

**Growth, Inequality, and the Kuznets Curve: Important trends in Income Inequality in Botswana,  
Brazil, China, and Thailand**

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PUBPOL 490S

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## **Introduction:**

Income inequality is rising on a global scale, but varies within countries (World Inequality Report, 2018). In this paper, we examine income inequality in Brazil, Botswana, China, and Thailand and their relationship to the Kuznets curve. All of these countries are cited by the Commission on Growth and Development (2008) for their ability to maintain a high economic growth rate for at least two decades post-1950s. Among the thirteen countries discussed in the report, these four are currently in a similar level of GDP per capita, in the range of \$7,000 to \$9,000 (World Bank). However, they vary in the size of population and economy, type of leadership, and geographic structures. Also, their routes to growth and development to this point differ from each other. Botswana achieved and sustained a mineral-led growth after organized mining began in the 1970s (Valentine, 1993). Brazil's economy grew at close to 10% per annum from the mid-1960s to the early 1980s due to a surge in manufacturing and trade (Adrogué, Cerisola, and Gelos, 2010). In the case of China, large scale capital investment and productivity growth led to its unprecedented growth in the last four decades (World Bank). Thailand, on the other hand, leveraged its economic growth from a rise in the production of electrical and electronics, automotive, and construction materials (WTO, 2013).

While these countries are successful growth stories, it is important to explore who has become winners and losers along the process. To do so, we look at the trends of income inequality in each country by using time-series data (discussed further in the literature review). Our work will provide a unique approach in assessing the validity of the Kuznets hypothesis in each country and looking into whether we could predict the future situations of income inequality from potential trends in economic growth. For a comprehensive perspective, we begin with a literature review and methodology discussion followed by an analysis of each country.

## **Literature Review:**

For the scope of this paper, Kuznets (1955) inverted-U hypothesis serves as the starting point in looking at the relationship between economic growth and inequality and taking the casualties existing between these variables into consideration. Kuznets (1973) argues that as countries develop and an

economy makes the transition from a rural model to industrialization, inequality will increase initially, but it will decline eventually after a sustained transition.

Some authors believe that inequality may be prejudicial to economic growth. Empirical studies, especially those conducted since 1990, show that high initial levels of inequality curb subsequent economic growth. Examples of these studies include those of Fields and Jakobson (1994), Deininger and Squire (1998) and Barreto, Melo Neto, and Tebaldi (2001). These studies show that the Kuznets curve is robust for cross-sectional data but disappears when fixed country effects are introduced. However, in this paper, we rely heavily on time-series data. Even though the countries we look at fall on a similar range of GDP per capita, they each have a distinct history of economic development. As such, their future characteristics of growth and inequality will perhaps differ from each other. So, we believe that such diversity can be better incorporated if we look at the time-series instead of the cross-sectional data.

According to Bourguignon (2002) and Ravallion (1997), there is a close relationship between inequality-reduction and poverty-reduction. Bourguignon (2002) states that a decrease in income inequality is an important poverty-reduction tool, whereas economic growth may not be so crucial. They thus conclude that reductions in inequality can play a critical role in ensuring that growth will actually lead to a decline in poverty levels. In a comparative study of 98 countries, Barro (2000) shows that the Kuznets curve exhibits a certain degree of empirical regularity over time, but that it does relatively little to explain the variation in inequality across countries.

Our work adds to the existing literature by discussing the post-1980 trends in income inequality in Botswana, Brazil, China, and Thailand. We highlight important factors shaping the growth and income distribution in these countries and analyze whether the Kuznets inverted U-curve applies to them. We believe that this overview will give a historical perspective of economic development in these countries and provide a window to look at the potential future relationships between growth and income within and beyond these countries.

#### **Data and Methodology:**

The World Bank income database is the main data source used in this paper. We use the GINI index which measures the extent to which the distribution of income among individuals or households within an economy deviates from perfect equality. We also use the income distribution data from the World Bank to find out the income share held by the top 20% and the bottom 20% population. Both of these datasets use after-tax national income adjusted to 2011 PPP (Purchasing Power Parity) level. Additionally, we use the GDP growth estimates for the past forty years. These data are based on primary household survey data obtained from government statistical agencies and World Bank country departments.

Given a similar trend in the growth of GDP per capita in these countries, under the Kuznets hypothesis, we expect these countries to be in similar positions of economic development and have comparable trends in income inequality.

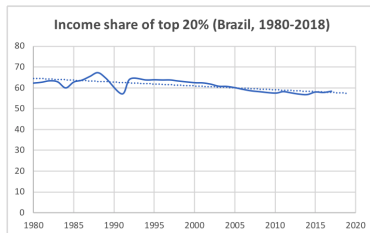


Fig 1: Kuznets curve (Source: Wikipedia)

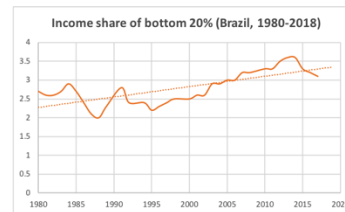
### **Brazil:**

The Commission on Growth and Development (2008) recognized Brazil as one of the thirteen countries that attained high economic growth rates throughout 25 years. According to the report, in the 1960s and 1970s, Brazil's real GDP grew at impressive rates, averaging close to 7.5 percent. By the early 1980s, slightly more than a quarter of the total labor force was employed by the agricultural sector. In short, the majority of the workers migrated from agriculture to industry (Adroque, Cerisola, and Gelos, 2010). During the same period (mid-1960s to late-1970s), Brazil's income per capita went up from \$300 to \$1500, and so did the GINI from 53 in 1962 to 60 in 1976. This would allow one to hypothesize Brazil's position in the Kuznets inverted U curve close to the vertex and towards the second half—reaching for a beginning of a decline in income inequality.

However, the period from 1981 to 1992 saw rising inequality in Brazil. The GINI for the distribution of household per capita income rose from 57.4 in 1981 to 62.5 in 1989 (Figure 5). During this period, the share of income held by the bottom 20% population declined by nearly a percentage point (from 3% to 2%), leading to a loss of over 30% of the original income share (Figure 3). In the same period, the total share of income for the top 20% rose from around 60% to 67% (Figure 2).



**Fig 2: Brazil - income share of top 20%** (Data Source: World Bank)



**Fig 3: Brazil income share bottom 20%** (Data source: World Bank)

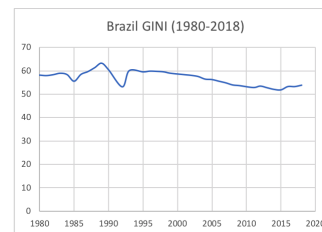
Crowe (2004), using cross-sectional data from 53 countries, concludes that there is a positive and strong correlation between inflation and income inequality. In the case of Brazil, the annual inflation rate accelerated from 80% in 1980 to 1509% in 1990 (Barreto et al, 2001). The increase in inequality in the 1980s appears to have been driven, in large part, by high and accelerating inflation. There are two pieces of evidence to justify this point. First, inflation is likely to have a regressive impact on the distribution of income. Since the ability to protect wealth through portfolio adjustments is generally held to be increasing in income, low-income families tend to have limited finances (e.g. savings) to cope up with a sustained period of price rise (Adroque, Cerisola, and Gelos, 2010). Second, Brazil's focus in the 1980s was to gain back the high levels of economic growth (Barreto et al, 2001). To do so, the central government invested heavily in building infrastructures and creating jobs in industrial regions, leaving behind many rural and agricultural regions. Hence, many low-income family and daily wage earners lacked access to government packages in mitigating the effects of high inflation (Adroque, Cerisola, and Gelos, 2010).

Reforms in social security and anti-poverty policies in the early 90s resulted in the restoration of macroeconomic stability in 1994 (The Economist, 2009). With a strong commodity boom, the economy expanded at around 4 percent per year from 2003 to 2010, and poverty declined by around one third

(World Bank, 2016). In turn, since early 2000, income inequality in Brazil has declined remarkably (Figure 5). GINI plunged from 60 in 1998 to 51 in 2015. In two decades (1992-2012), the share of income held by the bottom 20% went up from 2% to 3.5% (Figure 3). However, the decline in the share of income held by the top 20% has seen a smaller decline, from 62% in 1992 to 59% in 2012 (Figure 2).



**Fig 4: Brazil - GDP Growth** (Data Source: World Bank)



**Fig 5: Brazil GINI** (Data source: World Bank)

Among others, public policy reforms and growth in agricultural productions contributed to the decline in poverty and inequality in Brazil (Adrogué, Cerisola, and Gelos, 2010). Though meriting further research, agricultural and agriculture-related business growth since the trade liberalization of the early 1990s led to the convergence of household income between the country's rural and urban areas (Matins-Bekat & Kulkarni, 2009). Also, a cash-based social assistance system such as *Projeto Alvorada* (1994-95) and *Bolsa Família* (2003) have supplemented the income for the poor (The Economist, 2009). Additionally, the macroeconomic stability after 1994 eliminated the contribution from hyper-inflation to inequality (Matins-Bekat & Kulkarni, 2009).

Brazil's economic growth remains bumpy, so do its trends in income inequality. However, if we consider the mid-90s as the vertex, a sustained period of rising inequality in the 80s and its decline since 2000, qualifies the presence of the Kuznets curve in the case of Brazil. Nonetheless, much like in the past, economic shocks and recessions might lead to a rise in income inequality and the formation of an S-shaped curve.

### **Botswana:**

Botswana gained independence from Britain in 1966. At the time, Botswana was an extremely poor country -- economists Daron Acemoglu and James A. Robinson, authors of *Why Nations Fail*, report

that the nation "had a total of twelve kilometers of paved roads, twenty-two citizens who had graduated from university, and one hundred from secondary school" (Robinson, Acemoglu, and Johnson, 2003) However, between the early 1970s to late 1990s, Botswana's real GDP growth averaged nine percent – one of the most outstanding and uncontested economic performance records of any country in the world (Leith, 2005).

Income inequality in Botswana rose sharply in the 1980s and 1990s. The GINI rose from 52.4 in 1980 to 65.1 in 2003 (Figure 6). In the same period, the share of total income held by the bottom 20% halved as it declined from 4% in 1980 to 2.5% in 2003 (Figure 9). Conversely, the share of income held by the top 20% went up from 52% to 70%, resulting in a staggering inequality (figure 8).

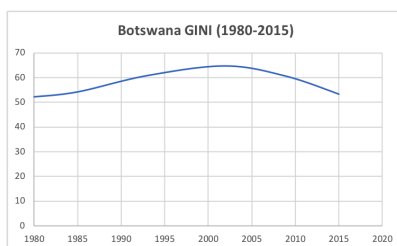


Fig 6: Botswana GINI (Data Source: World Bank)

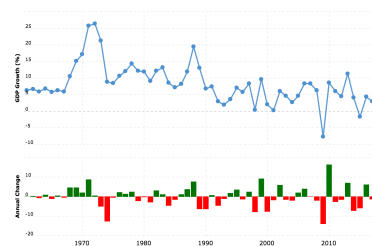
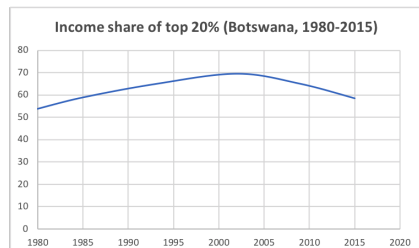


Fig 7: Botswana GDP growth (Data source: World Bank)

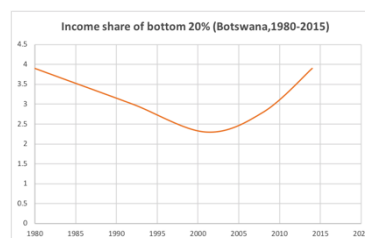
The record-high economic growth was primarily attributable to revenue earned from diamond-mining and the government's strong macroeconomic management of the resulting reserves. The mining sector grew at 25.3% per annum, with its GDP share rising from about 13% to roughly 47% (Robinson, Acemoglu, and Johnson, 2003). The expansion of the mining sector stimulated the growth of secondary and tertiary sectors, however the primary sector shrunk. For instance, between 1972 and 1988, the share of agriculture on GDP declined from 22.3% to 3.5% (Valentine, 1993).

Additionally, drought was severe and widespread throughout much of the ten years between 1979 and 1988 (Valentine, 1993). Crop production averaged 82.4 thousand metric tons during the period of good (timely and evenly spread) rains. However, due to frequent droughts, crop yields were extremely low, averaging 24.1 thousand metric tons per year, with a record low of 7.3 thousand metric tons in 1984-

85. Such substantial contraction of the primary sectors coupled with the plunge in agricultural production led to a decline in the income share of the bottom 20% and hence a rise in income inequality (Valentine, 1993).



**Fig 8: Botswana income share top 20%** (Data Source: World Bank)



**Fig 9: Botswana income share bottom 20%** (Data source: World Bank)

Unlike in the last two decades of the twentieth century, income inequality has narrowed since the early 2000s. In the last 15 years, the share of total income held by the bottom twenty percent has gone up from 2.3% to just under 4% (Figure 9) while the income share for the top 20% has fallen by over 14 percent from 70% to 60% (Figure 8). In turn, the GINI index has dropped to 50, just around where it was before the 1980s (Figure 6). A gradual rise in wage employment and structural policy changes have contributed to the decline in poverty and inequality in Botswana (Siphambe, 2007). Particularly, the comprehensive National Strategy on Poverty Reduction (NSPR), adopted in 2003, has been the key in stimulating broad-based economic growth, sound macroeconomic management, domestic entrepreneurship, employment creation, and attraction of foreign direct investment (World Bank, 2008).

With a history of unprecedented growth, Botswana has one of the highest GDP per capita among African countries. As evident in the graph for its GINI, Botswana's case for economic growth and income inequality seems to fit well with the Kuznets inverted U-curve, with its vertex around 2003 and current position on the second half of the curve.

### **China:**

The urban-rural divide is the biggest contributor to China's income inequality, despite the country's impressive overall poverty reduction. This can be traced back to the development strategy of the central planning era from the 1950s – 1970s, where the government artificially lowered the prices of

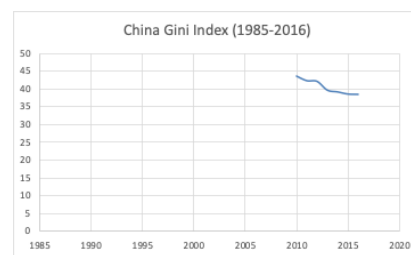


agricultural goods so they could support the new industries and urban development (Cheng, 2016).

Consequently, the hukou system was implemented so that rural to urban migration was prohibited through housing registration. Due to this migration barrier, more labor remained in agriculture than was desired by agricultural workers and productivity suffered as a result (2016). In 1978, the income gap was slightly adjusted after rural reforms were implemented to loosen restrictions. This significantly increased farmer's earnings from 1978-1985. However, the remaining hukou barrier ultimately prevented closing the income gap and the trend reversed again from the mid 1980s onwards (2016). The inherent problem was that urban industries benefited from capital intensity and investments that enabled them to quickly grow, while agricultural productivity was suppressed. In other words, this phenomenon demonstrates the dualism in the Chinese economy that has shaped the inequitable rural and urban divide since its inception.

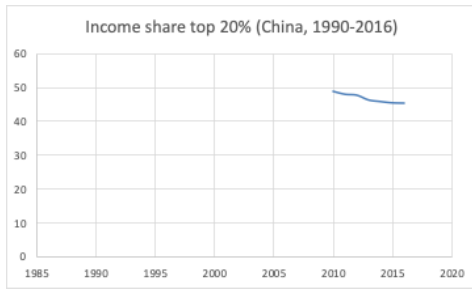


**Fig 10: China - GDP Growth** (Data Source: World Bank)



**Fig 11: China Gini Index** (Data Source: World Bank)

In recent years, China has expanded its economic development influence outside of the country in its Belt and Road Initiative. Additionally, it has implemented a strategic innovation plan to move away from being the “world’s factory” towards becoming high-tech manufacturers. These strategies could potentially cause another Kuznet inverted U curve to occur. Nevertheless, income inequality levels do seem to be progressing in a positive direction as the lowest 20% increased share from 5.1% in 2010 to 6.5% in 2018 (Figure 13). Comparably, for the highest 20% their share decreased from 49% in 2010 to 45.3% in 2016 (Figure 12). In terms of the Gini index, it has steadily declined down to 38.5 in 2016 after continuously rising to 43.7 from 1990 to 2010 (Figure 11).



**Fig 12: China income share top 20%** (Data Source: World Bank)



**Fig 13: China income share bottom 20%** (Data Source: World Bank)

Education is also a major contributing factor that perpetuates income inequality in China. Firstly, children from poor and rural families tend to perform worse than rich and urban children on the Gaokao – the National College Entrance Examination. Secondly, student loans from banks is not a familiar concept in the country. Consequently, higher education is losing its power as a “social leveler” and “safety valve” for poor youth (Jung, 2019). In fact, higher education is actually considered to widen inequality, while secondary education expansion is proven to reduce it at a provincial level (Cheng, 2016).

In terms of financial development, Jung and Vijverberg (2019) assert in their spatial data analysis of China’s income inequality that their insignificant spatial error term indicates that shocks associated by reforms or policies do not increase inequality. However, the spatial lag dependence does indicate that the inequality of one province significantly impacts its neighboring one. Additionally, their results showed that banking services are not useful in reducing inequality. This is important when considering that the Chinese government has a dominant impact on banking activities due to owning the country’s most powerful banks known as the “Big Four.” Consequently, other financial sector elements do have significant influence on reducing inequality. In their results, Jung and Vijverberg (2019) conclude that financial development does decrease income inequality in China.

China’s dualism is the compounded result of limited household registration and biased capital allocation, which reinforces the urban and rural divide. This is an important element of the nation’s economic landscape because productivity differences have a direct relationship with income-generating abilities. Furthermore, urbanization is a key driver of the Kuznet curve because richer provinces with an

industrial focus reached the turning point in the hypothesis earlier than poorer ones. Therefore, dualism and inflation are significant contributing factors to income inequality. Possible solutions are financial development activity outside of the big banks, a reformed hukou system, and a more equitable education pipeline.

### **Thailand:**

On the surface, Thailand is a social and economic development success story. Over the past few decades, its official poverty rate has decreased from 65.2% in 1988 to 9.85% in 2018 (World Bank). However, a byproduct of its economic progress has been income inequality, which gradually rose during the 1960s and started to decrease during the 1990s (Ikemoto & Uehara, 2000). This is significant because even though poverty has decreased, income inequality still persists at a high level. In the 1960s, Thailand's income inequality level was relatively lower than other Southeast Asian countries with a Gini coefficient around .5 and higher than East Asian countries with a Gini coefficient around .3. Nevertheless, just 30 years later, it reached the level of the most unequal Asian countries (2000). Originally, based on the Kuznet hypothesis, the inequality level was anticipated to decrease when the industrial sector absorbed the underemployed rural area labor force (2000). However, this never fully transpired due to the introduction of new industries that disrupted the economy.



**Fig 14: Thailand - GDP Growth** (Data Source: World Bank)



**Fig 15: Thailand Gini Index** (Data Source: World Bank)

Thailand's regional income gap accounts for around 20% of the income inequality in the country (2000). This is primarily accounted for by comparing the other regions of Thailand to Bangkok – the

nation's principal city with a considerably higher income. To put Bangkok into context, around 30% of its population is included in the top decile of the whole country, which is around 2 million people who make up the city's upper and middle class. In terms of how income is divided, the share of the top 20% increased from 51.4% in 1981 to 54.4% in 1992 before decreasing sporadically to 44% in 2018 (Figure 16). The income share of the lowest 20% was as low as 5.4% in 1992 before reaching 7.2% in 2018 (Figure 17). The Gini index reflects this relationship and has been on a relatively downward trend since 1992, reaching a low of 36.4 in 2018 (Figure 15).



Fig 16: Thailand income share top 20% (Data Source: World Bank)

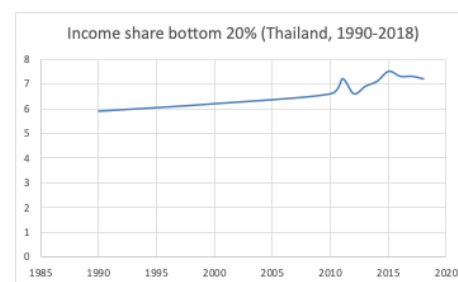


Fig 17: Thailand income share bottom 20% (Data Source: World Bank)

In total, the country consists of five regions: Bangkok, Center, North, Northeast, and South (2000). The most drastic income divide is between Bangkok and the Northeast, which is the poorest region. In 1992, when the income gap between these two regions was its widest, it reached 100:22 in terms of per capita household income (2000). In terms of per capita gross regional product, it reached as high as 9:1. This difference is relatively higher than within any other Asian country. Consequently, from 1981 to 1992, the regional gap seemed to imply a U-shaped curve (2000). According to Kuznets' hypothesis, if the industrial sector is high productivity and the agricultural sector is low productivity, then the agricultural labor force would be absorbed and inequality would decrease. However, this is not the case in Thailand because the process of the curve is continually interrupted with a new one. Therefore, the income gap will widen whenever a more "productive" industry is introduced to a "matured" or stagnant economy (2000). Nevertheless, if resources continue to be reallocated then the evidence indicates that Thailand would follow the Kuznets curve.

**Conclusion:**

Even though the trends of income inequality in Brazil, Botswana, China, and Thailand might fit with the Kuznets curve, the economic and social landscape within each country varies considerably between them. Since we are just looking at the span of 40 years, the direction of income inequality might be different in the long-term and in the future. Especially, if big economic shocks, high inflation, and poor employment conditions arise, then the inequality might rise and evolve into a S-shape curve.

While the empirical evidence from Botswana, China, and Thailand suggests that inequality tends to decline with sustained growth in the economy. Importantly, evidence from Brazil indicates that even decades of growth in GDP per capita might not inevitably lead to a decrease in income inequality. This finding calls for further research in the relationship between growth and income inequality. Alongside maintaining high levels of economic growth, implementing equitable distribution policies is crucial in narrowing the income gap. Despite successful growth stories of these countries, the disparity in income between the bottom 20% and the top 20% population still remains huge. Such grave inequality can only be addressed by a host of policy reforms and targeted efforts that can create income opportunities for the poor and ensure their upward mobility.

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