Economic geography of Indonesia: location, connectivity, and resources

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8 chapter

With its 13,000 islands, Indonesia is the world's largest archipelagic state and one of the most spatially diverse nations on earth in its resource endowments, population settlements, location of economic activity, ecology, and ethnicity. There are about 350 identified ethnic groups. In the early 2000s, per capita regional product in the richest province, East Kalimantan, was around 16 times that in the poorest, Maluku. The range of poverty incidence was from 3.4 percent of the population in Jakarta to 42 percent in Papua.

The country's regional development patterns are therefore of great analytical and policy interest. Indonesia is formally a unitary state, but all national governments have had to deal with major regional development challenges. The country's international boundaries have changed twice since independence, with the formal entry of Papua (then Irian) in 1969 and the entry and later exit of East Timor in 1976 and 1999, respectively. Subnational boundaries have changed frequently.

While national economic fortunes and policies explain much of the local development outcomes, regional responses to international and domestic events inevitably vary. Four examples briefly illustrate this proposition.

First, the 1970s oil boom disproportionately benefited the country's four resource-rich provinces, even though much of the windfall gains accrued to the central government and oil companies. Second, the major policy reforms of the 1980s resulted in rapid, export-oriented industrialization, mainly concentrated on Java and Bali, which in turn boosted the economic fortunes of these islands. Third, the economic crisis of 1997–98 particularly affected construction of the modern sector, finance, and import-substituting manufacturing sectors, and, because these are mainly located on Java, this region experienced the sharpest decline in economic activity. Fourth, the decentralization program has transferred considerable financial resources and administrative authority from the central government to the second-level tiers of government (*kabupaten* and *kota*) and, in the process, is likely to alter Indonesia's economic geography significantly.

While much has been written on various aspects of regional development in Indonesia, there are two reasons to revisit the issue. First, it has only been possible to measure accurately and quantify regional trends since the mid-1970s. Development dynamics are a long-term phenomenon, involving decades rather than years, and we are only now in a position to analyze Indonesia's regional economic, social, and demographic development over a period of 30 years.

The second motivation has to do with the renaissance of regional economics and science. Traditionally regarded as inhabiting the backwaters of the profession, "new economic geography has come of age" in the words of Neary (2001). This has arisen principally owing to the intellectual fusion between international trade and geography articulated by Krugman (1991).

A key insight from this literature concerns the interaction between the international

economy and local development patterns. As countries remove regulatory impediments to the cross-border flow of goods, services, capital, technology, and people, those regions most connected to the global economy—by dint of location, infrastructure, and enabling institutions—are likely to grow the most quickly. In cases where domestic infrastructure lags or there are regulatory barriers to domestic commerce, these internationally oriented regions may become in effect enclaves, more connected to the global economy than to the hinterland.

As a corollary, to the extent that national economic policies—openness, macroeconomic management, and so forth—are tending to converge around the world, local governance and institutions are likely to become increasingly important determinants of regional development outcomes. In the search for markets and mobile factors, for example, Jakarta is competing with both Surabaya and Shanghai, albeit in different dimensions.

This paper draws on this rapidly expanding literature and the rich Indonesian regional database to address the following issues, each of which constitutes a section of the paper. First, we provide an overview of Indonesia's changing regional economic geography, examining how the location of economic activity and provincial economic rankings have changed since the 1970s. Next, we investigate patterns of regional economic growth and structural change, examining regional growth dynamics, followed by the interrelationships among growth, structural change, and demographic dynamics. Next we examine convergence and inequality, both in terms of the "four-quadrants" story of initial incomes and subsequent growth and the various measures of convergence. These results are compared with Indonesia's provincial social indicators. We also discuss conflict at the regional level and assess various explanatory hypotheses. In a final section, we summarize our main findings.

To address these issues, we have assembled a large regional database from various series of Indonesia's Central Board of Statistics (Badan Pusat Statistik). These data are discussed in detail in the relevant sections, but we note here two general points. First, the analysis is conducted at the provincial level and is based on a standard set of 26 provinces. These are the 27 provinces that existed for most of the Soeharto era, excluding the special case of East Timor. Since 2000, there has been considerable fragmentation (*pemekaran*) of provincial boundaries, and so it is necessary to adjust the published data back to the pre-2000 provincial boundaries.[1]

The second general point to note is that, reflecting data constraints, our story commences in the 1970s, the period when reliable regional socioeconomic data became available (see Arndt 1973). In the case of demographic and related data, the starting point is the 1971 population census, while the regional accounts effectively commence in 1975.

Economic geography

As is well known in the Indonesian context, there are two relevant measures of regional economic activity and three indicators of economic welfare. There is no "true" measure of economic activity and welfare, as each one measures a different concept. We therefore present and examine the three series.

The activity measures are regional gross domestic product (GDP) and regional GDP excluding mining, in particular oil and gas. The latter measure is frequently employed in Indonesia owing to the presence of extractive activities, which significantly affect measured local economic activity but have much less effect on local economic and social welfare. This difference between the two series arises because a large proportion of the returns to extractive activities accrue to extra-provincial entities, principally the central government and foreign and domestically owned mining companies. With the introduction of decentralization measures in January 2001, regions now receive a higher proportion of mining revenue, and thus the differences between the welfare measures might be expected to narrow gradually over time (Resosudarmo and Vidyattama 2007).

In principle, the output of any "enclave" activity might be deducted from regional GDP to provide a better indication of local economic activity and welfare. In practice, the choice is between oil and gas, on the one hand, and mining, on the other. Other

resource-based activities, notably forestry, are substantially more labor intensive and therefore have larger local employment and income spin-offs. Some mining activities are also quite labor intensive (for example, small-scale gold mining) and perhaps do not need to be deducted from regional GDP. In practice, the distinction is inevitably somewhat arbitrary.

In this paper, we employ regional GDP and regional non-mining GDP. The latter is selected for two reasons. First, the non-mining series is available for a longer period of time (since 1975) than the non-oil and gas series (since 1983). Second, the difference between the non-mining and non-oil and gas series is not large, as oil and gas are the major component of Indonesian mining output, accounting for 68 percent of mining value added in 2004. The only regional exception—that is, a very large non-oil and gas mining sector—is Papua (Manning and Rumbiak 1989).

In addition to total and non-mining regional GDP, there are estimates of household consumption expenditure (CE) per capita. The latter are available for a shorter time period, since 1983. They are particularly useful for computing poverty estimates. They are not a superior indicator of economic welfare—by definition they exclude household saving and government consumption and saving—but they do provide an additional dimension. This series would be expected to correlate more closely with non-mining regional GDP.

We present the regional accounts data at three points in time, 1975 (1983 for the CE data), 1990, and 2004. These correspond to important time periods in Indonesia's recent economic history. These are, respectively, the early years of the oil boom, the year in which the major post–oil boom policy reforms were introduced, and the year in which national income per capita returned to pre-crisis levels.

Major concentrations of Economic activity

It is convenient initially to divide the country into five major island groupings: Java-Bali, Sumatra, Kalimantan, Sulawesi, and "eastern Indonesia." Java dominates Indonesia's economy, contributing 61, 66, and 67 percent of the country's total GDP, non-mining GDP, and household expenditure, respectively, in 2004 (see table 8.1). Sumatra comes next, with 22, 20, and 20 percent. Kalimantan has 9, 8, and 5 percent, Sulawesi has 4 percent on all measures, and the eastern provinces have around 3 percent on all measures. We examine the factors underlying these regional dynamics in the following section.

Over time and regardless of the measure used, there has been a clear shift of economic activity toward Java-Bali and, in particular, the national capital Jakarta. Jakarta generated one-sixth of Indonesian GDP in 2004, double that of 1975. Its share of non-mining GDP also has increased significantly, though not as fast. It accounts for virtually all of the increase in the Java-Bali share of GDP and more than 100 percent of the increase in non-mining GDP. That is, the Java-Bali share excluding Jakarta is stable for the total regional GDP series, while declining slightly for the other two series. In fact, the increase in Jakarta's share is understated, as some of its growth has spilled over the border to West Java, the only other province in the group with an increased share of GDP. The three big Java provinces—these two and East Java—account for half of Indonesia's GDP and a slightly higher share of its non-mining GDP.

Sumatra's share of non-mining GDP and household expenditure has been stable at 20–21 percent. Its share of GDP has been declining, owing to the falling share of oil and gas in the national economy and reflected in the declining shares of the island's main producers, Riau and Aceh. The two largest economies have been Riau with mining included and North Sumatra with mining excluded. Riau is a particularly unusual regional economy, with a large oil enclave, a cash crop economy, a relatively wealthy capital city, and a strong export-oriented manufacturing and service economy in the islands adjacent to Singapore. Thus, although its share of national GDP has declined since 1975 owing to the oil effects, its share of national non-mining GDP (and household expenditure) has more than doubled since 1990, the fastest increase in the country for this period.

Of note is the fact that the three southern provinces of Sumatra—South Sumatra,

Table 8.1 Shares of regional GDP with and without mining and household consumption expenditure in Indonesia, by province, various years, 1975–2004
Indonesia = 100 percent

	Regional GDP			Non-mining regional GDP			CE		
Province	1975	1990	2004	1975	1990	2004	1983	1990	2004
Sumatra	32.2	24.9	22.2	21.0	20.1	20.0	20.6	20.1	20.2
Aceh	1.6	3.8	2.2	1.7	2.8	1.7	2.1	2.1	0.9
North Sumatra	5.7	5.7	5.4	6.6	6.3	5.8	6.4	6.0	5.4
West Sumatra	1.8	1.8	1.7	2.3	2.0	1.8	2.2	2.2	1.8
Riau	15.1	6.5	6.8	2.1	1.9	5.0	1.9	2.0	5.5
Jambi	0.8	0.7	0.8	0.9	0.8	0.8	0.6	0.8	0.9
South Sumatra	4.8	4.2	3.3	4.5	3.8	2.8	4.7	4.2	3.6
Bengkulu	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4
Lampung	1.9	1.7	1.6	2.4	1.9	1.7	2.2	2.4	1.6
Java-Bali	51.5	58.6	61.0	62.8	64.5	65.7	64.4	65.8	67.4
Jakarta	8.7	12.1	17.1	11.0	13.8	18.8	10.4	9.9	16.5
West Java	14.5	16.8	17.2	16.3	17.1	18.0	17.2	19.4	19.0
Central Java	9.9	11.5	8.8	12.5	13.1	9.6	14.5	12.2	10.4
Yogyakarta	1.2	1.0	1.0	1.5	1.1	1.1	1.6	1.3	0.9
East Java	15.8	15.5	15.5	19.9	17.5	16.8	18.7	20.8	19.3
Bali	1.3	1.6	1.3	1.6	1.8	1.4	2.0	2.2	1.3
Java-Bali without Jakarta	42.8	46.4	43.8	51.8	50.7	46.9	54.0	55.9	51.0
Kalimantan	7.1	9.1	9.3	6.1	7.9	7.5	5.4	5.4	4.6
West Kalimantan	1.4	1.5	1.3	1.8	1.7	1.5	1.7	2.0	1.3
Central Kalimantan	0.5	0.7	0.8	0.7	0.8	0.9	0.9	1.0	0.9
South Kalimantan	1.0	1.2	1.2	1.3	1.4	1.1	1.5	1.3	0.9
East Kalimantan	4.1	5.7	6.0	2.3	4.0	4.0	1.2	1.1	1.6
Sulawesi	5.0	4.1	4.2	6.3	4.5	4.3	6.2	5.3	4.4
North Sulawesi	1.3	0.8	0.8	1.6	0.9	0.8	1.3	1.0	0.7
Central Sulawesi	0.4	0.5	0.7	0.6	0.6	0.7	0.8	0.8	0.8
South Sulawesi	3.0	2.4	2.2	3.8	2.6	2.2	3.5	2.9	2.4
Southeast Sulawesi	0.3	0.4	0.5	0.3	0.5	0.5	0.6	0.6	0.5
Eastern Indonesia	4.3	3.3	3.3	4.0	3.0	2.5	3.5	3.3	3.3
West Nusa Tenggara	0.8	0.7	1.0	1.0	0.8	0.7	1.0	1.0	0.7
East Nusa Tenggara	0.8	0.6	0.6	1.0	0.7	0.6	1.0	1.0	0.7
Maluku	0.9	0.8	0.3	1.1	0.9	0.3	0.9	0.9	0.4
Papua	1.8	1.2	1.4	0.9	0.7	0.8	0.7	0.5	1.5
Indonesia (current Rp trillion)	12	188	2,203	10	165	1,996	34	83	1,182

Source: Central Board of Statistics (various years).
Note: All numbers are in percentages. Based on current prices.

West Sumatra, and Lampung—have been slipping. In 2004 their share of non-mining GDP was about two-thirds of that in 1975. Evidently, their proximity to stronger economies to their south and north has not had a growth spillover effect. Lampung, in particular, was seen as a solution to Java's alleged problems of over-population and poverty, but since the 1970s its economic performance has lagged behind that of Java.

The largest and most dynamic regional economy in Kalimantan is East Kalimantan, with its large oil and gas resources. In fact, it has experienced "twin booms" in the words of Pangestu (1989), from both hydrocarbons and timber. Downstream industrial processing has provided a further boost, while since 2001 the decentralization program has enriched *kabupaten* Kutai Kartanegara, which has the nation's highest regional GDP per capita.[2] Both regional GDP series are misleading indicators of the region's living standards, as indicated by the much lower share of household expenditure compared to their shares of regional GDP with and without mining. Nevertheless, the latter is growing quickly, rising 50 percent as a proportion of the national total since 1990.

The share of the eight eastern provinces in the national economy is gradually declining. This generalization applies to the largest regional economy in the east, South Sulawesi, and its traditionally most prosperous region, North Sulawesi. The share of Maluku, the site of the country's most serious religious conflict, is now less

than one-third of the 1975 figure. The only exceptions to this picture of declining shares are the two small Sulawesi provinces (which were boosted by in-migration), West Nusa Tenggara (which recently experienced a major expansion in mining) and Papua (in the case of household expenditure since 1990). The latter reflects the combined effects of the mining boom and special government programs.[3]

Provincial economic rankings

We examine these rankings with reference to the three measures discussed above. All data are normalized around the national average of 100. There are large interprovincial income and welfare differences and evidence of both continuity and change in these rankings (see table 8.2). In 2004, the gap between the richest and poorest provinces was very large, depending on which series is used. The ratio of the richest to poorest was 15.9 for regional GDP per capita (East Kalimantan:Maluku), 14.7 for non-mining regional GDP per capita (Jakarta:Maluku), and 11.3 for household expenditure (Jakarta: West Nusa Tenggara).

The first three columns indicate how the inclusion of mining inflates the estimated regional GDP per capita for the resource-rich regions, especially in the earlier years. For example, in the case of Riau,

Table 8.2 Regional GDP with and without mining and household consumption expenditure per capita in Indonesia, by province, various years, 1975–2004
Indonesia = 100 (index)

	Regional GDP per capita			Non-mining regional GDP per capita			PCE		
Province	**1975**	**1990**	**2004**	**1975**	**1990**	**2004**	**1983**	**1990**	**2004**
Sumatra	177.0	121.7	103.1	115.3	98.1	92.9	104.8	98.4	93.9
Aceh	93.3	200.7	114.5	97.9	147.4	92.0	114.4	108.9	49.5
North Sumatra	101.9	99.6	92.2	116.7	110.1	100.5	111.0	104.9	92.3
West Sumatra	79.1	78.3	81.6	99.2	88.0	86.8	96.8	96.1	87.6
Riau	1,061.5	352.0	245.2	150.2	103.9	178.6	128.8	106.0	198.0
Jambi	87.1	65.5	67.0	101.5	72.0	62.2	62.0	72.5	75.9
South Sumatra	160.6	118.5	92.8	150.1	107.5	77.2	144.8	119.2	100.5
Bengkulu	61.9	64.6	49.0	77.6	70.0	52.4	90.5	75.7	56.3
Lampung	72.9	50.8	48.4	91.6	57.8	50.9	62.2	70.2	48.4
Java-Bali	79.4	94.9	103.3	96.9	104.4	111.3	101.9	106.5	114.2
Jakarta	212.1	262.9	419.1	267.1	299.9	460.9	224.9	214.3	403.0
West Java	78.7	84.9	85.9	88.6	86.2	89.6	91.3	97.7	94.8
Central Java	55.6	72.2	58.4	69.6	81.9	63.9	85.9	76.7	69.4
Yogyakarta	61.6	62.0	64.5	77.4	70.3	70.6	88.1	78.2	59.7
East Java	76.3	85.1	92.7	95.9	96.5	100.3	96.7	114.3	115.2
Bali	77.6	103.2	83.4	97.1	117.3	91.4	119.0	143.9	82.5
Java-Bali without Jakarta	70.5	81.3	79.8	85.4	88.7	85.3	92.2	97.8	92.7
Kalimantan	159.2	178.4	159.8	136.6	154.0	128.2	114.7	106.3	79.2
West Kalimantan	84.2	80.3	65.8	105.9	91.1	71.8	101.9	113.0	62.2
Central Kalimantan	88.3	93.9	83.9	110.9	106.7	91.9	132.7	122.5	86.7
South Kalimantan	72.2	85.3	77.0	90.5	93.7	70.8	110.6	90.9	59.3
East Kalimantan	576.5	538.2	462.3	325.9	380.4	311.8	131.5	104.0	123.3
Sulawesi	70.6	58.8	55.9	87.7	64.5	57.4	87.4	76.3	59.0
North Sulawesi	86.9	57.7	59.6	109.0	65.2	59.9	89.6	75.6	51.9
Central Sulawesi	55.1	53.2	60.0	69.1	59.1	65.0	91.4	79.9	67.5
South Sulawesi	70.7	60.9	55.3	89.0	66.6	56.0	85.7	75.3	61.4
Southeast Sulawesi	52.7	57.6	48.5	52.8	59.6	50.8	87.6	78.6	49.8
Eastern Indonesia	78.1	58.2	54.6	72.5	53.6	40.8	64.1	58.5	54.3
West Nusa Tenggara	45.5	37.5	50.6	56.6	42.1	36.2	53.9	51.5	35.8
East Nusa Tenggara	41.5	34.7	30.5	52.1	39.4	33.2	52.0	53.2	38.5
Maluku	91.9	76.6	29.0	113.1	82.6	31.3	89.6	84.6	38.5
Papua	226.8	126.8	123.5	111.1	72.8	69.7	84.3	54.0	126.2
Indonesia (current Rp thousands)	91	1,051	10,421	72	922	9,443	216	461	5,592

Source: Central Board of Statistics (various years).
Note: All provincial numbers are relative to Indonesia, which is set to 100. Based on current prices.

regional GDP per capita was seven times higher than non-mining regional GDP in 1975. By 2004, these effects were much smaller. The three series were about 37 percent higher in Aceh, 52 percent in Riau (and also in West Nusa Tenggara, owing to its recent mining expansion), 63 percent in East Kalimantan, and almost double in Papua. In the first and last of these provinces, non-mining regional GDP had fallen below the national average.

We therefore develop our main story around the non-mining series, which excludes the enclave mining effects. We identify what may be termed consistently "wealthy" and "poor" regions, those close to the national average, and those that have experienced a significant change in relative incomes.

Consistently wealthy. There are two really wealthy provinces, Jakarta and East Kalimantan. Jakarta is by far the richest province as measured by non-mining regional GDP per capita, at about four times the national average and double that of the next richest province. It has been getting relatively richer, especially since 1990. This is notwithstanding, first, the 1980s liberalizations, which reduced the regulatory powers of the capital; second, the decentralization of 2001, which transferred resources and funds to the regions; and third, the 1997–98 crisis, which affected it more severely than any other province apart from West Java.[4] However, it also recovered more quickly than most provinces. In spite of its role as the national capital, the public sector is one of the smallest in the country.

East Kalimantan's per capita non-mining regional GDP has consistently been at least three times the national average, indicating that its economic wealth extends well beyond the mining enclaves. However, its household expenditure suggests that community living standards are much closer to the national average. About 60 percent of East Kalimantan's non-mining regional GDP comes from oil- and gas-processing industries. These are relatively capital-intensive activities, and much of the return on these investments accrues to entities outside the province.

A third province, Riau, is generally well above the national averages. Its fortunes declined sharply during the 1980s in the wake of the fading oil boom, resulting in its income and expenditures being close to the national average. However, as noted, strong growth in the islands close to Singapore, combined with export-oriented cash crops on the mainland, resulted in it being the third-richest province in 2004 according to both series.

Consistently nonpoor. A second group of provinces may be termed consistently well-off, with non-mining regional GDP per capita at least 85 percent of the national average. This includes the traditionally strongest agricultural exporter, North Sumatra; the frontier province of Central Kalimantan (initially driven by timber, but with cash crops now the major agricultural activity); the country's two major industrial provinces, West and East Java (the latter's ranking rising appreciably); the major tourist region, Bali;[5] and West Sumatra (where both agriculture and a range of services are important). Aceh would have belonged in this group until recently, but the protracted conflict (at least until 2005) has resulted in sharply lower living standards.

Very poor. At the other extreme are the poor provinces, with a ratio of about half the national average or less. They are all located in eastern Indonesia. The two Nusa Tenggara provinces are consistently poor and evidently slipping further behind, falling from just over half the national average in both series to 35–40 percent. Maluku, which has experienced the most serious conflict since 1998, has fallen sharply, from above the national average (in non-mining regional GDP per capita) to one-third of it. Southeast Sulawesi, the poorest province on this island, is about half the national figure in all series.

Slipping behind. A number of provinces have slipped significantly in their rankings in both the non-mining regional GDP and expenditure series. These are mainly traditional agricultural exporters that have not been able to capitalize on their initial advantages. Examples include South Sumatra,[6] Jambi, Bengkulu (all in Sumatra), West and South Kalimantan, North and South Sulawesi, and resource-rich

Papua (although its household expenditure has risen). It is notable that Central Java and Yogyakarta have slipped according to both series, although not as much as the others in this group. The latter case is puzzling given its traditional importance as a major center of higher education. This is such a heterogeneous group of provinces as to render hazardous any attempt to find a common set of explanations. Perhaps the most important observation is that they generally lack a major, internationally oriented engine of growth. We return to this issue shortly.

These interprovincial rankings shed much light on Indonesian regional dynamics. In the first three decades of Indonesian independence, Java was regarded as the country's most serious development challenge, with the island "asphyxiating for want of land," in the words of Keyfitz (1965: 503). By contrast, in spite of their poorer human and physical infrastructure, the resource-rich regions in the Outer Islands were considered to have less poverty and better development prospects.

However, a different picture emerged in the 1980s. The major economic policy reforms increased the relative profitability of export-oriented manufacturing and related higher-value services, which are located mainly on Java-Bali. Declining commodity prices adversely affected many off-Java regions. Thus Sumatra's ranking on all three series declined significantly. It was overtaken by Java-Bali by 1990 and was below the national average for both series in 1990 and 2004. A particularly notable decline is Lampung, historically seen as the solution to Java's "population problem." In 2004 its income and expenditures were less than half those of Java-Bali in all three series.

Kalimantan displays above-average income but below-average expenditure, owing to the distributional effects of the natural resource sectors. The eight provinces of eastern Indonesia are both poor and slipping further behind, with the partial exception of Papua's enclaves.

Regional economic growth and change

We now examine provincial economic growth rates on a per capita basis over the same periods and for the same series. Java-Bali in general was the fastest-growing region, followed by Sulawesi (see table 8.3). Sumatra was pulled down by the oil sector. In the case of growth in non-mining regional GDP per capita, there is the same relatively even pattern of growth across island groupings: Java-Bali was the only major region to grow (slightly) faster than the national figure of 4.6 percent. Kalimantan and Sulawesi were just below it, followed by Sumatra and by eastern Indonesia, 0.9 percentage points below the average. The growth rates of household expenditure are similarly quite even.

It is not easy to identify obvious groupings and characteristics of provinces based on growth rates. The fastest growth rates (in regional GDP per capita) over the period of 1976–2004 occurred in Bali, West Nusa Tenggara, West Sumatra, Jakarta, Central Java, and North Sulawesi. The slowest rates were recorded in Riau, Papua, South Sumatra, Maluku, East Kalimantan, and Jambi. Thus the fast growers included both small and large provinces, "central" and remote locations, and areas with initially high and low per capita incomes. The only common element appears to be the absence of a major resource sector, whereas this is a feature of all but one of the slow growers.

For a more detailed examination, we focus on the non-mining regional GDP per capita series, which is arguably the most accurate indicator of provincial economic performance. The fastest-growing provincial economy by a significant margin (1.1 percentage point over number two) was Bali. Also in the high-growth group (at least 5 percent) are Southeast Sulawesi,[7] Jakarta, and West Sumatra. A further four provinces are just above the average: North Sumatra, West and Central Java, and North Sulawesi. Conversely, a number of provinces grew at a rate at least a percentage point slower than the national average. These are Papua and Maluku in the east and Riau, Jambi, and South Sumatra in Sumatra. The remaining 13 provinces grew close to, but slower than, the national average.

The story differs for the shorter (and not directly comparable) household consumption expenditure per capita (PCE) series. The fastest-growing provinces from 1984 to 2004 were East Java, North Sulawesi, East Nusa Tenggara,

Table 8.3 Annual growth rates of regional GDP with and without mining and household consumption expenditure per capita in Indonesia, by province, 1976–2004

	Regional GDP per capita			Non-mining regional GDP per capita			CE		
Province	1976–90	1991–2004	1976–2004	1976–90	1991–2004	1976–2004	1984–90	1991–2004	1984–2004
Sumatra	1.0	2.2	1.6	4.7	3.2	4.0	2.6	3.7	3.3
Aceh	9.8	–1.8	4.0	7.2	0.8	4.1	3.3	2.7	2.9
North Sumatra	5.5	3.6	4.6	5.9	3.8	4.9	1.8	4.2	3.4
West Sumatra	6.3	4.0	5.2	5.9	4.1	5.0	3.5	4.5	4.2
Riau	–5.3	–0.5	–3.0	2.6	1.7	2.2	0.8	2.7	2.1
Jambi	2.7	3.1	2.8	2.9	2.6	2.8	5.3	3.3	3.9
South Sumatra	2.4	2.7	2.5	2.9	3.5	3.2	2.2	3.9	3.3
Bengkulu	6.0	2.5	4.3	5.5	2.7	4.2	0.5	3.1	2.2
Lampung	4.3	3.9	4.1	4.2	3.8	4.0	4.7	3.1	3.6
Java-Bali	6.5	3.1	4.9	6.5	3.2	4.9	3.8	4.0	3.9
West Java	5.6	3.7	4.6	5.8	4.0	4.9	3.7	3.9	3.9
Central Java	6.7	3.2	5.0	6.6	3.2	4.9	2.5	4.8	4.0
Yogyakarta	4.4	2.9	3.7	4.3	3.0	3.7	1.3	2.0	1.8
East Java	6.8	2.3	4.6	6.7	2.2	4.5	5.7	3.9	4.5
Bali	8.7	3.6	6.2	8.7	3.6	6.2	2.4	1.9	2.1
Java-Bali without Jakarta	6.3	3.1	4.8	6.4	3.2	4.8	4.0	4.0	4.0
Kalimantan	5.1	2.7	3.9	6.2	2.5	4.4	1.9	3.9	3.2
West Kalimantan	5.7	2.5	4.1	5.6	2.5	4.1	4.3	2.1	2.9
Central Kalimantan	5.6	1.8	3.7	5.5	1.8	3.7	1.5	3.1	2.5
South Kalimantan	4.7	4.0	4.3	4.5	2.8	3.7	1.5	4.4	3.4
East Kalimantan	3.4	2.1	2.8	6.3	2.2	4.3	–0.2	4.9	3.2
Sulawesi	5.2	3.9	4.5	5.1	3.8	4.4	2.8	3.8	3.5
North Sulawesi	5.1	4.8	5.0	5.0	4.7	4.8	3.1	5.1	4.4
Central Sulawesi	5.1	3.4	4.2	4.9	3.4	4.2	1.3	3.7	2.9
South Sulawesi	5.1	4.0	4.6	4.9	3.9	4.4	3.3	3.7	3.6
Southeast Sulawesi	6.3	2.5	4.4	7.7	2.4	5.1	2.1	1.9	1.9
Eastern Indonesia	3.2	3.7	3.4	4.5	2.7	3.7	2.7	4.1	3.6
East Nusa Tenggara	4.9	4.2	4.5	4.8	4.2	4.5	3.0	5.0	4.3
Maluku	5.4	0.0	2.8	5.3	0.3	2.8	2.3	2.5	2.4
Papua	0.3	3.1	1.6	2.7	2.6	2.6	1.5	3.7	2.9
Indonesia	4.8	3.0	3.9	6.0	3.1	4.6	3.4	3.9	3.7

Source: Central Board of Statistics (various years).
Note: All numbers are in percentages. Based on 1993 prices.

West Sumatra, and Central Java. The slowest growth was recorded in Yogyakarta, Southeast Sulawesi, Riau, Bali, and Bengkulu.

The story also differs by subperiods. Aceh grew very fast over the period 1976–90, as its gas production came on stream, but very slowly since 1990 in an era of (mostly) lower energy prices and conflict that increasingly affected economic activity. Similarly, East Kalimantan's growth slowed in the second period as a result of lower energy prices and slower timber exploitation. In fact, Kalimantan experienced the greatest deceleration in growth among the major island groupings, mainly owing to these factors, principally the former. Bali also slowed from its exceptionally rapid growth, but was still above average after 1990.

By contrast, some provinces that grew slower than the national average in the first period recorded above-average rates in the second. This appears to be especially the case for a number of export-oriented economies, which benefited from the 1980s reforms and which weathered the economic crisis better than other regions. Examples include the predominantly agricultural producers, North, West, and South Sumatra (the latter the only province to grow faster in the second period than in the first), Lampung, all of Sulawesi except the Southeast, and the industrial province of West Java.

Although in aggregate growing more slowly than the national average, the four eastern provinces experienced mixed fortunes. Maluku, as noted, was severely affected by the post-crisis conflict. East Nusa Tenggara grew a percentage point faster than the national average in the second period, and the West grew at about the average. Papua's growth was dependent on commodity prices, but its household expenditure grew at almost the national rate.

There are several cases of provinces growing faster than the national average but slipping in the relative income rankings. For example, North Sulawesi grew faster than the Indonesian (non-mining) average during 1976–2004, but its relative regional GDP per capita fell very sharply, from 109 to 60. East Nusa Tenggara grew at the national average, but its income fell from 52 percent of the national average to just 33 percent. There are also converse cases, such as Riau, where non-mining per capita growth was less than half the national average, but its relative income rose. These are presumably the result of local terms of trade effects—that is, of local economies specializing in the production of goods and services whose prices have risen faster or slower than the general price level (or specifically the national accounts deflator). This is confirmed, for example, in the case of North Sulawesi: using constant rather than current prices, its per capita income ranking rose considerably.

There are no obvious correlates among the fast growers. The explanations for Jakarta and Bali are relatively straightforward—the seat of government, global connections, and high-value services and industry in the former and the tourism success story and resultant spillovers in the latter. In West and Central Java, export-oriented industrialization, especially in West Java from the mid-1980s, and the earlier agricultural successes, especially in Central Java, were important. North Sumatra has a strong agricultural base and was traditionally the most industrial province outside Java.

West Sumatra and North Sulawesi had traditionally strong agricultural bases and quite good education records. But both are somewhat distant from the main centers of commerce, and neither has had a "booming sector." West Sumatra's service sector growth is probably connected to high levels of inward remittances, as a result of its long history of mainly male out-migration (*merantau*). In the case of North Sulawesi, tourism, shipping, and agroprocessing (mainly based on coconuts and fisheries) have all done quite well. More recently, its tolerance of diverse religions and ethnicities has reportedly attracted investment from neighboring conflict-prone regions.[8]

Are these differences in regional growth amenable to quantitative explanation? As a growing literature has argued, the growth literature can be productively employed, in a modified form (Barro and Sala-I-Martin 1991). That is, openness can be redefined to mean "connected" (to the global economy); institutions clearly do differ among regions in many countries; and factor and product markets in developing countries are often poorly integrated.

The international evidence suggests, first, that regions which are the most connected to the global economy (in the sense of location, infrastructure, and trade regime) are likely to grow more quickly, as is the case of Jakarta, Bali, and in recent times Riau (at least the islands adjacent to Singapore). These are arguably the regions most connected to the global economy, in terms of facilitating physical infrastructure, trade in goods and services, and the movement of people.

A second factor is clustering and increasing returns to scale, as forward and backward linkages develop and spill over from growth centers. The best example in the Indonesian context is probably the rapid industrialization in West Java since 1980 around the periphery of Jakarta. This region has now become the industrial heartland of Indonesia.

The evidence regarding regional institutions and governance is mixed and incomplete. We lack reliable long-term estimates of any "quality" variables, and in any case the provinces have enjoyed significant political authority only since the decentralization of 2001, while local-level democracy has arrived even more recently. There is some anecdotal evidence to suggest that the higher-growth regions have been quite well governed.

The indifferent record of the resource-rich provinces is suggestive of a Sachs and Warner (2001) "resource curse" at work. Two of the four provinces have experienced very serious conflict, and most of the resource wealth (at least until 2001) accrued to entities outside the province. However, there is sufficient diversity within this group to caution against sweeping generalizations. Two of the provinces, East Kalimantan and Riau, have become increasingly prosperous.

Structure of regional economy

Indonesia was a predominantly agrarian economy in the mid-1970s. Reflecting this, agriculture was more than one-third of regional GDP in 21 out of the 26 provinces in 1975. In 10 it was at least half. By 2004, only 8 were above this threshold. Thus, consistent with the well-known hypothesis linking economic growth and structural change, there has been a rapid shift out of agriculture. The provinces that have been slow to make this transition either are among the poorest in the country (Maluku, Southeast and Central Sulawesi, East Nusa Tenggara) or have a very strong comparative advantage in agriculture (Central Kalimantan, Jambi) or a combination of both (Lampung, Bengkulu).

Industrialization is the flip side of the coin: no province had a share of manufacturing in regional GDP in excess of 20 percent in 1975. By 2004, seven provinces registered shares greater than 20 percent: the three big Java provinces dominated, particularly West Java with 43 percent. Off Java, the higher shares are found in Riau, owing principally to Singapore industrial spillover, the two Sumatran provinces with large agricultural or industrial processing sectors (North and South Sumatra), and East Kalimantan with its timber processing and oil-related fertilizer and heavy industries. There has been only one significant case of "deindustrialization," in Jakarta, where the manufacturing share is a little over half the 1985 figure, as factories have migrated across the border to West Java–Banten.

There has also been a general increase in the services sector share. In 1975 there were just two provinces in which services contributed at least half of regional GDP. By 2004, five provinces were in this group, and several more were close to it. Only resource-rich Riau, Papua, and East Kalimantan recorded a share below 25 percent of GDP. A high or increased share of the services sector occurred in a variety of development contexts. Land-scarce Jakarta has always had the highest service sector share, as the seat of national government, the provider of high-value commercial services, and the national transport and communication hub. There are high shares in Bali and Yogyakarta, reflecting their status as leading tourism and education centers, respectively. The share is also high in West Sumatra, reflecting the traditional importance of remittances. But the share is also high in poorer, more remote regions, including Maluku, East Nusa Tenggara, and North Sulawesi. For the poorer regions, the explanation has more to do with a relatively large government sector, as fiscal transfers have been weighted in their favor. Higher transport shares in remote regions are also a factor.

Theory predicts that there is a positive association between economic growth and the speed of structural change. We test this by calculating a simple index of structural change among the agriculture, non-mining industry, and service sectors for each province. The estimates and growth of non-mining regional GDP per capita are plotted in figure 8.1.

There appears to be quite a weak correlation between growth and structural change. The fastest structural change has occurred in a diverse group of provinces: East Kalimantan (reflecting the resource boom and spillovers), West Java (rising industrialization), Riau (resource boom plus Singapore-related industrialization), Maluku, Bali (tourism growth), and Central Java. Structural change has been relatively slow in many of the agricultural provinces (Kalimantan, Sulawesi, and Sumatra), reflecting the slow movement out of this sector in many of them. It is surprisingly low in Jakarta, presumably because the classification is too aggregated to pick up many of the new service sector activities.

Demographic dynamics

We are interested to know how closely Indonesia's regional demographics correlate with these economic changes.[9] The country's demographics reflect the interplay of four main factors: highly uneven "initial conditions" (in the pattern of spatial settlements); the uneven location of opportunities for employment, economic advancement, and education, which in turn triggers migration; official migration policy (a factor especially in the period of 1970–85); and the speed of the demographic transition toward low fertility and mortality.

Table 8.4 highlights these patterns over the period 1971–2000. First, the population is heavily concentrated on Java-Bali, though becoming less so, especially outside Jakarta–West Java. Sumatra and Kalimantan have been gaining most of the declining Java-Bali population share, while the share of Sulawesi and Eastern Indonesia (excluding Papua) has been constant over the three decades.

Provincial population growth is a combination of natural increase and net migration. No recent decomposition of these two elements is available, and thus low population growth could be the result of a very rapid decline in fertility, continuing high mortality, or out-migration. These factors have very different economic and demographic implications. However, the percentage of the population born outside the province gives a reasonably accurate indication of the extent of in-migration (see table 8.5).

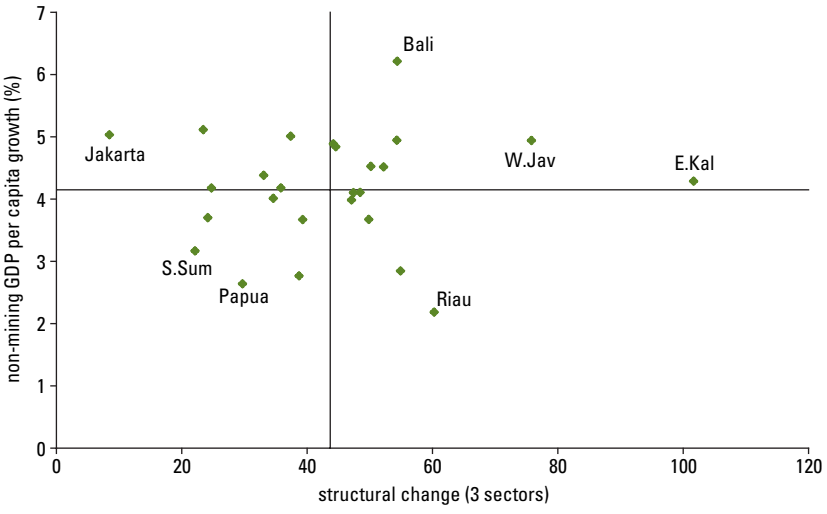
The major magnets are those provinces that offer opportunities for socioeconomic advancement. Thus they tend to be the richer ones or the frontier regions. Jakarta is quintessentially a migrant city, as it always has been (Castles 1989), with by far the highest proportion. There are also very high shares in resource-rich, frontier East and Central Kalimantan, almost all provinces in the southern part of Sumatra (proximity to Java and employment opportunities), Central and Southeast Sulawesi, and Papua.[10] Yogyakarta, a major education center, has the highest figure for Java-Bali outside Jakarta.

Regional inequality and convergence

We first extend this analysis with reference to the "four-quadrant" story relating initial (that is, 1975) levels of regional GDP per capita to income growth per capita over the period of 1976–2004 (see figure 8.2, panel A). In 1975 only 4 provinces had above-average income: East Kalimantan, Jakarta, Papua, and Riau. Subsequently, only Jakarta grew at above the national average. Conversely, of the 22 provinces with below-average income in 1975, only 5—Jambi, South Sumatra, Yogyakarta, Central Kalimantan, and Maluku—grew at a slower rate than the national average. Thus most provinces were in either the "above-average growth and below-average income" category or the converse, suggesting that interprovincial inequality was declining over this period. Many were very close to the national average growth rate. We shortly test this formally with reference to convergence estimates.

When mining is excluded, the story changes somewhat (figure 8.2, panel B). Two of the seven provinces with above-average non-mining regional GDP in 1975 also registered above-average growth in 1976–2004. These were Jakarta and East Kalimantan. Reassuring from the point of view of interregional equity, although there are seven provinces in the below-average income and slow-growth quadrant for the non-mining regional GDP series, all but one is close to one or other of the national averages. The one exception is the special and recent case of Maluku. In the case of the expenditure series, six provinces are in the bottom-left quadrant—that is, they are poor and apparently slipping behind: Bengkulu, Yogyakarta, West Kalimantan, Maluku, Central Sulawesi, and Southeast Sulawesi (see figure 8.2, panel C). Here, too, most of these are very close to one or the other national average. The latter three are farthest inside the quadrant and therefore are regions of concern from the point of view of regional equity.

Figure 8.1 Structural change and growth in Indonesia, 1975–2004



Source: Authors' calculations.
Note: Structural change = $\Sigma_i \left| share_{i,2004} - share_{i,1975} \right|$; $\forall$ i = {agriculture, non-mining industry, services}. C.Jav is Central Java. E.Kal is East Kalimantan. Jkt is Jakarta. Mlk is Maluku. S.Sum is South Sumatra. W.Jav is West Java.

Table 8.4 Social and demographic indicators in Indonesia, by province, 1971 and 2000

	Infant mortality		Average schooling		Poverty		Population (millions)		Annual growth in population (percent)
Province	1971	2000	1971	2000	1984	2002	1971	2000	1971–2000
Sumatra									
Aceh	143	40	2.3	6.0	14.3	29.8	2.0	4.0	2.4
North Sumatra	121	44	2.7	6.1	22.6	15.8	6.6	11.5	1.9
West Sumatra	152	53	2.6	5.6	23.8	11.6	2.8	4.2	1.5
Riau	146	48	1.8	6.0	29.1	13.6	1.6	4.8	3.7
Jambi	154	53	1.9	5.3	27.7	13.2	1.0	2.4	3.1
South Sumatra	155	53	1.9	5.3	34.1	21.1	3.4	7.8	2.8
Bengkulu	167	53	1.6	5.5	16.7	22.7	0.5	1.6	3.9
Lampung	146	48	1.6	5.1	54.5	24.1	2.8	6.6	3.1
Java-Bali									
Jakarta	129	25	4.0	8.4	13.7	3.4	4.6	8.3	2.1
West Java	167	59	1.9	5.5	19.4	12.6	21.7	43.8	2.5
Central Java	144	44	1.4	5.0	37.9	23.1	21.9	30.9	1.2
Yogyakarta	102	25	2.3	6.6	30.1	20.1	2.5	3.1	0.8
East Java	120	48	1.6	5.1	29.1	21.9	25.6	34.8	1.1
Bali	130	36	1.4	5.9	34.4	6.9	2.1	3.1	1.4
Kalimantan									
West Kalimantan	144	57	1.1	4.3	47.0	15.5	2.0	3.7	2.1
Central Kalimantan	129	48	2.3	5.4	29.4	11.9	0.7	1.8	3.3
South Kalimantan	165	70	1.9	5.1	22.4	8.5	1.7	3.0	2.0
East Kalimantan	104	40	2.0	6.3	37.7	12.2	0.7	2.4	4.2
Sulawesi									
North Sulawesi	114	37	2.9	6.0	26.7	17.4	1.7	3.8	1.7
Central Sulawesi	150	66	2.4	5.3	45.7	24.9	0.9	3.8	2.8
South Sulawesi	161	57	1.9	4.9	24.7	15.9	5.2	1.8	1.4
Southeast Sulawesi	167	53	1.4	4.9	29.1	24.2	0.7	2.1	3.2
Eastern Indonesia									
West Nusa Tenggara	221	89	1.0	3.9	53.8	27.8	2.2	3.8	1.9
East Nusa Tenggara	154	57	1.9	4.0	52.9	30.7	2.3	3.8	1.7
Maluku	143	66	2.7	5.6	31.7	26.6	1.1	1.8	1.8
Papua	86[a]	57	4.2[a]	4.3	27.2	41.8	0.9	2.1	2.9
Indonesia	145	47	1.9	5.4	29.5	18.2	119.3	203.9	1.9
Coefficient of variation	0.184	0.262	0.357	0.164	0.362	0.439	1.490	1.375	0.386

Source: Central Board of Statistics (various years).
Note: Infant mortality rate is defined as the number of deaths of infants (one year of age or younger) per 1,000 live births. Average schooling year is the average schooling year among those above 10 years old. Poverty is the percentage of poor people defined by the Central Board of Statistics in the province.
a. Urban areas only.

Convergence

We now examine the evidence on inequality and convergence, with reference to the two usual measures, absolute β convergence, that is whether poorer provinces are catching up to richer ones, and σ convergence, an overall measure of inequality. Furthermore, there are two types of β convergence, absolute and conditional. The former refers to the absence of any of the control variables presumed likely to influence convergence. In this paper we focus just on this concept, because an analysis of conditional convergence entails a much larger and more complex exercise. Furthermore, growth theory predicts that absolute convergence is more likely to apply across regions than among countries, principally because there are fewer barriers to mobility in the former and less variation in policies and institutions. However, much depends on center-region policies, particularly concerning fiscal arrangements (Sala-I-Martin 1996).

β convergence is a necessary, but not a sufficient, condition to achieve σ convergence. That is, the presence of poorer regions catching up to richer ones is necessary for aggregate inequality to decline. But catch-up does not guarantee reduced inequality. For example, the catch-up process may involve the once poorer provinces overtaking the once richer ones; if the margin between

Table 8.5 Indicators of social vulnerability in Indonesia, by province, various years, 1971–2004

Province	CV of growth per capita			Gini coefficient		Religious diversity		Percent of population born outside region	
	Regional GDP, 1976–2004	Non-mining regional GDP, 1976–2004	CE, 1984–2004	1984	2002	1971	2004	1971	2000
Sumatra									
Aceh	2.4	1.6	1.5	0.26	0.28	97.0	97.3	3.1	5.8
North Sumatra	0.9	0.8	0.7	0.26	0.29	60.3	65.4	8.3	3.9
West Sumatra	0.8	0.8	0.9	0.26	0.29	98.7	97.8	1.0	5.8
Riau	2.7	3.5	1.8	0.26	0.34	83.4	88.6	13.0	32.3
Jambi	1.4	1.4	0.8	0.20	0.27	97.2	96.2	15.9	23.5
South Sumatra	2.1	2.0	1.6	0.27	0.30	94.2	95.8	9.7	13.9
Bengkulu	0.9	1.0	1.3	0.21	0.30	97.4	97.5	7.0	22.7
Lampung	1.4	1.5	1.7	0.29	0.27	94.4	95.6	36.2	22.3
Java-Bali									
Jakarta	1.2	1.2	1.6	0.29	0.39	84.3	85.7	40.1	42.4
West Java	1.2	1.2	1.9	0.30	0.32	97.8	97.3	1.8	11.5
Central Java	0.9	0.9	1.0	0.31	0.29	96.4	96.8	1.2	2.3
Yogyakarta	1.1	1.1	1.6	0.34	0.41	93.5	91.8	4.1	12.3
East Java	1.3	1.3	0.8	0.31	0.32	96.9	97.1	1.2	2.2
Bali	0.6	0.6	1.2	0.29	0.33	93.3	87.4	1.1	7.0
Kalimantan									
West Kalimantan	1.0	1.0	1.0	0.25	0.32	42.7	57.6	1.2	7.2
Central Kalimantan	1.4	1.4	2.1	0.29	0.27	54.7	74.1	5.6	23.5
South Kalimantan	0.7	1.0	1.5	0.26	0.30	96.2	97.1	3.9	12.1
East Kalimantan	3.2	1.7	2.1	0.36	0.33	68.4	85.0	7.2	35.0
Sulawesi									
North Sulawesi	2.1	2.2	2.4	0.35	0.29	48.3	49.8	2.9	6.2
Central Sulawesi	0.9	0.9	1.1	0.30	0.30	72.4	78.4	5.6	18.4
South Sulawesi	0.8	0.9	0.7	0.35	0.30	88.8	89.2	1.4	3.5
Southeast Sulawesi	1.1	0.9	1.2	0.32	0.29	98.0	95.3	3.6	20.7
Eastern Indonesia									
West Nusa Tenggara	0.9	0.7	1.1	0.30	0.28	99.5	96.6	1.6	2.8
East Nusa Tenggara	0.7	0.7	1.3	0.31	0.29	52.0	53.9	0.6	2.8
Maluku	3.7	3.7	4.7	0.30	0.25	49.9	62.4	4.0	7.5
Papua	4.1	3.1	1.2	0.37	0.38	56.3	59.9	22.5	19.6
Indonesia	1.0	0.9	1.0	0.32	0.35	87.5	88.2	4.9	10.1

Source: Central Board of Statistics (various years).
Note: Religious diversity is defined as the percentage of people with the majority religion in the province.

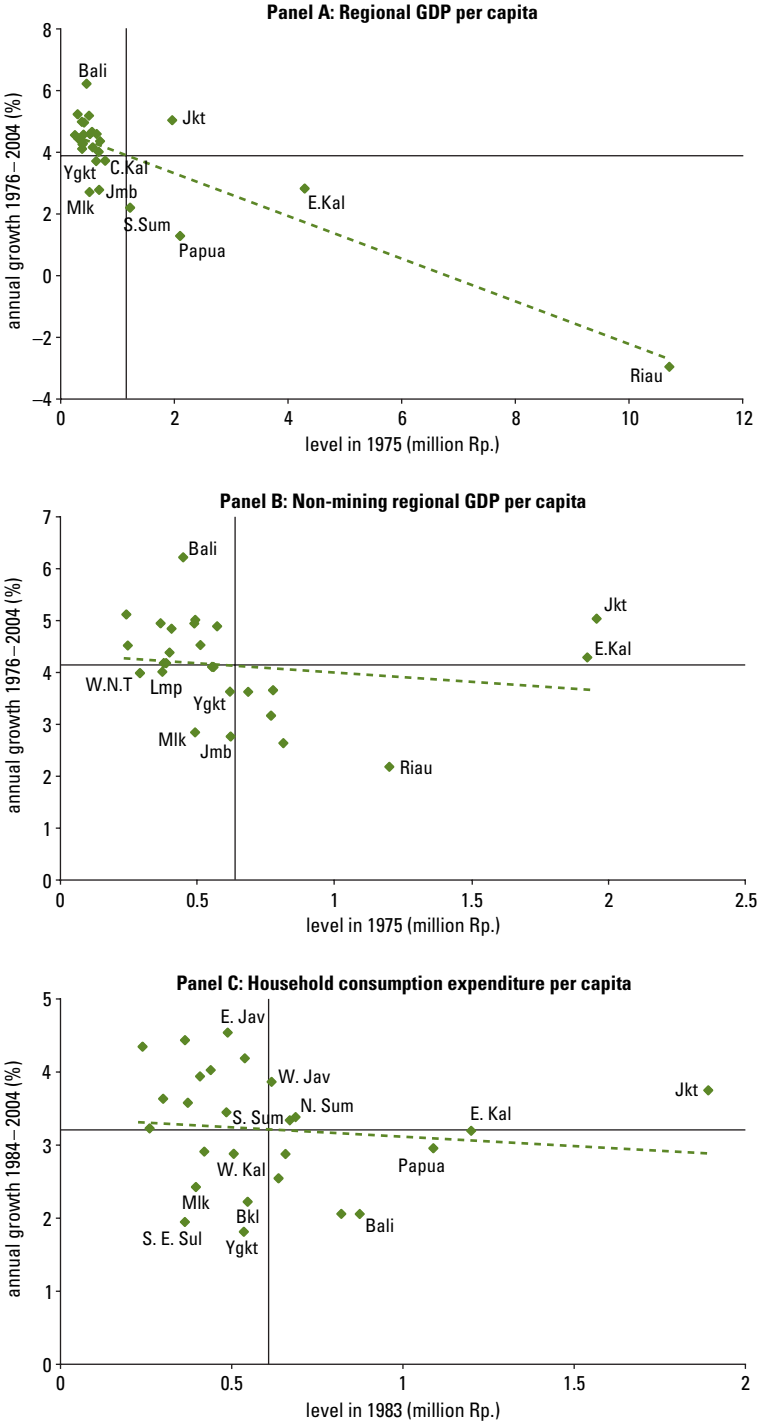
them remains the same, β convergence has occurred, but there is no σ convergence.

We report here estimates of provincial growth rates relative to initial (that is, 1975) incomes, that is, whether absolute β convergence is present (see table 8.6). For regional GDP per capita, we find a β coefficient of 1.5 percent for the period since 1975, suggesting that the observed disparity would halve over 46 years.[11] The results are statistically very significant.

However, these findings are sensitive to the period of analysis, as they are heavily influenced by the very high incomes of the resource-rich provinces in 1975 and the declining relativities as the oil and gas sector has become less important. For example, for the years 1975–81, coinciding with the oil boom, the absolute β convergence was even higher (2.0 percent) and significant at 5 percent. In fact, excluding mining, the absolute β convergence for the whole period falls to 0.4 percent, and it is insignificant. In the case of household consumption, available only since 1983, the coefficient is also low, 0.2 percent, and statistically insignificant.

The pace of β convergence varies significantly across development periods. It was quite rapid (2 percent) during the oil boom, 1975–81, with the coefficient significant at 5 percent. This is to be expected, with the oil-rich provinces such as Riau and East Kalimantan having high initial income but slower growth over the period. Moreover,

Figure 8.2 Initial regional GDP with and without mining and household consumption expenditure per capita vs. growth in Indonesia, by province, 1975–2004



Source: Authors' calculations.
Note: Blk is Bengkulu. C.Kal is Central Kalimantan. C.Sul is Central Sulawesi. E.Jav is East Java. E.Kal is East Kalimantan. Jkt is Jakarta. Jmb is Jambi. Lmp is Lampung. Mlk is Maluku. N.Sum is North Sumatra. S.Sum is South Sumatra. W.Jav is West Java. W.Kal is West Kalimantan. W.N.T is West Nusa Tenggara. Ygkt is Yogyakarta.

central government grants to the regions became increasingly important toward the end of this period.

The process of convergence accelerated still further in the wake of the oil boom, with a coefficient of 2.8 percent for 1981–86, reflecting the impact of the major policy reforms. It was also positive, though slower, for the other series. As the export-oriented reforms took hold, the speed of convergence slowed, to 1.7 percent for the period of 1986–92, and further still during the 1990s, to just 1 percent. During the crisis period, no significant convergence occurred. This may appear surprising, given the widely held presumption that this event particularly affected the country's richer regions, such as Jakarta. However, it needs to be remembered that some poorer regions were very badly affected by post-crisis conflicts (for example, Maluku) and that some strong agricultural exporters off Java capitalized on the sharp depreciation of the exchange rate.

For σ convergence, measured as coefficients of variation, the estimates are similarly highly sensitive to whether the mining sector is included (see figure 8.3). With mining, inequality is high and variable during the oil boom period. It then declines significantly, and more or less continuously, until the crisis period, after which it slightly increases again. The coefficients for non-mining regional GDP and household expenditure are initially much lower, less than half the value of the regional GDP series. They remain fairly stable during the 1980s reform period, but both begin to rise after the crisis, again only slightly. By 2004, reflecting the declining share of the mining sector, the two regional GDP series had almost converged.

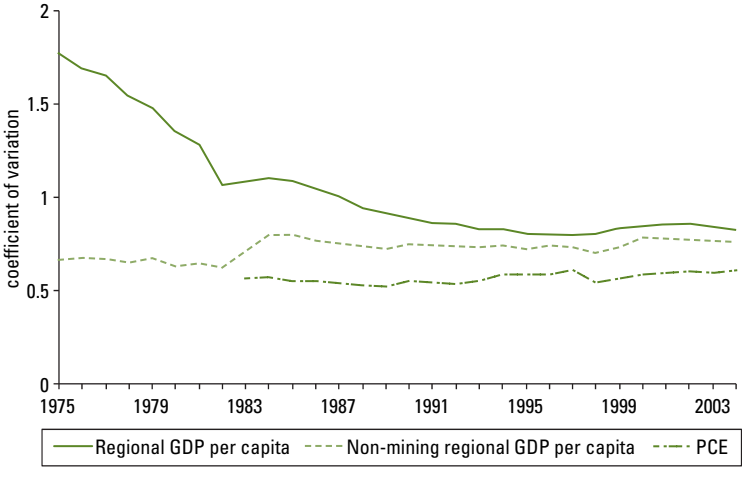
Additional insights are obtained by decomposing the variations in provincial income by sector. The results of this analysis are not shown here, but the broad summary is as follows. Overall, and as would be expected, regional inequality in agricultural and services output is much lower than that of mining and manufacturing. Regional inequality in mining is, of course, the highest, owing to the uneven spatial distribution of major mineral deposits. The inequality for the aggregate industrial sector (that is, mining, manufacturing, construction, and utilities) has therefore always been high, although it fell for most of the period, reflecting mainly the declining share of mining since the late 1970s. Regional inequality in agricultural output rose for most of the period, but this sector's share of GDP fell rapidly, hence the increase had little overall impact. By contrast, inequality in services declined, and this sector's share rose.

Table 8.6 Absolute convergence

Time period and proxy of income	Absolute convergence (–β)
Regional GDP per capita	
1975–2002	0.015***
1975–81	0.020**
1981–86	0.028***
1986–92	0.017***
1992–97	0.010*
1997–2002	0.007
Non-mining regional GDP per capita	
1975–2002	0.004
1975–81	0.010
1981–86	–0.001
1986–92	0.008
1997–2002	0.003
	0.001
Expenditure per capita	
1983–2002	0.002
1983–86	0.017**
1986–92	0.007
1992–97	–0.018
1997–2002	0.018

Source: Authors' calculations.
*** Significant at 1 percent.
** Significant at 5 percent.
* Significant at 10 percent.

Figure 8.3 Provincial income inequality in Indonesia, 1975–2003



Source: Authors' calculations.
Note: All numbers are calculated at 1993 prices.

Social indicators

We then ask how the economic and social indicators correlate with one another. Table 8.4 provides a summary picture. We include here a health indicator (infant mortality), an education indicator (average years of schooling), and the percentage of the population below the poverty line. The first two are based on the Population Censuses of 1971 and 2000, while the poverty estimates are available only from 1984.

Two general points deserve emphasis. First, there are dramatic improvements in the social indicators: by 2000, infant mortality was just a third of the 1971 rate, while average years of schooling had risen almost threefold. Moreover, these improvements have been experienced practically throughout the country. Although the rankings have not changed significantly, in all but one case infant mortality rates have at least halved, and years of schooling have doubled. The one exception is Papua, for which the early data series are incomplete. For the shorter time series of the poverty estimates, also, there is broad-based decline. Here too, Papua goes against the trend, partly owing to weaknesses in the data, but also reflecting the unequal nature of Papua's development. Aceh is the only other province where poverty increased, owing to the effects of the prolonged conflict.

Second, coefficients of variation (CVs) are low, but there is no clear trend. The health and education CVs are very low, well below those of the regional accounts series. They reflect the fact that, as with intercountry comparisons, interprovincial social inequalities are lower than economic inequality. The poverty CV is higher, which is to be expected because it is generated from the consumption expenditure estimates. There is a slight increase in the poverty and health CVs and a fall in the education CVs. These trends are to be expected and indicate, in particular, the government's emphasis on universal mass primary and lower secondary education since the 1970s.

There are now several estimates of the human development index (HDI) for Indonesian provinces (UNDP 2004). They are not presented here, but they show the expected positive relationship between non-mining regional GDP per capita and HDI, albeit with much clustering close to the averages. Jakarta stands out, with the highest ranking on both measures, while the Nusa Tenggaras and Papua are among the lowest. There are several provinces with below-average income per capita but above-average HDI. The two major cases are North Sulawesi and Yogyakarta, both with traditionally strong educational achievement. There are no cases of above-average (non-mining) regional GDP per capita but below-average HDI. This suggests that the resource-rich provinces (with the possible exceptions of Papua and Aceh) have been reasonably successful at translating the benefits of the resource booms into improved social indicators. One qualification that needs to be attached to these conclusions is that all of the provincial HDIs prepared thus far include an income or expenditure variable, typically with a weight of one-third, thus limiting their value as an independent check on economic and social correlates.

Social conflict

Particularly since the fall of the Soeharto regime, several regions have experienced episodes of severe social conflicts that have significantly interrupted their development progress. The most serious incidents have occurred in Aceh, West and Central Kalimantan, Central Sulawesi, Maluku, and Papua.

Only as an indicative exercise, we present a number of variables hypothesized to be likely explanations of interprovincial variations in conflict. A number of these are interrelated, and therefore any quantitative approach would need to deal with the problem of multicollinearity.

The first indicator is the volatility of provincial growth rates, defined as the coefficient of variation through a certain period of time (table 8.5). Its inclusion is based on the premise that higher variations in growth rates will lead to heightened insecurity and possibly conflict. These are shown in columns 1–3 for each of the three series. As would be expected, the resource-rich regions experience more volatile growth, with the CVs of Aceh, Riau, East Kalimantan, Maluku, and Papua at least double, and the CV of Papua four times, the national average. The high

figures for Aceh and Papua lend prima facie support to the hypothesis.

However, the direction of causality is unclear. For example, Maluku was peaceful and experienced fairly stable growth until the onset of serious conflict in 1998. In other words, this was a case of conflict causing the volatility of growth, rather than the converse. A similar observation applies to some extent in the case of Central Kalimantan.

The second indicator is the share of natural resources in regional GDP (table 8.1). This is a subnational variant of the "natural resource curse": a large natural resource sector will result in a more volatile income stream (that is, the first factor) and also possibly exacerbate conflict over the allocation of natural resource rents. In 2004 mining generated more than one-third of regional GDP in three of the resource-rich provinces and more than one-quarter in the fourth, Aceh.[12] High shares are also evident in West Nusa Tenggara (of very recent origins), South Sumatra, and South Kalimantan. Severe and protracted conflict has occurred in two of these provinces, Aceh and Papua, again lending prima facie support to this hypothesis. Nevertheless, the other resource-rich regions have been relatively peaceful, while serious conflict has occurred where mining shares are low, for example, Maluku, Central Kalimantan, and Southeast Sulawesi. Hence, the presence of mining enclaves per se is an insufficient explanation for conflict.

A third variable relates to ethnic fragmentation, data that we include on the grounds that greater ethnic diversity is alleged by some to hinder the development of local cohesion and trust and to heighten the potential for conflict. We lack precise estimates of ethnic diversity at the provincial level in Indonesia, but a good proxy for it is religious belief, especially as the latter has been a source of tension in some of Indonesia's most serious conflicts, such as in Poso (Central Sulawesi) and Maluku. A convenient proxy for religious diversity is the percentage share of the largest religion in each province, with the hypothesis being that the lower the share, the greater the possibility of conflict.

There does not appear to be a clear relationship between the incidence of conflict and religious diversity. There are cases of an apparently strong association, such as in Maluku and East Nusa Tenggara. Yet there are more examples where the converse applies. Aceh has one of the highest majority-religion shares and serious conflict. North Sulawesi is at the opposite end of the spectrum, with the highest religious diversity and little conflict. North Sumatra and some of the Kalimantan provinces are religiously mixed but have low recorded conflict (but note caveats). There are also instances of little religious diversity but considerable conflict, such as West Nusa Tenggara.

Papua is a special case in this context. There are two main sources of spatial inequality, which together explain the perception that the benefits of growth have been enjoyed primarily by immigrant communities. The first is the urban-rural divide. Much of this was fueled by the growth of the provincial capital, Jayapura, the center of the rapid expansion of the mainly non-Papuan civil service and major development projects. These growing centers also attracted many migrants from other provinces in search of business opportunities. Poverty in the urban areas was quite low in 2004, around 8 percent. By contrast, in rural areas, where the majority of Papuans reside, poverty was still around 50 percent. The second major source is the huge Freeport mine, whose impact is confined mainly to Timika.

Fourth, the percentage of the population born outside the province indicates the extent of settler arrivals. It too is suggestive of the possibility of conflict, as in-migrants compete for jobs and access to land and sometimes introduce customs at variance with local traditions (for example, concerning gender relations, diet, and so forth). Obviously, this variable is highly correlated with the share of the natural resource sector. As would be expected, a high presence of migrants is found in Jakarta, the resource-rich regions, remote "frontier" regions, and areas formerly designated by the central government as transmigration sites.

Here too the evidence for this variable is mixed. There are examples where conflict and in-migration are significantly correlated, such as Papua, Southeast Sulawesi, Central Kalimantan, and Jakarta. Yet, there

are also cases of large migrant communities generally living in harmony (some of the Sumatran provinces and Yogyakarta), while some of the most serious conflict has occurred in regions with below-average in-migration, such as Aceh and Maluku.

Finally, it might be expected that intraprovincial inequality in income and expenditures would predispose a province to conflict. That is, all things being equal, high-inequality provinces are more likely to experience conflict. We include estimates of provincial expenditure inequality for 1984 (the first year they were available) and 2002 to examine this proposition. Predictably, above-average inequality is found in the resource-rich provinces, except Aceh. Papua particularly stands out. There is also high inequality in the two most urbanized provinces of Java: Jakarta and Yogyakarta. With the exception of Papua, all the high-inequality provinces have been quite peaceful. By contrast, inequality is generally below average in areas of major conflict, such as Maluku and Central Sulawesi. Therefore, inequality per se does not appear to be a major explanatory factor.

This discussion highlights the fact that the magnitude and determinants of local conflict are complex, interrelated, and not easily amenable to quantitative explanation. The quality of local leadership is a key factor and thought to be one of the reasons why one of the most religiously diverse provinces, North Sulawesi, has been largely free of conflict. In the case of Aceh, one of the most conflict-prone provinces, the conflict has been principally between the central government and the very strong local identity, which, when mismanaged, has spawned a separatist movement. It required a terrible natural disaster (the December 2004 tsunami), presidential leadership, and a local capacity to negotiate to reach the 2005 peace settlement. Similarly, the protracted conflict in Papua reflects its complex history and a troubled record of central government and military intervention.

Conclusions

Our major conclusions include the following.

First, there continues to be great diversity in economic and social outcomes, but growth and social progress have been remarkably even. There has been no significant change in the concentration of economic activity across the major island groupings. As with all the economic variables, this conclusion is somewhat sensitive to whether or not the mining sector is included. Excluding mining, Java's share has risen, mainly at the expense of Sumatra.

More generally, economic activity has continued to cluster around some key regional economies. Java has remained dominant, along with Bali, Sumatra, and Kalimantan, as compared to the eastern region (although Sulawesi has gone from below-average to above-average growth over the two periods). Moreover, Greater Jakarta has assumed ever greater prominence in the nation's key economic agglomeration.

Nevertheless, the poorest regions, located mainly in eastern Indonesia, have generally performed about as well as the national average. There is no case of a province with consistently poor performance for decades, in the sense of being well below the national average growth rate, let alone with protracted periods of negative growth.

Second, as a corollary, regional disparities are either high and declining or moderate and stable, depending on which series is used. The former conclusion is based on the with-mining series. However, these provide a misleading indicator of local-level welfare and should be interpreted with caution. The other two series—that is, non-mining regional GDP and household consumption expenditure per capita—suggest no significant change in inequality or catch-up during both the 1980s reforms and the crisis periods. Over the entire period, there was no convergence in non-mining regional GDP per capita, while household expenditure per capita showed weak convergence.

It is also notable that the policy reform period of 1984–96 produced an even record of provincial economic performance, as compared to the mining boom, crisis, and post-crisis periods, when major exogenous events had uneven subnational impacts.

Third, while there have been strong performers—notably, Bali, Jakarta, and occasionally East Kalimantan and Riau—the group of top performers has been quite

diverse, as to location, size, and socioeconomic characteristics. In general, the better-performing regions are typically those that are the most connected to the global economy. In this respect, Jakarta stands out as a special case, growing richer than the rest of the country over time.

Although two of the strongest performers are resource-rich regions, there is no clear natural resource story, in that the performance of this group of provinces has varied considerably. The impact of enclave-style development has also varied among them, with the most challenging being the special case of Papua. Moreover, it is evident that conflict is particularly harmful to economic development, as illustrated in the case of Maluku since 1997 and to a lesser extent Aceh.

Future research in this area might focus on two areas. The first is an examination of the impact of decentralization on regional dynamics. This will need to be a longer-term project because, as illustrated by the experience in the Philippines and elsewhere, it will take at least a decade to discern impacts. Second, the fragmentation (*pemekaran*) of administrative boundaries is greatly complicating longitudinal analysis. This paper has consolidated the current 34 provinces back to 26, to facilitate comparisons over time. Even this process is a laborious one. It is currently not possible to draw inferences at the *kabupaten* level, the administrative unit to which authority and resources have been decentralized, because the process of boundary changes has proceeded much further. However, it may be possible to develop such a database with the cooperation of Indonesia's Central Board of Statistics. With a finer level of disaggregation, it would be possible to examine the development of regional clusters in more detail, because these invariably straddle provincial boundaries. It may also be the case that our main conclusions, of no major change in interregional inequality and no major dropouts (apart from Maluku in recent years), would have to be modified.

Notes

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1. Thus, for example, West Java refers to the existing provinces of West Java and Banten, North Sulawesi to North Sulawesi and Gorontalo, and so on.

2. The revenues of all *kabupaten* and *kota* governments in the province have increased by at least 300 percent since the 2001 decentralization.

3. In 2002, following the introduction of special autonomy measures, the budget of the Papuan provincial government was three times that of 1999–2000 in nominal terms.

4. In 1997–98, the economies of Jakarta and West Java contracted by about 50 percent more than the economy as a whole. This was explained mainly by the effects in finance, construction, and import-substituting manufacturing, all disproportionately important in these two provinces (Akita and Alisjahbana 2002).

5. But note that Bali's position has slipped significantly since the 1990s, mainly due to the downturn in international tourism following the terrorist incidents.

6. After having one of the highest per capita incomes in the country, this province has slipped more than most in this group. Part of the explanation is that it was one of the first oil-refining centers in the country, with Pertamina's Musi plant. However, this large sector of its economy has grown slowly since the 1970s, and, unlike Riau, new growth engines have yet to emerge, apart from palm oil.

7. The very high growth rates of small provinces like Southeast Sulawesi in the earlier period need to be interpreted with great caution. The statistical infrastructure was still rudimentary, and the transition from subsistence to a monetary economy may have inflated measured growth rates.

8. For an economic survey of the province since the crisis, see Sondakh and Jones (2003), which extends their earlier work on this province in Hill (1989).

9. See also Jones and Hull (1997).

10. The special case of Lampung deserves note. It was traditionally designated as a major transmigrant-recipient region and in 1971 had by far the highest share of migrants outside

Jakarta (Bakir and Humaidi 1989). However, its slower growth, combined with the emergence of other more attractive destinations and the lower cost of movement, meant that by 2000 it had slipped to seventh ranking in terms of the proportion born outside the province.

11. See also the work by Garcia Garcia and Soelistianingsih (1998).

12. The high share of mining in West Nusa Tenggara is of recent origins and dates from the establishment of the sometimes controversial Newmont copper and gold mine on Sumbawa. The share of mining in the province's GDP rose from 4 percent in 1999 to 28 percent in 2000.

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