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The Correlation between Migration and Economic Growth in Indonesia

In this report, we consider the relationship between migration and economic growth in Southeast Asia, and specifically in Indonesia. To do so, we utilize existing literature to pinpoint trends on Indonesian migration and to establish our theory that there is a negative correlation. Using data from the World Bank and the Penn World Tables, and using fixed-effects regression for our research, we receive supporting results, with caveats that can be logically explained. Thus, we conclude that, in general, there is indeed a negative correlation between Indonesia migration and its economic growth, and that the government is currently implementing the right emigration policies to boost aforementioned growth.

Introduction

The topic of migration has always been of interest to sociologists worldwide. There is a lot of contention as to what immigration causes (or does not cause), and it is a heavily nuanced topic. However, much of social science research surrounding the topic is around the Western world. Only a handful of the literature is about Asia, which is surprising considering the high levels of migrant activity surrounding the continent. Indeed, according to data from the United Nations (2017), "between 2000 and 2017, Asia added more international migrants than any other region," (ibid, 5)." Asia is also the continent poised for the most economic growth; China and India, for example, are two countries expected to be economic superpowers in the future. Fong and Shibuya (2020) note that "East and Southeast Asia has experienced rapid economic growth and integration in the last forty years," (ibid, 513). Because of these two trends, it is interesting to observe their relationship with one another. Our study thus aims to examine the correlation between migration and economic growth.

While Fong and Shibuya (2020) discussed East and Southeast Asia as a whole, we will be more specific. We will focus our attention on Indonesia since we believe it is uniquely positioned to be our topic of discussion. Indonesia is the biggest economy in Southeast Asia; it can potentially experience significant and explosive economic growth due to natural resources available in the country and a large and growing working age population. According to data from the Penn World Tables (2021), Indonesia's GDP per capita increased on average at 4% a year from 2000 to 2017, bested only by China and India. We will also be benchmarking our findings regarding Indonesia against Southeast Asia. The region is full of developing countries, similar to Indonesia. Many of the countries in the area share Indonesia's unique trait of being an island country. The region's overall similarity to Indonesia makes it an appropriate comparison and a good benchmark of our analysis. As a result, our research question is: "what is the correlation between migration and economic growth in Southeast Asia, and, specifically, Indonesia?"

This report proceeds with the study using the theory that there is a negative correlation between migration and economic growth. Specifically, we examine the two independent variables—net migration rate and the international migration stock—as a measure for migration. We argue that our theory makes sense because of the high rates of unskilled emigration in Indonesia that is possibly helping the country's economy.

We utilize datasets from the World Bank for data on our two independent variables. Additionally, we use the Penn World Tables dataset to receive data on the dependent variable, which is GDP per capita. We benchmark our findings for Indonesia against Southeast Asia. For each variable, we use the data for Indonesia as well as the average data for Southeast Asia as a whole. Since we are examining multiple countries, we use longitudinal data in this study, and therefore proceed with fixed-effects regression analyses. We find that while we receive mixed

results, they can be logically explained due to nuances in the economic growth variable as well as the differences in measurements between Indonesia and the rest of Southeast Asia. Thus, our result skews towards showing support for our theory. In terms of broader implications, our research seems to imply that the Indonesian government's policies on encouraging unskilled worker emigration out of the country might be working in the country's favor.

This report will be structured as follows. We begin by discussing literature on the relationship between emigration and production and on Indonesia and unskilled worker emigration. We then proceed to the theory and argumentation section. Here, we utilize existing literature to build the case for our theory of a negative correlation between migration and economic growth. We next discuss the data relevance and credibility, which are from the World Bank and the Penn World Tables datasets. We elaborate on the dependent, independent, and control variables as well as our chosen research method, which is fixed-effects regression. The analysis and discussion section comes next, where we run our statistical research on our data and discuss the results. Finally, in the conclusion, we summarize the report and present some policy implications of our findings.

Indonesia Migration in Literature

Like the rest of Asia, Indonesia is also experiencing lots of migrant activity, though there are more emigrants than immigrants. Kaur (2010) notes that "the member countries of the Association of Southeast Asian Nations (ASEAN) may be categorized into two broad groups on the basis of their specific migratory characteristics," with Indonesia falling into the "mainly emigration" group (ibid, 6). This claim is further corroborated in a data table sourced from the Malaysian Department of Immigration cited in the same research paper. The data note that "Indonesia is the largest labor-sending country and the main source of domestic workers," (ibid,

155). Generally, emigration out of a country is thought to be detrimental to a country's economy. For instance, Docquier and Rapoport (2004) argue that "in a context of scarcity of skilled labor and abundant unskilled labor, as is the case in developing countries, skilled labor migration [out of the country] may have a substantial negative impact on unskilled workers' productivity and wages," (ibid, 3). Hanson (2009) further notes that "in low-income sending countries, the complaint has long been that the wrong individuals leave," indicating that talent is depleted when emigration occurs, causing negative effects (ibid, 181). These findings seem to apply to Indonesia, as it is a low-income developing country.

However, Indonesia has an interesting quirk that its emigrants consist of mostly unskilled workers. Tuccio (2017) notes that "despite a gradual improvement in educational attainment in recent decades, Indonesian emigrants appear to be mostly unskilled," (ibid, 150). Silvey (2006) further points out that "[Indonesians] migrated overseas in large numbers to find employment in the [domestic servant] sector," (ibid, 23). Consider also the fact that the Malaysian Department of Immigration states that Indonesia is "the main source of domestic workers," (ibid, 155). All findings point to the fact that Indonesia, while a mainly emigration country, is also mainly having unskilled workers leave instead of skilled ones.

Since the effects of emigration depend on what type of people are leaving, it might not actually be harmful to Indonesia. In previous literature, it is noted that the detrimental effects are due to skilled workers emigrating out of the country, causing a scarcity in talent. As we have established, however, Indonesia mostly sends unskilled labor, so it does not have that problem. Docquier and Rapoport (2004) write that "skilled and unskilled labor complement one another in the production process," meaning that with fewer skilled workers, the unskilled suffer in their work, and vice versa (ibid, 3). While it may seem that they are arguing that emigration is always

detrimental for the sender country, it is not the case. Developing countries, and Indonesia specifically, have low numbers of skilled workers and extremely high numbers of unskilled workers. Since there is a surplus of unskilled workers, their emigration, therefore, will not disrupt the production process and will likely not cause harm to the country. The problem with emigration arises when skilled workers are the ones leaving, which is not the case for Indonesia.

Alternatively, emigration could potentially positively affect the sender country. For instance, Docquier and Marfouk (2006) argue that due to human capital theory, "more people, therefore, invest in human capital as a result of increased migration opportunities. This acquisition can contribute positively to growth and economic performance," (ibid, 151). Taken along with previous literature, there seems to be no drawbacks to developing countries in sending unskilled workers overseas, and it might even benefit the country in the long run.

As it relates to Indonesia, the government is actively encouraging unskilled workers to emigrate and work overseas, with the main reason being economic benefits for the country. Kaur (2004) states that Indonesia "include[s] targets for the number of workers they plan to send abroad in their economic development plans," indicating that the government is using emigration to spearhead economic growth (ibid, 8). Similarly, Fong and Shibuya (2020) observe that "some countries actively coordinate policies so that the remittances from citizens working abroad promote the home country's economic growth," with Indonesia being one of them (ibid, 14).

The unskilled workers who leave Indonesia, meanwhile, are still linked to the country and continue to support its economy. Indeed, Palmer (2019) notes that "Indonesian migrant workers […] mostly migrated for work because of economic reasons, such as lack of opportunities for gainful employment at home," (ibid, 2). This might seem counterintuitive, but consider the fact that unskilled workers are much less likely to uproot their families and relocate

entirely to a new country due to restrictions such as work authorization preventing them from doing so. Therefore, the link between the unskilled workers and Indonesia remains intact, and there is opportunity for economic benefit. Beine et al. (2008) note that there is a phenomenon where "host countries […] are now engaged in what appears as an international competition to attract global talent," (ibid, 631). However, this only applies to skilled workers, as these countries are introducing "quality selective immigration policies," (ibid, 631). Host countries, therefore, are also making it more difficult for an unskilled worker to settle down, proving our earlier point. Since the unskilled workers remain linked to Indonesia, they contribute to Indonesia's economy through taxes or remittances to family members. In summary, while we cannot draw a definitive cause and-effect conclusion, Indonesia is sending unskilled workers overseas with the purpose of economic growth, and there seems to be a correlation.

Theory, Hypotheses, and Argument

This research paper theorizes that there is a negative correlation between migration and economic growth. We tap into immigration using two measures, the net migration rate and the international migration stock. Specifically, the net migration rate is coded as immigration minus emigration. We hypothesize that emigration has a positive correlation with economic growth. However, because of how the net migration rate is coded, we hypothesize that the correlation between the net migration rate and economic growth is in the negative direction, instead.

As elaborated previously, Indonesia sends a lot of unskilled workers overseas. Unlike the emigration of skilled workers, which can cause the loss of talent, the emigration of unskilled workers, especially from a developing country like Indonesia, has little downside. There are, after all, a large number of unskilled workers in the country, so incentivizing them to work overseas makes sense. Indeed, the Indonesian government is taking this approach. The IOM

(2010) says that "the Government of Indonesia has facilitated the migration abroad of millions of Indonesian workers in the last two decades, as the country continues to be plagued by high levels of unemployment and underemployment despite high levels of economic growth since the late 1960s," (ibid, 10). Essentially, the government hopes that unskilled workers can contribute to the economy by decreasing unemployment and providing revenues through taxes and remittances. We do not know whether this works in practice; after all, it could very well be that economic growth is causing some unskilled jobs to disappear, pushing workers to go abroad. Both migration and economic growth are heavily nuanced topics, and, in this paper, we are not attempting to claim that one explains the other. However, we believe that our theory that migration and economic growth are correlated is substantiated by our argumentation.

We also hypothesize that the international migration stock, which is the percentage of immigrants living in Indonesia, has a negative correlation with economic growth. We argue that this is also because of our earlier argumentation that emigration in Indonesia correlates positively with economic growth. In particular, the data show that Indonesia has a small international migration stock percentage—which intuitively makes sense, considering it is a mostly emigration country. However, this also means that the positive effects of more immigrants, such as a larger labor force, are overshadowed by the effects of having a much larger number of emigrants, causing a negative correlation. Because emigration has that much more of an impact to Indonesia's economic growth by sheer numbers, it makes sense that the effect of immigration moves in the opposite direction.

Research Design

The data used in this study come from the World Development Indicators by the World Bank and the Penn World Tables. These datasets provide a context into Indonesia's position

compared to Southeast Asia. The other Southeast Asian countries we are examining are Brunei Darussalam, Cambodia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam. Including Indonesia, we are examining nine countries in total. We exclude Singapore because it is an anomaly and is growing extremely fast compared to its size—it could potentially skew our data in the wrong direction. We also exclude Timor-Leste (East Timor) because it became independent in 2002, and lacks sufficient data for our purposes. The unit of analysis in this study is the output of Southeast Asian countries, and specifically Indonesia, as our goal is to observe the focal relationship between economic growth and migration in these countries.

Data Relevance and Credibility

The World Development Indicators dataset is a collection of development indicators, such as indicators related to the fight against poverty, sourced by the World Bank Group on each country. The World Bank states that "the database contains 1,400 time series indicators for 217 economies and more than 40 country groups, with data for many indicators going back more than 50 years." The World Bank is part of the United Nations and is most well-known to focus on developing countries. Since we are observing Indonesia and other developing Southeast Asian countries in our research, the data provided by the World Bank are especially fitting.

One thing of note, however, is timing issues with the data. The World Bank claims to utilize data from official sources with some adjustments to timing differences if necessary. These discrepancies in timing and reporting may cause inconsistencies with data from different sources. This may be a problem since we are aggregating data from nine countries. However, we are going to proceed with the research analysis with this limitation in mind. The World Development Indicators dataset is as close to our purposes as possible. There are virtually no other datasets as reliable and as comprehensive as the one provided by the World Bank.

While not as well-known as the World Bank, the Penn World Tables is also an equally credible data source. It was constructed by economists at the University of Pennsylvania—Robert Summers and Alan Heston—along with the late American economist Irving Kravis. The data contain information productivity metrics in 183 countries between 1950 and 2019. The data are invaluable for making comparisons of economic growth and development across countries.

A potential issue is the possibility of timing discrepancies between the two datasets. While both the World Bank and the Penn World Tables source their data from official sources, there could be reporting and timing differences between them. We are using this separate dataset as a source for GDP instead of using everything from the World Bank because of the specialization of each dataset. The Penn World Tables, in particular, specializes in productivity and output. Since we are interested in economic growth, this dataset is more suitable. Therefore, we accept the risk that there could be timing issues and accept that we are working with accurate and reliable data.

In regards to timing, the World Development Indicators dataset provides information on all Southeast Asian countries since 1960. However, much of the data from the Penn World Tables start in 1970. Presumably, this is because of reporting problems in many developing countries. Therefore, we will be using data since 1970 from both datasets on these nine Southeast Asian countries—approximately fifty years of data in this study to gain the full picture.

Dependent Variable

We are analyzing the correlation between migration and economic growth in this study. Therefore, our dependent variable is the output-side real GDP per capita growth. The Penn World Tables, which is the source of this data, sources this information from the UN National Accounts Main Aggregates Database.

Gross domestic product (GDP) is one of the most common indicators used to track the health of a nation's economy. It represents the total dollar value of all goods and services produced by an economy over a specific time period. As a measurement, it is often described as a calculation of the total size of an economy. Economists and central bankers also use GDP to evaluate economical health and set the target interest rates in an economy. It thus makes intuitive sense why we are working with GDP data in this study.

We are using real GDP data instead of nominal GDP because real GDP factors in inflation or deflation and is thus a more accurate representation of a country's economy, which is what we are analyzing. We are also using the output-side of GDP instead of the expenditure-side. While theoretically, both should result in about the same amount, the output-side of GDP is more accurate to our study. Since our focal relationship is between migration and its correlation to economic growth and GDP, our study is directly related to output. On the other hand, the expenditure side measures the spending habits of the people, and can be subject to factors not measurable in this study such as globalization. Additionally, we are using GDP per capita instead of GDP to control for population sizes, which is different depending on a country's size and landmass. This will be elaborated further in the 'control variables' subsection.

Independent Variables

While the Penn World Tables provide the dependent variable, the World Development Indicators provide the data that will serve as the independent variables for our study. The analysis for these variables will be separate from one another, as will be elaborated further in the 'analysis and discussion' section. Both of these variables are outlined below.

The first independent variable is net migration, which the World Bank defines as "the net total of migrants during the period; that is, the total number of immigrants less the annual

number of emigrants, including both citizens and noncitizens." The data are five-year estimates and are available since 1962. We will be using net migration as a percentage of a country's total population instead of utilizing the raw numbers. Like GDP per capita, this is to control for population numbers. The World Bank sourced these data from the United Nations Population Division, World Population Prospects: 2019 Revision. The World Bank acknowledges limitations in the data as international migration is exceedingly difficult to measure and estimate due to a lot of volatility involved, such as responses to socio-economic factors. We acknowledge this limitation with the assumption that the World Bank is providing us with accurate data.

The second is the international migration stock for each country. The World Bank defines the international migration stock as "the number of people born in a country other than that in which they live." As above, we will control for population and use the international migration stock as a percentage of a country's total population. The World Bank sources this data from the United Nations Population Division, Trends in Total Migrant Stock: 2008 Revision. The data are in 5-year increments since 1960. The World Bank acknowledges that several countries lack data on foreign-born residents. In such cases, the organization uses data on the number of foreigners to estimate the international migrant stock for each country. Again, we will be taking these data in good faith that the World Bank has gathered data to the best of its abilities.

We pick net migration and the international migration stock as our independent variables because we want to observe the correlation of migration to GDP growth. The net migration percentage gives us the ability to analyze the correlation between immigration or emigration and the GDP per capita growth of a country. The international migration stock provides us insight into the number of immigrants, and whether the percentage of immigrants residing in a country has a statistically significant correlation with a country's growth. In this regard, we are looking at

immigration through two lenses: one as a percentage of people going in and out, and another as a percentage of immigrants in the population. This will give us a better idea of the correlation between migration and economic growth in Indonesia and in Southeast Asia as a whole.

Control Variables

The first control variable in this study is a country's population. The glaring issue with not controlling for population is that growth in a country's total output is easily attributed to growth in population. This is why this study is using real GDP per capita instead of simply real GDP. Not controlling for population will also make it difficult for us to compare our independent variables between countries. For example, a smaller country like Brunei Darussalam might have a smaller international migration stock number than Indonesia, but this is obviously due to the massive difference in population. For this reason, both our independent variables are as a percentage of the populations of their respective countries, instead of in raw numbers. Without controlling for population, we will get a skewed view of the situation, especially because our main focus is on Indonesia, the country with the fourth-largest population in the world. We believe this is an appropriate control variable because it levels the playing field and is a more accurate metric for cross-country comparisons, which is what we will be doing.

GDP per capita is highly dependent on previous GDP performance. Migration is also highly affected by outside factors such as socio-economic conditions. However, we cannot account for that as a separate variable. To get around this, we will be using a fixed-effects regression that takes this into account. This is elaborated in the upcoming subsection.

Fixed-effects Regression

Our study utilizes data on GDP per capita, net migration rates, and the international migration stock from several Southeast Asian countries over a fifty-year period. In effect, we are

using panel data. Panel data, or longitudinal data, are data for multiple entities (in our case, different Southeast Asian countries) across multiple time periods (fifty years). It is of prime importance in fixed-effects regression.

Fixed-effects regression means that we assume some characteristics, such as the variables we need to account for in GDP growth, are constant over fifty years. Similar to the concept of control variables, we use the fixed-effects model to avoid omitted variable bias. Essentially, we remove the noise that comes with panel data.

Fixed-effects regression is an extension of ordinary least squares (OLS) regression, which is a type of linear least squares model that estimates the unknown parameters in a linear regression. OLS estimates the relationship by minimizing the sum of the squares of the differences between the observed and predicted values of the dependent variable configured as a straight line. Note that both OLS and fixed-effects regression work well when the dependent variable is continuous. Contrast this with logistic regression models, which estimate the probabilities of events as functions of independent variables, but in a strict binary sense. Neither OLS nor fixed-effects regression has such limitations. However, an OLS regression does not consider potential skewness of the data due to omitted variable bias; fixed-effects regression does and is more suitable for use in this study.

Analysis and Discussion

We start our analysis by presenting the line graphs of the net migration rate and the international migration stock between Indonesia against the rest of Southeast Asia. This is so that we have an initial idea of what Indonesia looks like in comparison to the rest of the region. Considering that Indonesia is a mainly emigration country, we are expecting to see low net migration and international migration stock rates. However, since we are using the rest of the

Southeast Asian region as a benchmark, we should expect to see Indonesia's numbers hover around that of Southeast Asia as a whole, as an affirmation to our usage of the average Southeast Asian country as a proxy.

Recall that our theory and hypotheses are that net migration and international migration stock both correlate negatively with economic growth. We utilize the results of the fixed-effects regression that we conducted on both independent variables. Each independent variable will have an Indonesia-specific regression, as well as a general Southeast Asian regression. All of these regression results will be represented in the form of tables. In total, we have four tables, each of them containing valuable statistical and regression information. For both the net migration rates and the international migration stock, we are expecting to see negative coefficient estimates with statistically significant results.

Data Analysis

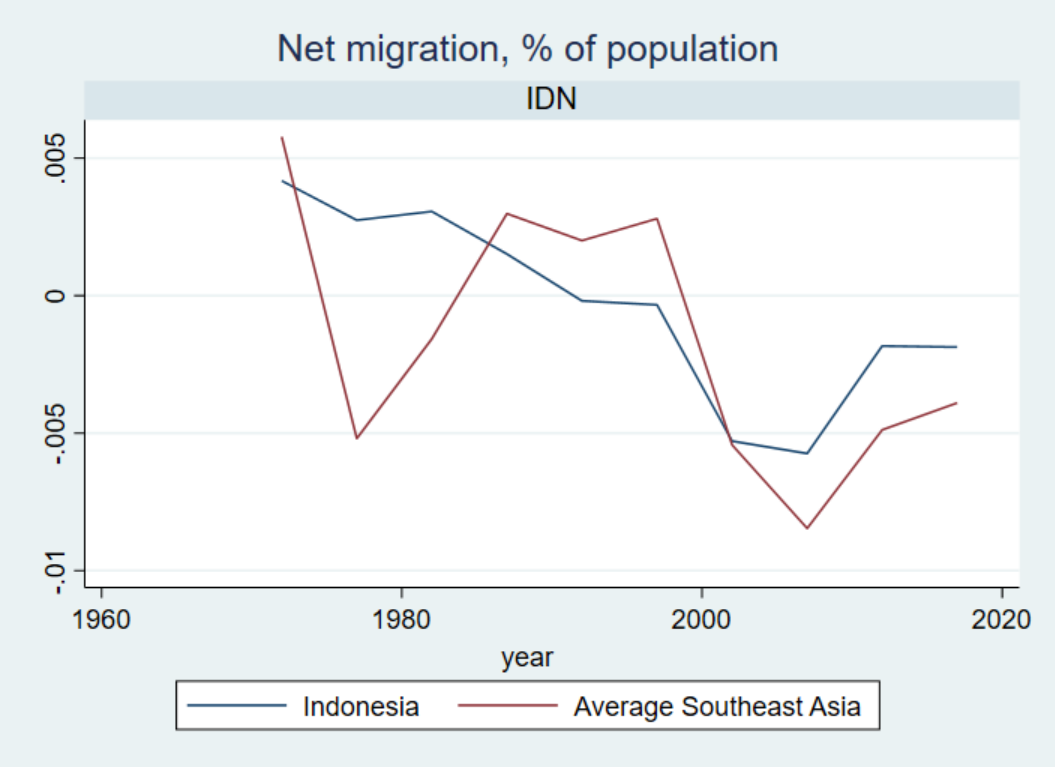

Fig 1. Line graph of the net migration rate since 1972

Fig 1 is the line graph comparing Indonesia's net migration rate and the average net migration rate of Southeast Asian countries since 1972, in 5-year increments. We are looking at 10 datapoints in total. The Southeast Asia metric is the average of the net migration rates for the nine Southeast Asian countries. As shown in the graph, the net migration stock for Indonesia is in the negatives as it approached the 2000s, meaning that gradually more people started leaving than entering. No visible trend can be seen in the Southeast Asia metric, probably due to it being a combination of many countries in the region. Nevertheless, the datapoints of Indonesia do not stray that far away from the datapoints of Southeast Asia, except for 1977, which seems to be an outlier. As such, this graph is what we expected to see.

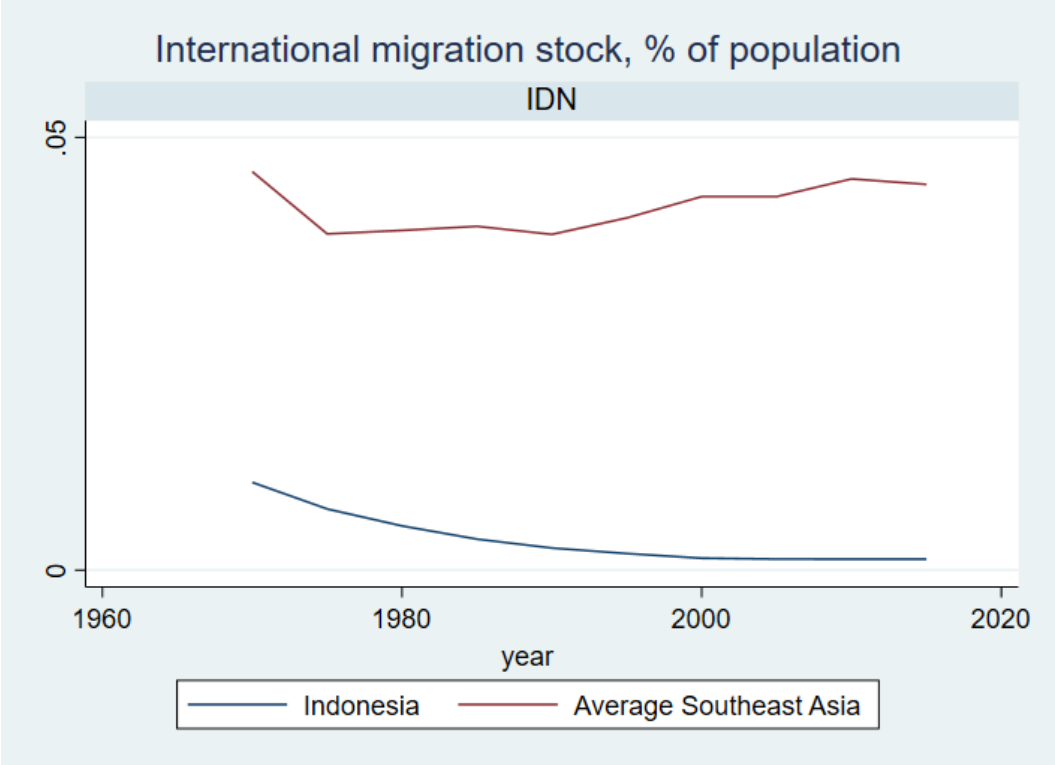

Fig 2. Line graph of the international migration stock since 1970

Fig 2 is the line graph comparing Indonesia's net migration rate and the average international migration stock of Southeast Asian countries since 1970, in 5-year increments. We are looking at 10 datapoints in total. The Southeast Asia metric is the average of the international

migration stock for the nine Southeast Asian countries. The international migration stock for Indonesia seems to be extraordinarily low—almost approaching zero—and is noticeably lower than that of Southeast Asia. While we expected Indonesia to have a low international migration stock, we did not expect there to be this much of a difference. This revelation could possibly have an effect on what we are expecting from our fixed-effects regressions.

Indonesia GDP	**Coefficient**	**Std Err**	**T statistic**	**P-value**	**95% CI**	
					Lower	**Upper**
Net Migration	-.4891196	.2904989	-1.68	0.131	-1.159011	.1807722
α	.0045993	.0009395	4.90	0.001	.0024328	.0067658

Fig 3. Fixed-effects regression of Indonesia GDP against net migration rate.

In Fig 3, we assess whether net migration is linked to GDP per capita in Indonesia. The data used are since 1972 in 5-year increments, amounting to 10 observations each for both GDP per capita and the net migration rate. The net migration term has a coefficient of -.4891196, which means that the correlation between the two variables runs in the hypothesized direction. The coefficient is not statistically significant, but just barely misses statistical significance at the 0.10 level. We believe, however, that this does not disprove our theory. GDP is a very nuanced variable, with lots of factors involved. The model shows that while net migration does have the negative correlation, it is perhaps a weaker correlation than other factors of GDP. We still believe that the results of this model show supporting evidence for the theory of this paper for Indonesia.

SEA avg GDP	**Coefficient**	**Std Err**	**T statistic**	**P-value**	**95% CI**	
					Lower	**Upper**
Net Migration	-.5120402	.0640052	-8.00	0.000	-.6394145	-.3846659
α	.012003	.0003027	39.65	0.000	.0114005	.0126054

Fig 4. Fixed-effects regression of Southeast Asia GDP against net migration rate.

In Fig 4, we assess whether net migration is linked to GDP per capita in Southeast Asia as a whole. The data used are since 1972 in 5-year increments, amounting to 10 observations each for

both GDP per capita and the net migration rate. The net migration term has a coefficient of -.5120402, which means that the correlation between the two variables runs in the hypothesized direction. With a p-value of 0.000, the coefficient is statistically significant. A unit increase [decrease] in the net migration rate would decrease [increase] the estimate of Indonesia's real GDP per capita by .5120402. The results of this model thus corroborate our hypothesis that there is a negative correlation between migration and economic growth.

Indonesia GDP	**Coefficient**	**Std Err**	**T statistic**	**P-value**	**95% CI**	
					Lower	**Upper**
Intl Migr Stock	-.6407814	.2434539	-2.63	0.030	-1.202187	-.0793756
α	.0065723	.0011125	5.91	0.000	.004007	.0091377

Fig 5. Fixed-effects regression of Indonesia GDP against international migration stock.

In Fig 5, we assess whether international migration stock is linked to GDP per capita in Indonesia. The data used are since 1970 in 5-year increments, amounting to 10 observations each for both GDP per capita and the international migration stock. The net migration term has a coefficient of -.6407814, which means that the correlation between the two variables runs in the hypothesized direction. With a p-value of 0.030, the coefficient is statistically significant. A unit increase [decrease] in the international migration stock would decrease [increase] the estimate of Indonesia's real GDP per capita by .6407814. The results of this model thus corroborate our theory that there is a negative correlation between migration and economic growth.

SEA avg GDP	**Coefficient**	**Std Err**	**T statistic**	**P-value**	**95% CI**	
					Lower	**Upper**
Intl Migr Stock	.3481771	.0987382	3.53	0.001	1.516818	.5446724
α	-.0023872	.0041505	-0.58	0.567	-.010647	.0058726

Fig 6. Fixed-effects regression of SEA GDP against international migration stock.

In Fig 6, we assess whether international migration stock is linked to GDP per capita in Southeast Asia as a whole. The data used are since 1970 in 5-year increments, amounting to 10

observations each for both GDP per capita and the international migration stock. The net migration term has a coefficient of .3481771, which means that the correlation between the two variables runs opposite to the hypothesized direction. With a p-value of 0.001, the coefficient is statistically significant. The results of this model are not what we expected, and it does not corroborate our theory. Given the statistically significant results, we cannot simply chalk up our findings to being due to chance.

We can attempt to explain the results of Fig 5 and Fig 6 with the fact that Indonesia has a much lower international migration stock than the rest of Southeast Asia. Consider our argument earlier in this paper. We mentioned that since Indonesia has a low international migration stock percentage, the effects of immigration are overshadowed by the positive effects of emigration. However, like we have pointed out, Southeast Asia as a whole has much higher international migration stock. This potentially correlates to more output. For example, more immigrants could mean there are more people to produce work and output. Alternatively, more work opportunities cause more immigrants to come into the country and work. Either way, a high international migration stock plausibly has a positive correlation with GDP. Therefore, it makes sense that there is a positive correlation between the two variables when looking at Southeast Asia. The reason why it may be a negative correlation for Indonesia is because the country has low international migration stock, and thus we cannot discern the effects of this positive correlation over the much larger effects of emigration.

Overall, we view these results as providing support for our theory, with a few caveats. As we saw in Fig 3, the variables run in the correct hypothesized direction, but did not meet statistical significance. Additionally, in Fig 6, the variables run in the opposite of the hypothesized direction. However, we have attempted to explain the discrepancy behind the

results and our theory. We thus believe that the results, in general, do indeed support our theory that there is a negative correlation between migration and economic growth in Indonesia.

Conclusion

Migration has always been a very interesting topic. However, despite the flurry of migrant activity in the Asian continent, there is not much literature surrounding it. Additionally, Asia is also poised to be the region to potentially experience lots of economic growth. Within Asia, we focus on Indonesia specifically due to its interesting trends in both migration (lots of emigration activity) and growth (massive growth opportunities). We also use the Southeast Asian region as a benchmark for comparison.

In this study, we examine the relationship between Indonesia's economic growth and its migration rates. Through analyzing existing literature, we theorize that there is a negative correlation between Indonesia migration and its economic growth. We also argue that this is due to Indonesia's high rates of unskilled worker emigration that is potentially assisting the economy.

We utilize data from the World Bank and the Penn World Tables dataset for the study, and we implement fixed-effects regression. We used GDP per capita as the dependent variable as it is a key indicator of a country's economy. We measure migration through the net migration rate and the international migration stock. Specifically, we analyze the relationships between the net migration rate and GDP per capita, as well as the international migration stock and GDP per capita. We also analyze the data for Southeast Asia as a whole to compare Indonesia's position with the region.

In summary, our data analysis provides mixed evidence for our theory and hypotheses, but we believe there is strong enough evidence in support for our theory. We addressed concerns over statistical insignificance in one regression, and opposite-direction correlation in another.

The former missed statistical significance only slightly, while the latter is due to higher levels of international migration stock in the region in comparison to that of Indonesia. Taken as a whole, in general, our results seem to support our theory.

Recall that near the beginning of the paper, we mentioned that the International Organization for Migration (2010) notes that the Indonesian government is actively incentivizing more unskilled workers to go overseas. Given the findings of our research, it is plausible, then, that the emigration efforts enacted by the Indonesian government are working and make sense. Sending more unskilled workers abroad causes the net migration rate to fall and the international migration stock to remain low because people have no reason to enter the country. Because of how the variables are coded, both net migration and the international migration stock negatively correlate with growth. Indonesia's having lower numbers in those two metrics therefore correlate positively with economic growth and development.

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