Assessing the Causal Impact of Government Transfers on Poverty Reduction: An Instrumental Variables Approach in Indonesia

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Abstract

This study examines the causal effect of government transfers on Indonesia's poverty reduction and income inequality. It utilizes Instrumental Variables (IV) techniques to address the potential endogeneity problems that arise from how transfers are allocated. Using measures that are likely exogenous of the poverty outcomes but correlated to the distribution of government transfers, the study offers an analysis of the impact of fiscal transfers in reducing economic inequalities. The results indicate that government transfers have a substantial impact on reducing poverty rates and inequality. This suggests that these transfers are beneficial in both alleviating poverty and encouraging equitable allocation of income. The robustness of these findings is verified by multiple examinations, including a check utilizing the Gini coefficient and dynamic panel models, which also affirms the redistributive effect of government transfers. This study contributes to the wider discussion on fiscal policy and economic development by showing how specific government actions might effectively improve social well-being. The study's findings highlight the significance of enhancing the targeting mechanisms of transfer programs to optimize their effect on poverty and inequality.

Keywords: Government Transfers, Poverty Reduction, Instrumental Variables, Indonesia, Fiscal Policy, Endogeneity **(JEL Code: I38, H53, O15)**

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1 Introduction

The complex connection between government payments and poverty reduction is a central topic of scholarly and policy discussions globally. Nations must prioritize understanding the effectiveness of budgetary initiatives in reducing poverty. Indonesia's extensive archipelago and varied socioeconomic environment offer an intriguing setting in which to study this phenomenon. Government transfers play an extensive part in reducing poverty, affected by factors like targeting efficiency, the quantity of funds, and the socioeconomic context in which they are implemented (Barrientos, 2013).

This study utilizes an instrumental variables (IV) method to analyze the causal effect of government transfers on poverty rates in Indonesia's 33 provinces from 2000 to 2022. The hypothesis of this study suggests that government transfers reduce poverty by increasing the income of impoverished individuals, hence facilitating their access to vital services and basic requirements. Nevertheless, the effectiveness of these initiatives may be compromised by inefficiencies such as leakage, inadequate targeting, and insufficient funding (Hanna and Olken, 2018). Indonesia's varied implementation of transfer programs, from conditional cash transfers inspired by Latin America's Bolsa Família to more universal subsidy schemes, offers a rich dataset for analysis (Kirana, 2016). This analysis improves our comprehension of how different transfer mechanisms affect poverty outcomes, especially in countries with constrained fiscal capability and economic scale.

When examining the allocation and impact of government transfers in Indonesia, it is crucial to consider the principle of equity. Although the objective is to promote equitable development, these transfers occasionally fail to meet that goal. Less developed areas of Indonesia, particularly in the eastern regions, generally receive fewer resources than more developed ones in the western regions. This worsens regional inequalities and hampers the achievement of balanced development. It is crucial to address these inequities to ensure that regions with higher levels of need receive sufficient support, ensuring fair and balanced regional development.

To accurately assess the impact of government transfers on poverty, endogeneity must be addressed. Due to the possibility of a reciprocal relationship between government transfer allocations

and poverty rates, a methodological approach is required to determine the causal direction. Population size is used as an instrumental variable as it influences the distribution of government transfers due to increased demand for public services but is less susceptible to short-term fluctuations in poverty rates (Deaton, 1997).

A scholarly investigation has extensively examined the impact of government transfers on poverty reduction; however, an in-depth understanding of this interplay in the Indonesian context, specifically from a causal standpoint, continues to elude explanation. Previous studies frequently employed cross-sectional analyses or panel data, neglecting to sufficiently account for the endogeneity that afflicts the association between government transfers and poverty outcomes. This disparity is particularly conspicuous in analyses that neglect to account for the considerable diversity among Indonesian provinces in terms of social infrastructure, population density, and economic conditions (Alatas et al., 2016; Bazzi and Clemens, 2013). To address this disparity, this research employs an instrumental variables methodology that has been carefully selected to mirror the distinctive socioeconomic circumstances of Indonesia. As a result, the causal relationship between government transfers and poverty can be more precisely discerned.

Moreover, the temporal aspect of government transfer programs, which is crucial for comprehending their efficacy across various policy administrations and economic cycles, has been largely neglected in the literature. Research that exclusively concentrates on immediate consequences while neglecting to account for long-term ramifications might fail to fully encompass the situation, especially when applied to developing nations where economic conditions and policy implementation can fluctuate substantially over time (Khandker et al., 2009). This research thoroughly analyzes the temporal changes in government transfers and their correlation with poverty rates from 2000 to 2022, providing valuable longitudinal perspectives to the current knowledge base.

In addition, this research contributes to the conversation over the most effective design and targeting of poverty alleviation programs. Existing work highlights the significance of focusing on efficiency and the influence of conditionalities in improving the effectiveness of cash transfers (Baird et al., 2011), but less is known about how these factors play out in the Indonesian setting.

This study enhances our understanding of how to customize social assistance programs to meet the varied requirements of the Indonesian population by analyzing the distinct effects of government transfers in various provinces and periods. This method addresses a crucial gap in scholarly discussions and offers practical guidance for policymakers seeking to improve social welfare programs for more effective poverty reduction.

The method used in this study is based on the growing body of research that employs instrumental variable estimations to distinguish causality when evaluating government policies. These methods have been crucial for obtaining detailed insights into how effective policy interventions are in different scenarios, providing a strong framework for the analysis in this study (Imbens and Wooldridge, 2009). The aim of this research is to enhance the empirical analysis of the impact of fiscal policy on poverty reduction in Indonesia, contributing to academic knowledge and policy development.

In summary, this study aims to estimate the effect of government transfers on poverty in Indonesia and to add to the worldwide discussion on measures to reduce poverty. By introducing causal inference approaches, the goal is to offer policymakers evidence-based insights to inform the development and execution of future welfare programs, thereby improving their ability to effectively address poverty. The research findings are set to provide useful insights for developing and emerging nations facing comparable obstacles in their efforts to reduce poverty (Ravallion, 2001).

2 Literature Review

2.1 Context and Importance

Government spending is a crucial component of economic plans in developing nations and has a key role in reducing poverty. These grants are financial allocations from central governments to local administrative levels or individuals intended to enhance economic stability and social well-being. Extensive research has investigated how helpful these funds are in reducing poverty. Re-

search by Saharudin et al. (2023) illustrates that government spending plans can effectively reduce poverty by distributing public monies efficiently and promoting equitable development across all economic sectors. This could greatly affect poverty rates in the future. Omar and Inaba (2020) emphasize growing government spending to enhance the quality of life through multiplier effects and attract foreign direct investment.

Furthermore, a study conducted in Nigeria indicates that government investment in economic services, including recurrent expenditure, social and community recurrent expenditure, and transfer recurrent expenditure, decreases poverty levels (Adegboyo, 2020). In Iraq, a recent case demonstrates that although poverty rates initially decreased due to more government spending, there has been a subsequent rise in poverty levels, highlighting the necessity for improved public spending strategies (Khader and Salman, 2022). Government expenditure programs should prioritize targeted interventions, including subsidies, poverty alleviation programs, and support for vulnerable groups to efficiently decrease poverty (Miar and Yunani, 2020). The funds are typically directed towards the most vulnerable groups in society, such as low-income households, the elderly, and the unemployed, to achieve a fairer allocation of resources. Studies have demonstrated that effective transfer programs can boost local economies by enhancing consumer spending and fostering small expansions of companies, leading to a multiplier effect on poverty alleviation.

Keynesian assumptions emphasize the government's responsibility in ensuring economic stability and providing public goods. Unemployment is considered the main factor leading to poverty (Davis and Sanchez-Martinez, 2015). This crucial function holds the government responsible for ensuring economic stability and improving the population's well-being through implementing expenditure policies, including subsidies, social security programs, and cash transfers. The government's ability to generate employment opportunities through public work projects and state-owned companies could help decrease the unemployment rate and lessen economic inequality (Stack, 1978). Moreover, the government's involvement in employment creation programs could have a multiplier effect. A job creation program boosts productivity and produces extra revenue for reinvestment in the public and private sectors.

However, the implementation of government transfer funds is fraught with challenges, particularly in developing countries where administrative and fiscal capacities may be limited. Issues such as improper targeting, inefficiencies in fund distribution, and corruption can significantly diminish the impact of these programs on poverty reduction. Moreover, the effectiveness of government transfer funds is highly contingent on the broader socioeconomic and political context. As noted by researchers, the impact of these funds can vary widely based on factors such as governance quality, the level of economic development, and existing social safety nets. For example, Ahmed (2022) found that government effectiveness had an insignificant effect on the Human Development Index (HDI) in South Asian countries, but good governance as a whole positively impacted HDI and the per capita GDP growth rate. Similarly, Halásková et al. (2023) found that government expenditures had differing effects on governance indicators in European countries with higher and lower economic levels. Additionally, Zou and Lu (2020) found that the effectiveness of general transfer payments in promoting fair development needs improvement and that general transfer payments are more effective than special transfer payments in promoting balanced development. These findings highlight the importance of considering the specific context when evaluating the impact of government transfer funds.

Therefore, a nuanced understanding of the local context is crucial in designing and implementing transfer programs. Additionally, the sustainability of these programs is a key consideration, as reliance on short-term transfers without addressing underlying structural issues may not lead to long-term poverty alleviation. In this regard, comprehensive policy approaches integrating transfer funds with broader economic and social reforms are more effective in reducing poverty.

2.2 Theory of Government Transfer Funds

The rationale for utilizing government transfer funds in poverty reduction is based on modern Keynesian economic ideas, which support government involvement in stabilizing and boosting the economy (Blanchard, 2017). Government transfer funds are intended to redistribute money to the economically disadvantaged sectors of society in order to reduce income disparity and alleviate

poverty. This strategy relies on the idea that increasing the disposable income of low-income individuals can boost overall demand, leading to economic growth and creating jobs (Galí, 2015).

This viewpoint is supported by the contemporary comprehension of the multiplier effect, in which an increase in expenditure results in a more substantial rise in national revenue and consumption. Modern welfare economics, as further highlighted by Atkinson and Bourguignon (2015), endorses these transfers as a way to achieve Pareto gains, allowing some persons to benefit without harming others.

However, the efficacy of these transferred funds is currently a topic of continuous discussion. Critics, referencing neoclassical and market efficiency theories, contend that government interventions can cause market distortions and impact labor supply patterns (Acemoglu and Autor, 2011). The 'dependency theory' which has emerged in current discussions, posits that extended dependence on government assistance might cultivate a culture of reliance, thereby diminishing the motivation of recipients to pursue employment or enhance their economic standing (Moffitt, 2015).

Empirical studies present mixed results; the impact largely depends on the program's design, implementation, and the specific socioeconomic context (Banerjee et al., 2015). As a result, there is general agreement on the importance of carefully planned and focused transfer programs, along with measures like education and job training, to achieve successful and long-lasting poverty reduction.

2.3 Intergovernmental Transfers and Poverty Reduction

Intergovernmental transfers, commonly referred to as fiscal transfers, refer to the provision of financial resources from central governments to regional or local governments. Transfers are essential in the financial administration of decentralized governance systems. Intergovernmental transfers primarily aim to alleviate fiscal disparities, promote equity, and ensure the uniform provision of public services in regions with varying fiscal capabilities (Bahl and Linn, 1992).

The theory of fiscal federalism provides a substantial explanation for the role and influence

of intergovernmental transfers. According to this concept, decentralization has the potential to enhance the efficiency and responsiveness of government services. Fiscal federalism highlights the importance of allocating resources from higher levels of government to lower levels in order to solve inequities and inefficiencies caused by differences in regional fiscal capacities and needs (Oates, 1999).

Intergovernmental transfers can be classified into several types, each with distinct economic implications:

- **General Purpose Transfers (Block Grants)**: Lump-sum payments provided to regional administrations without specific stipulations for the allocation of the funds. The primary objective is to attain fiscal equalization among regions, enabling local administrations to provide comparable public services regardless of their capacity to generate revenue (Shah, 2007).

- **Matching Grants**: Grants requiring local governments to match the funding provided by the central government with their own resources. This type of grant introduces a price effect by lowering the effective cost of providing additional public services. The Baumol-Oates framework suggests that matching grants are likely to result in higher levels of local government spending compared to lump-sum grants. This is because the financial incentive created by matching grants encourages local governments to increase their expenditures to maximize the benefit from the external funds (Baumol et al., 1979).

- **Specific Purpose Transfers (Conditional Grants)**: Funds designated for particular initiatives or areas, such as education, health, or infrastructure. Their objective is to synchronize local spending with national objectives and tackle particular regional shortcomings (Martinez-Vazquez and Boex, 2006).

- **Equalization Grants**: Policies aimed at reducing fiscal disparities by redistributing resources to regions that are economically disadvantaged, ensuring each region has the capacity to provide a fundamental standard of public services (Bird and Smart, 2002).

Additionally, intergovernmental transfers enhance public service delivery, particularly in underserved regions. By providing funds for healthcare, education, and infrastructure, these transfers improve the quality and availability of public services. This enhancement is vital for the development of human resources and achieving sustainable economic growth (Shah, 2006). Improved public services contribute to better health and education outcomes, which in turn support long-term economic development and poverty reduction.

Furthermore, intergovernmental transfers play a crucial role in maintaining economic stability. During periods of economic downturns, these transfers can act as automatic stabilizers by ensuring continued funding for essential services. By mitigating the impact of economic shocks and stabilizing regional economies, intergovernmental transfers help maintain social and economic stability (Rodden et al., 2003). This stabilizing effect is essential for preventing economic crises from disproportionately affecting vulnerable regions.

Well-designed transfer systems also provide significant incentive effects. Performance-based grants, for instance, encourage local governments to enhance their budgetary management and efficiency by meeting specific criteria in service delivery or fiscal control. Such incentives drive improvements in local governance and resource management, ensuring that funds are used effectively to achieve desired outcomes (Weingast, 2009). This approach not only enhances the efficiency of public spending but also promotes accountability and transparency in local government operations.

The efficacy of intergovernmental transfers is contingent upon various elements, such as the structure and execution of the transfer system, the governance framework, and the administrative capability of local governments (Bird, 2000). Transfers can be hindered by misallocation, corruption, and lack of accountability, which can result in inefficiencies and perpetuate regional inequities.

2.4 Baumol-Oates Framework

The Baumol-Oates framework, developed by economists William Baumol and Wallace Oates, provides a fundamental theoretical basis for understanding the impacts of intergovernmental transfers

on local government spending and behavior. This framework is critical in analyzing how different types of government transfers, whether lump-sum grants or matching grants, influence the allocation of resources and the provision of public services by local governments (Baumol and Oates, 1988).

According to the Baumol-Oates framework, lump-sum grants, also referred to as block grants, are fixed amounts of money provided by central governments to local governments without specific conditions on their use. These grants are intended to support general expenditure needs, allowing local governments the flexibility to allocate funds according to local priorities and preferences. The framework predicts that lump-sum grants will have an income effect akin to an increase in the local government's own revenue. This income effect enables local governments to enhance public goods and services, thereby potentially improving social welfare and addressing local needs more effectively (Oates, 1999).

Baumol and Oates (1988) argue that if the amount of money received is independent of local government behavior, meaning it does not depend on how much the local government spends or matches—then the impact of these grants is equivalent to an increase in income. Whether the grants are general funds or categorical does not significantly alter this outcome. This prediction aligns with the neoclassical framework, which suggests that fixed grants would not create a substantial behavioral change in how local governments allocate resources; instead, these grants augment the local government's budget, allowing them to spend more across various areas as they see fit.

The indifference curves shown in Figure 1 below illustrate this concept. When local governments receive a lump-sum grant, their budget constraint shifts outward, similar to an increase in income, allowing them to achieve higher levels of utility without altering their spending behavior.

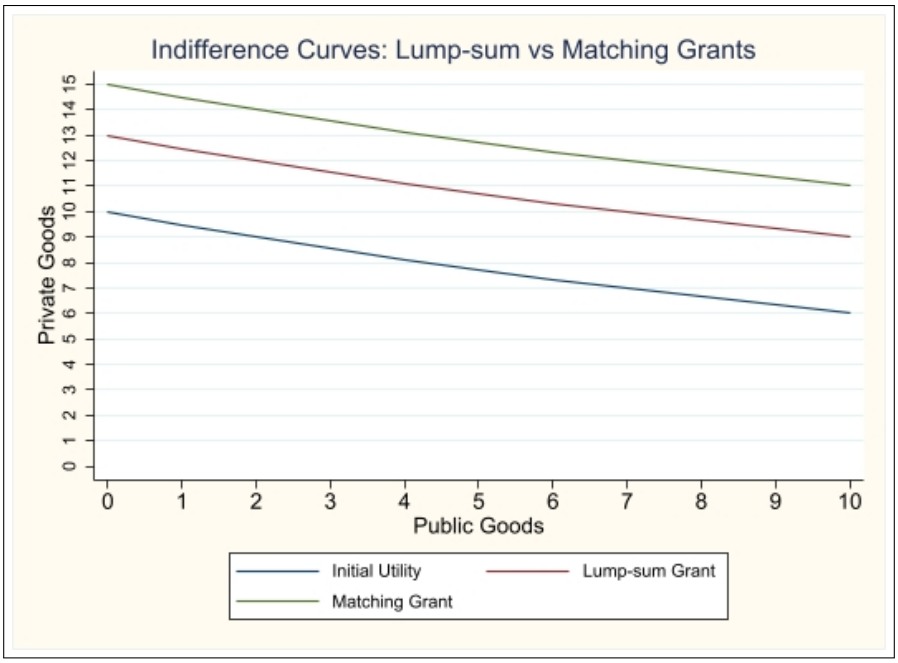


Figure 1: Indifference Curve: Lump-Sum vs. Matching Grants

In contrast, matching grants require local governments to match the funding provided by the central government with their own financial resources. These grants introduce a price effect by lowering the effective cost of providing additional public services. The Baumol-Oates framework suggests that matching grants are likely to result in higher levels of local government spending compared to lump-sum grants. This is because the financial incentive created by matching grants encourages local governments to increase their expenditures to maximize the benefit from the external funds. Essentially, matching grants make it cheaper for local governments to provide public services, thereby promoting greater investment in those services (Baumol et al., 1979).

The framework also emphasizes the role of fiscal decentralization in enhancing the efficiency and responsiveness of public service delivery. Fiscal decentralization involves transferring authority and financial resources from central to local governments, allowing local authorities to tailor public services to the specific needs and preferences of their communities. Baumol and Oates argue that decentralization can lead to improved allocative efficiency as local governments are better positioned to understand and respond to the unique demands of their residents. By aligning resource allocation with local needs, fiscal decentralization can contribute to better governance and

more effective public service provision (Oates, 2005).

Moreover, the Baumol-Oates framework highlights the importance of considering the fiscal capacity and needs of different regions when designing intergovernmental transfer systems. The allocation of grants should consider the varying economic conditions, population sizes, and development levels across regions to ensure that resources are distributed equitably and efficiently. This approach can help mitigate regional disparities and promote balanced economic development (Baumol and Oates, 1988).

In summary, the Baumol-Oates framework provides valuable insights into the dynamics of intergovernmental transfers and their impact on local government behavior. By distinguishing between the effects of lump-sum and matching grants and underscoring the significance of fiscal decentralization, this framework offers a robust theoretical foundation for designing effective transfer systems that support equitable and sustainable development. Understanding these principles is essential for policymakers aiming to enhance the efficiency and effectiveness of public expenditure through well-structured intergovernmental transfers.

2.5 The Flypaper Effect

The flypaper effect is a phenomenon in public finance whereby government contributions to local authorities lead to higher levels of local public spending compared to corresponding increases in local income. In essence, funds allocated by the central government tend to remain in the hands of the recipient government rather than being distributed to residents through tax reductions or other methods.

Arthur Okun extensively discussed the concept in the 1970s, and it has since become a well-documented and studied phenomenon in fiscal federalism. The flypaper effect posits that intergovernmental funds exert a greater influence on local government expenditures compared to increases in local revenue derived from taxes or other sources (Hines and Thaler, 1995).

2.5.1 Theoretical Background of the Flypaper Effect

The flypaper effect challenges the conventional economic theory that advocates for local governments to handle all sources of income, such as grants or local taxes, in a comparable manner. According to the conventional perspective, local authorities should align their spending and tax policies with the overall budget restriction, irrespective of the origin of funding (Bradford and Oates, 1971).

Nevertheless, the flypaper effect suggests that local governments tend to grow their spending to a greater extent when they get subsidies from higher-level governments compared to when they generate a comparable amount of cash locally. Multiple explanations can elucidate this occurrence:

- **Bureaucratic Behavior Theory**: Officials from local governments may prefer expanding public expenditures as it enhances their authority, financial resources, and impact. Grants are typically allocated towards public services rather than being used to lower local taxes (Niskanen, 2017).

- **Fiscal Illusion Theory**: Residents may view grants as ”unearned funds” and hence may not want tax reductions or enhanced accountability for the allocation of these funds. This misconception enables local governments to expend funds more liberally (Oates, 1988).

- **Political Economy Theory**: Local politicians may be motivated to utilize funds in order to finance conspicuous initiatives that have the potential to attract political backing and votes. This conduct is especially common in areas with intense election competition (Knight, 2002).

2.5.2 Empirical Evidence of the Flypaper Effect

Numerous empirical studies have documented the existence and magnitude of the flypaper effect, providing compelling evidence of its impact on local public spending. For instance, Hines and Thaler (1995) found strong evidence of the flypaper effect within the United States, demonstrating

that intergovernmental transfers lead to significantly higher levels of local public spending compared to equivalent increases in local revenue. This finding suggests that funds transferred from higher levels of government tend to ”stick” where they are allocated, resulting in greater public expenditure at the local level.

Further analysis by Knight (2002) explored the political economics of intergovernmental grants in the United States, revealing that these funds result in increased local public spending due to political motivations and electoral rivalry. Knight's study highlights how local politicians may use grants to finance visible projects that can attract political support and votes, particularly in competitive electoral environments. This political dimension of the flypaper effect underscores the influence of electoral considerations on the allocation and use of intergovernmental transfers.

Grossman (1990) also contributed to the understanding of the flypaper effect through an analysis of the influence of federal grants on the expenditure of state and local governments in the United States. Grossman's study confirmed that grants tend to remain within the recipient areas, leading to a rise in public spending. This phenomenon further supports the notion that intergovernmental transfers result in higher local expenditures than equivalent amounts of local revenue, reinforcing the idea that these funds have a distinct impact on local government behavior.

2.5.3 Implications of the Flypaper Effect

The flypaper effect has several significant implications for public policy and fiscal federalism. One of the primary impacts is the increase in public expenditure at the local level resulting from allocations from central governments. This increase can be advantageous if the expenditure properly addresses public needs, enhancing the quality and availability of public services. However, it can also lead to inefficiencies if the funds are not utilized optimally, potentially resulting in wasteful spending and misallocation of resources (Boadway and Shah, 2007).

Another critical implication of the flypaper effect is the potential reduction in fiscal discipline among local governments. The availability of grants from higher levels of government may diminish the incentive for local governments to maintain budgetary discipline and effectively manage

their resources. This can lead to fiscal imbalances and an increased reliance on transfers from the central government, creating a dependency that undermines the financial autonomy and sustainability of local governments (Rodden, 2003).

Understanding the flypaper effect is essential for designing effective intergovernmental transfer mechanisms. Policymakers must carefully evaluate the potential impacts of grants on local government behavior and structure transfers in a way that promotes efficient and equitable use of funds. This involves creating transfer systems that incentivize local governments to use grants responsibly and align expenditures with public needs, thereby enhancing the overall efficiency and effectiveness of public spending (Oates, 1999).

2.5.4 Theoretical Framework for Government Transfers

Social Protection Theory: The philosophy of social protection provides the basis for government transfers in less developed countries (LDCs). The argument suggests that social transfers are crucial in safeguarding individuals from economic risks and uncertainties, hence improving their capacity to engage in economic activity. (Barrientos and Hulme, 2008).

Social protection programs are designed to offer a fundamental level of security, safeguarding individuals from plunging into severe destitution as a result of unforeseen circumstances like sickness, joblessness, or natural calamities (Devereux and Sabates-Wheeler, 2004), 2004). Furthermore, human capital theory posits that investments in education, health, and nutrition have a vital role in improving individuals' productivity and capacity to earn income. Government transfers aimed at these specific sectors have the potential to disrupt the cycle of poverty by enhancing the future opportunities of those who receive them (Becker, 1964). Social transfers contribute to the formation of a more educated and healthier workforce by giving resources for education and healthcare. This is crucial for fostering economic growth (Gertler et al., 2012).

2.5.5 Empirical Evidence on the Impact of Government Transfers

Numerous empirical studies have highlighted the positive impact of government transfers on poverty reduction in less developed countries (LDCs). Conditional cash transfer (CCT) programs, which provide monetary assistance to impoverished households based on specific conditions such as consistent school attendance and regular health check-ups, have demonstrated notable effectiveness. Prominent examples include the Progresa/Oportunidades program in Mexico and Bolsa Família in Brazil, which have successfully enhanced school enrollment, improved health outcomes, and alleviated poverty (Fiszbein et al., 2002; Rawlings and Rubio, 2005).

Similarly, unconditional cash transfers (UCTs) offer cash to households without specific conditions. Research conducted in multiple African nations, including Kenya and Uganda, has shown that UCTs can effectively reduce poverty, enhance food security, and boost investments in productive endeavors within households(Baird et al., 2011; Haushofer and Shapiro, 2016).

Additionally, food assistance programs and subsidies for essential products play a crucial role in reducing poverty. Food subsidy programs in countries like India and Bangladesh have effectively alleviated hunger and improved nutritional outcomes for the poorest segments of the population (Ahmed et al., 2024; Drèze and Khera, 2013). Public works programs also significantly contribute to poverty reduction by offering temporary employment to impoverished individuals. For example, India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) provides a safety net through job opportunities while generating substantial infrastructure. These programs have proven successful in reducing poverty, particularly in rural areas (Zimmermann, 2023). Together, these studies underscore the diverse and substantial impact of government transfers in mitigating poverty and improving living conditions in LDCs.

2.5.6 Challenges and Considerations

While government transfers have been effective in reducing poverty in (LDCs), several challenges must be addressed to maximize their impact. One significant challenge is targeting efficiency, as ensuring that transfers reach the intended recipients is critical. Incorrectly directed resources can

result in benefits being dispersed to individuals who are not in need (leakage) or the exclusion of deserving individuals (under coverage). Effective targeting techniques, such as means testing and community-based targeting, are crucial for the success of social transfer programs (Coady et al., 2004). Fiscal sustainability is another major concern, as the viability of transfer programs depends on the availability of sufficient financial resources. LDCs often face financial constraints that make it difficult to sustain extensive social transfer programs. Enhancing tax collection methods and reallocating public expenditures can help ensure fiscal sustainability (Nissanke and Ocampo, 2019).

Additionally, strong administrative capacity is essential for the effective implementation and management of transfer programs. Inadequate administrative structures and infrastructure can hinder the efficient distribution of social transfers. Investing in administrative capacity and utilizing advanced technologies, such as digital payment systems, can significantly enhance program efficiency (Gelb and Decker, 2012). Addressing these challenges is vital for optimizing the impact of government transfers on poverty reduction in LDCs.

Government transfers are essential for reducing poverty in LDCs. They offer prompt assistance to impoverished individuals, improve the skills and knowledge of the workforce, and foster economic stability. Nevertheless, to optimize their influence, it is imperative to tackle obstacles pertaining to the effectiveness of targeting, financial viability, and administrative capability. Social transfer programs can make a substantial contribution to reducing poverty and promoting economic development in LDCs by successfully addressing these problems.

2.6 Review of Previous Studies and Indonesian Context

section Extensive research has been conducted on the efficacy of government transfer funds in alleviating poverty in many parts of the world. These studies have consistently shown that such monies have a substantial effect in improving access to healthcare, promoting equal educational opportunities, and directly reducing poverty in deprived regions. A study examining the susceptibility to healthcare poverty in rural households in China emphasizes the essential function of public

transfer payments in alleviating financial burden related to health care. Through the provision of financial assistance, these transfers empower households to access essential medical treatments, hence reducing their susceptibility to healthcare-related poverty (Li, 2021).

Transfer payments in the field of education have been shown to alleviate disparities in mandatory education in impoverished regions of China. According to Zhou and Fu (2022), These payments direct resources towards education, guaranteeing that children from lower-income households have the opportunity to receive high-quality education, so fostering social equality. Similarly, Wang et al. (2020) present empirical evidence from China demonstrating that government financial inflows into impoverished regions have a substantial impact in alleviating poverty. Their research indicates that providing specific financial assistance promotes economic growth and has a direct impact on reducing poverty.

Within the European environment Miežienė and Krutulienė (2019) analyze the influence of social transfers on the alleviation of poverty in EU member states. Their research emphasizes the crucial significance of social welfare programs in reducing poverty and social exclusion, demonstrating the value of social safety nets. These studies jointly confirm the crucial importance of government transfer monies in tackling poverty and socioeconomic disparities.

Studies conducted in Indonesia have repeatedly demonstrated that government transfer monies have a substantial effect on reducing poverty. Kharisma* et al. (2020) discovered that social transfers from the budgets of local governments were advantageous in alleviating poverty, whereas Majid et al.,(2019 emphasized the significance of directing monies from the financial sector to particular groups of the people. However, Arham and Payu (2020) suggested that the transfer of village funds was not significant in alleviating rural poverty, indicating a need for increased funding. Furthermore, Nursini and Tawakkal (2019) highlights the significance of fiscal decentralization in alleviating poverty by emphasizing the contribution of regional government income and intergovernmental payments.

Empirical research conducted in Indonesia and other comparable developing nations has provided insight into the efficacy of government transfer money in different sectors. These findings

demonstrate the effects of such funding, emphasizing their ability to facilitate fair growth and mitigate regional inequalities.

3 Conceptual Framework

This research incorporates several theoretical viewpoints into a conceptual framework, which offers a systematic way to comprehend the causes and results of these financial allocations. The factor affecting this framework In Indonesia include poverty rates and income levels. The inputs are the basis of systems that encompass the allocation of transfers to local governments, the usage of these payments for public services and infrastructure, and the implementation of performance-based rewards and incentives. The anticipated outcomes of these procedures include greater provision of public services such as education, healthcare, and infrastructure, augmented household income and consumption, and improved efficiency of local government.

The key components of this system consist of government transfers, local government capacity, and socioeconomic factors. Government transfers consist of three primary categories: the General Allocation Fund (DAU), the Special Allocation Fund (DAK), and the Revenue Sharing Fund (DBH). The goal of the DAU is to achieve fiscal equity among regions, guaranteeing that even economically disadvantaged areas have adequate resources for essential administrative and governance purposes (Lewis, 2013). The DAK focuses on targeted endeavors the improvement of infrastructure, education, and health services, in order to synchronize regional development with the overarching national objectives (Nasution, 2016). The DBH, which relies on tax and natural resource revenues, aims to guarantee equitable distribution of funding to regions that contribute to national revenue, thereby promoting local development.

Local government capacity refers to the capability of local governments to efficiently utilize the monies they receive. These criteria encompass administrative capacity, transparency, and efficiency in resource management (Lewis, 2003). Ultimately, socioeconomic factors such as poverty rates and income levels play a crucial role in determining how government transfers are distributed

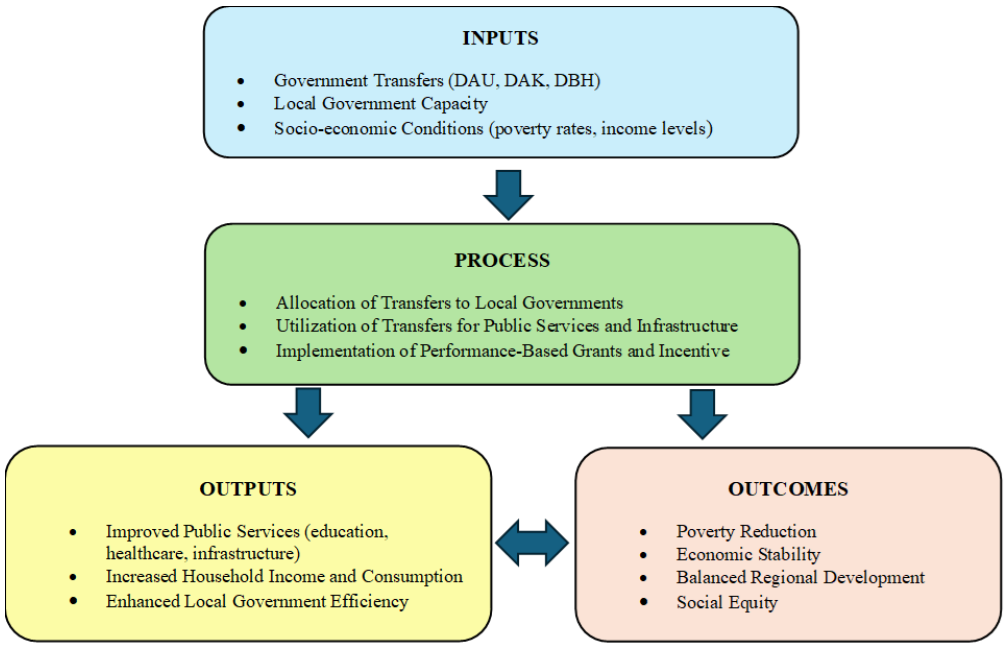


Figure 2: Conceptual Framework

and their overall effects. Comprehending these circumstances is essential for formulating efficient transfer initiatives that cater to the distinct requirements of various areas (Suryahadi et al., 2012).

The activities in this framework encompass the distribution and utilization of transfers, together with the execution of performance-based rewards and incentives. The distribution of transfers from the central government to local governments takes into account variables such as population size, geographical affluence, and specific requirements. The objective of this method is to allocate monies in a fair manner in order to promote balanced development across different regions. The usage of transfers pertains to the allocation and deployment of these monies by local governments for a range of public services and infrastructure projects. The effective usage of resources is contingent upon the capabilities of local governments and the socioeconomic circumstances specific to each region (DJPB Indonesian Ministry of Finance, 2022). Performance-based grants and incentives are utilized to motivate local governments to enhance their performance in the delivery of public services and management of resources. These procedures have the objective of improving local governance and ensuring that resources are utilized effectively to accomplish desired results.

The anticipated outcomes of these processes encompass expanded public services, augmented

household income and consumption, and heightened local government efficiency. The efficient utilization of government transfers leads to enhanced public services, including improved education, healthcare, and infrastructure (Lewis, 2013). Increased household income and consumption are direct benefits for households from these improved services and infrastructure, leading to higher living standards (Haushofer and Shapiro, 2016). Enhanced local government efficiency is achieved through performance-based incentives and capacity-building efforts, increase the effectiveness of local governments management of resources effectively (Bahl and Linn, 1992).

The overarching objectives of this framework are to diminish poverty, ensure economic stability, promote balanced regional development, and foster social fairness. Efficient usage of government payments results in poverty reduction by enhancing access to vital services and economic prospects (Fiszbein et al., 2002). Economic stability is achieved through increased household income and consumption, which contribute to more resilient local economies (Haushofer and Shapiro, 2016). Promoting balanced regional development involves ensuring the fair allocation of resources, eliminating regional inequalities, and ensuring that all areas benefit from national development endeavors. Ultimately, social justice is improved by guaranteeing a fairer allocation of resources and opportunities, specifically for underprivileged areas and communities (World Bank, 2023).

The strategic significance of well-planned intergovernmental transfers in Indonesia is highlighted by this conceptual framework, as they play a crucial role in fostering sustainable development and mitigating socioeconomic inequalities. Through the enhancement of public services, augmentation of household income, and optimization of local government efficiency, these transfers have the potential to make a substantial impact on poverty reduction, economic stability, and the promotion of balanced regional development.

4 Institutional Background

Indonesia's journey towards fiscal decentralization, crucial for understanding the DAU and DAK, began in earnest with the fall of Suharto's (Indonesia longest serving President from 1967-1998) New Order regime in 1998. This period marked a significant shift from a highly centralized system to a more decentralized governance structure. In 2001, the Indonesian government implemented Law No. 22/1999 and Law No. 25/1999, which laid the groundwork for fiscal decentralization (Abimanyu et al., 2004). These laws were aimed at redistributing financial resources to regional governments, enhancing local autonomy, and improving public service delivery at the regional level. There are several kinds of transfer funds in Indonesia, explained in the following sections:

4.1 Dana Alokasi Umum (DAU) / General Allocation Fund

The Dana Alokasi Umum (DAU), or General Allocation Fund, was introduced as a key component of Indonesia's fiscal decentralization process. The DAU is a mechanism for redistributing revenue from the central government to regional governments across Indonesia. Its primary purpose is to equalize fiscal capacity among regions, ensuring that all regions, regardless of their economic status, have sufficient funds to cover their general administrative and governance expenses (Lewis, 2003).

The allocation of DAU funds is primarily based on a formula that considers factors such as population size, regional wealth, and geographic conditions. The formula to calculate DAU is as follows:

$$\text{DAU (General Allocation Fund)} = \text{AD} + \text{CF} \tag{1}$$

Where,textbfAD denotes the basic allocation, which represents the total amount of civil servant salary and **CF** denotes the Fiscal Gap calculated from Fiscal Needs (*kbf*) reduced by Fiscal Capacity (*kpf*).

The Fiscal Needs are estimated with the following formula:

$$\text{Fiscal Needs (kbf)} = \text{TBR} \times (\alpha_1 \text{IP} + \alpha_2 \text{IW} + \alpha_3 \text{IKK} + \alpha_4 \text{IPM} + \alpha_5 \text{IPDRB}) \tag{2}$$

Where, **TBR** is the Total Local Expenditure, **IP** is the Population Index, **IW** is the Area Index (in km^2), **IKK** is the Construction Cost Index, **IPM** is the Human Development Index, **IPDRB** is the Local/Regional per capita GDP, and α's represent the respective weights for each index.

For the Fiscal Capacity, the formula is the following:

$$\text{Fiscal Capacity (kpf)} = \alpha_6 \text{PAD} + \alpha_7 \text{DBH-SDA} + \alpha_7 \text{DBH-Pajak} \tag{3}$$

Where, **PAD** is the Local Own Source Revenue, **DBH-SDA** is the Natural Resource Revenue Sharing Fund, and **DBH-Pajak** is the Tax Revenue Sharing Fund.

The DAU, as the primary mechanism for revenue sharing between the central and regional governments, has seen substantial growth in its scope and scale over the years. It represents a significant portion of regional government revenues, ensuring that even less economically prosperous regions have the necessary funds for basic administrative and governance functions. According to the Fiscal Policy Agency, Ministry of Finance Republic of Indonesia et al. (2022), the DAU allocation has been consistently increasing, reflecting the government's effort to support regional governments in providing public services and maintaining administrative capacities.

4.2 Dana Alokasi Khusus (DAK) / Special Allocation Fund

The Dana Alokasi Khusus (DAK), or Special Allocation Fund, was established to finance specific activities related to regional priorities and national programs. DAK funds are allocated to regions based on specific criteria and needs, such as infrastructure development, education, health services, and other sectors deemed vital for regional and national development (Nasution, 2016). The DAK is seen as a tool for aligning regional development objectives with national priorities.

The DAK, focused on financing specific development activities in regions, has also seen a

considerable increase in allocation. This reflects the Indonesian government's strategy to address specific development needs such as infrastructure, education, health, and other priority sectors at the regional level. The DAK is instrumental in aligning regional development projects with national priorities, and its allocation is often based on specific criteria and assessments of regional needs. A report by the Dhar (2021) highlights how DAK funds have been pivotal in supporting infrastructure projects, which are crucial for regional economic development and poverty reduction.

According to the DJPK Indonesian Ministry of Finance (2016), the DAK allocation mechanism is as follows:

- **General Requirements**: These are determined by assessing the local government's capacity, which is measured by subtracting the regional civil servant spending from the overall local government budget (*APBD*).
- **Specific Criteria**: Developed in accordance with statutory laws that govern the application of unique autonomy and regional features.
- **Technical Criteria**: Formulated using precise activity indicators that will be paid for through DAK.

The allocation of DAK is determined using a two-stage process. Initially, the government ascertains the specific territory that will be allocated by the DAK. Furthermore, the allocation of funding for each region that receives DAK is determined by the government.

4.3 Dana Bagi Hasil (DBH) / Revenue Sharing Fund

Based on DJPB Indonesian Ministry of Finance (2022), the revenue sharing fund is defined as, "The funds are derived from APBN (State Budget) revenue and are distributed to regions based on a specific percentage. These funds are intended to support regional needs in the context of implementing decentralization."

The DBH is guided by several pieces of legislation that aim to guarantee the fair distribution of resources based on their origin, and it is allocated in accordance with the actual revenue generated.

DBH encompasses tax-related aspects such as property tax and income tax, as well as natural resource-related aspects like forestry, mining, and oil and gas. The formula entails the equitable allocation of revenue among the central government, producing areas, and other regions to ensure a harmonious balance between local development and national interests. Each category of DBH follows precise distribution regulations mandated by legislation, guaranteeing that areas receive funding in proportion to their contribution or according to established formulas to foster equitable and focused development throughout provinces.

In Indonesia, the allocation of Dana Bagi Hasil (DBH) is determined by precise formulas that depend on the origin of the funds, such as tax revenues and revenues derived from natural resources. The allocation for tax-related DBH is decided by considering the regional contributions to national tax revenue, which enables regions to directly profit from their economic activities. Conversely, the distribution of natural resources related to DBH is determined by the amount of resources exploited in a specific area, which accurately reflects the direct connection between resource exploitation and financial compensation.

The distribution procedure of these allocations is driven by comprehensive legislative frameworks to increase fairness and transparency. The methods and specific percentages assigned to different regions vary to achieve a balance between local development requirements and national goals. This system promotes regional autonomy by allocating financial resources that are closely tied to local contributions to the national economy. This helps stimulate regional growth and mitigate inequities.

4.4 Dana Desa / Village Fund

Dana Desa, or Village Funds, represent a crucial fiscal policy in Indonesia designed to foster equitable growth and development across its numerous villages. Instituted by Law No. 6 of 2014, these funds are a direct response to the need for enhanced infrastructure, improved public services, and economic empowerment at the village level (DJPB Indonesian Ministry of Finance, 2022). They are specifically allocated through district and city budgets aimed at catalyzing development

and reducing disparities among rural communities.

The allocation mechanism for Dana Desa is meticulously structured to address varied regional needs, factoring in population size, geographical challenges, area size, and levels of poverty. This formula ensures that funds are distributed in a manner that promotes fairness and targets areas most in need. By accounting for these diverse factors, the government aims to facilitate more balanced and inclusive development across Indonesia's vast archipelago.

The overarching objectives of Dana Desa are to enhance local governance, improve access to public services, and stimulate economic activities at the grassroots level. These funds support a range of projects from infrastructure development to health and education improvements, which are vital for reducing rural poverty and supporting sustainable community development. The effective implementation of these funds is pivotal for empowering villagers, allowing them to play a significant role in shaping their economic futures and contributing to the broader national development agenda.

4.5 Miscellaneous Funds (Special Autonomy Funds, Regional Incentives Fund, and Special Regions Funds)

In this category, the government provides targeted financial assistance to specific regions based on their unique qualities. These funds include the Dana Otonomi Khusus (DOK) or Special Autonomy Funds, Dana Insentif Daerah (DID) or Regional Incentives Fund, and Dana Keistimewaan Daerah (DAIS) or Special Region Funds. The transfer payments from the government are designated financial allocations intended to provide support for regional governance and development in Indonesia (KPPN Aceh, 2022).

The DOK funds are allocated to regions having special autonomy, such as Aceh and Papua, to assist them in addressing their distinct governance and development requirements. These funds are governed by a legal framework that encompasses rules from 2001, 2008, and subsequent changes. The allocation of this money is essential for the financing of tasks that are special to autonomy, such as the construction of infrastructure, education, and health.

The Regional Incentives Fund, also known as the DID, is designed to provide incentives to regions based on their success in enhancing public governance services and community welfare. It motivates areas or provinces to excel in several administrative and development standards, providing additional funding as a reward for improvements. The allocation method for DID is organized to accurately represent the regions' fiscal management and efficient delivery of public services.

Finally, the DAIS (Special Region funding) is distributed to the Special Region of Yogyakarta, providing financial support for its distinct cultural and governmental position within Indonesia. The allocation of these funds occurs in stages throughout the fiscal year, guaranteeing uninterrupted assistance for the specific requirements of the region. Each of these funding streams is specifically tailored to match overarching national development objectives while also accommodating regional variations.

4.6 Current State of Transfer Funds in Indonesia

Over the years, government transfers have played a crucial role in shaping Indonesia's regional development landscape. They have been instrumental in addressing regional disparities and fostering local development, especially in less developed regions (Suryahadi et al., 2010). However, the implementation of these funds has also faced challenges, including issues of transparency, efficiency, and alignment with local needs (Sjahrir et al., 2014). Over time, government transfers in Indonesia have increased yearly, which can also be seen as a response to the increase in population.

Figure 3, which depicts the link between transfer per capita and population in Indonesia, demonstrates a tendency that corresponds to the concepts incorporated in the country's transfer formula. The allocation of government funds to regional and local governments is significantly determined by population size, as per the DAU (General Allocation Fund) formula. Overall, the population has consistently increased from over 205 million in 2000 to around 274 million in 2022.

This has led to a proportional rise in transfers per capita, highlighting the significant role of population in shaping the allocation of government finances. The rise in transfers per capita signifies the government's commitment to ensuring that regions receive sufficient financing in accordance

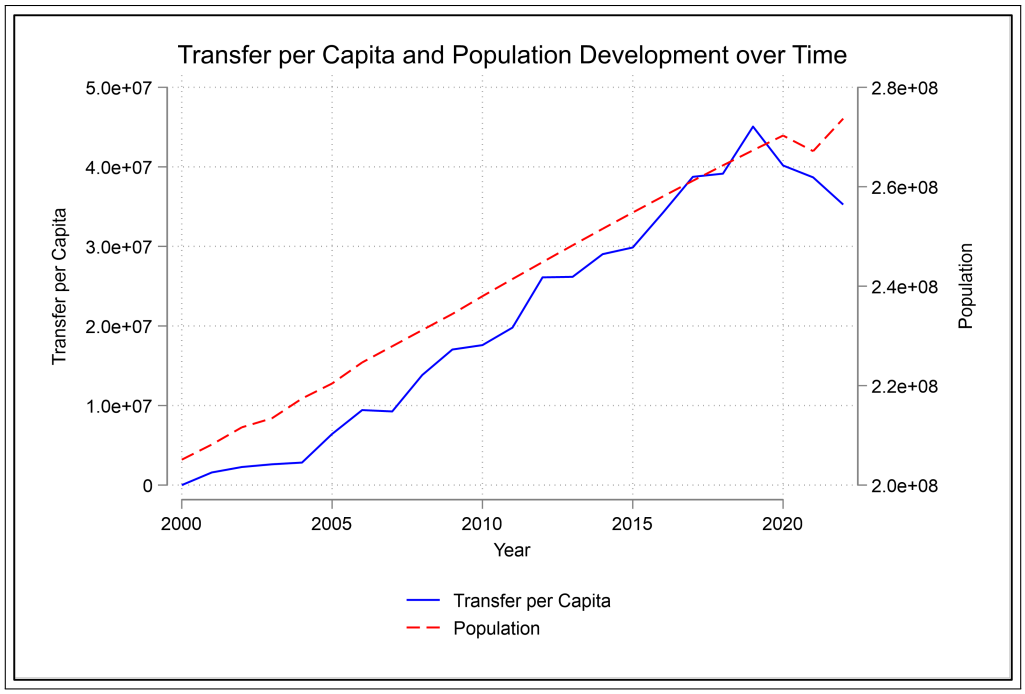


Figure 3: Government Transfer Per Capita and Population

with their demographic requirements, with the goal of fostering fair development and tackling the distinct issues faced by each region.

Nevertheless, this relationship does not adhere precisely to a linear pattern. Over time, variations in transfers per capita indicate that other factors impact the allocation formula or the overall amount of funds available for distribution. For example, there was a notable increase in the amount of money transferred per person from 2004 to 2005 (from around 2.8 million to over 6.4 million rupiah). This was followed by a continuous rise in per capita payments, which indicates particular policy changes or economic situations that extended the available funds. In contrast, the decline from 2020 to 2022 (from 40.1 million to 35.3 million rupiah per capita) can be attributed to the effects of the COVID-19 pandemic.

Furthermore, The DAU, as the primary mechanism for revenue sharing between the central and regional governments, has seen substantial growth in its scope and scale over the years. It represents a sizable portion of regional government revenues, ensuring that even less economically prosperous regions have the necessary funds for basic administrative and governance functions. According to the Indonesian Ministry of Finance (2023), the DAU allocation has been consistently

increasing, reflecting the government's effort to support regional governments in providing public services and maintaining administrative capacities.

The DAK, focused on financing specific development activities in regions, has also seen a considerable increase in allocation. This reflects the Indonesian government's strategy to address specific development needs such as infrastructure, education, health, and other priority sectors at the regional level. The DAK is instrumental in aligning regional development projects with national priorities, and its allocation is often based on specific criteria and assessments of regional needs.

Moreover, the Indonesian government has been working on improving the efficiency and effectiveness of these funds. Efforts include enhancing the transparency and accountability in the allocation and use of DAU and DAK, and ensuring that these funds are more closely aligned with regional development goals and national priorities. The government has also introduced various reforms to ensure that the allocation of these funds is more performance-based and outcome-driven, thus fostering better governance and regional development outcomes.

In addition to social assistance and subsidies, the Indonesian government aims to assist each province in maintaining economic stability and ultimately in reducing poverty through grant financing, which is separated into two categories: Special Allocation Fund and General Allocation Fund. According to the Indonesian Ministry of Finance, the Special Allocation Fund is a fund that is given to the Provinces to fund special activities that are the affairs of the Regional Government and are in accordance with national priorities, whereas the General Allocation Fund is an amount allocated by the Central Government to each Autonomous Region (Province/District/City) in Indonesia each year as development funds. Moreover, based on research by Kusumadewi and Rahman (2007), Maulana and Masbar (2018), and Tuasikal (2008), this grant from the Indonesian central government shows an impact on increasing the economic growth of provinces in Indonesia. However, these studies did not discuss how the total grant helps reduce poverty.

Alternatively, to provide significant context about the transfer of cash and poverty in Indonesia, we might analyze the per capita transfer, and the transfer specifically aimed at alleviating poverty

(Figure 4) . From 2000 to 2020, the total transfer per capita and transfer per poverty remained mostly steady with minor changes. The stability observed here is a result of maintaining a consistent method of intergovernmental transfers, without making any significant changes that would greatly impact the per capita and per poverty distributions.

In 2022, there is a significant growth in both indicators, with the transfer per poverty experiencing a particularly pronounced increase. The per capita transfer similarly exhibits an increased trend, with a more significant rise observed in the transfer per poverty.

The substantial surge in 2022 can be ascribed to various sources. Initially, as a response to the economic consequences of the COVID-19 epidemic, numerous countries, including Indonesia's, enacted comprehensive fiscal stimulus measures to aid in the revival of the economy. The stimulus measures encompassed significant intergovernmental transfers with the objective of enhancing local economies, bolstering public health initiatives, and alleviating the detrimental impacts of the epidemic on vulnerable populations (International Monetary Fund, 2021).

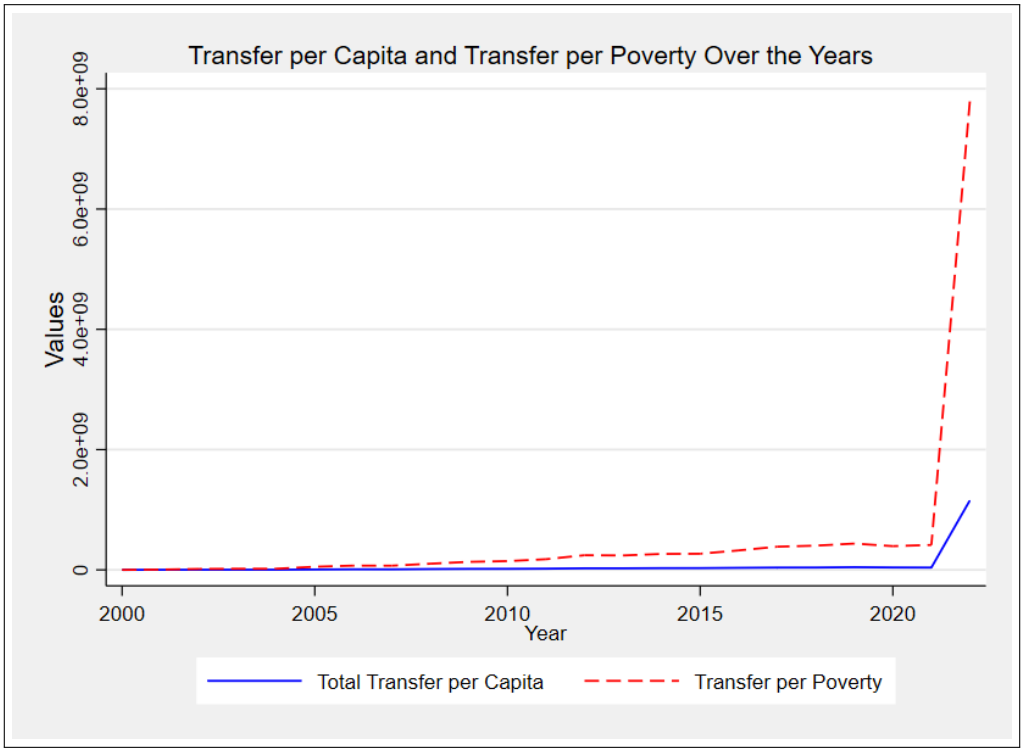


Figure 4: Transfer per Capita vs Transfer per Poverty

Furthermore, the significant increase in transfer per poverty demonstrates a focused strategy

in providing assistance to the most economically disadvantaged sectors of society. This is likely a result of governmental changes that specifically target the increased poverty caused by the pandemic. These changes involve allocating more monies to social safety nets, providing direct cash transfers, and implementing initiatives to alleviate poverty (World Bank, 2021).

In addition, the rise could potentially stem from modifications in the allocation formulae employed to disperse intergovernmental transfers. Adjusting the formulas to specifically target locations with higher poverty rates would account for the disproportionate increase in transfers per poverty. These improvements are made as part of continuous attempts to enhance the fairness and efficiency of fiscal decentralization programs (Lewis, 2013).

Global economic developments, such as inflation, may have contributed to the increase in nominal values of transfers. Rising expenses for products and services require increased transfers in order to sustain the same level of actual assistance to regions. Moreover, the influx of international financial support and grants likely played a role in the general augmentation of cash available for intergovernmental transfers (OECD, 2021).

4.7 Poverty in Indonesia

The phenomenon of poverty in Indonesia has undergone significant transformations throughout time, illustrating a multifaceted interaction between economic, social, and policy determinants. According to data obtained by the Badan Pusat Statistik (BPS) in 2023, from 1996 to 2019, there was a substantial decrease in the population living in poverty. During the Asian economic crisis in 1998, Indonesia's poverty rate was about 50 million people; however, it decreased by almost half by 2019. The increase in poverty in 2020 can be attributed to the repercussions of the COVID-19 pandemic, which led to significant changes in the economy, particularly affecting disadvantaged populations. Nevertheless, the growth was not as substantial as anticipated and has recently decelerated once more. This phenomenon underscores the nation's progressive achievement in alleviating poverty (Hill, 2021).

However, as of March 2014, around 28 million Indonesians remained below the national

poverty threshold, which was set at around US$25 per month per person, equivalent to roughly 82 cents per day. Applying the worldwide poverty level of $2 per day would result in approximately 40% of the population being categorized as impoverished, highlighting the persistent difficulties in combating poverty (Asian Development Bank, 2023).

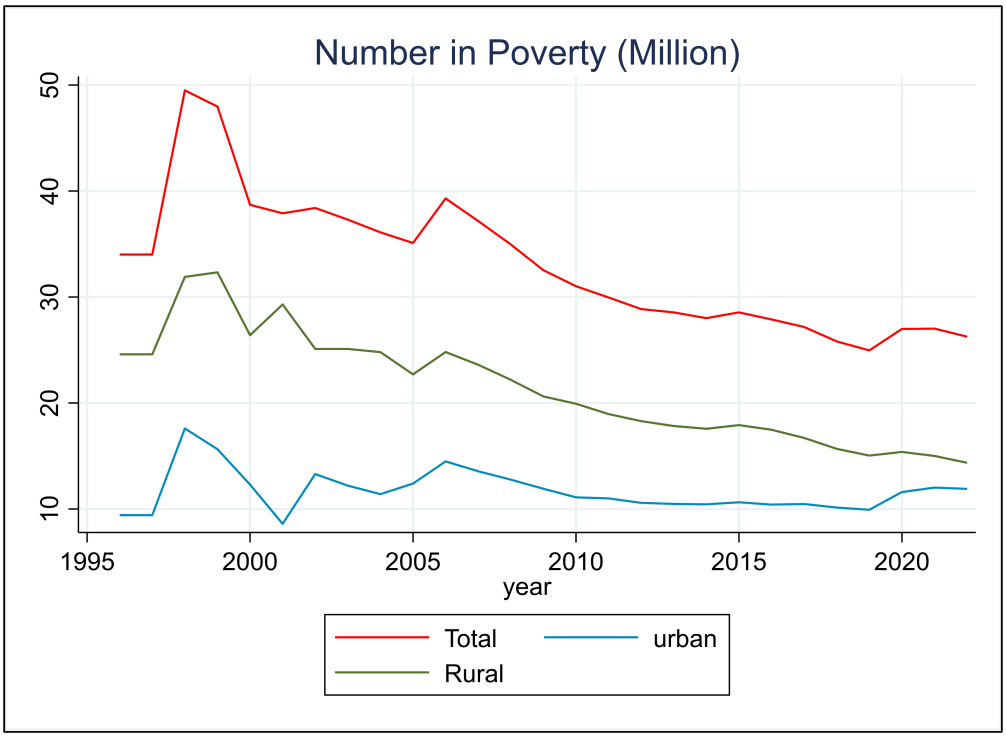


Figure 5: Number of People in Poverty (Million)

Indonesia's poverty characteristics are multifaceted, with both urban and rural populations significantly affected. The country's rural areas traditionally have higher poverty rates compared to urban areas, illustrating the geographical disparities in economic well-being. The multidimensional nature of poverty in Indonesia, especially highlighted during the COVID-19 pandemic, points to the necessity of considering a range of aspects of well-being, including health, education, and living standards, in any poverty analysis (Natih and Satriawan, 2023).

Table 1: Vulnerable groups in Indonesia - IFLS Transition Matrices

Group	Poor	Vulnerable	Aspiring Middle Class	Middle Class
1. IFLS I–II, 1993–1997				
Poor	39.9	30.3	25.7	4.2
Vulnerable	18.0	29.0	44.0	9.0
Aspiring Middle Class	8.6	17.4	53.5	20.5
Middle Class	2.0	8.4	41.8	47.9
2. IFLS II–III, 1997–2000				
Poor	44.8	29.4	23.3	2.5
Vulnerable	25.2	30.3	39.8	4.7
Aspiring Middle Class	10.8	19.9	54.3	15.0
Middle Class	4.2	7.4	44.0	44.4
3. IFLS III–IV, 2000–2007				
Poor	34.8	31.1	29.6	4.5
Vulnerable	19.7	28.5	45.6	6.2
Aspiring Middle Class	8.0	20.4	53.8	17.8
Middle Class	2.6	7.6	47.1	42.6
4. IFLS IV–V, 2007–2014				
Poor	30.4	28.1	36.0	5.5
Vulnerable	16.7	20.0	46.1	10.2
Aspiring Middle Class	6.6	15.4	54.9	23.2
Middle Class	2.5	7.7	37.9	51.9
5. IFLS I–V, 1993–2014				
Poor	23.7	23.9	42.1	10.4
Vulnerable	15.1	21.8	47.2	15.8
Aspiring Middle Class	7.7	17.7	51.0	23.6
Middle Class	3.8	9.3	43.2	43.7

Source: Indonesian Family Life Survey and World Bank (Hill, 2021)

In addition, Indonesia's poverty is characterized by a notable degree of susceptibility among its population. According to the most recent statistics obtained from the Indonesian Family Life Survey (IFLS), Indonesia's lower-class income is mostly composed of a susceptible and ambitious middle class. This means that any changes or movements in the economy will have a direct influence on this group. The most recent example of this is the COVID-19 pandemic, which led to an increase in the number of individuals living in poverty during the pandemic year.

Another inference drawn from Table 1 pertains to mobility: From the fifth set (1993–2014), 24% of the individuals who were classified as poor in 1993 continued to be poor in 2014, while

the remaining 76% transitioned into one of the three higher-income groups.

The Gini Coefficient is a commonly used metric to quantify income disparity within a community. It is measured on a scale from 0 (representing total equality) to 1 (representing entire inequality). According to data provided by the World Bank in 2022, in recent years, inequality in Indonesia has seen a gradual reduction in the Gini coefficient, indicating a progressive decrease in income disparity (Figure 6).



Figure 6: Gini Coefficient Trends in Indonesia

However, there has been a minor upturn in recent years due to the impact of the pandemic. The positive trend can be attributed to the Indonesian government's focused endeavors to enhance social welfare through comprehensive social assistance programs, improve accessibility to essential services such as education and healthcare, and promote economic inclusivity by empowering small and medium enterprises (SMEs). These measures are essential for encouraging fair and balanced economic growth and minimizing inequalities between various demographic groups, especially between urban and rural areas (Yusuf et al., 2014).

Although there have been improvements, there are still obstacles to effectively reducing income

disparity. These hurdles are mostly related to the concentration of economic activity in some regions and the difference between urban and rural areas. These factors highlight the intricate nature of attaining fair and balanced economic development (Hill, 2018). Moreover, although the rate of poverty reduction has been decelerating in recent years, this is occurring despite the country's robust economic growth. This decrease in speed indicates that mere expansion is not enough to eliminate poverty. Furthermore, the COVID-19 pandemic has introduced additional levels of intricacy to initiatives aimed at reducing poverty, impacting all facets of life and requiring a reassessment of policies and strategies for alleviating poverty.

4.8 Equity: The Distribution of Funding and the Implications

The allocation of government transfers in Indonesia has been a topic of heated discussion, particularly with regard to the discrepancies among provinces. Although the intended objectives of decreasing regional disparities and fostering balanced development are in place, the allocation of money frequently demonstrates substantial inequities. This section examines the inequitable allocation of government transfers in Indonesia, emphasizing the disparities between places with significant economic activity and those with higher poverty rates.

The map and data in Figure 7 demonstrate significant differences in the allocation of government funds between eastern and western Indonesia. The provinces of Papua and West Papua in eastern Indonesia receive substantial government transfers amounting to around IDR 8,950 trillion and IDR 7,378 trillion, respectively. Notwithstanding these substantial transfers, these provinces have vast territories to oversee, encompassing isolated and impoverished areas, which necessitate substantial financial assistance from the central government. On the other hand, Jakarta, despite its small size, receives a significant transfer of approximately IDR 20,801 trillion. The substantial amount of money is a direct result of Jakarta's status as the capital city and economic center of Indonesia, necessitating substantial resources to sustain its infrastructure and public services.

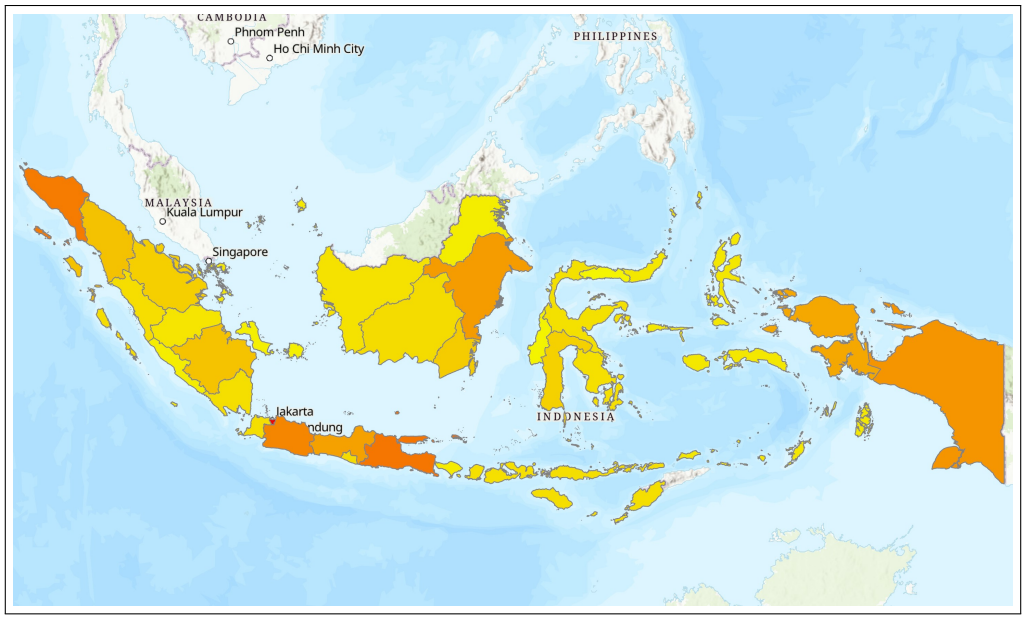


Figure 7: Distribution of Government Transfers Across Indonesia (2022)
Source: Indonesian Ministry of Finance

Based on the data depicting in this figure, it is evident that Eastern Indonesia, particularly provinces such as Papua, West Papua, East Nusa Tenggara, and Maluku, exhibit considerably greater poverty rates in comparison to western Indonesia. The extreme poverty levels can be ascribed to various factors such as inadequate infrastructure, restricted availability of education and healthcare, and a primarily rural and agricultural economy. The expansive and arduous landscape of these provinces also impedes development endeavors, intensifying poverty.

Conversely, the poverty rates in western Indonesian provinces, particularly those located on Java and Sumatra, are comparatively lower. Jakarta and Bali, as prominent centers for both economic and tourism activities, exhibit the lowest poverty rates due to their sophisticated infrastructure, abundant employment prospects, and superior availability of public services. Nevertheless, certain regions in western Indonesia still have areas with significant levels of poverty, emphasizing the necessity for specific and focused efforts.

Furthermore, the examination of government transfers and poverty rates among Indonesian provinces demonstrates a correlation that highlights the difficulties in tackling regional inequalities. The allocation of government payments, as evidenced by the data, is significantly impacted by both

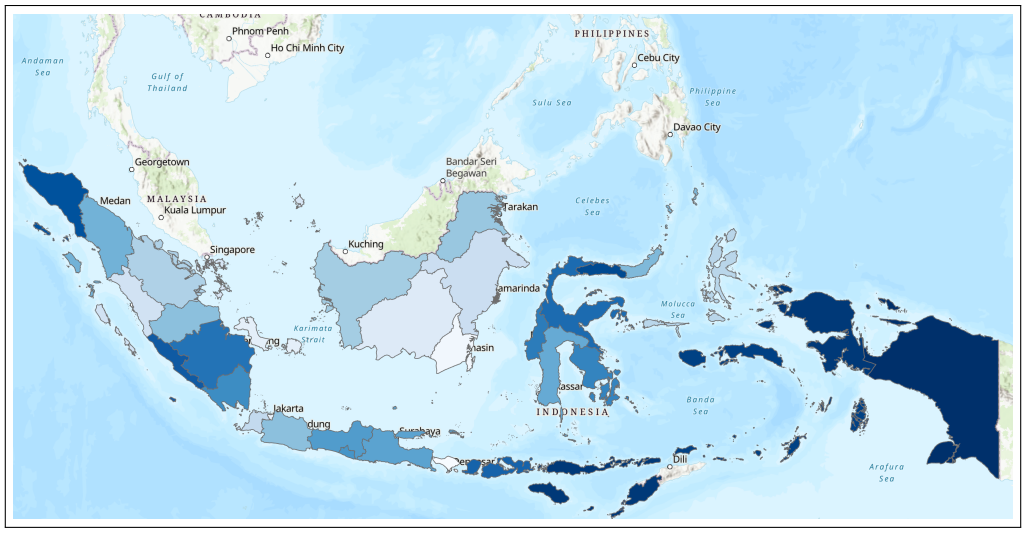


Figure 8: Poverty Rate Across Provinces in Indonesia (in % of Population) 2022
Source: Indonesian Bureau of Statistics

the density of the population and the socioeconomic requirements of various regions. Nevertheless, even with significant financial allocations to specific areas, there are still prevalent levels of poverty, emphasizing the necessity for more efficient and focused initiatives.

Papua and West Papua provinces receive substantial government transfers per capita because of their vast territories and isolated, impoverished areas. Although significant amounts of resources have been allocated to these provinces, they continue to have the highest poverty rates in Indonesia, specifically 26.56% and 21.33%. This implies that although the financial assistance is substantial, more focus is needed on how the funds are used and the particular socioeconomic difficulties faced by these areas (Siburian, 2020).

On the other hand, Jakarta, despite being tiny in terms of land area and having a low poverty rate of 4.44%, receives a significant amount of financial support from the government. This is because Jakarta is the capital city and economic center of Indonesia. The substantial per capita payments in Jakarta contribute to the maintenance of its enormous urban infrastructure and public services, which are essential for supporting its sizable population and economic endeavors (Nasution, 2016). This allocation system, although essential for preserving Jakarta's infrastructure, prompts inquiries regarding the equitable distribution of resources between economically prosper-

ous and impoverished regions.

Government transfers are allocated to regions such as West Java, Central Java, and East Java because of their substantial population densities and economic importance. These provinces demonstrate moderate levels of poverty, suggesting that although the payments assist in sustaining public services and infrastructure, there is still a requirement for specific initiatives aimed at reducing poverty. The scenario in these provinces highlights the significance of connecting transfer allocations with specific developmental objectives in order to achieve more efficient poverty reduction (Suryahadi et al., 2012).

The provinces located in the eastern part of Indonesia, namely East Nusa Tenggara and Maluku, further emphasize the discrepancy in the efficiency of government transfers. Although some provinces receive substantial per capita transfers, they still experience elevated poverty rates, indicating the distinct difficulties they encounter, such as inadequate infrastructure and restricted availability of basic services. This highlights the importance of not only distributing cash but also ensuring their efficient application to tackle the underlying factors of poverty.

5 Data

This study employs a broad dataset compiled from multiple authoritative sources to examine the influence of government transfers on poverty in Indonesia between 2000 and 2022. The Indonesian Bureau of Statistics (BPS), known for its comprehensive and dependable nationwide surveys, provided the main statistics on poverty rates, demographic features, and socioeconomic indicators. The Ministry of Finance provided financial statistics on government transfers, including the allocation and distribution among Indonesia's provinces. This data was used to monitor fiscal policies that attempted to reduce poverty. In addition, data at the household level, which is essential for comprehending the direct influence of government transfers on poverty, were obtained from surveys carried out by the World Bank's Indonesian Database for Policy Research (INDODAPOER).

The variables in the dataset for this research are chosen and organized to represent the con-

nection between government transfers and initiatives to reduce poverty in Indonesia. This dataset is notable for its extensive time span and wide geographical coverage, encompassing a period that includes significant political and economic changes in Indonesia, such as the decentralization movement that began in the early 2000s. Understanding the long-term effects of government payments on poverty levels is essential, and this historical range plays a critical role in that understanding. The choice to concentrate on Indonesia's 33 provinces, as delineated during the study period, arises from a need to uphold uniformity in geographical units of analysis over time, regardless of administrative modifications and the establishment of additional provinces after 2010. This methodology guarantees that the analysis remains unbiased by alterations in administrative boundaries and enables the investigation of long-term patterns in poverty reduction and the effectiveness of fiscal policies within defined provincial frameworks.

In addition, the dataset contains variables that represent both direct and indirect factors that affect poverty rates. Furthermore, it incorporates indices of economic activity, public infrastructure, and social services in addition to the fundamental variables of government transfers and poverty rates, thereby encompassing the diverse aspects of poverty. Metrics such as GDP per capita and unemployment rates offer valuable information on the economic conditions in each province, while factors pertaining to education, sanitation, and infrastructure quality provide a look into the social factors that contribute to poverty.

Further information and details about the variables can be found in the following Table 2.

Table 2: Descriptive Statistics

Variable	Description	Mean	Std. Dev.
Province	Number of Province	17	9.528
Year	Year	2011	6.638
Transfer	Total Transfers To each Province (Realization)	2.592e+12	3.384e+12
Transfer Per Capita	Total transfer/ capita	639200.48	1020204.9
Area	Area (KM2)	58151.724	64967.886
Population	Population	7291336.7	10341542
Unemployment	Unemployment (INDODAPOER)	200020.55	393120.44
Poverty	Number of people live below the poverty line (in number of people)	19996655	1.740e+08
School	Average years of Schooling	7.221	2.984
Unemployment BPS	Unemployment (BPS data)	6.493	3.181
Sanitation	Household Access to safe Sanitation (in % of total Household)	64.103	18.491
Electricity	Household Access to Electricity: Total (in % of total household)	85.004	21.345
Birth	Birth attended by Skilled Health worker (in % of total birth)	67.807	30.168
Safe Water	Household Access to Safe Water (in % of total household)	49.631	24.396
Road BPS	Length of National Road: Good (in km) (BPS Data Province only)	167.121	308.13
Literacy	Literacy Rate for Population age 15 and over (in % of total population)	81.814	31.501
Morbidity	Morbidity Rate (in %)	25.281	11.149
Employed	Number of people employed	2504479.8	4319869.6
Underemployed	Number of people underemployed	760605.95	1264263.9
Lab Force	Number of people in labor force	2708840.9	4675078.6
GDP Cap	GDP per capita	32104.858	36054.581
Household Exp Cap	Household per capita expenditure (in IDR)	536007.18	425747.42
Educ Exp	Monthly Per Capita Household Education expenditure (in IDR)	22525.584	21932.126
Health Exp	Monthly Per Capita household Health Expenditure (in IDR)	12585.707	12301.599
Totalexp Poor	Monthly Per Capita TOTAL Household Expenditure for The Poorest 20 percent (in IDR)	199032.27	164019.16
Pov Rate	Poverty Rate (in % of population)	12.561	8.357
Gini	Gini coefficient	0.305	0.12

Source: Author calculations

The dataset included in this study consists of 759 observations from 33 provinces in Indonesia spanning from 2000 to 2022, encompassing a wide array of socioeconomic characteristics. The variables encompass provincial attributes such as population, which exhibits considerable variation ranging from as low as 1,192 to as high as over 50 million, so emphasizing the demographic heterogeneity across the region. Likewise, there is significant variety in both the total and per capita government transfers, as well as the GDP per capita, which suggests different economic situations and fiscal distributions among provinces.

The socioeconomic metrics, such as educational attainment, availability of sanitation facilities, and literacy rates, highlight significant regional variations. For example, there is significant variation in the average years of schooling and access to sanitation among provinces, which indicates disparities in educational possibilities and infrastructure development. Moreover, the fluctuation in economic indices such as unemployment rates and household expenditures offer valuable insights into the economic difficulties and quality of life in various locations.

The significant variation observed in important variables such as poverty rates, health expenditures, and labor force statistics highlights the necessity of implementing customized policies at the regional level. An essential aspect of assessing the efficacy of fiscal policies in decreasing poverty and improving welfare is the analysis of government transfers, specifically on a per capita basis, and their association with poverty rates. Hence, examining these variables can provide valuable understanding of the relationship between government involvement and socioeconomic progress in Indonesia.

6 Econometric Method

This study employs an analytical methodology that systematically evaluates the causal influence of government transfers on poverty rates in Indonesia. The core of this study relies on the instrumental variables (IV) technique, which is selected for its capacity to tackle the issue of endogeneity that frequently hampers empirical evaluations of policy efficacy. Endogeneity in this case might occur due to reverse causation, where poverty levels impact the distribution of government transfers, or due to omitted variable bias, when unobserved factors simultaneously affect both poverty rates and government transfers (Angrist and Pischke, 2009).

To establish a plausible cause-and-effect relationship, we employ population size as a means to measure the impact of government transfers. This decision is based on the instrument's significance - its ability to forecast government payments and its assumed exogeneity, which means it only affects poverty rates through its impact on government transfers, meeting the essential criteria for a valid instrument (Bound et al., 1995). The utilization of the instrumental variable (IV) approach, divided into two stages, enables the separation of the external factors affecting government payments, thereby producing unbiased estimates of its influence on poverty rates by eliminating endogeneity bias.

6.1 Model Specification

This study utilizes an instrumental variables (IV) methodology to assess the causal impact of government transfers on poverty rates in Indonesia. The use of this two-step analysis is crucial in order to address the endogeneity problems that could potentially distort the evaluation of the impact of transfers.

In the first stage, the model of government transfers is a function of the instrumental variable (IV) and a set of control variables. The equation is formulated as follows:

$$\log(\text{Transfer_Capita}_{it}) = \alpha_0 + \alpha_1 \text{Population}_{it} + \sum \beta_k X_{kit} + \epsilon_{it} \tag{4}$$

Where:

- Transfer_Capita$_{it}$ is government transfers to province i in year t, potentially endogenous due to reverse causality or omitted variables.
- Population$_{it}$ is the population of province i in year t.
- X_{kit} represents control variables such as unemployment rates, schooling levels, sanitation access, and healthcare expenditures, allowing for a more nuanced analysis of poverty determinants controlling for numerous factors.
- ϵ_{it} is the error term.

The rationale for using the logarithmic transformation to the government transfers variable is based on economic principles. This transformation enables a more meaningful interpretation of the impacts by allowing for a multiplicative (percentage change) perspective, which is more relevant in economic terms compared to absolute changes. This is especially beneficial when working with variables that exhibit significant variations in magnitude among different observations.

The second stage of the analysis links the instrumented government transfers to poverty rates, incorporating the same set of control variables:

$$\text{Poverty}_{it} = \gamma_0 + \gamma_1 \log(\text{Transfer}_{it}) + \sum \beta_k X_{kit} + \mu_{it} \tag{5}$$

Where:

- Poverty_{it} is the poverty rate in province i in year t.
- Transfer_{it} is the predicted value of government transfers from the first stage, used to mitigate endogeneity.
- X_{kit} is the same vector of control variables as in the first stage.
- μ_{it} is the error term.

By employing this two-step approach, the estimation of the causal connection between government transfers and poverty can be facilitated, thereby effectively mitigating the concern of endogeneity. By applying the instrumental variables (IV) technique to instrument for government transfers, one can ascertain the magnitude and direction of the impact of transfers on poverty rates in a methodologically solid manner. This methodology transcends mere correlation and estimates causation, a differentiation that is emphasized in the scholarly contributions of Angrist and Pischke (2009) and Wooldridge (2010).

6.2 Identification Strategy

By isolating the causal effect of government transfers on poverty rates, the identification strategy of this study circumvents the endogeneity that ordinarily besets analyses of this nature. Endogeneity can manifest as a result of two factors: simultaneity, which occurs when poverty impacts government transfer allocations and omitted variable bias, which occurs when unobserved variables influence both poverty rates and the magnitude of government transfers.

The selection of population size as the metric for calculating government transfers depends on two fundamental assumptions: exogeneity and relevance. In accordance with the relevance assumption, there must be a correlation between the instrument and the endogenous explanatory

variable; in this case, government transfer allocations are influenced by population size. It is logical that regions with greater populations would necessitate and consequently obtain greater levels of government assistance. The exogeneity assumption stipulates that there should be no correlation between the instrument and the error term in the regression equation pertaining to the outcome variable (poverty rates). This means that any influence of population size on poverty is mediated exclusively through its effect on government transfers. Weak instrument problems are unlikely given the large effect on population (Bound et al., 1995).

In order to verify these assumptions, multiple empirical estimations are carried out. The instrument's strength is evaluated using the first-stage F-statistic. Values that are significantly greater than 10 indicate that the instrument is not weak (Staiger and Stock, 1997). The Sargan-Hansen test is not utilized as a diagnostic tool to assess the validity of instruments in an exactly identified instrumental variables (IV) framework. However, it becomes especially pertinent when many instruments are utilized. The assessment of overidentifying constraints involves testing the absence of correlation between the instruments and the error term in the regression model. The test aims to determine whether additional instruments beyond the minimum required for identification are exogenous. In other ways, this is impossible in a single-instrument scenario (Baum et al., 2003). Examine the practical uses and restrictions of these tests, emphasizing that the Sargan-Hansen test is only useful when several instruments are present, which means it cannot be applied in our study environment. To mitigate endogeneity and provide more reliable estimates of government transfers' causal effect on Indonesia's poverty rates.

For the purpose of conducting robustness checks to ensure the reliability of this study, there is a different approach by modifying the variable that is being measured. Instead of the poverty rate, inequality is measured through the Gini coefficient. This modification directly evaluates the impact of government transfers on the overall extent of poverty, offering a more distinct understanding of the policy's efficacy in alleviating poverty. By using the Gini coefficient, a new viewpoint is presented that, while poverty rates focus on the lower segment of the income distribution, the Gini coefficient considers the entire distribution. This change could reveal whether transfers are merely

lifting people above the poverty line or more broadly reshaping income distribution.

In addition, this study also introduced fixed effects to improve the analysis. The utilization of the fixed effects model manages unobservable factors that are consistent over time but differ among provinces. That is essential to separate the impact of government transfers from the influence of unchanging differences among provinces, such as geographical, cultural, or policy-related factors that may affect both government transfers and poverty outcomes but are not directly measured (Wooldridge, 2010). The objective is to appropriately attribute changes in poverty levels to government transfers by specifically examining differences within provinces during the research period. This approach allows exclusion of the impact of province-specific unobserved factors.

In addition, the study utilizes dynamic panel data models employing the Generalized Method of Moments (GMM) to tackle potential endogeneity concerns and reflect the changing nature of the connection between government transfers and poverty rates.

7 Result

7.1 Relationship Between Government Transfers and Poverty Rates

When examining the correlation between government transfers and poverty rates in various provinces of Indonesia, the scatter plot in Figure 9 presents a compelling yet intricate depiction. The data points represent the logarithmically converted government transfers percapita plotted against poverty rates and do not demonstrate a significant inverse correlation.

The regression line, which is almost flat, suggests that there is no relationship between variations in government transfers per capita and variances in poverty rates among provinces. This indicates that despite significant allocations, the efficacy of these grants in mitigating poverty is small. The significant variation in poverty rates among regions with identical levels of per capita government payments underscores the regional inequities and possible inefficiencies in using funds.

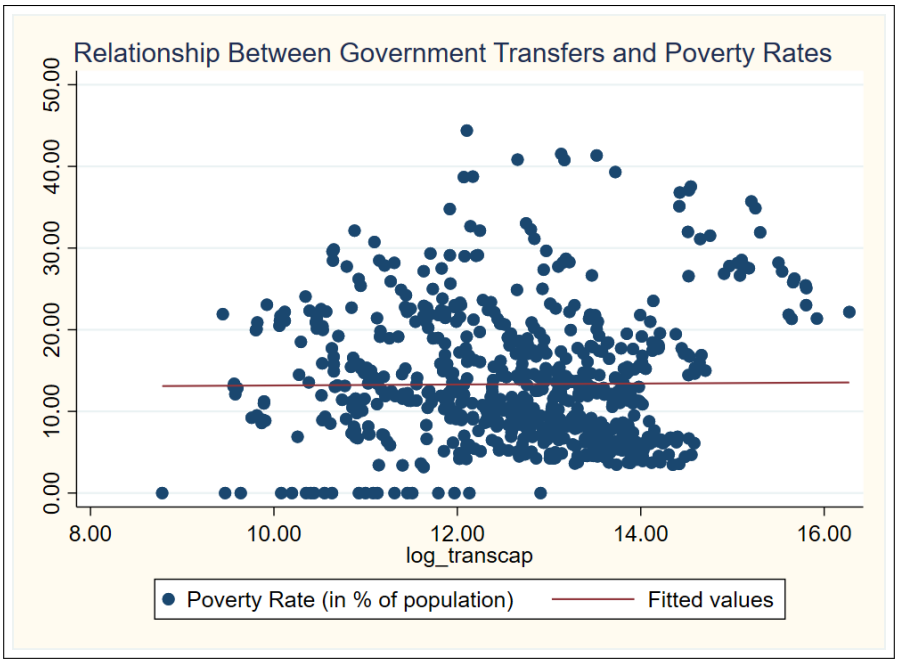


Figure 9: Relationship Between Government Transfers and Poverty Rates in Indonesia
Source: Author Calculation

The presence of inefficiencies in the conversion of cash transfers into tangible poverty reduction can be attributed to a range of issues such as mismanagement, corruption, or poor infrastructure (Lewis, 2016; Nasution, 2016).

This analysis highlights the need for policy actions that are more focused and comprehensive. Mere augmentation of per capita financial transfers is inadequate to tackle the intricate and deeply ingrained factors that contribute to poverty. Policymakers should prioritize improving the efficiency and efficacy of these transfers by boosting governance, openness, and accountability. Furthermore, it is imperative to tackle underlying problems such as education, healthcare, and economic opportunities in order to adopt a more holistic strategy for poverty alleviation. The absence of a substantial association between government transfers and poverty rates highlights the necessity for a more thorough examination of the contextual factors that impact poverty in various regions, as underscored by research on fiscal decentralization and regional inequality (Siburian, 2020; Suryahadi et al., 2012). To effectively tackle the fundamental causes of poverty and foster fair and sustainable development throughout Indonesia, authorities should implement a comprehensive approach that integrates financial assistance with structural reforms.

7.2 Trends Analysis for Specific Provinces

For this analysis, I have selected DKI Jakarta and Papua provinces as they exhibit notable disparities in terms of geographical size, demographic attributes, and poverty rates while both receiving substantial per capita government transfers. Jakarta, the capital city and economic center of Indonesia, is known for its compact size and dense population. Conversely, Papua, situated in the eastern region of Indonesia, possesses a huge expanse of land but with a significantly reduced population density. Jakarta and Papua are great case studies for understanding the unequal impact of government payments on poverty reduction due to their differing characteristics.

Jakarta's advanced infrastructure, thriving economic activities, and improved access to public services are key factors in its overall reduced poverty rates. However, Papua is confronted with significant developmental obstacles, including inadequate infrastructure, geographically distant and isolated villages, and restricted availability of critical services. These issues are seen in the elevated poverty rates. Examining these two provinces enables us to investigate the utilization of government payments in different situations and to determine the factors that impact their efficacy in reducing poverty.

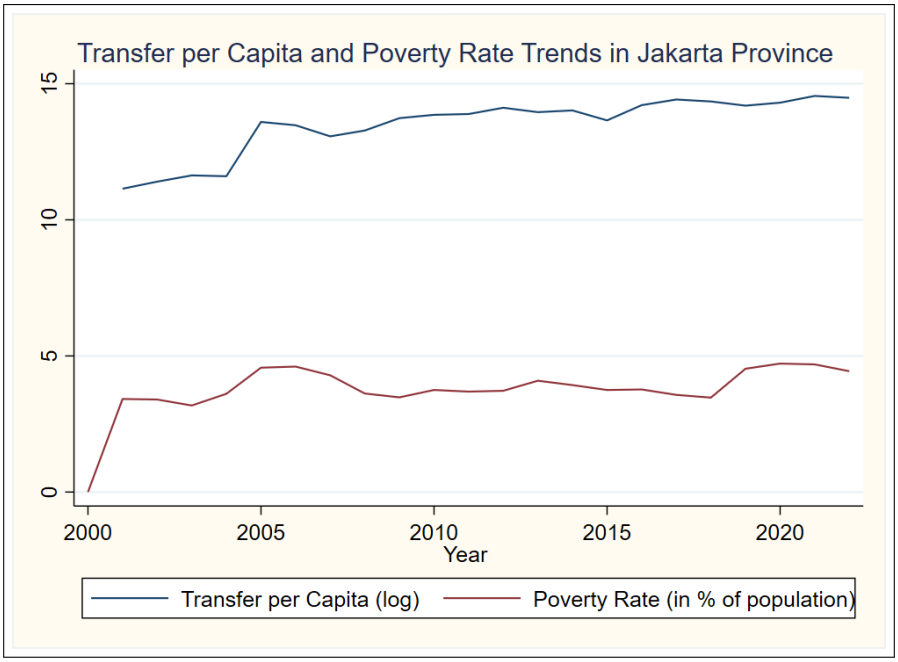


Figure 10: Transfer per Capita and Poverty Rate Trends in DKI Jakarta Province
Source: Author Calculation

The poverty rate in Jakarta is relatively low and consistent, indicating that government transfers, along with the city's economic advantages, efficient infrastructure, and public services, have effectively kept poverty levels low. This is consistent with the research conducted by Lewis (2017), which emphasizes the crucial importance of effective public service delivery and infrastructure in utilizing financial transfers to alleviate poverty. The effectiveness of Jakarta in utilizing government transfers highlights the significance of local governance and infrastructure in optimizing the influence of financial assistance.

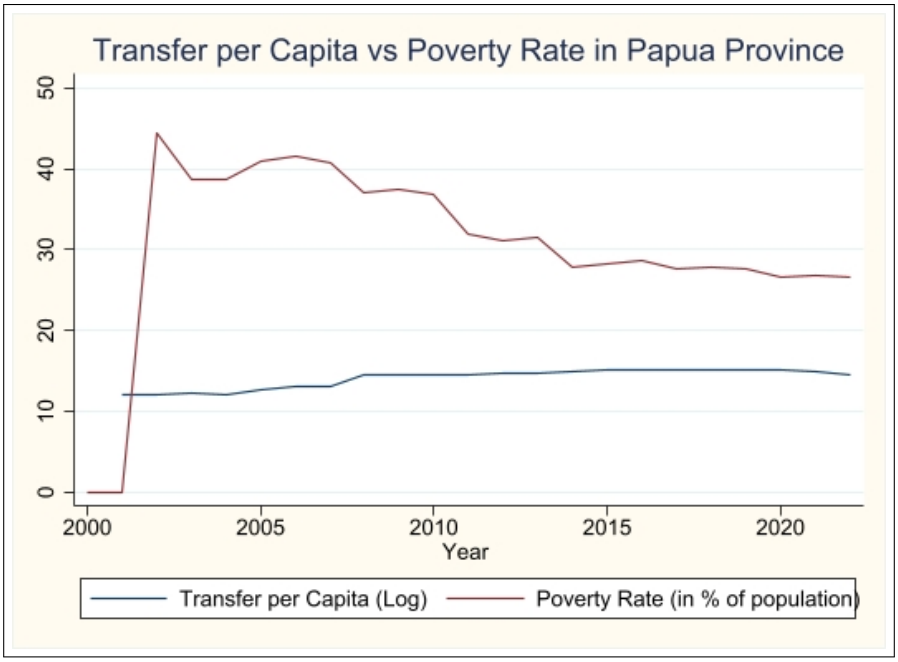


Figure 11: Transfer per Capita and Poverty Rate Trends in Papua Province
Source: Author Calculation

The enduringly high poverty rates in Papua, despite significant government payments, highlight the difficulties faced by the province in efficiently utilizing this money. The progressive alignment of real and predicted poverty rates indicates that although financial transfers have some effect, the rate of poverty reduction is sluggish due to structural obstacles such as insufficient infrastructure, geographically scattered populations, and restricted availability of key services. These findings align with research that emphasizes the problems in rapidly reducing poverty in regions with substantial developmental obstacles (Mansuri and Rao, 2012).

The dynamic panel data approach offers unique insights into the delayed impacts of govern-

ment transfers on poverty rates in Jakarta and Papua. The congruence between the real and adjusted poverty rates in Jakarta demonstrates the city's ability to effectively employ government transfers, aided by a well-developed infrastructure and efficient governance. On the other hand, in Papua, the ongoing high poverty rates notwithstanding significant transfers emphasize the necessity for specific initiatives that tackle the distinct structural difficulties of the region.

7.3 Main Results

The estimation of the instrumental variable (IV) analysis provides crucial insights into the relationship between government transfers and poverty rates in Indonesia. The analysis is conducted using both Ordinary Least Squares (OLS) and Instrumental Variables (IV) methods to address potential endogeneity concerns.

Table 3: Main Results: Impact of Government Transfers on Poverty Rate

	OLS		IV 1st Stage		IV 2nd Stage	
Variable	**Coeff**	**Std. Err**	**Coeff**	**Std. Err**	**Coeff**	**Std. Err**
Interest Variable						
Transfer per capita	3.180***	(0.330)	-	-	-10.91***	(1.134)
Covariates						
Unemployment	0.0254	(0.0980)	-0.198*	(0.115)	-2.131***	(0.224)
Average years of Schooling	0.0361	(0.132)	0.536***	(0.176)	5.885***	(0.574)
Access to safe Sanitation	-0.156***	(0.0208)	-0.187***	(0.0231)	-2.196***	(0.210)
Access to Safe Water	0.0137	(0.0225)	-0.0364	(0.0263)	-0.383***	(0.0426)
Length of National Road	0.00493***	(0.00107)	0.00165	(0.00134)	0.0229***	(0.00241)
GDP Per Capita	-0.0000378***	(0.0000105)	-0.0000126	(0.0000124)	-0.000176***	(0.0000196)
Literacy Rate	0.0415**	(0.0166)	0.0305*	(0.0179)	0.374***	(0.0393)
HH per capita expenditure	-0.00000818***	(0.00000183)	0.000000433	(0.00000267)	-0.00000346**	(0.00000167)
HH Per Capita Expenditure on Education	0.0000723**	(0.0000356)	0.0000177	(0.0000397)	0.000265***	(0.0000433)
HH Per Capita Expenditure on Health	-0.0000729	(0.0000687)	-0.000136*	(0.0000745)	-0.00156***	(0.000163)
Constant	-17.14***	(4.583)	27.24**	(10.60)	280.0***	(26.72)
Observations	715		715		715	
R-squared	0.328		0.222		0.328	
Number of provinces	33				33	

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Author calculations

The estimation findings of the OLS or linear model indicate an initial positive correlation between log-transformed transfers per capita and poverty rates, with a coefficient of 3.180, which is statistically significant at the 1% level. This counterintuitive finding aligns with similar conclusions reached by Anderson et al. (2018), who argued that several studies show a positive relationship between assistance programs in the form of government transfers and poverty rates, which is likely due to reverse causality. The association could be explained by the fact that areas

with higher poverty rates tend to receive more payments. Nevertheless, additional socio-economic factors, such as unemployment and education, also played a role in shaping these patterns. The analysis revealed that sanitary facilities had a negative coefficient, indicating that increased access to sanitation is associated with a decrease in poverty.

The first-stage IV model estimated the coefficient of -0.291 for the instrumental variable's projected transfer per capita (*log_transcap*). This outcome confirms the significance and soundness of the instrument, which is essential for appropriately assessing the causal relationship between government transfers and poverty. At this level, variables such as unemployment and sanitation show strong negative coefficients, indicating their ability to predict government grant allocations. Enhancements in both sectors seem to result in heightened support from the government.

The second-stage instrumental variable (IV) model, which addresses endogeneity by using an instrumented *log_transcap* (linear prediction of transfer per capita), demonstrated that transfers have a substantial and strongly negative impact on poverty rates. At the 1% significance level, a coefficient of -10.91 indicates that there is a negative relationship between government transfers per capita and poverty rates, after accounting for endogeneity. The obtained outcome presents a clear opposition to the findings of Ordinary Least Squares (OLS), emphasizing the significance of addressing endogeneity to uncover the genuine association between transfers and poverty. Additional influential factors, such as GDP per capita, household expenditures, and sanitation, consistently demonstrated negative impacts on poverty, thereby emphasizing their importance in mitigating poverty. These findings align with those of Banerjee and Duflo (2011), who stress the importance of focused interventions in infrastructure, education, and sanitation as crucial for poverty reduction. These findings confirm the theoretical predictions outlined in the conceptual framework. The improved public services and increased household income and consumption resulting from government transfers are linked to poverty reduction, economic stability, and balanced regional development.

In summary, this outcome emphasizes the connection between government transfers and poverty rates, and the importance of considering endogeneity when studying this connection. By

employing instrumental variable (IV) methodologies to account for biases, it was revealed that government support plays a pivotal role in mitigating poverty. This complements the positive effects of enhancements in infrastructure, education, and economic growth.

Despite the overall positive impact of government transfers on poverty reduction, there are instances where the impact may not be as significant as expected. One potential reason is the ineffectiveness of the programs funded by these transfers. If the programs are poorly designed, inadequately implemented, or fail to address the root causes of poverty, the funds may not translate into significant poverty reduction. For instance, programs aimed at improving education or healthcare might not achieve their intended outcomes due to inadequate infrastructure, lack of trained personnel, or inefficient resource allocation. Another potential reason is the diversion of funds to purposes other than poverty reduction. Local governments might allocate a sizable portion of the transfers to administrative expenses, salaries of civil servants, or other projects that do not directly target poverty alleviation, diluting the effectiveness of the transfers in reducing poverty. Corruption and mismanagement of funds at the local level can also hinder the impact of government transfers on poverty reduction. When funds are siphoned off through corrupt practices or mismanaged due to lack of transparency and accountability, the intended beneficiaries do not receive the full benefits of the transfers, reducing their overall impact.

Furthermore, there could be a discrepancy between the allocated amounts and the specific requirements of the regions. If the allocation mechanism fails to adequately represent the socioeconomic situations and specific requirements of the regions, the payments may not successfully combat poverty. Regions characterized by high poverty rates but smaller populations may receive insufficient money to effectively address poverty reduction. The effectiveness of government transfers in reducing poverty is influenced by the local governments' abilities to efficiently manage and utilize the funds. Local governments with low administrative ability, insufficient planning, and weak implementation frameworks may encounter difficulties in effectively utilizing the money, leading to delays, exceeding the budget, and achieving less than optimal results. Government transfers can be influenced by external economic circumstances, such as economic recessions, natural

calamities, or worldwide economic crises, which might affect their effectiveness. These factors can place enormous pressure on local economies, leading to higher rates of unemployment and worsening levels of poverty. This makes it difficult for government transfers alone to effectively reduce poverty.

7.4 Robustness Checks

7.4.1 F-test

In the robustness check of the first-stage regression employing an F-test, the analysis confirms the strength and effectiveness of the instrumental variable used to predict log-transformed government transfers (*log_transcap*). The results are shown in Table 4.

Table 4: F-test Result

	Adjusted R-sq.	**Partial R-sq.**	**R-sq.**	**F(1751)**	**Prob > F**
log_transcap	0.7232	0.7189	0.1333	161.308	0.0000

Source: Author calculations

The Adjusted R-squared value of 0.7232 indicates that the model, inclusive of the instrument and other covariates, accounts for more than 72% of the variance in the dependent variable. This substantial explanatory power reflects a well-specified model where the instrument effectively captures significant aspects of the variability in log-transformed government transfers.

The Partial R-squared, which measures the variance in *log_transcap* explained solely by the instrument, is 0.1866. This demonstrates that the instrument alone makes a significant contribution to explaining the variance, an assertion further supported by an F-statistic of 161.308. This statistic not only surpasses the commonly accepted threshold of 10, indicating a strong instrument, but its associated p-value shows the statistical significance of this relationship.

Additionally, the minimum eigenvalue statistic at 161.308 provides robust support for the instrument's strength, significantly exceeding the critical values from the Stock-Yogo tests for weak identification (Stock and Yogo, 2005). These tests set thresholds such as 16.38, 8.96, 6.66, and 5.53 at various significance levels to evaluate potential bias in the 2SLS estimates. The fact that

the F-statistic considerably exceeds these critical values reinforces the strength of the instrument, ensuring that the 2SLS estimates are unlikely to be biased by a weak instrument.

This comprehensive validation of the instrumental variable used in the econometric models is crucial. By confirming the validity and strength of the instrument, the results show that the IV approach in the study is robust, enhancing confidence in the reliability of the estimated causal effects of government transfers on economic outcomes. Such meticulous verification of instrumental strength and validity is essential in econometric analyses, providing a solid foundation for drawing accurate and policy-relevant conclusions from statistical investigation.

7.4.2 Use of IV with Fixed Effect

The robustness check used in this research utilized the Gini coefficient as the dependent variable with a three-model strategy. This approach allows the research to validate the results from the main estimation and checks whether government transfers from the central government had an impact on reducing poverty and inequality in Indonesian provinces. The estimation uses a similar approach to the main results, including the use of Linear Fixed Effects (FE) and the Instrumental Variable with Fixed Effects (IV-FE). The results are as follows:

Table 5: Robustness Checks, IV Fixed Effect using Gini Coefficient

	Linear		IV 1st Stage		IV 2nd Stage	
Variable	**Coeff**	**Std.Err**	**Coeff**	**Std.Err**	**Coeff**	**Std.Err**
Transfer per Capita	0.0407***	(0.00829)	-	-	-0.918***	(0.187)
Unemployment	0.000527	(0.00237)	-0.00530***	(0.00134)	-0.00434*	(0.00240)
Average years of Schooling	0.0193***	(0.00122)	0.0276***	(0.00205)	0.0446***	(0.00489)
Access to safe Sanitation	0.000397	(0.000659)	0.0000284	(0.000269)	0.000423	(0.000657)
Access to Safe Water	-0.00121***	(0.000356)	-0.00121***	(0.000306)	-0.00232***	(0.000340)
Length of National Road	-0.00000276	(0.0000126)	-0.0000691***	(0.0000156)	-0.0000662***	(0.0000135)
GDP Per Capita	-9.20e-08	(0.000000153)	0.000000197	(0.000000145)	8.92e-08	(0.000000160)
Literacy Rate	0.00155***	(0.000314)	0.000518**	(0.000208)	0.00202***	(0.000318)
HH per capita expenditure	-2.22e-08	(2.27e-08)	9.98e-08***	(3.11e-08)	6.94e-08**	(2.87e-08)
HH Per Capita Expenditure on Education	5.40e-08	(0.000000355)	0.000000321	(0.000000462)	0.000000349	(0.000000342)
HH Per Capita Expenditure on Health	-0.000000196	(0.000000649)	-0.00000137	(0.000000867)	-0.00000145*	(0.000000735)
Constant	-0.420***	(0.102)	0.689***	(0.123)	0.213***	(0.0695)
Fixed Effects	Yes		No		Yes	
Observations	715		715		715	
R-squared	0.586		0.273		0.586	
Number of provinces	33				33	

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Author calculations

The Linear FE model indicates a positive and statistically significant coefficient for *log_transcap* (0.0407), indicating that higher government transfers per capita are linked to an in-

crease in income inequality, or support the main result assumption about the possibility of reverse causality. This finding aligns with more recent research, such as that by **?**, suggesting that government supports in the form of transfers can unintentionally worsen income inequalities if the programs are not properly designed to target the most economically disadvantaged groups. Nevertheless, the notable negative coefficient for *safe_water* suggests that increased availability of safe water helps to reduce growing inequality, emphasizing the need for easily accessible public infrastructure.

In the 1st stage of the IV model, the instrumental variable exhibits a strong predictive power for *log_transcap*, with a coefficient of -0.0443. Variables such as unemployment and *safe_water* have a substantial impact on the distribution of government payments, supporting the notion that socio-economic conditions play a role in determining how government assistance is distributed.

The second stage of the instrumental variable (IV) model provides a more precise estimation of the correlation between transfers and inequality by taking into account and resolving concerns related to endogeneity. The instrumented *transfer_hat2* demonstrates a highly significant and negative coefficient (-0.918), suggesting that an increase in government transfers per capita is linked to a significant decrease in income inequality. This stands in stark contrast to the results obtained using the Linear FE model and emphasizes the significance of addressing endogeneity. Additional influential factors such as educational attainment, literacy rates, and household expenditure further support the notion that enhancing education and increasing household spending are crucial for mitigating inequality. These findings align with research conducted by Higgins and Lustig (2016) which highlights the significance of education and household income in diminishing disparities.

These findings support the main results by emphasizing that government transfers, when accurately aimed and adjusted, can greatly diminish economic inequalities. The findings underscore the necessity of implementing meticulously planned social programs in conjunction with infrastructure improvements to effectively decrease inequality.

7.4.3 Dynamic Panel Data Model: Visualization of Lagged Effects

This study utilizes a dynamic panel data model to assess the lagged impacts of government transfers on poverty rates. The Generalized Method of Moments (GMM) is employed to estimate the model, effectively dealing with any endogeneity concerns by including past values of the dependent variable as instrumental variables. This methodology enables a more sophisticated understanding of the impact of previous government transfers on present poverty rates over time, providing valuable insights into the enduring nature and temporal patterns of these effects.

The outcomes obtained from estimating the dynamic panel data model using the Arellano-Bond Generalized Method of Moments (GMM) technique offer crucial insights into the delayed impacts of government transfers on poverty rates in different provinces of Indonesia. This estimation includes 693 data points from 33 provinces over the required period and uses previous values of the dependent variable to account for endogeneity.

Table 6: Dynamic Panel Data Model Results

VARIABLES	**pov_rate**
L.pov_rate	0.930***
	(0.0191)
L.transfer_cap	3.36e-08
	(1.28e-07)
Constant	1.336***
	(0.304)
Observations	693
Number of Province_num	33

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Author calculations

This research shows that the lagged poverty rate (L.pov_rate) has a coefficient of 0.930, which is highly statistically significant ($p - value < 0.01$). This outcome demonstrates a robust continuity in poverty rates, implying that previous levels of poverty have a substantial impact on current poverty rates. The coefficient value approaching 1 indicates that poverty is deeply ingrained and enduring, making it extremely difficult to achieve short-term poverty reduction.

On the other hand, the coefficient for lagged government transfers per capita (L.transfer_cap) is 3.36e-08, although it is not statistically significant with a p-value of 0.794. These findings suggest

that there is no statistically significant causal relationship between lagged government payments per capita and poverty rates in the following period. The insignificance implies that the existing distribution and utilization of government funds may not efficiently diminish poverty rates. This discovery emphasizes the necessity for additional research on the implementation of these transfers and indicates possible inefficiencies in their targeting and utilization.

The model utilizes 212 instruments to address endogeneity. The abundance of instruments is typical of Arellano-Bond estimation. The Wald chi-square test statistic is 15001.01 (p¡0.001), indicating that the model as a whole is statistically significant. These findings indicate that the variables used in the model collectively exert a substantial impact on poverty rates.

The use of an instrumentation technique that incorporates lagged values of the poverty rate and government transfers, in addition to the traditional instrument for the level equation, effectively tackles concerns related to endogeneity and supports the consistency of the estimators.

To validate the instruments used in the model, a Hansen J test for overidentifying restrictions was conducted. The test statistic was 0.00 with a p-value of 1.0000. These results indicate that the model is exactly identified, meaning that the number of instruments equals the number of endogenous variables, and therefore the test is not applicable in the usual sense since there are no excess instruments to evaluate. The high p-value confirms that the instruments are valid and not correlated with the error term, which supports the reliability of the GMM estimation.

The results obtained from this dynamic panel data model offer crucial insights into the long-lasting nature of poverty and the impact of government transfers in Indonesia. The enduring nature of poverty rates highlights the underlying structural obstacles that need to be tackled in order to achieve significant poverty reduction. The lack of statistical significance in the relationship between lagged government payments per capita and poverty rates shows that the effects are at most short-term. This is consistent with previous research, which highlights that successful efforts to reduce poverty necessitate holistic approaches that go beyond simply providing money, and instead involve enhancing infrastructure, education, healthcare, and local government (Henderson and Kriticos, 2018). Furthermore to give an example of the dynamic models, we can compare the

result of provinces with distinct characteristics, such as DKI Jakarta and Papua, to evaluate the effectiveness of government transfers in diverse contexts and better understand the role of regional factors in poverty alleviation.

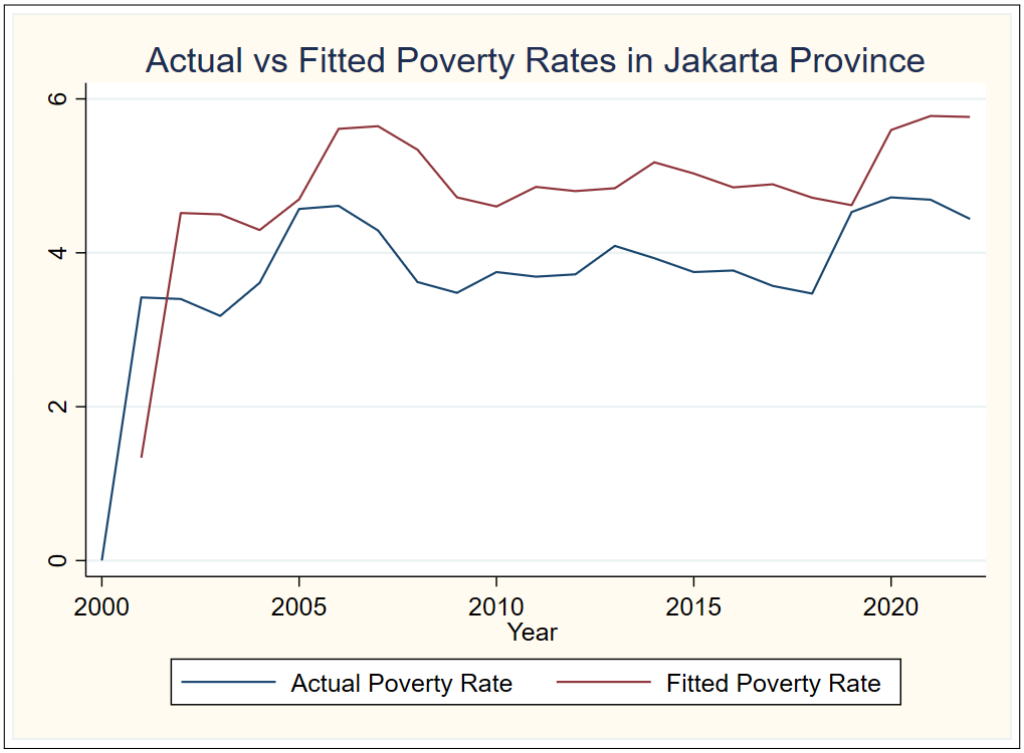


Figure 12: Actual vs Fitted Poverty Rates in Jakarta Province
Source: Author Calculation

Figure 12 displays the observed poverty rates compared to the predicted poverty rates in Jakarta Province spanning from 2000 to 2022. The observed poverty rates, represented by the blue line, exhibit oscillations ranging from 2% to 6% across the timeframe, with an overall tendency towards stability in recent times. The estimated poverty rates, depicted by the red line, closely track the observed rates, suggesting a strong alignment of the dynamic panel data model.

The strong correlation between the observed and predicted poverty rates indicates that the model accurately captures the main factors influencing poverty in Jakarta. The consistent poverty rates, regardless of changes in government payments, demonstrate the city's strong economic framework and effective public service provision, which minimize the effects of fluctuations in financial assistance. This discovery is consistent with the wider body of research on reducing urban

poverty, which highlights the significance of infrastructure, governance, and economic diversity in maintaining low levels of poverty (Eshun and Denton, 2022).

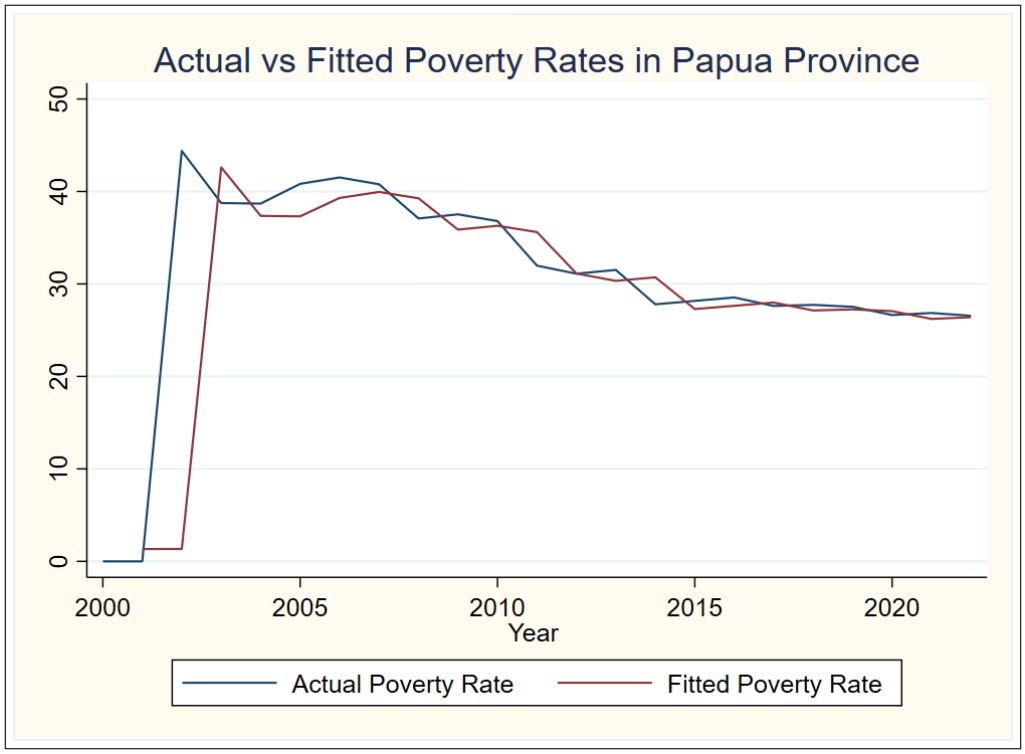


Figure 13: Transfer per Capita and Poverty Rate Trends in Papua Province
Source: Author Calculation

Figure 13 depicts the comparison between the observed and predicted poverty rates in Papua Province for the same time frame. The current poverty rates, represented by the blue line, demonstrate an initial high level of nearly 40%, followed by a gradual decrease to approximately 30% in recent years. The poverty rates obtained from the model, represented by the red line, exhibit a comparable decline, suggesting that the model accurately captures the changes in poverty levels in Papua.

The enduringly high poverty rates in Papua, despite significant government payments, highlight the difficulties faced by the province in efficiently utilizing this money. The progressive alignment of real and predicted poverty rates indicates that although financial transfers have some effect, the rate of poverty reduction is sluggish due to structural obstacles such as insufficient infrastructure, geographically scattered populations, and restricted availability of key services. These findings

align with research that emphasizes the problems in rapidly reducing poverty in regions with substantial developmental obstacles (Mansuri and Rao, 2012).

The dynamic panel data approach offers unique insights into the delayed impacts of government transfers on poverty rates in Jakarta and Papua. The congruence between the real and adjusted poverty rates in Jakarta demonstrates the city's ability to effectively employ government transfers, aided by a well-developed infrastructure and efficient governance. On the other hand, in Papua, the ongoing high poverty rates notwithstanding significant transfers emphasize the necessity for specific initiatives that tackle the distinct structural difficulties of the region.

8 Conclusion

This study investigates the influence of government transfers on poverty rates in different provinces of Indonesia. It utilizes both Ordinary Least Squares (OLS) and Instrumental Variables (IV) approaches to address potential endogeneity concerns. The primary findings from the ordinary least squares (OLS) model initially indicated a direct and positive correlation between government transfers per capita and poverty rates. However, it is probable that this result was affected by reverse causality, where regions with higher poverty rates received a greater amount of transfers. Later, the instrumental variable (IV) models offered a more accurate representation by effectively addressing the issue of endogeneity. These models demonstrated that higher government payments result in a noteworthy decrease in poverty rates.

The validity of these conclusions was confirmed by robustness testing, namely by utilizing the Gini coefficient as a dependent variable and the utilization of dynamic models. The checks not only confirmed the negative effect of government transfers on poverty but also showed a reduction in income disparity, thus validating the effectiveness of transfers in more evenly distributing wealth among the people. This outcome is crucial because it supports the idea that specific government measures can reduce economic inequalities and contribute to overall socioeconomic progress.

From a policy standpoint, our findings indicate that government transfers are a powerful instru-

ment for decreasing poverty and inequality. However, their success depends on accurate targeting and sufficient scalability. The policy implications entail the need for the Indonesian government to improve the procedures for distributing transfers, ensuring that they are adequately progressive and effectively reach the most vulnerable parts of society. Furthermore, it is apparent that policies should not exclusively prioritize augmenting the quantity of transfers but should also tackle the underlying structural problems that sustain poverty and inequality, such as limited access to education, healthcare, and sanitation.

However, the study also highlights several potential reasons for the lack of a more pronounced impact on poverty reduction in certain instances. Those factors are not included in this study, but they might be reducing the effectiveness. Ineffective programs, misallocation of funds, corruption, mismanagement, and the insufficient capacity of local governments are critical issues that can hinder the effectiveness of government transfers.

Another potential factor not included in this study is how the money is spent by local governments. The allocation of funds is often diverted to administrative expenses, salaries, or projects that do not directly target poverty alleviation. This misallocation limits the potential impact of government transfers on poverty reduction. Strengthening oversight, transparency, and accountability in the use of funds is essential to maximize their effectiveness.

Moving forward, a comprehensive examination of how government transfers are utilized at the local level is crucial. Understanding the specific areas where funds are allocated and identifying inefficiencies can help design better-targeted interventions. This concern will be the focus of a potential next essay, which will investigate the allocation and utilization of government transfers in greater detail. The next essay will aim to answer critical questions regarding the efficiency of fund utilization, the types of projects funded, and their direct impact on poverty alleviation and regional development.

To summarize, this study provides evidence for the importance of government transfers in addressing poverty and promoting economic fairness. The acquired knowledge emphasizes the necessity for ongoing and improved endeavors in formulating and executing policies to ensure

that the capacity of government transfers in attaining social welfare and economic progress is completely actualized.

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