et al.* (2018) share a common finding that the most crucial factor contributing to changes in income inequality is the growth of the labor income of workers in the lowest part of the distribution, in particular their hourly wage followed by public transfers such as *Bolsa Familia* in Brazil or *Oportunidades* in Mexico.

The key characteristics explaining significant inequalities in labor markets shed light on understanding total inequality. The gaps between skilled and unskilled workers extend to labor force participation, employment, hours worked, wages, and labor benefits and remain substantial; therefore, their reduction will have a declining effect on income inequality (Gasparini and Cruces, 2021, p.24).

The second most important factor, transfer programs, was expanded significantly during the 2000s (Gasparini and Cruces, 2021, p.27) as Latin American

budgets were augmented during the “commodity boom.” Expanded coverage primarily accounts for these increases, although they have less equalizing effect than similar programs in the OECD (Gasparini and Cruces, 2021, p. 28). The latter may be accounted for by much lower tax burdens in Latin America and more progressive and efficient tax systems in the OECD.

Another contributing factor discussed in previous studies is education. Abdul A. *et al.* (2013), after doing a comprehensive meta-regression analysis of the extant empirical literature, find that education affects the two tails of the income distribution, raising the bottom earners' share but decreasing the income share of top earners. Acemoglu D, *et al.* (2001) and Gasparini and Lustig (2001) trace the origins of inequality to the colonial institution framework that restricted access to education, which has extended into modern times. Gasparini and Lustig (2001) state, “Differences in education are today the most important predictor of the difference in income levels among households in Latin American countries.” Education levels are generally much higher than they were decades ago, regardless of income levels, but the gaps remain the same. (Gasparini and Cruces, 2021 p.33). More private educational institutions, especially at the tertiary level, have increased opportunities for more education, leading to higher enrollment rates. The quality of education levels remains a challenge as Latin American countries continue to lag other regions in education quality, at least when measured by scores

from harmonized international tests like the PISA scores (Gasparini and Cruces, 2021, p.41).

Other factors besides those that were considered have also been discussed in the literature, such as equality of opportunities in education as well as other social variables such as gender inequality, segregation, housing, and the distribution of essential services like water and sanitation, but we did find a scant discussion of financial development as a contributing factor. Before we turn to this specific contributing factor, we point out that after a decade of some improvements in the 2000s, there is an apparent slowdown or even stagnation in the 2010s; therefore, regardless of the underlying causes, the region remains one of the most unequal in the world with significantly higher income inequality than its degree of development would predict (Gasparini and Cruces, 2021 p.58).

## FINANCIAL DEVELOPMENT IN LATIN AMERICA

Financial development has been linked to faster growth and greater welfare (Levine, 1997; Luintel and Kahn, 1999; Levine and Zervos, 1996; King and Levine, 1993). More direct access to financial services has been linked to business improvement for SMEs, as found in Didier and Schmukler (2013), who states that “increased access to financing has beneficial effects, especially for historically underserved segments, such as small and medium enterprises (SMEs)”. (see, for example, de la Torre, Martínez Pería, and Schmukler, 2010; Beck, Demirgüç-Kunt, and Martínez Pería, 2011; Beck and Demirgüç-Kunt, 2006).

In Latin America, financial development equates to more household savings being channeled directly into capital markets through the retail market or financial intermediaries such as pension funds, mutual funds, and insurance companies that manage these funds. (Didier and Schmukler, 2013, p.4). Firms can raise capital by resorting to these markets, bypassing banks that have come to play a less central role. (Didier and Schmukler, 2021, p.4). Since the era of structural adjustment that followed the debt crisis in Latin America, the region has been involved voluntarily or involuntarily in efforts at financial development. Among these pro-market reform efforts are the privatization of state-owned banks, pension reforms, and financial market liberalization.

Nonetheless, the record in the region remains mixed. Regarding financial liberalization and growth, Santana (2020) states that “the influence of financial

liberalization has proved to be a controversial issue in the research on the relationship between financial development and economic growth, particularly in developing countries.” His analysis shows that emerging and recurring banking crises prevented economic growth, and the financial liberalization process itself generated banking crises, especially in developing countries (ESADE, 2021). Financial development is also uneven across the region; “while Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Uruguay have recently taken some preliminary though necessary steps toward compliance with Basel III reforms, the rest of the region is markedly silent on its implementation (Didier: pp. 5).

While some of the literature sounds pessimistic about the possibilities for financial sector improvement, Didier and Schmukler (2013) find renewed optimism in analyzing data from the mid-to late-2000s. Among the trends in emerging economies highlighted in their study are lower inflation rates, reduced fiscal, high liquidity in international markets, and the issuance of long-term bonds in domestic markets. Emerging economies have weathered the recent global financial crisis relatively well (Didier, Hevia, and Schmukler, 2012). Regardless of the contrasting views on financial development in Latin America, we summarize the region's leading trends in financial development.

Latin American financial systems, according to Didier and Schmukler (2013), “have effectively developed over the past two decades, becoming in many respects and by several standard measures deeper and more complex.” Among the salient characteristics are the transition from a primarily bank-based model to one that is complete and more interconnected and where bond and equity markets have increased in absolute and relative size (Didier and Schmukler, 2013, p.8). An IMF paper by Heng D. *et al.* (2016) also suggests “that access to financial institutions had expanded notably in the past decade... however [the region] continues to lag behind peers on broader financial development”.

Didier and Schmukler (2013) also note that consumer credit has increased. Still, bank credit has stagnated at the expense of firm financing. At the same time, private bond markets have increased in size but remain relatively small (bond markets in LAC-7 countries are 32% of GDP on average during 2000-2009 compared to about 56% for Asia and 112% for G-7 countries). Equity markets also remain relatively small (after accounting for equity price increases,

growth in market capitalization shows a more modest expansion than the rest of the world). Furthermore, the latter remain illiquid and highly concentrated in large firms (Didier and Schmukler, 2013, p.8). Firms still compete with governments to attract large amounts of savings. Historically, Latin American governments have shown more robust government spending than G-7 countries and Asian countries, with almost double the percentage of total claims of the banking sector by LAC countries than by G-7 governments (Didier, p. 13).

On other metrics like financial inclusion, LAC fares better than other low-income countries (LIC) due to the “emphasis that countries have placed on improving financial inclusion through improved bank and ATM networks (Dabla-Norris *et al.*, 2015). There also seems to have been a qualitative change as credit to the private sector in LAC-7 countries has shifted away from commercial lending and mortgage credit toward household financing through credit cards and collateralized loans (Didier and Schumkler, 2013, p.13). Finally, a more positive trend is the decline in the dollarization of loans and foreign currency deposits.

Bond markets in LAC-7 countries remain relatively small but concentrated compared to developed countries, becoming a restricted source of firm financing (Didier and Schumkler, 2013, p.15). The figures are astounding. During the 2000s, 19 firms, on average, issued bonds in LAC-7 countries compared to 432 firms in G-7 countries, and the top five issuers captured 43% of new bond financing (Didier and Schumkler, 2013, p.15).

Equity markets follow a similar pattern with only a few firms capturing most of the market and only a small number of firms using equity financing. Only six firms issued equity in any given year during the 2000s in LAC-7 compared to more than 290 in the G-7 countries during the 2000s, and the bulk of equity financing (82%) was done by the top five issuers between the 1990s and the 2000s. (Didier and Schumkler, 2013, p.16). In sum, “equity markets like bond markets seem to remain small, illiquid, and highly concentrated in a few firms across the region” (Didier and Schumkler, 2013, p.17).

There is some, albeit small, warranted optimism to look for further financial development in the LAC region. There is evidence to suggest that these countries are in a substantially better position than in the past, making them an attractive place for foreign investors. Financing depends less on banks, while debt

moves towards longer maturities and is much more denominated in local currencies (Didier, p.32). Since these developments have been more pronounced in the LAC-7 than in the rest of the region, much remains relatively underdeveloped financially, allowing for room to expand. (Didier, p.33). As a report by CEPAL (n.d.) warns, one caveat may be that “financial innovation can serve as a catalyst for financial inclusion of households and businesses through greater diversification of the financial system,” but this requires clear and articulate public policies with clear objectives and priorities.

On the one hand, only a few firms seem to be able to use capital markets financing; thus, Latin America has not become a place with finance for all. On the other hand, as retail chain credit has increased, consumers might be better served by credit card and store credit financing, but the poor may be impervious to these trends as they are not likely to participate in these markets. The distributional impact on the poor may happen, if at all, through microenterprise financing. Since 70 percent of Latin America’s poor earners are either microenterprise employees or single-person owners, the impact of financial development on lessening inequality might be through their income and their access to adequate financing (Westley, 2001). This leads to the question of how the existing degree of financing development might impact the reduction of inequality in the region.

## **FINANCIAL DEVELOPMENT AND INCOME INEQUALITY**

In the transition from a slow-growing economy to a developed, fast-growing one, a nation passes through a stage in which the distribution of wealth across the rich and poor widens (Kuznets, 1955). The same has been argued for the relationship between financial development and income inequality (Greenwood and Jovanovic, 1990).

Financial and credit markets are imperfect, and the poor generally cannot gain access to credit markets either to engage in productive activities or to protect themselves against financial downturns. The poor also lack credit histories, so they have a higher-than-average interest rate when they do get a loan. These developments perpetuate existing social structures and diminish future economic mobility (Meyer, 2006). The poor are also over-represented in the share of micro-enterprises, so financial development, especially for small enterprises in Latin America, is important when

the majority of the poor own or are employed by small enterprises that have very little access to formal credit (Westley, 2001). Furthermore, poverty rates among employees of microenterprises are much higher than among employees of larger firms even when they are owners of microenterprises, and the situation of rural microenterprises is even worse (Westley, 2001).

According to Westley (2001), smaller firms are poorly served with credit from financial institutions. The statistics are staggering. Only 2.6 percent of the 59 million enterprises in Latin America have formal or semi-formal credit from a Micro Finance Institution (MFI), and probably less than one percent of banking system credit goes to these firms despite micro enterprises accounting for approximately 20 percent of GDP (Westley, 2001; Westly and Schaffer, 1999).

Financial development, which encompasses providing financial services to microenterprises, can, in principle, reduce income inequality through different channels. The more obvious one is the use of credit for business purposes. Small businesses, like any other business, have a need to finance goods and services like machinery and equipment, raw materials, and even to hire more labor. Evidence of this impact is presented by the study of Sebstad and Chen (1996), who made clear that small firms derive substantial income gains and increases in hiring from access to credit.

Another channel is due to the fungibility of money. Some of the business proceeds will probably be used for non-business purposes, releasing some liquidity constraints in poor households. These funds could be used to soften economy-wide shocks like recessions, inflation, natural disasters, individual emergencies, and even life-cycle events, all of which have an indirect impact on business performance. Some of these funds can also be used for consumption-investment-type activities such as education of the children and housing improvements, very much like migrant remittances, which can enhance economic mobility.

There is ample literature that shows that the poor do save when given the opportunity, but they often lack financial institutions to channel their savings. In the absence of financial institutions, especially in rural areas, to capture their savings, the poor resort to less liquid instruments such as jewelry, livestock, housing, etc. These assets are subject to fluctuating prices and the problem of indivisibility, as well as the possibility of theft. The availability of savings is also correlated with the ability of households to take advantage of new

business opportunities and invest in new technologies, such as new fertilizer inputs or new seeds. Furthermore, the availability of functioning financial institutions, especially in rural areas, may decrease the need to resort to informal channels, which often offer usury rates. Thus, financial development may be a means to decrease income inequality in Latin America through credit availability either directly to households or through the financing of their small business initiatives.

## **FINANCIAL DEVELOPMENT AND INCOME INEQUALITY: EMPIRICAL STUDIES**

In this section, we review some of the few studies that have empirically examined the relationship between financial development and income inequality. Some studies have reviewed the theory of a nonlinear relationship between financial development and income inequality. There are studies showing support for the positive relationship between financial development and income inequality, as well as other papers with inconclusive results.

A recent paper by Canavire-Bacaraza *et al.* (2021) analyses the effects of financial development on the distribution of income in Latin American countries. Using United Nations data, the researchers calculated the average income of Latin American countries as a whole and split the data into five quintiles with data ranging from the 1960s-2005. These quintiles are compared against the Gini coefficient, private credit, and per capita growth of the region as well. Through a regression model, the growth of income for each quintile was calculated along with the growth of GDP, the growth of the Gini coefficient, and the average years of schooling. A brief section of the report compares the data to East Asia's and demonstrates that East Asia has experienced large increases in average income, while Latin American countries remain stagnant or have slightly increased. Overall, the results show that financial development has not influenced the incomes of the poorest quintile. Conversely, it has had a positive and disproportionate effect on the incomes of quintiles Q2, Q3, and Q4. A possible explanation for this is the poor's inability to receive a loan or financing from microfinance institutions because many of them require collateral to make a loan. On the one hand, the poor also might not have full access to financial services due to their location or lack of trust in financial institutions. On the other hand, the results show that financial development seems to have succeeded in

raising the income of individuals in the middle-income ranges, particularly the second quintile (Q2).

Bolivar *et al.* (2019) analyze the relationship between financial development and income inequality in thirteen Latin American countries spanning the period 1990 to 2015. The financial development variable is measured by the credit to the GDP ratio, and income inequality is calculated using the Gini index. Using an estimated generalized least square, the method of generalized moments together with estimated generalized least squares, they concluded that the development of the financial system increases income inequality. Robustness tests are presented to verify this claim and provide a statistical interpretation of the correlation. Their relationship is highly significant; however, it is of small magnitude. A 10% increase in private credit leads to an average .04% increase in income inequality.

Mikek (2019) focuses on the large reduction in inequality over the past few decades and relates it to the effects of the rapid development of the financial sector in Latin America. Using data from sixteen Latin American countries from 1990-2017, inequality is measured as an income-based Gini coefficient, and economic development is defined as financial deepening. The Gini value is computed using gross national income per capita, schooling, financial deepening, growth rate, and percentage of the population in poverty as major determining factors. The study concludes that there is no Kuznets curve in Latin America. Financial deepening exacerbated the inequality in Latin America over the period under study. This is likely due to easier access to financial services but for a small share of the population. In contrast, educational attainment, which increased on average by about three years over the studied period, was the major contributor to improving Gini coefficients. Tax revenues and FDI are concluded to be major factors in worsening inequality, while exports are not statistically significant. The most important result is the inclusion of financial deepening into the benchmark model. Results suggest that there is a significant effect of financial deepening on income distribution. An increase in the share of credit in GDP by a percentage point is associated with a higher Gini coefficient of about 0.04-0.06 percentage points.

Concha and Rodrigo (2014) assess the relationship between the use of insurance and economic growth in eleven Latin American countries. Their empirical analyses suggest that there is a positive relationship

between financial development and economic growth. More financial development brings about growth in the long term by means of risk diversification, efficient capital use, increased savings opportunities, and trade of goods and services. One vehicle of financial development is insurance services, which were measured by penetration and density and then compared to GDP, credit, government spending, inflation, and stocks to spot any trends. They find a positive relationship between insurance use and economic growth. This relationship is statistically significant when insurance density is considered as the measure of insurance. This finding supports arguments in favor of the relevance of the insurance industry as a proxy for financial development to foster economic prosperity.

Other indirect studies of the relationship between financial development and income inequality are found in the paper by Lee and Shen (2006), which has been heavily cited in many other works discussing financial development. This study on the relationship between financial development and real GDP per capita growth in 48 countries assumes that economic growth will eventually lead to a reduction in income inequality through financial variables that could foster economic growth. Yet their findings seem to indicate that only stock market development has a positive effect on growth while banking development does the opposite. Using dummy variables for regions, currency and banking crises, good creditor protection, and higher corruption, they find that the dummy variable for Latin America strengthens the negative impacts of banking development on growth. The relationship between growth and bank development is better described as a weak inverse U-shape. This inverse U-shape becomes stronger when additional stock market variables are squared. Therefore, financial development and growth may be related in a nonlinear form.

## METHODOLOGY AND DATA

As the new century dawned in Latin America, new challenges and opportunities arose. China's trade and investment accelerated and brought a new commodity boom around the 2003-2013 period<sup>1</sup>. This provided an opportunity for governments to reduce income inequality in the region, a trend that also culminated in

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<sup>1</sup><https://cepr.net/report/latin-american-growth-in-the-21st-century/#:~:text=Latin%20America%27s%20economic%20growth%20rebound,the%20price%20of%20commodity%20exports>

a reduction of poverty and an unprecedented expansion of the middle class.<sup>2</sup> Although some of these trends were already in decline before the pandemic, the latter unfortunately accelerated a reversal of such trends. This context of economic boom, along with declining income inequality followed by an opposite cycle of declining growth and rising income inequality, allows for the observation of long-term trends and patterns in income inequality and financial development.

The 2001-2021 period provides a comprehensive view of how these variables have evolved over a significant period. This period, characterized by both periods of growth and recession, can bring to light how these variables are affected by economic cycles and how they might also influence economic stability. Despite data challenges, we were able to gather consistent data for the 2001-2021 period to examine the effects of financial development on income inequality and include the possible effect of COVID-19 on the decline of financial activities and money supply movements. The pandemic seemed to have obstructed financial activities through declining investor confidence. At the same time, central banks also engaged in significant money supply changes; therefore, this data period might help us discern some of their impact on financial development.

Our data period (2001-2021) also includes the 2008 financial crisis, which may have had lasting effects on income inequality and financial development. This period also witnessed significant developments in technology that have affected the financial sector, such as fintech, digital payments, and block chain, among others, and can potentially affect income distribution.

As shown in Table 1, a panel dataset of 12 Latin American countries<sup>3</sup> over the period from 2001 to 2021 was employed to investigate the effect of financial development on income inequality. The data were taken from the World Bank and Macro trends. The Gini coefficient and the Unemployment rate for a few years and countries are missing<sup>4</sup>. Abrevaya and Donald

(2017) examined that the GMM estimator can be more efficient when dealing with missing variables.

As discussed above, financial development is the key variable affecting income disparities. To control other contributors that might affect income inequality at the country level, we estimated the GMM regression model with the set of control variables.

$$y_{i,t} = \beta_1 y_{i,t-1} + \beta_2 F'_{i,t} + \beta_3 X'_{i,t} + \alpha_i + u_{i,t}$$

Where  $y_{i,t}$  is the dependent variable, the Gini coefficient in country  $i$  and year  $t$ . The vector  $F_{i,t}$  is the measurements for financial developments: 1) M3 to GDP, 2) Credit to GDP, and 3) Personal credit to GDP.  $X_{i,t}$  contains the set of control variables: 1) GDP per capita, and 2) Openness. And  $\alpha_{i,t}$  is a country-specific effect, relying on the model-specific assumption such as fixed or random effect, and  $u_{i,t}$  is an error term. This paper employs measurements for financial development widely used in the previous literature, such as M3 to GDP, credit to GDP, and Personal credit to GDP. Control variables included in our empirical model were country GDP per capita and trade openness.

We add a lagged Gini coefficient as one of the control variables on the right side of the equation because the previous state of income level may affect or relate to the current state of income level. However, adding a lagged Gini coefficient may cause endogeneity issues in the panel model due to the association between the control variables and the error term or with the country-specific error component. Thus, the Ordinary Least Square estimator could be biased and inconsistent (Jung and Cha, 2020). Arellano and Bond (1991) find that an estimator with lagged instruments can be inconsistent if the error terms are linked. Thus, using the first differenced GMM, the authors found that the estimator turned out to be more efficient compared to the Instrument Variable estimator. Bond, Heffler, and Temple (2001), however, investigate that the first differenced GMM estimator can be biased and thus inappropriate due to the small number of times series ( $n$ ) or long time period ( $t$ ). To fix this issue, Blundell and Bond (1998) suggest that the system GMM estimator can be more appropriate when the number of time series is small, and the autoregressive parameter is high. The time span of this paper's dataset is ten due to the data limitation on availability for the Gini coefficient. To deal with the issue, we employ the system GMM estimator,

<sup>2</sup>[https://www.worldbank.org/en/news/press-release/2021/06/24/pandemic-crisis-fuels-decline-of-middle-class-LAC#:~:text=The%20middle%20class%20\(per%20capita,hit%20in%20health%20and%20economic](https://www.worldbank.org/en/news/press-release/2021/06/24/pandemic-crisis-fuels-decline-of-middle-class-LAC#:~:text=The%20middle%20class%20(per%20capita,hit%20in%20health%20and%20economic)

<sup>3</sup>Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Paraguay, Peru, and Uruguay.

<sup>4</sup>Missing gini coefficient: Argentina (2015), Bolivia (2003; 2010), Brazil (2010), Colombia (2006; 2007), Ecuador (2001; 2002), El Salvador (2020), Honduras (2020; 2021), Uruguay (2001; 2002; 2003; 2004; 2005).

Missing unemployment rate: Bolivia (2003; 2010), Brazil (2010), Colombia (2006), Ecuador (2002), Honduras (2021).

**Table 1: Overview of Variables**

Gini	The Gini coefficient	Source
Independent Variables/ Financial Variables		
M3 / GDP	M3 is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper.	World Bank
Credit to Private / GDP	Domestic credit to the private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit-taking corporations except central banks), such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment.	World Bank
Control Variables		
GDP per capita	GDP / number of residents	World Bank
Openness	The ratio of the sum of exports and imports to GDP	Macrotrends
Unemployment rate	Unemployment refers to the share of the labor force that is without work but available for and seeking employment.	World Bank

which has two important characteristics: 1) It uses both the level equation and the differenced equation, and 2) the variables in levels of the second equation are instrumented with the lagged first differences of the endogenous variables.

## EMPIRICAL RESULTS

The relationship between money supply and income inequality is complex and multifaceted. An increase in the money supply can lead to changes in the distribution of wealth, which can, in turn, affect income inequality. If the new money enters the economy through channels that primarily benefit the rich, it can exacerbate income inequality. However, policies related to an increase in money supply encourage financial inclusion and provide easier access to credit for marginalized or low-income individuals, which can help them invest in productive assets or start small businesses. Then this can potentially lead to increased income and improved economic mobility. M3 to GDP is employed to determine how it affects income inequality in Latin America, and the empirical results are displayed in Table 2.

The second column of Table 2 indicates the result with M3 to GDP. With controlling for the endogeneity, the system GMM model shows that M3 to GDP is significant and negatively affects income inequality. It means that the size of financial development measured by M3 to GDP increases income inequality, which is consistent with the theoretical argument. When the size

of financial development measured by the ratio of M3 to GDP is increased by 1%, income inequality is decreased by about 0.06%. Next, we examine the financial accessibility using Credit to the private sector to GDP. If financial accessibility is restricted to the rich, it will cause or worsen income inequality because of the lack of financial accessibility. Credit to GDP is also statistically significant and negatively affects income inequality. When the accessibility of financial development measured by the ratio of credit to private

**Table 2: GMM Estimation Results (Dependent Variable: Gini Coefficient)**

Variables		
M3_gdp	-0.06*** (-4.96)	
Credit_gdp		-0.04*** (-3.32)
Gini(-1)	0.61*** (13.23)	0.64*** (13.85)
lgdp_ca	-1.31*** (-3.50)	-1.13*** (-2.93)
Openness	0.05*** (3.78)	0.04*** (3.12)
Unemployment	0.29*** (4.95)	0.25*** (4.20)
Intercept	27.62*** (5.34)	23.67*** (4.56)
Obs	218	218

Note: \*\*\*, \*\*, and \* indicates significance at the 1%, 5%, and 10% level, respectively. The numbers in parentheses are z-statistics.



sector to GDP is increased by 1%, income inequality is decreased by about 0.04%. Because the credit to GDP is captured by its relative amount of credit to the private sector to GDP, this empirical result implies that financial resources could possibly be distributed to the poor. Thus, in turn, it could decrease income inequality in this model.

As expected, the logarithm of GDP per capita is statistically significant and negatively affects income inequality. Also, the magnitude of the coefficient is relatively larger than other control variables. These empirical results are also consistent with the theoretical argument and imply that the expansion of the economies can reduce income inequality since economic growth can create more chances for the poor to improve their income. Openness is also significant but has a positive effect on income inequality. Theoretically, openness can stimulate economic growth by increasing accessibility to larger international markets, fostering specialization, and attracting foreign investment. In turn, it can create more job opportunities and increase income levels, potentially benefiting a broader segment of the population and thus decreasing income inequality. However, openness can lead to increased competition, especially in labor-intensive industries. This might favor workers with higher skills and education, potentially widening the income disparities between skilled and unskilled labors. Also, openness can lead to the decline of certain domestic industries that are unable to compete with cheaper imports. This can lead to job losses in these industries, possibly affecting workers who are less skilled and less mobile. Although openness in literature is controversial for whether it decreases or increases income inequality, we found that when openness is increased by 1%, the income inequality is increased by about 0.05% and 0.04%, respectively. Lastly, unemployment is also significant and has a positive effect on income inequality.

Another interesting empirical result is that the coefficient of lagged the Gini coefficient is over 0.6, showing that income inequality is persistent. This result implies that income inequality is dependent on the previous state of income inequality, and therefore, the initial state of economic condition may be important to handle income inequality.

## CONCLUSION

The Gini coefficient of Latin America, ranked as the highest income inequality among many countries in the

world, peaked in 2002 and gradually decreased until 2012. However, the Gini coefficient, which is still disproportionately high compared to other developed countries, remains at a high level of over 0.45. And since 2011, the index of income inequality in Latin America has been stagnant without an apparent decline. On the other hand, over the past 20 years, the financial systems of Latin American countries have developed by leaps and bounds.

While the financial development of Latin American countries has been progressing, we investigate how these financial developments have affected income inequality in Latin American countries. As a result, like the situation in developing countries found in the literature, where financial development has decreased income inequality, in Latin American countries, mainly developing countries, financial development has resulted in less income inequality. A developed financial system can provide better accessibility to credit for individuals and businesses, especially those who are traditionally underserved by formal banking institutions. The improved accessibility enables people to invest in education, regarded as human capital accumulation, or make productive investments, potentially leading to better income and alleviating income inequality. The system GMM result shows that financial development measured by M3 to GDP was a factor in alleviating income inequality in Latin America. In addition, the effect of credit to the private sector to GDP also reduced income inequality. These results would suggest that the improved financial system makes funds more accessible to those who need to raise funds. In other words, an increase in M3 to GDP or credit to GDP may promote financial inclusion and accessibility to credit for marginalized populations. Thus, in turn, it can help individuals and small businesses with their allocations of financial resources, possibly leading to reduced income inequality in Latin American countries.

Jung and Vijverberg (2019) investigate the effect of financial development on income inequality with spatial econometrics techniques using provincial-level data from 1998 to 2014. The spatial lag and error are both statistically significant, suggesting the level of income inequality in each province or municipality is affected by its neighboring province or municipality. Thus, it is important to consider spatial effects when studying the impact of financial development on income inequality. For further research, therefore, considering that Latin America is closely connected as an economic cooperation entity, it is necessary to evaluate the

relationship between financial development and income inequality considering spatial effects.

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