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DOI: 10.5281/zenodo.4542164

Opening the Black Box: Disbursement Delays Impacts on Growth in Asian Development Bank (ADB) Loan Projects in Indonesia

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ABSTRACT: Compared with commercial banks that take one day, Asian Development Bank (ADB) loans take over 5-year before they are fully disbursed after the borrower signed the loan agreements, because of conditionalities. During which, the funds stay in the banks and gain compounded interest disfavoring Indonesia and affect its economic growth. Development aid studies have mostly overlooked these gains, and their impacts. We reviewed the financial costs of delays during project implementation in Indonesia and their impacts on GDP growth involving 325 ADB's loan projects with over 1,100 sub-loans, from 1969 to 2017 totaled over $33 billion. We applied a non-econometric, and quantitative attribution methodology, adopting project and portfolio management principles. The results show that 'if disbursed 100% in year-1', the ADB loans help Indonesia stabilizing growth at 6% per annum until they are at 1%-GDP. Because of disbursement delays, this is shortened by half with 60% volatility and declining at 0.42%-GDP (average ADB loans) due to ADB's standard implementation of 5-year and with 2-year delays (7-year). Growth sharply decays at 0.5%-GDP and reaches zero as ADB loans increase to 0.81%-GDP. Indonesia suffers a capital loss of $0.5 - $12 per $1 loan because of disbursement delays under today's prevalent banking practices. Accounting for these losses, ADB loans have severe negative impacts as growth suffers over 200% volatility because of disbursement delays. Fixing this is simple but requires a fundamental change.

KEYWORDS: Disbursement delays, growth, money creation, negative impact, volatility, bank

1. Introduction

A study by the Organization for Economic Co-operation and Development (OECD 2003) discovered that 'disbursement delays' is one of the five most burdensome donor practices that may be the cause of aid volatility. Despite Pallage and Robe (2001, 10) found that many studies classified disbursement delay (lead and lag) as a minor issue, Diarra (2011, 7) has empirically identified that the *"disbursement delays approach"* by donors is one of the main causes of aid volatility. To date, notwithstanding all aid volatility studies have anchored on disbursements, yet there is almost no reference that shows unequivocally that disbursement delays alone are the primary cause of volatility in the loan projects implementation. Let alone from banking theories and practices. Hence, this paper is endeavoring to fill this gap by showing that 5-year delays in disbursement, under ADB loan funded projects in Indonesia, as opposed to the full disbursement of 100% in year-1, reduces long-term growth stability by about 60% and delays beyond 5-year and incorporating the financial costs of delays under loanable fund (LF), severely impacting growth negatively. Disbursement delays induce financial losses as the capital flight over ten times the loan value, adopting 10% reserve requirements per Indonesia Law No.23/1999 on Bank of Indonesia, under fractional reserve banking (FRB) theory. If these losses are endogenized in favor of Indonesia, the disbursement delays significantly holding back growth. Translated as negatively impacting growth towards zero and into negative. Meaning ADB loans with or without delays (5-year) have zero impacts on increasing Indonesia's growth. On the contrary, significantly retarding it.

The following sections discuss aid volatility definitions, ADB implementation delays, and Indonesia's capitals in ADB. Then, the underlying theory of the negative impact of disbursement delays and a literature review on aid volatilities and return per US Dollar aid, a brief description of capital endogenization, and three banking theories and practices. This is succeeded by an elaboration on the methodology, discussion on the results, and followed by recommendations.

2. Aid volatility definition

Loans, grants, technical assistance (TAs) and in-kind assistance are categorized as aid (OECD 2020). Most authors infer aid volatility as the difference between commitment and disbursements (Pallage and Robe 2001; Bulíř and Haman 2006; Eifert and Gelb 2005), while Bulíř and Lane (2004) refer to aid conditionalities and shortfall by Celasun and Walliser (2008). All of them harnessed disbursement as the main predictor and almost all are using econometrics approaches while the rest with contextual descriptions.

This paper specifically deals with ADB loans to Indonesia and defines aid volatility because of disbursement delays measured by the difference between 100% loan disbursement in year-1 upon loan agreement (LA) signing versus planned and/or actual disbursements. We perform the analysis using a non-econometric yet empirical methodology aided by graphical and numerical explorations.

3. ADB Disbursement Delays in Indonesia

Although development banks, such as the ADB, operate in similar ways to traditional banks (Mazzi 2013, p. xxvi), unlike borrowing from a commercial bank where the fund or bank credit is immediately disbursed in-full and deposited into the borrower's controlled-account upon Loan Agreement (LA) signing, borrowing from ADB does not work like this (Figure 1). The ADB ties its disbursements with certain conditionalities and controls the borrower's loan account. Kanbur (2000, 413-416), a former World Bank staff, expresses that conditionality of whatever type has failed in Africa, and they deliberately designed it to fail as a systemic imperative to ensure the aid keeps flowing. Conditionality incriminates the real issue that is "*one of an unhealthy interaction between donor and recipient processes which propagate aid dependence but are not so simple as to be characterised as the strength of the donors and the weakness of the recipients*" (Kanbur 2000, 414). To date, as shown by Howarth (2017, 33) that the infliction of 'conditionality', is a nuisance, highly controversial, and ineffective.

Essentially ADB requires that upon signing, the borrower must meet certain LA conditions before making the first disbursement, and only then ADB declares the loan is effective which signifies the availability of loan funds. This is still subject to the submission of withdrawal application (WA) by the borrower and the formal "No-objection (NO)" issued by the ADB before it can disburse any funds. ADB (2011, ii-iii) in their evaluation study on Uzbekistan admits that on average their projects experience 2-year delays and that the major limitations to ADB's efficiency are from delays in project implementation which increased project overall costs. Delays over 19-month are considered a serious delay (ADB 2018). This strange and appears imprudent in project and portfolio management as any delays, irrespective of duration, in loan-funded projects are causing money as compounded accrued interests, fees, and penalties.

Indonesia signed its first ADB loan (No.12) on 2 July 1969 and took 3.7 years (year-4) for its first disbursement on 7 February 1973. The average 1st disbursement time since 1969 is over 2 years (year-3). ADB-wide overall project implementation duration normally coincides with the grace period, which is its "standard" 5 years (ADB 2018, APPR, 21). On average, ADB-wide experiences 2.2 years delays hence in their year-8 of implementation (ADB 2018 APPR, p. iii).

This is consistent with Indonesia's project data. According to ADB's President Nakao, about 90% of ADB loan projects are experiencing 2-year delays (Witular 2016). Hence, we use standard 5-year with 2 years delays (7-year).

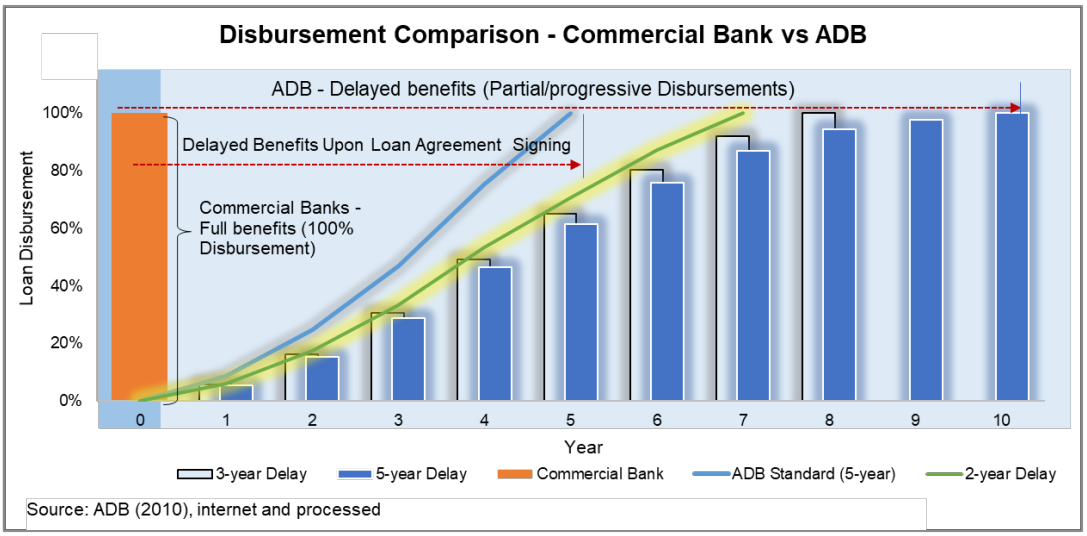


Figure-1. Loan Disbursements Comparison, Commercial Bank vs ADB

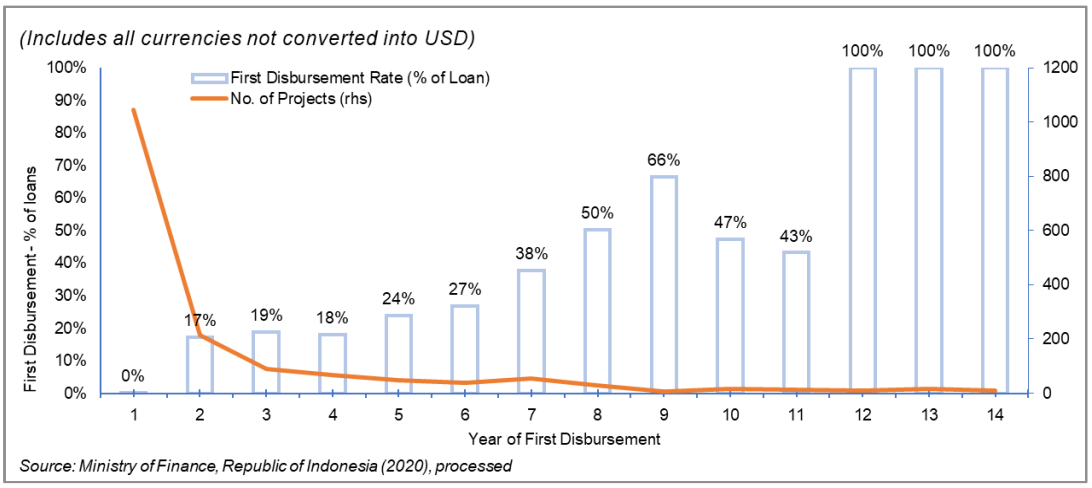


Figure-2. Indonesia-ADB Loans 'First Disbursement'

4. Indonesia Capitals in ADB

Indonesia's paid-in (in-cash) plus subscribed capitals (total about $8 billion) and guarantees (in-kind) to ADB. Under banking governance, these are Promissory Notes (PNs) per Bill of Exchange 1882 thus can be traded as securities, leveraged as deposit, or to create money. Each signed LA is a tradeable security and bank reserve (Nichols 1992, 11; Werner 2016 and IMF (Gross and Siebenbrunner 2019) and adding to Indonesia's securities to ADB. The borrowers can use these as 100% full loan-fund-disbursement collateral. Despite this and Indonesia's much larger disbursement capacity, ADB is asserting on controlling, thus delaying, the disbursement following its interpretation of its Charter, Article 14.

5. Theory and Hypothesis

Ibnu Khaldun, in the 14th century, warned that when the ruler (government) is not spending money, causing a shortage of capital. *"Now, if the ruler keeps it to himself* [undisbursed]*, it is lost to the subjects"* (Khaldun 1377, 365). Similarly, when the ADB loan funds remain undisbursed, it causes a shortage of capital, growth retardation, and loss to Indonesia.

6. Literature Review

6.1. Aid volatility and growth

Despite development aid initiatives were established in the 1940s, the nexus between aid volatility, effectiveness, and growth was long neglected by scholars (Bulíř and Hamann 2006, 4; Diarra 2011, 1) and has only been identified as early as 1995 by Ramey and Ramey (1995) and the most current one is by Hudson (2015) and McKee et al. (2020). Notwithstanding aid unpredictability harmfulness, loan disbursement delays discourage scholars to pursue deeper study as they consider it difficult (Chauvet and Guillaumont 2009, 453). This finding correlates with Aldashev and Verardi (2012, 3) who express that there is a lack of empirical cognition about how aid volatility affects development outcomes while Easterly (2006, 41) expresses that there is a disconnection in aid policy based on the assumption that aid promotes growth which in reality is the opposite. Hudson and Mosley (2008) shared this. They show that volatility reduces growth relevant to the size of aid on the recipient's economy as expressed in %-GDP. Rajan and Subramanian (2008), show the negative effect of aid flows on economic growth in developing countries regardless of the quality of policy or geographic location of the recipients. In 2009, the IMF identified that the 'right kind' of development aid has a positive impact on long-run economic growth (Minoiu and Reddy 2009, 6; McKee et al. 2020). However, their most recent study discovered that there is no robust evidence that aid increases growth (Dreher and Lohmann 2015, 5).

Over the past 40 years, significant evidence shows that aid volatilities have a severe negative impact on growth but little is known about their main sources (Desai and Kharas, 2010, p.1). Desai and Kharas (2010) identified loan disbursement delays as one of the possible sources of aid volatility which impairs aid recipients through the raising of financial costs, slashes investments, and reduces welfare and hence affects growth. Kharas (2008, 9) exhibits that disbursement volatility has massive negative shocks on growth and national income similar to those experienced by developed countries during the two World Wars and Great Depression.

6.2. The impacts of volatility

Hudson (2015) citing Pallage and Robe (2001, 18-19) discover that aid is highly volatile with an average of about 24.7% in African countries and the rest is 29.5%. Aldashev and Verardi (2012, 3-4) show that doubling aid volatility causes a fall in average GDP growth by two-thirds (67%). Using return per $1 aid invested and disbursed by donors as a measure of volatility, this indicates a range of 15%-2400% (Jepma 1991; Andrews and Wilhelm 2008; GFI et al. 2015; ANU 2017; Lotti and Presbitero 2019; and Hickel 2019). The US Congress (1968, 280) record relating to 1969 budget appropriation for ADB registers *"... we find that many of the members… put in $1 and get out $7* [700%]*"*. For paying interest alone it consumes 0.8%-GDP (Griffiths 2014).

6.3. Capital Endogenization

Interest earned on ADB undisbursed loan amounts and fees incurred are the ADB's and/or its private banks' profits and not accounted as Indonesia's national income (Paradox of profits). Those gains need to be monetized and endogenized by treating them

consistently as a source of capital (Zezza 2011, 15) for Indonesia. The concept of capital endogenization is used to estimate the regional economy wealth leakages (Rustiadi et al. 2018) and development sustainability (Fauzi 2019).

7. Foundation: Banking Theories, Practices and Governance

Bourguignon and Sundberg (2007) and Edwards (2014) have voiced the need to go beyond econometrics to open the 'black box' of development aid as a plethora of studies, including aid volatilities, remain inconclusive. Since no cross-country financial transactions (GFI et al. 2015) can occur in the world without engaging banking systems hence, this paper builds its foundation on banking practices, which we discuss below, rather than econometrics. As the black box opener, the knowledge on how the banks work is essential as expressed by Galbraith (1975, 5) *"[t]he study of money, above all other fields in economics, is the one in which complexity is used to disguise truth or to evade truth, not to reveal it.… Money, in contrast, is equally important to those who have it and those who don't. Both, accordingly, have a concern for understanding it. Both should proceed in the full confidence that they can."* Hence, the subsequent section is opening the black box yet briefly, by expatiating on the three banking theories identified by Werner (2014, 2016)

7.1. Financial Intermediation Banking (or Loanable fund) (LF)

First, LF is the most dominant theory which holds that banks are merely financial intermediaries. They gather deposits, mostly in cash, from patient savers and lend them out to customers or impatient spenders and charge interest. ADB appears practicing the LF as it continuously requests its member countries to replenish its ordinary capital resources.

7.2. Money Multiplier or Fractional Reserve Banking (FRB)

Second, this FRB theory adopts that banks create money through 'multiple deposit expansion' by using a fraction of money in their possession as the basis for the credit generation. A bank with $10 cash in its entire holding able to lend out $100 (10 times) under the 10% reserve rule (adopted based on Indonesia, Article 62. b, Law No. 23 (1999) on Bank Indonesia) (Nichols 1992 - 1st ed. 1961, 11). At the time of ADB creation in 1966, the Federal Reserve Bank (FED) required all banks to maintain a reserve ratio of 4-6% (The Fed, 2020, Footnote 10-13). The Fed nullified this requirement on 26 March 2020 (The Fed 2020) which means, any bank can lend out money with zero reserves (Nichols 1992, 3). Per its 2020 Information Statement (ADB 2020, 9), ADB lending operation appears to maintain between 4-8% reserve (FRB) ratio. Based on this evidence, we assumed that ADB, through its banking governance is adopting both the FRB and LF. Subsequently, this paper uses these two terms in the analysis.

Werner (2014, 2016), Keen (2014) and Moore (1983) and a growing number of central banks, such as the Fed (Carpenter and Demiralp 2010) and the Bank of England (McLeay, et al, 2014), have mathematically, empirically, and practically proven that both LF and FRB theories are untenable, factually incorrect and not reflecting reality hence are indefensible.

7.3. Money or Credit Creation (CC)

Third, the CC is the most dominant theory and currently practiced around the world in which banks require neither deposit nor reserve. All it needs is a signed LA or promissory note. This is the oldest banking theory in the modern civilization that was based on 5000 years of practices (Werner 2016; Hudson 2018).

Werner (2014, 14) in the first-ever practical empirical test in 5000 years of modern banking, observed in real-time and in an actual bank environment, with BBC crew filming, the whole process from LA signing until he receives the credit money into his bank account. The entire process took only 35 minutes in contrast with ADB's fund outlaying that takes over 5 years or an average of 7-8 years (Figure 1).

To illustrate the gains from money creation under the three banking theories, this online calculator (The Calculator Site 2020), which uses the compounded interest formula $A = P (1 + r)^t$, helps to view those gains under two scenarios namely 'borrow-to-invest' and 'borrow-to-project finance with 12.5% annual withdrawal'. Annual interest (r) is using average ADB loans to Indonesia of 4.727%. A hypothetical loan (P) of $100 under LF and 10% bank reserve hence, 100/10% = $1000 money creation under FRB or CC. For (t), we applied eight years for the LF to reflect average ADB delays and five years for FRB/CC, which coincides with the ADB grace period when loan repayment begins, and the beginning of FRB/CC money creation reduction. We do not calculate principal repayment plus interest to mirror the implementation phase or grace period of ADB loans. The results show gains (A) per $1 loan are between $0.24 - $12.6 ($2.60 + $10) or 24% - 1160% for LF and FRB, respectively. This includes the new money created plus compounded interest, which is all not in favor of Indonesia, hence a capital flight or loss.

Hence, this means for every one-year delay in ADB loan funded project causing the borrower (i.e., Uzbekistan) to lose between $0.24/8year and $12.6/5year ($0.03 - $2.52) per $1 loan or $0.25 - $21 per $100 loan/day under LF and FRB correspondingly. In summary, if they do not disburse the loan fund 100% in year-1 upon LA signing, it costs the borrower $2.1 per day per $1 loan under today's prevalent banking practices.

8. A case study with one country and one source of fund

The bulk of aid effectiveness and impacts studies have been typically centered on aggregated aid (see footnote 1) as a single resource of development funding. As identified by the World Bank (Bourguignon and Sundberg 2007, 316), Aldashev and Verardi (2012, 2), Edwards (2014), and Howarth (2017, 41-49) that lumping aids and countries in the analysis have fragile, fragmented, often ambiguous, spurious and gives inconclusive results. Hudson (2015, 66) concludes that the most important predictor of aid volatility is debt-financed by loans. Dreher and Lohmann (2015, 5) identify the gap in the literature on aid effectiveness because of the lack of empirical evidence at the country-level. Hence, this paper covers only one country (i.e., Indonesia), and one component of aid, that is ADB loan.

9. Methodology

Our paper uses a novel methodology identified as Development Outcomes Attribution (DOA) on Bank Outlays Growth On-development Results (BOGOR) (Ingratubun 2020). This applies quantitative attribution by treating a scenario of 100% loan disbursement upon LA signing in year-1 as the benchmark. We then compared them with progressive disbursement based on project S-curve and integrating money creation and their compounded interests and fees from undisbursed amounts, using triangulation of numerical, graphical, and stochastic approaches.

9.1. The Philosophy of DOA-BOGOR

We defined attribution in DOA as taking a slice of economic development (i.e., preferably current GDP) indicators and examine their compositions most relevant to the project/program, assess and understand their outcome apportionments to the source of funding which in this paper are the ADB loans.

As an illustration, in a slice of 'white' bread, equally sized and weighted, one can get 3-gram sugar, 2-gram protein, and zero-gram fiber whilst in a slice of 'brown' bread, 2-gram, 3-gram, and 2-gram respectively. Thicker or thinner slice produces different configurations. Likewise, in a GDP of Indonesia (a loaf of white bread), from which loaf a slice thereof (ADB loans) is extracted. From the loaf, one can obtain an average value (1969-2017) of 5.598% GDP growth level over average ADB's loans 0.415%-GDP hence, ADB loans slice attributes a 1.351% GDP growth of Indonesia. We term this as a growth attributor. Likewise, an equal slice of brown bread (ADB loans in a different country) will produce different results. Figure-3 below illustrates the basic mechanics of DOA-BOGOR.

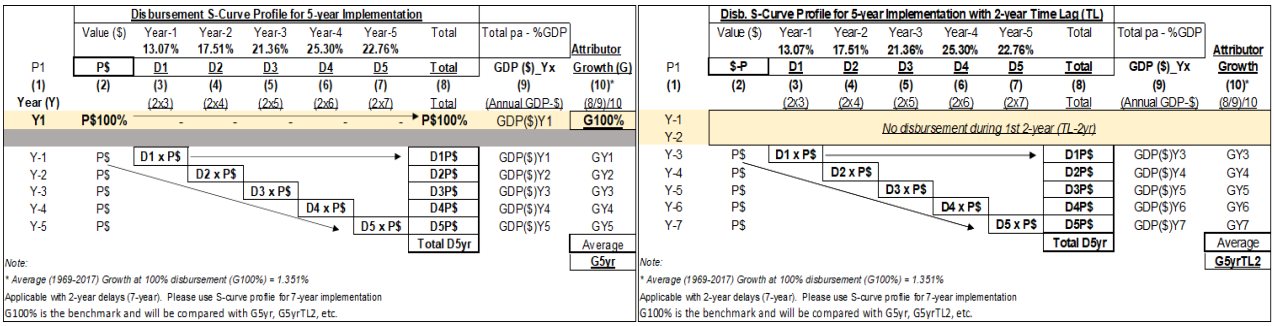


Figure-3. Basic Mechanics of the attribution methodology (DOA-BOGOR)

From the borrower or recipient's perspective, the soonest they sign the LA, the credit money is immediately created. Accordingly, there are costs or gains attached to it and grows over time. This includes the costs of delays and money created under LF and FRB in favour of ADB and/or its commercial banks where Indonesia loans' funds are parked. These should be balanced by endogenizing them for Indonesia and treated as national income under the Stock-flow consistent (SFC model is a specific macro model that coherently integrates all stocks and flows in an economy developed by Copeland (1949). He studies “money flows,” in his quest to understand where does the money come from to finance the increased national spending and what happens to the money once obtained but not spent (Copeland 1949, 254)

9.2. Description

For this paper, we selected GDP growth as attributor (DOA) which will be quantitatively measured as ADB loans outlay progress following S-curve profiles until they reach 100% (BOGOR). The financial costs of delays (e.g., circa 30% and 250% for LF and FRB respectively) after being monetized, are endogenized as Indonesia's capital in the BOGOR. Meaning, we benchmark the endogenized costs of delays with the 100% outlays in year-1 wherein there is no delay.

Hence, we applied a 10% bank reserves ratio per Article 62. b, Law No.23/1999 on the Bank of Indonesia (Undang-Undang Republik Indonesia Nomor 23 Tahun 1999 Tentang Bank Indonesia). Subsequently, we ascribed the attribution with ADB loans (0.415) as % of Indonesia GDP (Current GDP in US$) being the numerator over average annual GDP (annual GDP growth in %) growth equally weighted (linearized). From this, we got a growth attributor of 1.351%. We normalized the factual disbursement S-curve profiles (constructed from ADB Dataset (1985-2008), Loan Project No.730 – 2501 consists of 185 loan projects between $16.8 billion or 12% of ADB-wide total for the same period; this is 50.4% of Indonesia’s borrowing (1969- 2017)) following the implementation plan with 2-5 years delays (Table-1). We then spread ADB loans into succeeding 5 and 7-years according to their disbursement profiles per its actual or projected S-curve. Thus, we found the growth attributors of 1.318 (5-year) and 1.232 (7-years) and compared them with the 1.351% (at 100% disbursement). We adjusted the actual interest rates, the London Inter-bank Offered Rate (LIBOR), and fees per ADB's (2021) rules and applied them to calculate compounded amounts from undisbursed funds. These are endogenized under LF and FRB adopting the Stock-flow consistent (SFC) model to balance the money created and its

multiplication from the LA. Subsequently, following the same steps as above, we produced the growth attributors of -1.757 (LF) and -2.895 (FRB). The negative signs show the endogenized sources. We used these in the Monte-Carlo simulations using random normal Gaussian distribution to see the volatility of growth versus ADB's loans progressive disbursements. For ADB's actual disbursement 'not-normalized' S-curve profile, Poisson distribution will be the best fit due to prolong loan closing. We run the growth attributor at a minimum of 1,000 iterations with 5% increments simulating the disbursement ratio. For estimating future total loan principal plus interest, despite they can be calculated individually from the actual data, we adopt the Rule of 72 using 19 years as average loans' life. Hence {0.415 x 19/ (72/4.727)} = 0.52%-GDP which is enveloped between 2% and 5% interest rates show in Figure-7).

Table-1. Normalized Disbursement S-curve Profiles

	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
Program Loans	82.99%	9.17%	2.65%	4.23%	0.96%					
Project Loans										
On-Time	13.07%	17.51%	21.36%	25.30%	22.76%					
2-year Delay	7.25%	11.69%	15.54%	19.48%	16.94%	16.03%	13.07%			
3-year Delay	6.08%	10.52%	14.38%	18.31%	15.78%	14.86%	11.90%	8.17%		
5-year Delay	5.38%	9.83%	13.68%	17.62%	15.08%	14.17%	11.20%	7.47%	3.46%	2.12%
MOF	14.89%	8.77%	12.62%	16.56%	14.02%	13.11%	10.15%	6.41%	2.40%	1.07%

Source: ADB (2011) and Ministry of Finance (MOF), Republic of Indonesia (2020), processed

10. Data

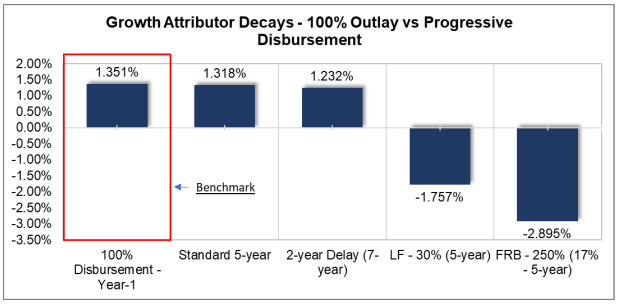
We adopted time-series datasets from ADB (2017) and World Bank (2020), GOI's Ministry of Finance (MOF) and St. Louis Fed (FRED 2020), and Indonesia's ADB loans from 1969 to 2017. The World Bank data provides the GDP growth level. FRED data caters to various interbank lending rates. As ADB loans since 1969 are all below 1%-GDP, we identified one outlier at 2.4%-GDP in 1998 coinciding with the Asian financial crisis and we kept it to maintain data integrity. We fill missing data with their neighboring values.

11. Findings

Delays, despite they are disadvantaging Indonesia in many areas (i.e. economy, finance, social politic), are financially and politically beneficial for ADB or its commercial bank where the undisbursed loan funds are deposited.

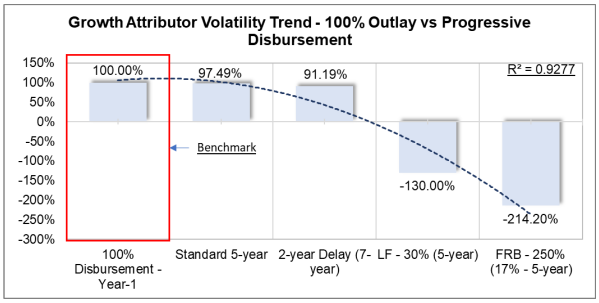
11.1. Numerical

Figure-4 shows ADB loans attribute for 1.351% (or 0.08% per year) of Indonesia's growth of average 5.598% per year had they been outlaid immediately 100% upon LA signing in year-1 into Indonesia's economy. However, the decision not to 100% disburse in year-1 degenerate the ADB loans slice for GDP growth by about 9% (from 1.351% to 1.232%) hence exposes the negative impacts of disbursement delays versus 100% disbursement.



Source: Processed.

Figure-4. Growth attributor decays



Source: Processed.

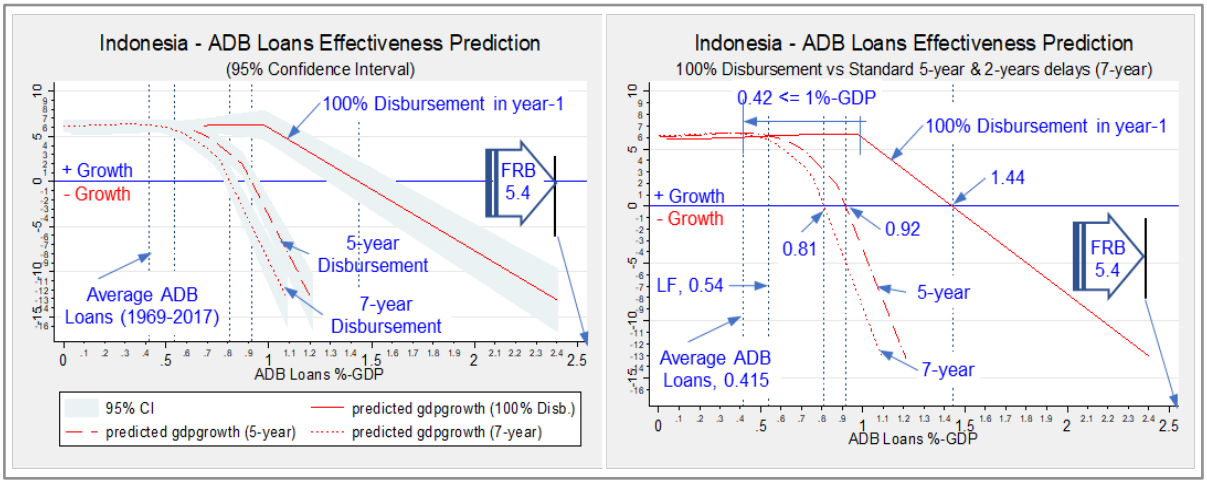
Figure-5. Growth volatility

These values are much smaller compared with those under LF (incorporating 30% compounded interests and fees) and FRB (250%) which pulls growth into -1.757% and -2.895% correspondingly hence, a 214% volatility. The negative signs indicate the endogenized sources. The R-squared value indicates that 93% of deterioration of ADB loans values relevant to the growth promotion due to delays which means the stability of growth attributor is only 7%. The FRB impact was calculated by taking into account that only 15% of FRB amounts are for real GDP transactions and contribute to growth (Bezemer & Hudson, 2016). Hence, to account for transaction costs, we apply 17% due to US Dollar denomination despite in Rupiah it is around 30% of real GDP transaction after disaggregating Bank Indonesia's data.

11.2. Graphical

After observing data trendlines between linear, quadratic, and polynomial subsequently, we selected the fractional polynomial as an intermediate between non-linear and polynomial (Royston and Sauerbrei, 2007, p.27). Hence, STATA's Twoway graph fractional polynomial function (fpfit) predicted that ADB loans (at 0.415%-GDP average loans to Indonesia, 1969-2017), if disbursed 100% in year-1, while they slightly maintain steady small GDP growth at around 6-6.2% level (3.2% gain), the effects are declining towards zero when reaching 1% or more of GDP (Figure-6). In tandem with 5- and 7-year delays, ADB loans plus their annual interest rate beyond 2% per annum signals a reduction of ADB loans impacts on Indonesia's growth as it is approaching zero at 0.8%-GDP (Figure-7) which is about double the 0.415%-GDP of ADB average loans size since 1969. Meaning ADB loans have no impact at all on Indonesia's growth, particularly when their amounts are increased. Meaning, more ADB loans are bad for Indonesia's growth. Taking into accounts ADB's average interest rate of 4.727%/year, the amounts of interest paid estimated using the rules of 72 starting at 2%/year (at 0.8%-GDP, this coincides with Griffiths (2014)) per $1 loan is more than $2 (+200%). This not only restrains growth but also pulls down into negative. Interestingly, even at 100% disbursement in year-1 under FRB (5.4%-GDP), it shows about 150% volatility (6% to -15%) starting at 1%-GDP and reaching zero at 1.44%-GDP and continues to negative growth zone.

This hints that the impacts of the money created under LF and/or FRB or CC but not in favour of Indonesia, immediately upon LA signing, makes ADB loans negatively influencing Indonesia's growth. This will be fully reversed when the 100% disbursement on year-1 is observed.



Authors processed with STATA

Figure-6. ADB's loans effectiveness with the confidence interval

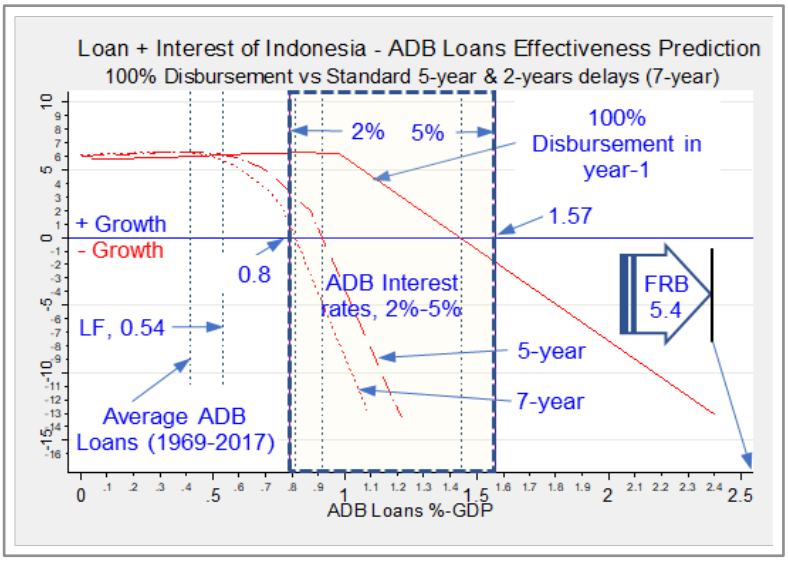


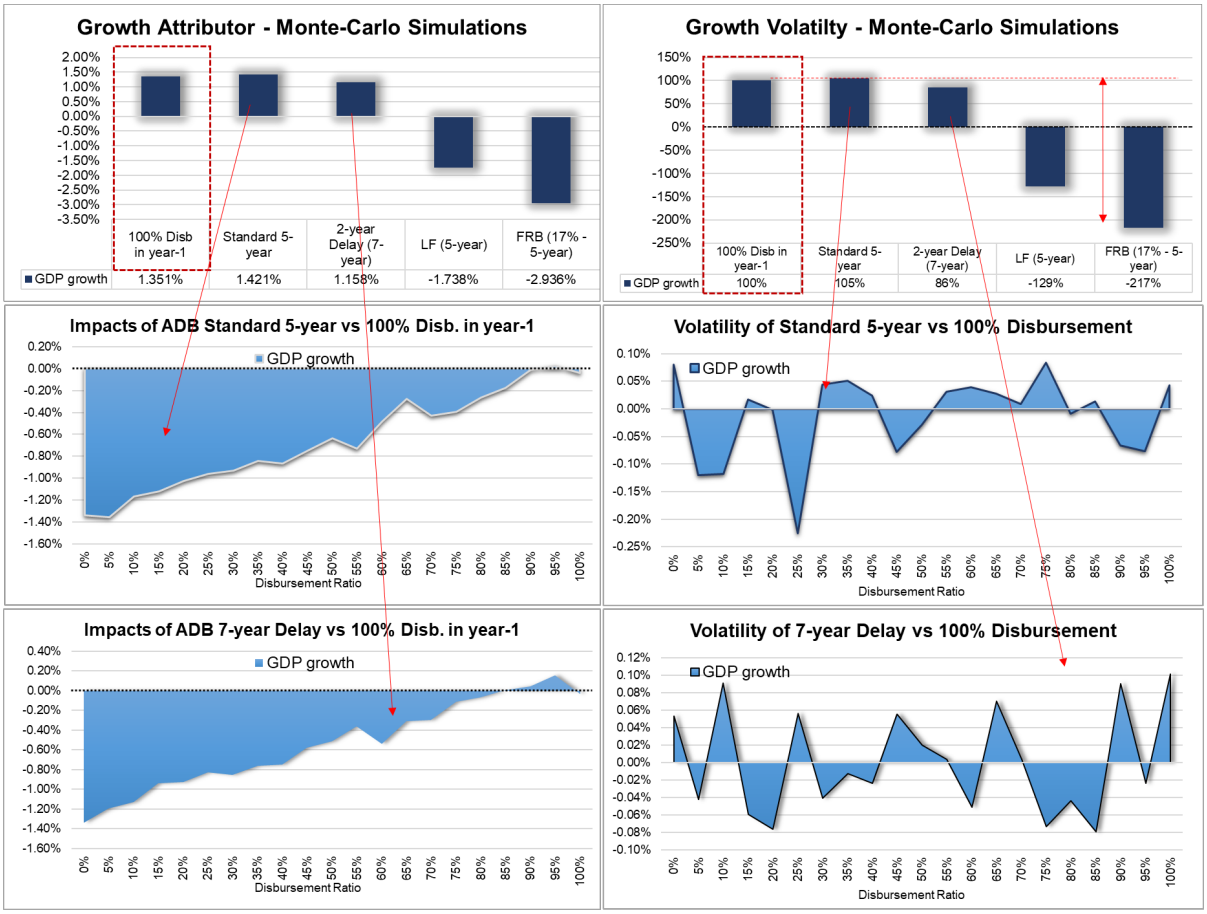
Figure-7. ADB's loans effectiveness including interest

Subsequently, it is the cornerstone of the argument not to delay disbursement as the development outcomes will critically suffer from the volatility of Indonesia's national economic engine. This phenomenon has been similarly observed using the econometrics approach by Bulíř and Hamann (2006), Rajan and Subramanian (2008), Doucouliagos and Paldam (2008), Quibria (2014), Dreher and Lohmann (2015) and many others. Collectively, our results confirm the findings that aid has a temporary small positive, statistically insignificant, relationship to growth and there is no clear and convincing evidence that more aid leads to faster growth. Our paper shows that increasing ADB loans with their disbursement delays, plus interests and fees cause Indonesia a significant negative growth under prevailing banking theories and practices.

11.3. Stochastic (Monte-Carlo Simulation)

Indonesia's growth was not Granger-cause by ADB loans at time-lag 1 (TL-1) or 100% disbursement at year-1, accordingly correlation test shows that ADB loans are not-significant with a weak correlation of 0.21 (0.29) with GDP growth. We interpret this as ADB loans increase, they might insignificantly increase or maintain steady growth. With a mean of 5.598 and a standard deviation of 3.181, Indonesia's growth and ADB disbursement relationship under numerical approach were stochastically imitated with Monte-Carlo simulations, which we show some of the results in Figure-8. The results are similar to the numerical and correspond with graphical.

The ADB standard 5-year disbursement and with 2-year delays not only reduce but also shortens the long-term impacts of ADB loans effectiveness by half and even exacerbate them into negative growth. This establishes that disbursement delays beyond year-1, notwithstanding a short increase of 5% within 5-year, are reducing growth by 14% (7-year) correlative to ADB loans. Particularly, when we endogenized the financial costs of delays under LF and FRB, before reaching zero and entering negative growth at -1.738% and -2.936% respectively, hence volatility of over 200%. Figure-8 also shows that ADB standard 5-year implementation causes Indonesia to lose almost 100% growth potentials as disbursement progresses and only at around 85% disbursement in beyond year-5, sees positive impacts before being dragged down back to negative. ADB loans have 'push and pull' down effects on Indonesia's growth. This means only around 10% of ADB funds in Indonesia induce growth and 90% are causing negative growth because of the 5-7 years delays.



Note: Authors processed. Results may not be the same when rerun due to Monte-Carlo nature. Each bar was equally simulated with the same percentage of disbursement increment.

Figure-8. Monte-Carlo simulation results showing the impacts of delays and their volatilities, measured against 100% disbursement in year-1

11.4. Financial impacts

Triangulating the three results, *ceteris paribus*, the endogenized costs of average 2-year delays engender financial losses to Indonesia of a minimum 1.3–12.5 (under ADB's 4% reserve ratio, yields $32 per $1 or 32 times of the loan value) times the loan value for LF and FRB correspondingly. The ADB loans (actual) financial impacts of delays per $1 loans, as compounded interests and fees under LF of 22.17–27.91% are consistent with Jepma (1991), Pallage and Robe (2001), and Kharas (2008). Whilst the FRB of $12.5 (calculated) correlates with more than $10 capital flight (GFI et al., 2015) or half of $24 (Hickel, 2017) per $1 aid. We estimate that between 70-80% of the loan amounts are disbursed into Indonesia's economy and ADB paid the rest to the international services providers. This means 6%-62% (e.g. 70% x 1/1.3 (LF) (or 1/12.5 (FRB)) of the money created including their compounded gains, or $0.5 (LF)—$12 (FRB) per $1 loan are capital flight and never entered Indonesia's national economy. This yields a 50%-1200% volatility of ADB loans to Indonesia, measured against 100% disbursement in year-1. This is almost double the expected return of 700% per $1 by developed member countries in their investment in ADB (US Congress 1968, 280). This indicates that ADB loan volatility through disbursement delays is not incidental.

12. Recommendations

National law and political decisions are critically required by GOI to have any ADB loan funds be immediately 100% disbursed into Indonesia's banking systems in year-1, given the availability of sufficient collateral or no ADB loans at all. In mitigating moral hazard (Coase

1960), reforming the governance of ADB's disbursement. It requires more studies with different attributors, endogenized capitals, and LA conditionalities. (Asymmetric information is defined as when one side knows more than the other and benefit certain party but disadvantage others. This is considered a moral hazard in which decision-makers maximize their benefits while impairing others because of incomplete information on how things actually works, such as banking theories and practices).

13. Conclusion

ADB's disbursement delays have severe negative impacts on Indonesia's growth. More ADB loans cause negative growth. Fixing this issue is simple but requires a fundamental shift in their loan disbursement governance.

Acknowledgment

Appreciations and gratitude are expressed to the IPB University, Regional and Rural Development Planning (PWD) Department for opening a deeper understanding of the true scope of wealth leakages and their critical role in regional development and poverty eradication.

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