Online Appendix:
Resource Booms, Revenue Sharing, and Growth

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A Appendix

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A.1 Details on Oil and Gas Revenue Sharing

This section details the construction of the fiscal endowments, $\boldsymbol{F}_d$, in Equation (1). As described in Section 2, the central government shares 15 percent of oil revenue with subnational governments: 3 percent goes to the provincial government, 6 percent goes to the producing district, and the remaining 6 percent is evenly split by the other districts in the province. Thirty percent of gas revenue is shared: 6 percent to the province, 12 percent to the producing district, and 12 percent evenly divided among the other districts in the province. The provincial governments of Aceh, Papua, and Papua Barat each receive an additional 55 percent of oil revenue and 40 percent of gas revenue. The fiscal endowment variables are designed to capture the district's exposure to the spending shock induced by revenue sharing.

Provinces have discretion over how they spend their shared resource revenue within their borders. However, they do not report spending figures broken down by geographical location. Therefore, to quantify the district-level spending shocks induced by revenue sharing, we need to make an assumption about the spatial distribution of provincial expenditures. Our baseline fiscal endowment measure assumes that provinces spend their resource revenue on districts in proportion to their population. Nevertheless, our findings remain consistent when alternative assumptions are made, such as equal spending per district or allocations based on the national revenue sharing formula.

We construct fiscal endowments by replacing actual resource revenue collected by the central government with physical endowments in the revenue-sharing formula. Informally, fiscal endowment per capita is

$$\frac{\substack{\text{District Claim on}\\ \text{Own Endowment}} + \substack{\text{District Claim on Endowments}\\ \text{of Other Districts}} + \substack{\text{Provincial Endowment}\\ \text{Allocated to District}}}{\text{District Population in 1980}}.$$

Formally, let $R^{\text{oil}}_{d,t}$ and $R^{\text{gas}}_{d,t}$ be the physical endowments of oil and gas under the ground in 1975 and belonging to district d according to borders in year t. Both variables include onshore and offshore resources and are expressed in millions of barrels of oil equivalent. Let $p(d)$ index the province of district d, let $N_{p(d),t}$ be the number of districts in province $p(d)$ in year t, and let $S_{d,t}$ be district d's share of provincial population in year t according to borders in year t. For a district d located in a province other than Aceh, Papua, or Papua Barat, the fiscal endowments per capita according to borders in year t are

$$F^{\text{oil}}_{d,t} = \frac{1}{\text{Pop}_{d,1980}} \left(0.06 \cdot R^{\text{oil}}_{d,t} + \frac{0.06}{N_{p(d),t} - 1} \cdot \sum_{\substack{j \neq d \\ p(j)=p(d)}} R^{\text{oil}}_{j,t} + 0.03 \cdot S_{d,t} \cdot \sum_{\substack{j \\ p(j)=p(d)}} R^{\text{oil}}_{j,t} \right),$$

$$F^{\text{gas}}_{d,t} = \frac{1}{\text{Pop}_{d,1980}} \left(0.12 \cdot R^{\text{gas}}_{d,t} + \frac{0.12}{N_{p(d),t} - 1} \cdot \sum_{\substack{j \neq d \\ p(j)=p(d)}} R^{\text{gas}}_{j,t} + 0.06 \cdot S_{d,t} \cdot \sum_{\substack{j \\ p(j)=p(d)}} R^{\text{gas}}_{j,t} \right).$$

For districts in Aceh, Papua, and Papua Barat, the formula is modified to account for the additional 55 percent of oil revenue and 40 percent of gas revenue received by the province, yielding

$$F^{\text{oil}}_{d,t} = \frac{1}{\text{Pop}_{d,1980}} \left(0.06 \cdot R^{\text{oil}}_{d,t} + \frac{0.06}{N_{p(d),t} - 1} \cdot \sum_{\substack{j \neq d \\ p(j)=p(d)}} R^{\text{oil}}_{j,t} + 0.58 \cdot S_{d,t} \cdot \sum_{\substack{j \\ p(j)=p(d)}} R^{\text{oil}}_{j,t} \right),$$

$$F^{\text{gas}}_{d,t} = \frac{1}{\text{Pop}_{d,1980}} \left(0.12 \cdot R^{\text{gas}}_{d,t} + \frac{0.12}{N_{p(d),t} - 1} \cdot \sum_{\substack{j \neq d \\ p(j)=p(d)}} R^{\text{gas}}_{j,t} + 0.46 \cdot S_{d,t} \cdot \sum_{\substack{j \\ p(j)=p(d)}} R^{\text{gas}}_{j,t} \right).$$

Fiscal endowments $F^{\text{oil}}_{d,t}$ and $F^{\text{gas}}_{d,t}$ can vary over time due to changing district and province borders. Notably, after Papua split into two provinces—Papua and Papua Barat—in 2003, non-producing districts located in the new province of Papua saw their fiscal endowments drop to nearly zero, as most of Indonesian Papua's oil and gas is located in the west (Figure 2). Border changes can directly affect economic and political outcomes.[1] To avoid bias, we average across year-specific endowments in the post-decentralization period,

$$F^{\text{oil}}_{d} = \frac{1}{14} \sum_{t=2001}^{2014} F^{\text{oil}}_{d,t}, \qquad F^{\text{gas}}_{d} = \frac{1}{14} \sum_{t=2001}^{2014} F^{\text{gas}}_{d,t}.$$

As a result, the time variation in value of fiscal endowments, $\boldsymbol{P}_t' \boldsymbol{F}_d$, is solely due to price changes.

[1] See, e.g., Burgess, Hansen, Olken, Potapov and Sieber (2012); Lewis (2017); Alesina, Gennaioli and Lovo (2019); Bazzi and Gudgeon (2021); Singhania (2022); Cassidy and Velayudhan (2026).

A.2 National Government Expenditure

In Section 4, we claim that the fiscal endowment will have the same correlation with the change in district spending and the change in *total* government spending, from before to after 2001, as long as the central government spending change is uncorrelated with the fiscal endowment. We provide the supporting argument below.

Consider the regression of total government spending at the district level on shock $S_{d,t} = \boldsymbol{P}_t' \boldsymbol{F}_d \cdot 1(t \geq 1999)$,

$$G_{d,t} = \beta S_{d,t} + \alpha_d + \lambda_{r(d),t} + \varepsilon_{d,t}.$$

Letting $\widetilde{S}_{d,t}$ and $\widetilde{G}_{d,t}$ denote residuals from regressing $S_{d,t}$ and $G_{d,t}$ on the district and region-by-year dummies, we have

$$\operatorname{plim} \hat{\beta}_{\text{FE}} = \frac{\sum_{t=1}^{T} \mathrm{E} \widetilde{S}_{d,t} \widetilde{G}_{d,t}}{\sum_{t=1}^{T} \mathrm{E} \widetilde{S}_{d,t}^2}.$$

Total spending is the sum of national and subnational spending, $G_{d,t}^N$ and $G_{d,t}^S$. Since $\widetilde{G}_{d,t} = \widetilde{G}_{d,t}^N + \widetilde{G}_{d,t}^S$, using $G_{d,t}^S$ as the outcome variable would yield the same probability limit as long as $\sum_{t=1}^{T} \mathrm{E} \widetilde{S}_{d,t} \widetilde{G}_{d,t}^N = 0$, because in that case $\sum_{t=1}^{T} \mathrm{E} \widetilde{S}_{d,t} \widetilde{G}_{d,t} = \sum_{t=1}^{T} \mathrm{E} \widetilde{S}_{d,t} \widetilde{G}_{d,t}^S$.

A.3 Data Appendix

A.3.1 Manufacturing Plants

We use data from the Indonesian manufacturing census of large and medium-sized firms (*Survei Industri Besar/Sedang*, or IBS) spanning 1975–2014 (Central Bureau of Statistics, Indonesia, 1975–2014). These data are produced by Indonesia's Central Bureau of Statistics (*Badan Pusat Statistik*, or BPS) and cover the universe of manufacturing plants with at least 20 employees. The dataset contains information on wages, energy use, capital, number of employees, 5-digit industry, legal status, district of operation, and other information. There are 76,194 separate plants in an unbalanced panel; plants are observed for an average of 9.1 years. Although we use the words "firm" and "plant" interchangeably, we cannot link plants that belong to the same firm.

For all plant-years, we construct a 2-digit industry code that maps onto the 1999–2009 coding scheme; it is similar to codes in ISIC rev. 3. For 1999–2009, the 2-digit industry code is the first two digits of the 5-digit industry code. The Indonesian industry code scheme underwent three overhauls during the analysis period: 1989–1990, 1998–1999, and 2009–2010. We use a data-driven approach to map codes from earlier and later years. For example, if plants with the 5-digit product code 33212 in 1998 generally had a 2-digit code of 17 in 1999, we use that mapping.[2]

[2] Occasionally, 5-digit product codes frequently mapped into multiple 2-digit industries. In these cases, plants with a two-year track-record were assigned that plant's 2-digit code. Plants without a two-year track-record were assigned the most common mapping. Additionally, if a plant reported product code A in years 1 and 3, but product code B in year 2, we assume that this plant straddles industries or there was a coding error. We change year 2's product code to A.

While all districts that existed in 1975 are represented in our plant-level data, some newer districts do not have plant entries. This could be because some rural districts are quite small (e.g., around 15,000 people), but also because there may be some coverage issues within the data. Our intuition suggests that any potential bias from incomplete coverage is likely to be small because the coverage issues would need to be correlated with oil prices/production and they would need to affect the types of plants that are being surveyed within a district (e.g., only successful plants are being interviewed in some regions, while less successful plants are skipped). Instead, to the extent that coverage issues occur, it appears that entire districts may not be covered for some years. We have no evidence that any potential coverage issues are correlated with plants in a way that would bias our central estimates.

Wage variables are also constructed using the Indonesian Manufacturing Census. For both production and non-production workers within a given plant-year, we calculate total wages, total benefits, and total compensation. We also calculate total payments to all workers. While the precise wage subcategories that are reported each year vary, there is less deviance at the aggregated levels we use. Categories that drop out in some years are typically minor compensation types and frequently appear to be subsumed into other categories.[3] Our final proxy for average wages is total payments to all employees divided by the number of employees.

Finally, we also use the output, value added, and employee count variables reported in the Indonesian Manufacturing Census. Output and value added are reported directly, while employee counts are broken down by production and non-production roles. Of note, value added is unavailable for 1976–1978.

We exclude plants that are fully or partially owned by the government (national or subnational) in more than 10 percent of the years that the plant is observed, as these plants may be insulated from market forces. (Around 7.5 percent of plants are government-owned, according to this definition.) Consequently, one district is omitted from the sample, as only government-owned plants are observed in that district. We also exclude plants that experience a one-year change in output, output per worker, value added, or value added per worker exceeding 500 log points in absolute value; a change in wages exceeding 300 log points in absolute value; or a change in number of employees exceeding 200 log points in absolute value.

A.3.2 Oil-Connected Industries

This section describes our process for determining which two-digit sectors are most connected to the oil and gas industry. We use this to investigate whether some of our main results are driven by sectors that are well-connected.

[3]For example, the 2000 census reports subcategories for (i) "wage/salary," (ii) "overtime, gifts, bonuses, and other similar payments," and (iii) "company's contribution to pension funds, social security, accident allowance, insurance, and other benefits," while the 2001 census only reports subcategories for (i) "wage/salary" and (ii) "other incentive."

We determine that the manufacturing sectors most related to the oil industry are 23 (Fuel industry, oil and coal refining, petroleum products, and nuclear fuel) and 24 (Chemicals and chemical products). The next most related sectors are 27 (Basic metal) and 28 (Metal goods, not machinery and equipment). We also run a robustness check that includes sector 25 (Rubber and plastic products industry) as related to the oil industry. Appendix Table A.1 lists all two-digit manufacturing sectors.

Table A.1: Translation of KBLI 2005 Two-Digit Manufacturing Industry Codes

Code	Sector Name
15	Food
16	Tobacco
17	Textiles
18	Ready-made clothing
19	Leather, leather goods, and footwear
20	Wood, wood products (excluding furniture), and woven goods from materials like rattan
21	Paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Fuel, oil and coal refining, petroleum products, and nuclear fuel
24	Chemicals and chemical products
25	Rubber and plastic products
26	Non-metallic mining
27	Basic metal
28	Metal goods, not machinery and equipment
29	Machinery and equipment
30	Office equipment, accounting, and other electrical machinery
31	Other electrical machinery and its equipment
32	Radio, television, and communication equipment
33	Medical, measuring, navigation, or optical equipment
34	Motor vehicles
35	Transportation equipment, other than motor vehicles with 4+ wheels
36	Furniture and other processing
37	Recycling

Notes: Two-digit manufacturing industry codes are translated from the KBLI 2005, produced by Indonesia's Central Bureau of Statistics. These codes only include industries in the manufacturing sector, and exclude other sectors like agriculture, transportation, and services. Translations have been lightly edited for length and clarity.

To make this determination, we analyze input-output (IO) tables constructed by Indonesia's Central Bureau of Statistics (Central Bureau of Statistics, Indonesia, 2005). We consider the 2005 iteration, focusing on the set of tables that divide the economy into 66 sectors.[4] Because many of these 66 sectors are outside of manufacturing, it is only modestly more granular than the sectors in our manufacturing data.

We ascertain which of the 66 sectors are most related to the "Oil, gas and geothermal" (25) and "Petroleum refinery" (41) sectors, examining both upstream and downstream effects. Appendix Table A.2 details the full set of 66 sectors.

IO sector 25 is upstream of sectors 25 (itself, with a technical coefficient of 0.1209), 39

[4] It also includes tables based on 19 sectors (which are too coarse for our purposes) and 175 sectors (which are too granular).

(0.4603), 40 (0.2280), 41 (0.3889), 44 (0.0806), 45 (0.1153), and 51 (0.0746). It is only downstream of itself (again, 0.1209). Using the crosswalk between the 66-sector codes and the KBLI 2005 codes (which form the basis of our manufacturing data and can be found in Appendix Table A.1), we see that these relationships correspond to sectors 23 (Fuel, oil and coal refining, petroleum products, and nuclear fuel) and 24 (Chemicals and chemical products) in the KBLI 2005 two-digit manufacturing industry codes. They also modestly correspond to KBLI sectors 27 (Basic metal) and 28 (Metal goods, not machinery and equipment), as well as a range of non-manufacturing sectors.

IO Sector 41 (Petroleum refinery) is upstream of many manufacturing sectors, but generally with weak relationships. The strongest relationships are with KBLI sectors 17 (Textiles), 24 (Chemicals and chemical products), 26 (Non-metallic mining), 27 (Basic metal), 28 (Metal goods, not machinery and equipment). Of note, IO Sector 41 has much stronger relationships with many transportation-related industries, but these are not in the manufacturing sector. It is only meaningfully downstream of sector 25 (Oil, gas, and geothermal).

We include the rubber and plastic products industry (KBLI sector 25) as a related industry in a robustness check. We do this for two reasons. First, plastic is directly derived from oil. Second, in the input-output tables this industry (IO sector 42) has a meaningful relationship with IO sector 66 (Unclear activities / limitations). It is plausible that some of these unclear transactions are actually with the oil industry but were difficult to classify because the underlying documentation is ambiguous. The rubber and plastic products industry may therefore be meaningfully connected to oil and gas.[5] However, we also note that the "rubber" part of sector 25 is large and unlikely to be closely linked to the oil and gas industry.

For comparison, Allcott and Keniston (2018) analyze input-output tables from the United States at the four-digit industry level. Their analysis is considerably more granular than we are able to achieve in our context; they have a larger set of firms to analyze and also have fewer industry code changes to contend with. They find that the downstream sectors most connected (> 0.05) to the U.S. hydrocarbons industry are: Petroleum refining (0.69), Products of petroleum and coal not elsewhere classified (0.31), Nitrogenous and phosphatic fertilizers (0.081), and Carbon black (0.062). The upstream sectors most connected (> 0.05) to the U.S. hydrocarbons industry are: Oil and gas field machinery and equipment (0.23), Hydraulic cement (0.12), Ground or treated minerals (0.086), and Chemicals and chemical preparations not elsewhere classified (0.066).[6] While we take the comparison with a grain of

[5] Indeed, our prior was that the three sectors most closely connected to the oil industry are: 23 (Fuel industry, oil and coal refining, petroleum products, and nuclear fuel), 24 (Chemical industry and chemical products), and 25 (Rubber and plastic products industry).

[6] Of note, in the Indonesian context we find a weak relationship between the oil and gas industry and sector 29, "machinery and equipment." This contrasts with the strong relationship Allcott and Keniston (2018) see between the oil and gas sector and "Oil and gas field machinery and equipment." There are several possible reasons for this difference. First, we note the relevant code in Allcott and Keniston (2018) is considerably narrower, strengthening the estimated relationship. Second, it is possible that firms in Indonesia purchase more of their oil and gas machinery and equipment from foreign firms than firms in the United States.

Table A.2: Translation of 66-Sector Division for the 2005 KBLI Input-Output Tables

Code	Sector Name	Code	Sector Name
1	Rice	34	Cigarette industry
2	Legumes	35	Spinning industry
3	Corn	36	Textile, clothing and leather industry
4	Tubers	37	Bamboo, wood and rattan industry
5	Vegetables and fruits	38	Paper and paper products industry
6	Other food crops	39	Fertilizer and pesticide industry
7	Rubber	40	Chemical industry
8	Sugar cane	41	Petroleum refinery
9	Coconut	42	Rubber and plastic goods industry
10	Palm oil	43	Industry of goods from non-metallic minerals
11	Tobacco	44	Cement industry
12	Coffee	45	Iron and steel base industry
13	Tea	46	Non-ferrous base metal industry
14	Cloves	47	Metal goods industry
15	Fiber crops	48	Machinery, tools and electrical equipment
16	Other plantation crops	49	Transportation equipment industry and repairs
17	Other crops	50	Other goods industry not classified elsewhere
18	Livestock	51	Electricity, gas and clean water
19	Cutting animal	52	Buildings
20	Poultry and its products	53	Trade
21	Wood	54	Restaurants and hotels
22	Other forest products	55	Railway transportation
23	Fisheries	56	Land transportation
24	Coal and ore mining (metal)	57	Water transportation
25	Oil, gas and geothermal	58	Air transportation
26	Mining and excavation (others)	59	Transportation support services
27	Food processing and preservation	60	Communications
28	Oil and fat industry	61	Financial institutions
29	Rice milling industry	62	Construction and service businesses
30	Flour industry (all types)	63	Defense
31	Sugar industry	64	Social community services
32	Other food industry	65	Other services
33	Beverage industry	66	Unclear activities / limitations

Notes: Two-digit sector codes are translated from the KBLI 2005, produced by Indonesia's Central Bureau of Statistics. These codes represent the entire Indonesian economy, and include the agricultural, manufacturing, services, and transportation sectors, among others. Translations have been lightly edited for length and clarity.

salt due to the different levels of granularity and contexts, we view their analysis as suggestive that our list of oil-connected industries is reasonable.

A.3.3 District GDP

We construct a nearly balanced panel of district GDP using multiple sources. BPS produces estimates of two versions of district GDP—total GDP and GDP excluding oil and gas—using census data, survey data, and administrative records. The World Bank's Indonesia Database for Policy and Economic Research (INDO-DAPOER) disseminates these data for 2000 onwards. The district non-oil GDP series ends in 2013, because BPS stopped reporting this variable. We extend the GDP data back to 1993 by digitizing archival BPS reports.[7]

[7]The reports are available at BPS's Online Public Access Catalogue (https://perpustakaan.bps.go.id/opac). We found the reports by using the search query "produk domestik regional bruto kabupaten/kota di indonesia."

To capture real growth, we use non-oil GDP measured in constant prices. The archival data from 1993 to 2000 are expressed in constant 1993 prices, while the World Bank data from 2000 to 2013 are expressed in constant 2000 prices. We combine the two series using chain linking. Specifically, we extend the newer series backwards in time using the level of the newer series in 2000 and the annual growth rates of the older series.

Formally, let Y_t^{old} be GDP in year t in constant 1993 prices, and let Y_t^{new} be GDP in year t in constant 2000 prices. Define the backfilled GDP series in constant 2000 prices as

$$\widetilde{Y}_t^{\text{new}} = \frac{Y_{2000}^{\text{new}}}{\prod_{s=t+1}^{2000}\left(1+g_s^{\text{old}}\right)}$$

for $t \in \{1993, \ldots, 1999\}$, where $1+g_s^{\text{old}} = Y_s^{\text{old}}/Y_{s-1}^{\text{old}}$ is the gross growth rate in year s based on the older series. This ensures that real growth rates are always calculated within-series and that there is no artificial discontinuity in GDP in 2000.

In the GDP dataset, we aggregate all variables to 1993 district borders and normalize endowments by 1980 population.

A.3.4 Oil and Gas Data

Data on the Brent oil price and oil and gas endowments and production come from Rystad Energy's proprietary UCube database (Rystad Energy, 2019). Endowments include both proven reserves and (estimated) unproven reserves as reported by Rystad. The onshore shock variable in Equation (1), $\boldsymbol{P}_t'\boldsymbol{E}_d$, uses oil and gas endowments at the start of our sample period in 1975. The fiscal shock variable, $\boldsymbol{P}_t'\boldsymbol{F}_d$, uses oil and gas endowments in 2000, the year before decentralization was enacted.

While oil prices closely track each other globally, natural gas prices are regional. Because oil is energy dense, trading oil is relatively inexpensive. Global oil prices therefore track each other very closely, and Brent oil prices do an excellent job of approximating oil prices in Indonesia. Natural gas, however, is voluminous, expensive to trade, and natural gas prices vary substantially by region.[8] As a result, we need data on local natural gas prices.

Data on liquefied natural gas (LNG) prices in Indonesia are from IndexMundi,[9] which sources from World Gas Intelligence and the World Bank.[10] Because the data only go back

BPS also provides a document reporting district GDP over 1983–1993. However, we choose not to use this document due to inconsistencies in the data. First, the document does not report separate series for total GDP and GDP excluding oil and gas. For some districts containing hydrocarbons, reported GDP clearly excludes oil and gas, while for others, the GDP figures clearly include oil and gas. Second, even for districts with no hydrocarbons, the GDP series for 1983–1993 is inconsistent with the series for 1993–2013 in subsequent reports. For example, 1993 GDP reported in the 1983–1993 document tends to be much smaller than 1993 GDP (all in current prices) reported in subsequent documents published in 1997. This is likely due to BPS adopting the System of National Accounts 1993 (SNA 1993) methodology in 1993.

[8] For more, please see https://www.eia.gov/todayinenergy/detail.php?id=3310.

[9] See https://www.indexmundi.com/commodities/?commodity=indonesian-liquified-natural-gas&months=360.

[10] We have tried to purchase the data directly from World Gas Intelligence, but they have not responded to multiple inquiries.

to 1994, we backcast earlier prices using the relationship between West Texas Intermediate (WTI) oil prices and Indonesian LNG prices. We use WTI prices instead of another region's gas prices because oil prices are a good proxy for the cost of energy over the long run, while one region's gas prices are not particularly informative about another region's gas prices. Further, LNG prices are generally contracted over long periods of time, with contracts often tied directly to world oil prices.

Like most non-renewable natural resources, oil and gas deposits are geographically concentrated, yielding a skewed distribution across districts (Figure 2). Based on 2000 oil and gas prices, the 75th percentile of onshore endowment is 0 and the 95th percentile is USD 7,176 per capita (in constant 2010 USD). For offshore endowment, the corresponding percentiles are USD 0 and 560 per capita. Fiscal endowment is less skewed due to the sharing rules. The 25th percentile is 0, the median is USD 56 per capita, the 75th percentile is USD 347 per capita, and the 95th percentile is USD 9,690 per capita (in constant 2010 USD). When restricting to positive values only, the 5th and 95th percentile ranges for onshore, offshore, and fiscal endowment are $[0.022, 291.955]$, $[0.560, 553.587]$, and $[0.003, 24.598]$ respectively, in USD thousands per capita.

A.3.5 Other District Variables

We use microdata from the Population Census (*Sensus Penduduk*) and the Intercensal Population Survey (*Survei Penduduk Antar Sensus*) to measure district population and employment by sector. The census years are 1971, 1980, 1990, 2000, and 2010; and the intercensal surveys take place in 1976, 1985, 1995, and 2005. These data are produced by BPS and disseminated by the Integrated Public Use Microdata Series (IPUMS) International (Minnesota Population Center, 2020). We also use annual population estimates from the World Bank's Indonesia Database for Policy and Economic Research (INDO-DAPOER), covering 1983–2014. We combine this series with census population in 1980, and we log-linearly interpolate missing population values.

Official 1999 district-level poverty rates are calculated by BPS and obtained from INDO-DAPOER.[11] District-level poverty rates in 1999 are missing for Jakarta, so we assign the province-level poverty rate to these districts.[12]

Data on land area come from INDO-DAPOER, while data on topography, coastline, and forestland come from the 2011 wave of the Village Potential Statistics (*Pendataan Potensi*

[11]BPS began calculating district-level poverty rates in 1999, using a two-step procedure. First, it estimated the poverty line using the SUSENAS consumption module, which had comprehensive expenditure data but was only representative at the province level. Second, it calculated the percentage of households below the poverty line using the larger SUSENAS core survey, which was representative at the district level. The core survey had less comprehensive expenditure data, leading to underestimation of consumption. As a result, BPS had to calibrate the poverty line to account for this underestimation before calculating the poverty rate. In principle, BPS could have applied this same methodology to 1993 or 1996 data, but to the best of our knowledge it did not.

[12]This is likely because BPS initially calculated district-level poverty rates for the purpose of allocating central transfers to autonomous districts, and Jakarta's districts are not autonomous.

Desa, or PODES). Data on coal-bearing formations come from the Badan Geologi *Formasi Pembawa Batubara* polygon layer from ESDM One Map (Badan Geologi, 2019). We measure coal formations in square kilometers per 1,000 inhabitants in 1980. Data on infrastructure in 1999 come from PODES 2000.

Data on district expenditures come from INDO-DAPOER and the Ministry of Finance (*Kementerian Keuangan*). The INDO-DAPOER data span 2001–2014. We fill in any missing data and extend the series back to 1994 using Ministry of Finance budget reports. The five districts in Jakarta lack expenditure data, as these districts are managed by the province. Most districts are missing law and order expenditure for 2003–2004, and all districts are missing agriculture expenditure for 2013–2014.

We construct five proxies for baseline central government expenditure using PODES 1983. The first four proxies are measures of public services provided by the centrally administered Presidential Instruction (*Instruksi Presiden*, or INPRES) program. The INPRES school construction program (INPRES *Sekolah Dasar*) built over 61,000 primary schools between 1973 and 1979 (Duflo, 2001). Our school variable therefore reflects the stock of INPRES primary schools as of 1979. We also construct measures of the number of INPRES teachers and family toilets in 1983, and the number of completed or ongoing INPRES capital projects in the 1982–1983 budget.[13] The fifth proxy is the number of completed or ongoing national capital projects in the 1982–1983 budget. These projects are larger in scale than the INPRES projects.

A.3.6 Spatial Harmonization

The number of districts in Indonesia increased dramatically over the analysis period. To construct consistent geographic units, we use the district crosswalk for 1993–2014 provided by the World Bank's Indonesia Database For Policy And Economic Research (2015) (INDO-DAPOER).[14] We modify and extend the crosswalk back to 1970 using data from Olken (2009) and the Village Potential Statistics (*Pendataan Potensi Desa*). Using the crosswalk, we assign each establishment to a district according to 1975 borders.

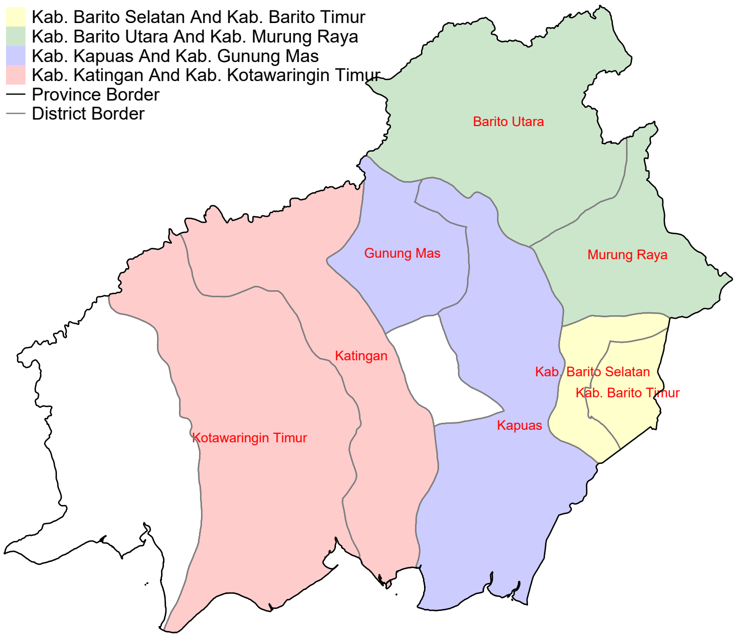
In 1975, there were 287 districts. However, our analysis uses 280 geographic units, merging some districts to spatially harmonize our data over time. In Kalimantan Tengah, four pairs of districts (all *kabupaten*) amalgamated in 1985 and separated again in 2002: (1) Katingan and Kotawaringin Timur; (2) Gunung Mas and Kapuas; (3) Barito Timur and Barito Selatan; and (4) Murung Raya and Barito Utara. We amalgamate the districts in each pair to maintain consistent borders. Additionally, we combine Kabupaten Bogor with Kota Bogor, and we combine Kabupaten Sukabumi with Kota Sukabumi—all in Jawa Barat. For both pairs of districts, the smaller kota expanded in 1995 to include several subdistricts that previously belonged to the larger kabupaten. Similarly, we combine Kabupaten Sawahlunto/Sijunjung

[13] PODES 1983 also contains information on INPRES public toilets, but these data appear to be unreliable.

[14] INDO-DAPOER is hosted at http://databank.worldbank.org/data/reports.aspx?source=1266.

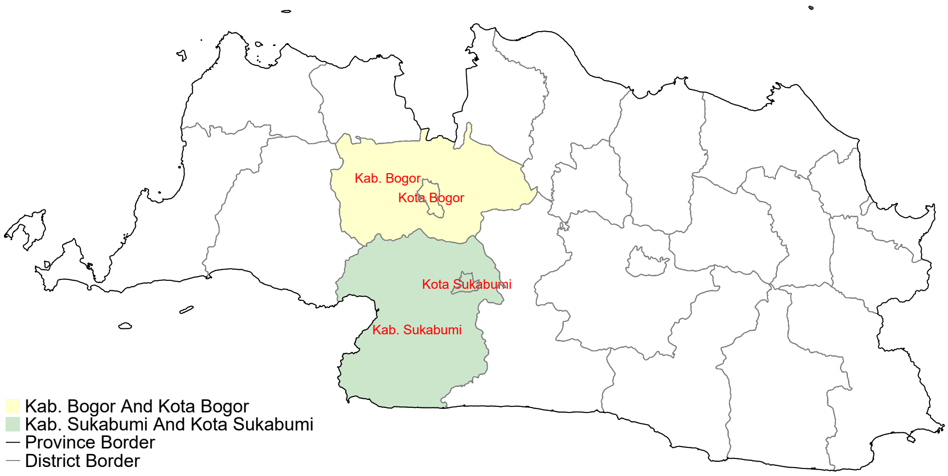
Figure A.1: Spatial Harmonization of Districts, 1975 Borders

(a) Kalimantan Tengah



(b) Sumatera Barat

(c) Jawa Barat



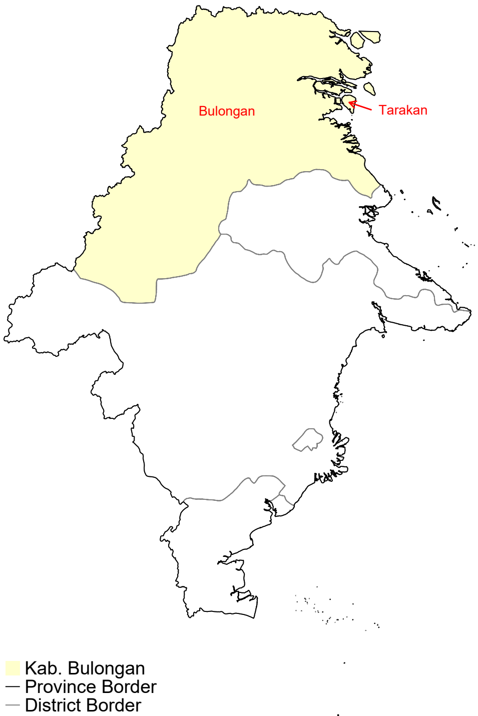
Notes: This figure depicts the districts we combined in Kalimantan Tengah (Panel (a)), Jawa Barat (Panel (b)), and Sumatera Barat (Panel (c)) to harmonize district borders over the sample period. We use the 1976, 1980, and 1985 shapefiles from Minnesota Population Center (2020).

with Kota Sawahlunto (in Sumatera Barat) because the smaller kota expanded into the larger kabupaten in 1990. Figure A.1 displays our spatial harmonization process for 1975 borders.

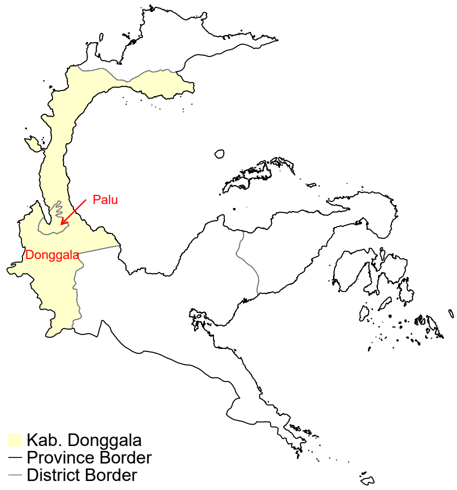
In 1993, we begin with 292 districts. We combine Tarakan with Bulongan (in Kalimantan Timur), Donggala with Palu (in Sulawesi Tengah), and the same Jawa Barat districts we did in 1975 to ensure that geographies are harmonized across the years 1993–2014. The process yields 288 districts which we use in our analysis. Figure A.2 displays our spatial harmonization process for 1993.

Figure A.2: Spatial Harmonization of Districts, 1993 Borders

(a) Kalimantan Timur



(b) Sulawesi Tengah



Notes: This figure depicts the districts we combined in Kalimantan Timur (Panel a) and Sulawesi Tengah (Panel b) to geographically harmonize our sample of 1993 district borders. Shapefiles used are provided by Minnesota Population Center (2020), and use 1995 geographies.

A.4 Additional Results: Tables

Table A.3: Summary Statistics

	(1) Mean	(2) Std. Dev.	(3) Min.	(4) Max.	(5) Obs.
Firm Outcomes, 1975–2014					
Output (IDR Million)	40.82	332.33	0	40,430	490,798
Value Added (IDR Million)	16.52	194.19	0	43,226	472,238
Number of Workers	145.61	520.32	1	40,850	490,786
Output per Worker (IDR Million)	0.17	0.99	0	486	490,786
Value Added per Worker (IDR Million)	0.07	0.56	0	290	472,238
Average Wage (IDR 1,000)	12.02	15.96	0	3,864	489,855
District GDP, 1993–2013 (1993 Borders)					
GDP (IDR Billion)	14,147	26,627	248	287,657	6,044
GDP Excluding Oil and Gas (IDR Billion)	12,787	23,712	248	287,657	6,041
Oil and Gas GDP (IDR Billion)	1,367	9,201	0	164,218	6,040
(> 0)	9,161	22,283	0	164,218	901
District Expenditures, 1994–2014 (1975 Borders)					
Total Expenditure p.c. (USD)	314.46	424.78	2.64	5,187.34	5,864
Administration Expenditure p.c. (USD)	81.41	156.82	0.00	2,413.63	5,715
Education Expenditure p.c. (USD)	72.42	84.77	0.00	812.79	5,716
Infrastructure Expenditure p.c. (USD)	55.80	102.37	0.10	1,624.77	5,708
Health Expenditure p.c. (USD)	26.56	43.07	0.02	496.45	5,698
Agriculture Expenditure p.c. (USD)	9.57	19.13	0.00	278.15	4,732
Environment Expenditure p.c. (USD)	5.93	10.25	0.00	143.39	5,476
Law and Order Expenditure p.c. (USD)	3.42	7.18	0.00	141.72	4,794
Social Protection Expenditure p.c. (USD)	3.42	7.77	0.00	105.29	5,176
Tourism and Culture Expenditure p.c. (USD)	2.02	4.32	0.00	69.00	5,176
Onshore Oil and Gas Production, 1975–2014 (1975 Borders)					
Onshore Oil and Gas Production p.c. (USD)	193.56	1,442.85	0.00	39,632.33	11,200
(> 0)	1,537.47	3,805.12	0.03	39,632.33	1,410
District Shocks, 1999–2014 (1975 Borders)					
Price × Onshore Endowment p.c. (USD 1,000)	10.80	86.01	0.00	1,874.59	4,480
(> 0)	81.71	224.18	0.00	1,874.59	592
Price × Offshore Endowment p.c. (USD 1,000)	5.44	62.99	0.00	1,542.65	4,480
(> 0)	95.23	247.21	0.64	1,542.65	256
Price × Fiscal Endowment p.c. (USD 1,000)	6.51	24.41	0.00	317.18	4,480
(> 0)	9.30	28.72	0.00	317.18	3,136
District Covariates (1975 Borders)					
Land Area (1,000 km^2)	7.07	13.98	0.02	119.04	280
District Has Some Coastline	0.65	0.48	0.00	1.00	280
Share of Villages with Slope > 15°	0.31	0.18	0.00	0.80	280
Share of Villages Located in or Near Forest	0.21	0.18	0.00	0.78	280
Coal Formation Area (km^2 per 1,000), 1980	4.23	19.43	0.00	170.86	280
Population (1,000), 1980	539.80	548.60	23.82	5,481.47	280
Share of Population Aged 0–14, 1980	0.41	0.04	0.29	0.50	280
Share of Population Aged 15–64, 1980	0.55	0.03	0.46	0.67	280
Share of Population with Primary Education, 1980	0.23	0.10	0.04	0.60	280
Share of Population with Secondary Education, 1980	0.04	0.04	0.01	0.23	280
Literacy Rate, 1980	0.56	0.11	0.15	0.82	280
Urbanization Rate, 1980	0.23	0.31	0.00	1.00	280
Poverty Rate, 1999	0.24	0.14	0.02	0.78	280
INPRES Schools per 1,000, 1983	1.12	1.34	0.02	9.73	280
INPRES Teachers per 1,000, 1983	5.75	6.83	0.17	44.59	280
INPRES Family Toilets per 1,000, 1983	7.58	21.46	0.00	318.81	280
INPRES Capital Projects per 1,000, 1982–83 Budget	0.53	0.75	0.00	5.67	280
National Capital Projects per 1,000, 1982–83 Budget	0.10	0.18	0.00	1.90	280

Notes: The top four panels present statistics for outcomes at the firm-year and district-year levels. The bottom panel presents statistics for the cross section of districts. Firm output and output per capita are expressed in constant 2010 IDR millions, and average wages are expressed in constant 2010 IDR thousands. GDP is expressed in constant 2010 IDR billions. District expenditures are expressed in constant 2010 USD per capita based on 1980 population. The price × endowment variables are expressed in constant 2010 USD thousands per capita based on 1980 population.

Table A.4: Baseline Characteristics and Central Expenditure Proxies

	Covariates: (1) Onshore Endow. × Price	Covariates: (2) Fiscal Endow. × Price	(3) Joint Test p-value	(4) Obs.
Outcome Variables: Baseline Characteristics				
Log Land Area	4.64**	11.68	0.000	280
	(1.82)	(8.65)		
% Villages with Slope > 15°	−32.99**	57.70	0.010	280
	(14.20)	(81.42)		
% Villages Located in or Near Forest	−23.14	234.18***	0.033	280
	(15.08)	(90.87)		
District Has Some Coastline	0.03	6.67***	0.000	280
	(0.29)	(1.59)		
Coal Formation Area (km^2 per 1,000), 1980	−10.43	590.04*	0.137	280
	(57.80)	(315.52)		
Log Population, 1980	3.34***	−10.44***	0.011	280
	(1.25)	(4.02)		
% Population Aged 0–14, 1980	3.23	−22.61	0.316	280
	(2.46)	(14.86)		
% Population Aged 15–64, 1980	−2.89	28.57*	0.128	280
	(2.70)	(15.64)		
% Population with Primary Education, 1980	−19.40	58.80	0.225	280
	(12.12)	(63.07)		
% Population with Secondary Education, 1980	−7.27	28.84	0.406	280
	(5.41)	(26.92)		
Literacy Rate (%), 1980	−2.64	−30.98	0.303	280
	(8.40)	(51.60)		
Urbanization Rate (%), 1980	−26.54	82.46	0.734	280
	(33.98)	(144.90)		
Outcome Variable: Poverty, Pre-Decentralization				
Poverty Rate (%), 1999	1.96	−16.35	0.961	280
	(10.30)	(59.50)		
Outcome Variables: Central Expenditure Proxies				
INPRES Schools per 1,000, 1983	−0.60	29.01**	0.000	280
	(1.78)	(11.46)		
INPRES Teachers per 1,000, 1983	6.68	81.73*	0.060	280
	(9.62)	(47.09)		
INPRES Family Toilets per 1,000, 1983	−35.49	206.13	0.238	280
	(21.72)	(183.46)		
INPRES Capital Projects per 1,000, 1982–83 Budget	0.97	10.27	0.000	280
	(0.88)	(6.74)		
National Capital Projects per 1,000, 1982–83 Budget	0.24	1.48	0.001	280
	(0.17)	(1.06)		

Notes: This table presents estimates from cross-sectional regressions of baseline characteristics on the two endowment variables, controlling for region fixed effects. Each row is a separate regression. Column 3 reports the p-value from the test that the endowment coefficients are jointly zero. Each price × endowment variable is expressed in constant 2010 USD thousands per capita based on 1980 population and 2000 oil and gas prices. All variables are measured at 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: District Expenditure: Dynamic Model, Robustness to Omitting High-Leverage Districts

	District Expenditure by Function, Scaled by 1980 Population									
	(1) Total	(2) Admin.	(3) Edu.	(4) Infra.	(5) Health	(6) Agri.	(7) Env.	(8) Law & Order	(9) Social Prot.	(10) Tourism & Culture
	Panel A: Omitting Kutai									
Onshore Endow. × Price (β)	-0.45^{**}	-0.17^{**}	-0.14^{***}	-0.12^{*}	-0.07^{**}	-0.06^{***}	0.01	-0.02^{***}	-0.01^{**}	−0.00
	(0.19)	(0.08)	(0.05)	(0.07)	(0.03)	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	9.17^{***}	2.96^{***}	2.12^{***}	2.52^{***}	1.04^{***}	0.56^{***}	0.19^{***}	0.18^{***}	0.14^{***}	0.07^{***}
	(1.15)	(0.49)	(0.24)	(0.50)	(0.16)	(0.12)	(0.04)	(0.03)	(0.02)	(0.02)
Observations	5,569	5,419	5,420	5,412	5,402	4,714	5,182	4,501	4,881	4,886
Districts	274	274	274	274	274	274	274	274	274	274
	Panel B: Omitting Bengkalis									
Onshore Endow. × Price (β)	-1.80^{***}	-0.67^{***}	-0.43^{***}	−0.30	-0.21^{**}	-0.16^{***}	-0.06^{***}	-0.06^{***}	-0.03^{*}	−0.02
	(0.55)	(0.22)	(0.12)	(0.25)	(0.08)	(0.06)	(0.02)	(0.01)	(0.01)	(0.02)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	9.53^{***}	3.22^{***}	2.18^{***}	2.56^{***}	1.08^{***}	0.57^{***}	0.21^{***}	0.20^{***}	0.15^{***}	0.08^{***}
	(1.08)	(0.47)	(0.23)	(0.50)	(0.15)	(0.12)	(0.04)	(0.03)	(0.01)	(0.02)
Observations	5,568	5,417	5,418	5,410	5,400	4,712	5,179	4,501	4,879	4,883
Districts	274	274	274	274	274	274	274	274	274	274
	Panel C: Omitting Kutai and Bengkalis									
Onshore Endow. × Price (β)	-1.51^{**}	-0.64^{**}	-0.46^{***}	−0.18	-0.27^{***}	-0.17^{***}	-0.03^{*}	-0.06^{***}	-0.04^{***}	−0.00
	(0.68)	(0.27)	(0.14)	(0.27)	(0.07)	(0.07)	(0.02)	(0.02)	(0.01)	(0.02)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	9.46^{***}	3.10^{***}	2.22^{***}	2.52^{***}	1.10^{***}	0.59^{***}	0.21^{***}	0.20^{***}	0.15^{***}	0.07^{***}
	(1.17)	(0.51)	(0.23)	(0.53)	(0.15)	(0.12)	(0.04)	(0.03)	(0.02)	(0.02)
Observations	5,549	5,399	5,400	5,392	5,382	4,697	5,162	4,485	4,864	4,868
Districts	273	273	273	273	273	273	273	273	273	273

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (3) for $K = 3$, where the outcomes are district expenditure on different functions. The regressions omit high-leverage districts, as indicated. Expenditure is expressed in constant 2010 USD thousands and scaled by 1980 population. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the change in spending in USD due to a USD 1 thousand increase in the value of the endowment. The sample covers 1994–2014. The five districts in Jakarta are missing, as these districts are managed by the province. Most districts are missing law and order expenditure for 2003–2004, and all districts are missing agriculture expenditure for 2013–2014. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. $^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$.

Table A.6: Firm Outcomes: Robustness to Starting Fiscal Shock in 2001

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Static Model ($K = 0$)					
Onshore Endow. × Price (β)	0.42***	0.03	−0.06	0.48***	0.13	0.25***
	(0.09)	(0.10)	(0.05)	(0.08)	(0.08)	(0.06)
Fiscal Endow. × Price × ($t \geq 2001$) (δ)	−0.53	−0.11	1.06	−1.59	−1.29	−3.66***
	(1.34)	(1.48)	(0.82)	(1.26)	(1.34)	(0.77)
$\beta - 0.3 \cdot \delta$	0.58	0.06	−0.38	0.96**	0.51	1.35***
	(0.47)	(0.51)	(0.29)	(0.44)	(0.46)	(0.28)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278
	Panel B: Dynamic Model ($K = 3$)					
Onshore Endow. × Price	−0.06	−0.34***	−0.11***	0.05	−0.19**	0.10*
	(0.10)	(0.09)	(0.04)	(0.10)	(0.09)	(0.06)
Lag 1	0.34***	0.40***	−0.01	0.35***	0.43***	0.08**
	(0.07)	(0.06)	(0.03)	(0.06)	(0.06)	(0.04)
Lag 2	0.11*	−0.03	0.10***	0.02	−0.13*	−0.03
	(0.07)	(0.08)	(0.02)	(0.06)	(0.07)	(0.05)
Lag 3	0.44***	0.19**	0.05**	0.40***	0.15**	0.21***
	(0.07)	(0.08)	(0.02)	(0.06)	(0.07)	(0.04)
Sum of Lags 0–K (β)	0.83***	0.23**	0.02	0.81***	0.26***	0.37***
	(0.12)	(0.12)	(0.07)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price × ($t \geq 2001$)	1.90	−0.24	2.34***	−0.44	−2.64	−1.82**
	(1.74)	(1.56)	(0.64)	(1.90)	(1.66)	(0.83)
Lag 1	−1.66	−0.97	−0.09	−1.57	−0.90	−2.61***
	(1.23)	(1.42)	(0.34)	(1.09)	(1.24)	(0.88)
Lag 2	0.89	2.05*	−1.33***	2.22**	3.38***	−1.02
	(1.22)	(1.22)	(0.29)	(1.08)	(1.14)	(0.92)
Lag 3	−2.73**	−0.85	−0.46	−2.27*	−0.45	1.54
	(1.37)	(1.64)	(0.47)	(1.32)	(1.53)	(0.97)
Sum of Lags 0–K (δ)	−1.60	0.00	0.47	−2.07	−0.61	−3.91***
	(1.51)	(1.67)	(0.95)	(1.28)	(1.44)	(0.89)
$\beta - 0.3 \cdot \delta$	1.31**	0.23	−0.12	1.43***	0.44	1.54***
	(0.54)	(0.58)	(0.34)	(0.45)	(0.50)	(0.33)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of the coefficients in Equation (1), measuring the fiscal shock as $\boldsymbol{P}_t'\boldsymbol{F}_d \cdot 1(t \geq 2001)$. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7: Firm Outcomes: Static Model, Robustness to Omitting High-Leverage Districts

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Omitting Kutai					
Onshore Endow. × Price (β)	0.46***	0.04	−0.06	0.52***	0.15*	0.25***
	(0.09)	(0.10)	(0.06)	(0.08)	(0.08)	(0.06)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.70	0.08	1.22	−1.92*	−1.28	−3.85***
	(1.36)	(1.57)	(0.88)	(1.14)	(1.28)	(0.67)
$\beta - 0.3 \cdot \delta$	0.67	0.02	−0.43	1.10***	0.53	1.41***
	(0.47)	(0.54)	(0.31)	(0.39)	(0.44)	(0.24)
Observations	481,342	462,147	481,330	481,330	462,147	480,422
Plants	52,120	51,254	52,120	52,120	51,254	52,022
Districts	277	277	277	277	277	277
	Panel B: Omitting Bengkalis					
Onshore Endow. × Price (β)	0.75	0.26	−0.44	1.20*	0.60	1.08*
	(0.84)	(0.77)	(0.38)	(0.70)	(0.62)	(0.62)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.79	0.12	2.12**	−2.93**	−1.94	−4.74***
	(1.59)	(1.77)	(1.04)	(1.38)	(1.56)	(0.79)
$\beta - 0.3 \cdot \delta$	0.98	0.23	−1.07*	2.08**	1.19	2.50***
	(1.14)	(1.05)	(0.61)	(0.97)	(0.89)	(0.78)
Observations	480,340	461,190	480,328	480,328	461,190	479,421
Plants	51,995	51,129	51,995	51,995	51,129	51,897
Districts	277	277	277	277	277	277
	Panel C: Omitting Kutai and Bengkalis					
Onshore Endow. × Price (β)	1.53*	0.80	−0.41	1.97***	1.18*	1.11
	(0.81)	(0.75)	(0.41)	(0.73)	(0.62)	(0.77)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.70	0.55	2.16**	−2.87*	−1.59	−4.81***
	(1.71)	(1.98)	(1.03)	(1.49)	(1.70)	(0.88)
$\beta - 0.3 \cdot \delta$	1.74	0.64	−1.06*	2.83***	1.66*	2.55***
	(1.16)	(1.16)	(0.63)	(1.03)	(1.00)	(0.95)
Observations	479,887	460,743	479,875	479,875	460,743	478,968
Plants	51,933	51,067	51,933	51,933	51,067	51,835
Districts	276	276	276	276	276	276

Notes: This table presents fixed-effects estimates of the coefficients in Equation (1) for $K = 0$ after dropping high-leverage districts. Kabupaten Kutai is dropped in Panel A, Kabupaten Bengkalis is dropped in Panel B, and both are dropped in Panel C. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8: Firm Outcomes: Dynamic Model, Robustness to Omitting High-Leverage Districts

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Omitting Kutai					
Onshore Endow. × Price (β)	0.79***	0.19*	−0.00	0.79***	0.25**	0.34***
	(0.11)	(0.12)	(0.06)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.33	1.41	0.89	−1.22	0.37	−3.81***
	(1.58)	(1.80)	(0.99)	(1.35)	(1.54)	(0.93)
$\beta - 0.3 \cdot \delta$	0.89	−0.23	−0.27	1.16**	0.14	1.48***
	(0.55)	(0.62)	(0.35)	(0.47)	(0.53)	(0.34)
Observations	481,342	462,147	481,330	481,330	462,147	480,422
Plants	52,120	51,254	52,120	52,120	51,254	52,022
Districts	277	277	277	277	277	277
	Panel B: Omitting Bengkalis					
Onshore Endow. × Price (β)	0.57	0.37	−0.50	1.08	0.77	1.18
	(0.99)	(0.88)	(0.43)	(0.81)	(0.72)	(0.77)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.19	1.13	1.90	−2.10	−0.70	−5.13***
	(1.92)	(2.09)	(1.20)	(1.66)	(1.81)	(1.06)
$\beta - 0.3 \cdot \delta$	0.62	0.03	−1.07	1.71	0.98	2.72***
	(1.35)	(1.18)	(0.69)	(1.14)	(1.00)	(1.00)
Observations	480,340	461,190	480,328	480,328	461,190	479,421
Plants	51,995	51,129	51,995	51,995	51,129	51,897
Districts	277	277	277	277	277	277
	Panel C: Omitting Kutai and Bengkalis					
Onshore Endow. × Price (β)	1.25	0.94	−0.52	1.79**	1.44*	1.31
	(1.01)	(0.90)	(0.49)	(0.88)	(0.76)	(0.99)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−0.04	1.41	1.95*	−2.00	−0.52	−5.13***
	(2.03)	(2.30)	(1.13)	(1.80)	(1.97)	(1.17)
$\beta - 0.3 \cdot \delta$	1.26	0.52	−1.10	2.39*	1.59	2.85**
	(1.41)	(1.35)	(0.69)	(1.28)	(1.20)	(1.25)
Observations	479,887	460,743	479,875	479,875	460,743	478,968
Plants	51,933	51,067	51,933	51,933	51,067	51,835
Districts	276	276	276	276	276	276

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$, $\delta = \sum_{k=0}^{K} \delta_k$, and $\gamma = \sum_{k=0}^{K} \gamma_k$ in Equation (1) for $K = 3$ after dropping high-leverage districts. Kabupaten Kutai is dropped in Panel A, Kabupaten Bengkalis is dropped in Panel B, and both are dropped in Panel C. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9: Firm Outcomes: Only Using Fields Discovered by 1975

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Static Model ($K = 0$)					
Onshore Endow. × Price (β)	0.48***	0.06	−0.05	0.53***	0.15*	0.26***
	(0.10)	(0.11)	(0.06)	(0.08)	(0.09)	(0.06)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	−1.61	−0.91	0.96	−2.57*	−2.03	−4.37***
	(1.55)	(1.69)	(0.96)	(1.37)	(1.48)	(0.85)
$\beta - 0.3 \cdot \delta$	0.96*	0.33	−0.34	1.30***	0.76	1.57***
	(0.54)	(0.59)	(0.34)	(0.47)	(0.51)	(0.30)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278
	Panel B: Dynamic Model ($K = 3$)					
Onshore Endow. × Price	0.16	−0.14	−0.13**	0.29***	0.02	0.15***
	(0.10)	(0.12)	(0.06)	(0.08)	(0.10)	(0.06)
Lag 1	0.13*	0.26**	0.00	0.12*	0.27**	0.09
	(0.08)	(0.13)	(0.03)	(0.06)	(0.11)	(0.05)
Lag 2	−0.03	−0.18*	0.13***	−0.15*	−0.32***	−0.13*
	(0.10)	(0.10)	(0.02)	(0.09)	(0.10)	(0.07)
Lag 3	0.55***	0.26***	0.01	0.54***	0.26***	0.23***
	(0.10)	(0.10)	(0.03)	(0.09)	(0.09)	(0.06)
Sum of Lags 0–K (β)	0.81***	0.20	0.01	0.80***	0.23**	0.34***
	(0.12)	(0.12)	(0.07)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price × ($t \geq 1999$)	−4.31**	−5.34**	2.04**	−6.35***	−7.49***	−3.27***
	(1.83)	(2.34)	(0.91)	(1.47)	(1.90)	(0.77)
Lag 1	2.77	1.83	−0.02	2.80	1.80	−2.63**
	(1.86)	(2.51)	(0.46)	(1.71)	(2.29)	(1.04)
Lag 2	4.22*	5.08**	−1.54***	5.75***	6.67***	0.39
	(2.22)	(2.39)	(0.49)	(1.92)	(2.15)	(1.52)
Lag 3	−3.70	−0.69	0.06	−3.76*	−0.83	1.26
	(2.37)	(2.16)	(0.62)	(2.02)	(1.80)	(1.26)
Sum of Lags 0–K (δ)	−1.02	0.88	0.54	−1.55	0.16	−4.24***
	(1.88)	(2.00)	(1.09)	(1.67)	(1.80)	(1.18)
$\beta - 0.3 \cdot \delta$	1.12*	−0.07	−0.15	1.26**	0.18	1.61***
	(0.66)	(0.69)	(0.38)	(0.57)	(0.61)	(0.40)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of the coefficients in Equation (1). Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Endowments are based on oil and gas fields discovered by 1975. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10: Firm Outcomes: Static Model, Robustness to Changing Covariate Set

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Controlling for Additional Demographic Covariates					
Onshore Endow. × Price	0.55***	0.19	−0.05	0.60***	0.27***	0.33***
(β)	(0.11)	(0.12)	(0.06)	(0.08)	(0.09)	(0.06)
Fiscal Endow. × Price	−1.37	−1.08	1.33	−2.70**	−2.54*	−3.45***
× ($t \geq 1999$) (δ)	(1.54)	(1.70)	(0.98)	(1.21)	(1.36)	(0.64)
$\beta - 0.3 \cdot \delta$	0.96*	0.51	−0.45	1.41***	1.03**	1.37***
	(0.54)	(0.59)	(0.35)	(0.42)	(0.47)	(0.23)
	Panel B: Controlling for Baseline Central Expenditure Proxies					
Onshore Endow. × Price	0.41**	0.01	−0.12	0.53***	0.17	0.32***
(β)	(0.16)	(0.17)	(0.08)	(0.12)	(0.13)	(0.09)
Fiscal Endow. × Price	−0.83	−0.41	1.64*	−2.47*	−2.18	−3.77***
× ($t \geq 1999$) (δ)	(1.52)	(1.63)	(0.86)	(1.30)	(1.41)	(0.74)
$\beta - 0.3 \cdot \delta$	0.66	0.14	−0.61*	1.27***	0.83*	1.46***
	(0.56)	(0.60)	(0.32)	(0.47)	(0.50)	(0.29)
	Panel C: Controlling for Additional Covariates, Central Expenditure Proxies					
Onshore Endow. × Price	0.42**	0.08	−0.12	0.54***	0.24*	0.34***
(β)	(0.17)	(0.18)	(0.09)	(0.13)	(0.14)	(0.09)
Fiscal Endow. × Price	−0.66	−0.53	1.68*	−2.34*	−2.35	−3.20***
× ($t \geq 1999$) (δ)	(1.69)	(1.80)	(0.94)	(1.42)	(1.54)	(0.74)
$\beta - 0.3 \cdot \delta$	0.61	0.24	−0.63*	1.24**	0.94*	1.30***
	(0.62)	(0.66)	(0.35)	(0.51)	(0.56)	(0.28)
	Panel D: Omitting All Covariates					
Onshore Endow. × Price	0.50***	0.13	−0.00	0.50***	0.16**	0.23***
(β)	(0.07)	(0.09)	(0.05)	(0.06)	(0.06)	(0.05)
Fiscal Endow. × Price	−0.25	0.95	0.81*	−1.06	0.05	−1.90***
× ($t \geq 1999$) (δ)	(0.80)	(0.93)	(0.44)	(0.68)	(0.76)	(0.51)
$\beta - 0.3 \cdot \delta$	0.57**	−0.16	−0.25	0.82***	0.15	0.80***
	(0.29)	(0.32)	(0.16)	(0.25)	(0.26)	(0.17)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of the coefficients in Equation (1) for $K = 0$ after adding baseline covariates interacted with year effects. The estimates in Panel A control for all baseline characteristics in Appendix Table A.4, Panel B estimates control for the central expenditure proxies in Appendix Table A.4, Panel C estimates control for both sets of variables, and Panel D estimates omit all covariates. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.11: Firm Outcomes: Dynamic Model, Robustness to Changing Covariate Set

	Log(Outcome)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Output	Value Added	Number of Workers	Output per Worker	Value Added per Worker	Avg. Wage
	Panel A: Controlling for Additional Demographic Covariates					
Onshore Endow. × Price	0.85***	0.33**	−0.01	0.86***	0.37***	0.42***
(β)	(0.14)	(0.14)	(0.08)	(0.10)	(0.11)	(0.07)
Fiscal Endow. × Price	−1.02	0.27	1.07	−2.09	−0.95	−3.31***
× ($t \geq 1999$) (δ)	(1.79)	(1.95)	(1.13)	(1.44)	(1.61)	(0.87)
$\beta - 0.3 \cdot \delta$	1.16*	0.25	−0.33	1.49***	0.66	1.42***
	(0.64)	(0.68)	(0.40)	(0.50)	(0.55)	(0.31)
	Panel B: Controlling for Baseline Central Expenditure Proxies					
Onshore Endow. × Price	0.67***	0.11	−0.10	0.77***	0.26*	0.44***
(β)	(0.18)	(0.19)	(0.10)	(0.14)	(0.14)	(0.10)
Fiscal Endow. × Price	−0.17	1.21	1.44	−1.61	−0.39	−3.90***
× ($t \geq 1999$) (δ)	(1.73)	(1.90)	(1.00)	(1.50)	(1.67)	(0.91)
$\beta - 0.3 \cdot \delta$	0.72	−0.25	−0.53	1.25**	0.38	1.61***
	(0.64)	(0.69)	(0.37)	(0.54)	(0.59)	(0.34)
	Panel C: Controlling for Additional Covariates, Central Expenditure Proxies					
Onshore Endow. × Price	0.64***	0.16	−0.13	0.77***	0.33**	0.45***
(β)	(0.19)	(0.20)	(0.10)	(0.15)	(0.15)	(0.10)
Fiscal Endow. × Price	0.04	1.13	1.55	−1.51	−0.59	−3.06***
× ($t \geq 1999$) (δ)	(1.95)	(2.13)	(1.11)	(1.65)	(1.84)	(0.93)
$\beta - 0.3 \cdot \delta$	0.63	−0.18	−0.59	1.22**	0.50	1.36***
	(0.71)	(0.77)	(0.41)	(0.59)	(0.66)	(0.35)
	Panel D: Omitting All Covariates					
Onshore Endow. × Price	0.81***	0.28***	0.04	0.77***	0.28***	0.34***
(β)	(0.08)	(0.10)	(0.05)	(0.07)	(0.08)	(0.07)
Fiscal Endow. × Price	−0.25	2.01**	0.71	−0.96	1.21	−1.82***
× ($t \geq 1999$) (δ)	(0.90)	(0.98)	(0.48)	(0.78)	(0.82)	(0.59)
$\beta - 0.3 \cdot \delta$	0.88***	−0.32	−0.18	1.06***	−0.08	0.88***
	(0.32)	(0.35)	(0.17)	(0.28)	(0.30)	(0.21)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (1) for $K = 3$ after adding baseline covariates interacted with year effects. The estimates in Panel A control for all baseline characteristics in Appendix Table A.4, Panel B estimates control for the central expenditure proxies in Appendix Table A.4, Panel C estimates control for both sets of variables, and Panel D estimates omit all covariates. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12: Firm Outcomes: Dynamic Model, Robustness to Controlling for Poverty

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Controlling for Poverty Rate in 1999					
Onshore Endow. × Price	0.82***	0.27**	0.01	0.80***	0.29***	0.38***
(β)	(0.12)	(0.12)	(0.07)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price	−0.95	0.52	0.61	−1.56	−0.21	−3.55***
× ($t \geq 1999$) (δ)	(1.60)	(1.80)	(1.01)	(1.39)	(1.60)	(0.88)
$\beta - 0.3 \cdot \delta$	1.10**	0.11	−0.17	1.27***	0.35	1.45***
	(0.56)	(0.61)	(0.36)	(0.47)	(0.53)	(0.32)
	Panel B: Omitting Poorest 5 Percent of Districts					
Onshore Endow. × Price	0.77***	0.19*	−0.01	0.78***	0.24***	0.35***
(β)	(0.11)	(0.11)	(0.07)	(0.08)	(0.09)	(0.07)
Fiscal Endow. × Price	−0.74	0.92	0.90	−1.63	−0.11	−3.91***
× ($t \geq 1999$) (δ)	(1.54)	(1.72)	(1.00)	(1.31)	(1.50)	(0.90)
$\beta - 0.3 \cdot \delta$	0.99*	−0.09	−0.28	1.27***	0.27	1.52***
	(0.54)	(0.59)	(0.35)	(0.45)	(0.51)	(0.33)
Observations	476,824	457,824	476,812	476,812	457,824	475,957
Plants	51,560	50,708	51,560	51,560	50,708	51,465
Districts	259	259	259	259	259	259
	Panel C: Omitting Poorest 10 Percent of Districts					
Onshore Endow. × Price	0.81***	0.20*	0.00	0.81***	0.24**	0.37***
(β)	(0.11)	(0.12)	(0.06)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price	−0.94	0.94	0.98	−1.91	−0.17	−4.03***
× ($t \geq 1999$) (δ)	(1.58)	(1.79)	(1.05)	(1.33)	(1.55)	(0.88)
$\beta - 0.3 \cdot \delta$	1.09**	−0.08	−0.29	1.38***	0.29	1.58***
	(0.55)	(0.61)	(0.37)	(0.46)	(0.52)	(0.33)
Observations	468,283	449,624	468,271	468,271	449,624	467,424
Plants	50,512	49,680	50,512	50,512	49,680	50,418
Districts	246	246	246	246	246	246
	Panel D: Omitting Poorest 25 Percent of Districts					
Onshore Endow. × Price	0.79***	0.16	−0.00	0.79***	0.21*	0.32***
(β)	(0.13)	(0.14)	(0.07)	(0.09)	(0.11)	(0.08)
Fiscal Endow. × Price	−0.83	0.97	1.32	−2.14	−0.51	−4.01***
× ($t \geq 1999$) (δ)	(1.81)	(2.04)	(1.17)	(1.47)	(1.70)	(1.00)
$\beta - 0.3 \cdot \delta$	1.04	−0.13	−0.40	1.44***	0.36	1.52***
	(0.64)	(0.71)	(0.41)	(0.50)	(0.59)	(0.36)
Observations	421,427	405,178	421,420	421,420	405,178	420,900
Plants	44,778	44,061	44,778	44,778	44,061	44,706
Districts	206	206	206	206	206	206

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (1) for $K = 3$. The estimates in Panel A control for the district poverty rate in 1999 interacted with year effects. Panels B, C, and D drop subsamples of poor districts. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13: Firm Outcomes: Static Model, Robustness to Controlling for District Splits

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Controlling for Post-Split Dummies					
Onshore Endow. × Price	0.45^{***}	0.06	−0.07	0.52^{***}	0.16^{**}	0.26^{***}
(β)	(0.09)	(0.10)	(0.06)	(0.07)	(0.08)	(0.06)
Fiscal Endow. × Price	−1.20	−0.73	1.23	-2.44^{**}	-2.08^{*}	-3.90^{***}
× ($t \geq 1999$) (δ)	(1.30)	(1.48)	(0.88)	(1.06)	(1.20)	(0.64)
$\beta - 0.3 \cdot \delta$	0.81^{*}	0.28	−0.44	1.25^{***}	0.78^{*}	1.43^{***}
	(0.45)	(0.51)	(0.31)	(0.36)	(0.41)	(0.24)
	Panel B: Controlling for Log Number of Districts					
Onshore Endow. × Price	0.51^{***}	0.09	−0.05	0.56^{***}	0.18^{**}	0.27^{***}
(β)	(0.09)	(0.10)	(0.06)	(0.07)	(0.08)	(0.06)
Fiscal Endow. × Price	−2.15	−1.79	0.81	-2.96^{***}	-2.74^{**}	-3.81^{***}
× ($t \geq 1999$) (δ)	(1.35)	(1.55)	(0.91)	(1.11)	(1.29)	(0.62)
$\beta - 0.3 \cdot \delta$	1.16^{**}	0.63	−0.29	1.45^{***}	1.00^{**}	1.42^{***}
	(0.47)	(0.52)	(0.32)	(0.38)	(0.44)	(0.23)
	Panel C: Controlling for Ever Split × Year Dummies					
Onshore Endow. × Price	0.48^{***}	0.13	−0.06	0.53^{***}	0.22^{***}	0.27^{***}
(β)	(0.10)	(0.10)	(0.06)	(0.07)	(0.08)	(0.05)
Fiscal Endow. × Price	−0.86	−0.60	1.29	-2.15^{**}	−2.01	-3.41^{***}
× ($t \geq 1999$) (δ)	(1.31)	(1.52)	(0.90)	(1.09)	(1.24)	(0.57)
$\beta - 0.3 \cdot \delta$	0.74	0.31	−0.44	1.18^{***}	0.82^{*}	1.30^{***}
	(0.46)	(0.52)	(0.32)	(0.38)	(0.42)	(0.21)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of the coefficients in Equation (1) for $K = 0$ after adding controls for district splits. The estimates in Panel A control for a dummy that equals one after the first district split and a dummy that equals one after the first split in the post-decentralization period (1999 and later). Panel B estimates control for the log number of districts contained within original district borders. Panel C estimates control for a dummy for ever splitting during 1975–2014 interacted with year dummies. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.14: Firm Outcomes: Dynamic Model, Robustness to Controlling for District Splits

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Controlling for Post-Split Dummies					
Onshore Endow. × Price	0.78***	0.20*	−0.01	0.79***	0.25***	0.35***
(β)	(0.11)	(0.11)	(0.07)	(0.08)	(0.09)	(0.07)
Fiscal Endow. × Price	−0.80	0.70	0.91	−1.70	−0.33	−3.92***
× ($t \geq 1999$) (δ)	(1.54)	(1.71)	(1.01)	(1.27)	(1.45)	(0.90)
$\beta - 0.3 \cdot \delta$	1.02*	−0.01	−0.28	1.30***	0.35	1.52***
	(0.54)	(0.58)	(0.36)	(0.43)	(0.49)	(0.33)
	Panel B: Controlling for Log Number of Districts					
Onshore Endow. × Price	0.86***	0.27**	0.01	0.85***	0.30***	0.37***
(β)	(0.11)	(0.11)	(0.07)	(0.09)	(0.10)	(0.07)
Fiscal Endow. × Price	−1.64	−0.37	0.48	−2.12	−1.01	−3.71***
× ($t \geq 1999$) (δ)	(1.59)	(1.76)	(1.06)	(1.30)	(1.50)	(0.84)
$\beta - 0.3 \cdot \delta$	1.36**	0.38	−0.13	1.49***	0.61	1.48***
	(0.56)	(0.60)	(0.38)	(0.45)	(0.51)	(0.30)
	Panel C: Controlling for Ever Split × Year Dummies					
Onshore Endow. × Price	0.81***	0.28***	−0.00	0.81***	0.32***	0.37***
(β)	(0.11)	(0.11)	(0.07)	(0.08)	(0.09)	(0.07)
Fiscal Endow. × Price	−0.55	0.72	0.95	−1.50	−0.36	−3.35***
× ($t \geq 1999$) (δ)	(1.56)	(1.74)	(1.04)	(1.31)	(1.50)	(0.83)
$\beta - 0.3 \cdot \delta$	0.97*	0.07	−0.29	1.26***	0.43	1.38***
	(0.55)	(0.60)	(0.37)	(0.45)	(0.51)	(0.30)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (1) for $K = 3$ after adding controls for district splits. The estimates in Panel A control for a dummy that equals one after the first district split and a dummy that equals one after the first split in the post-decentralization period (1999 and later). Panel B estimates control for the log number of districts contained within original district borders. Panel C estimates control for a dummy for ever splitting during 1975–2014 interacted with year dummies. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.15: Firm Outcomes: Robustness to Omitting Districts with Onshore Endowments

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Static Model ($K = 0$)					
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	2.73	6.61	5.34**	−2.61	1.30	−4.04***
	(3.73)	(4.88)	(2.10)	(3.07)	(3.84)	(1.37)
Observations	402,675	386,015	402,668	402,668	386,015	401,825
Plants	43,731	42,963	43,731	43,731	42,963	43,639
Districts	241	241	241	241	241	241
	Panel B: Dynamic Model ($K = 3$)					
Fiscal Endow. × Price × ($t \geq 1999$)	−1.76	1.86	4.38***	−6.14**	−2.49	−3.41**
	(3.81)	(3.67)	(1.65)	(3.13)	(3.24)	(1.41)
Lag 1	1.92	1.97	1.03	0.88	0.94	−0.47
	(2.72)	(3.29)	(0.72)	(2.69)	(3.07)	(1.68)
Lag 2	8.89**	10.10***	0.39	8.51***	9.72***	−1.81
	(3.55)	(3.65)	(1.05)	(3.14)	(3.14)	(2.82)
Lag 3	−4.92	−5.88**	−0.21	−4.71	−5.68**	1.59
	(3.40)	(2.78)	(1.18)	(3.01)	(2.60)	(2.68)
Sum of Lags 0–K (δ)	4.12	8.05	5.58**	−1.46	2.49	−4.11**
	(4.78)	(5.94)	(2.42)	(4.03)	(4.68)	(1.90)
Observations	402,675	386,015	402,668	402,668	386,015	401,825
Plants	43,731	42,963	43,731	43,731	42,963	43,639
Districts	241	241	241	241	241	241

Notes: This table presents fixed-effects estimates of $\{\delta_k\}$ in Equation (1), omitting districts with any onshore endowments. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.16: Firm Outcomes: Robustness to Alternative Specifications of Shocks

	Log(Outcome)					
	(1) Output	(2) Value Added	(3) Number of Workers	(4) Output per Worker	(5) Value Added per Worker	(6) Avg. Wage
	Panel A: Allowing for Time-Varying Effects of Onshore Booms					
Onshore Endow. × Price	0.50^{***}	0.16	0.03	0.47^{***}	0.18^{**}	0.18^{***}
$\times(t < 1999)$ (β^{pre})	(0.10)	(0.12)	(0.05)	(0.07)	(0.09)	(0.06)
Onshore Endow. × Price	0.36^{**}	−0.16	-0.25^{**}	0.61^{***}	0.10	0.42^{***}
$\times(t \geq 1999)$ (β^{post})	(0.16)	(0.18)	(0.11)	(0.14)	(0.15)	(0.09)
Fiscal Endow. × Price	−0.63	0.58	2.16^{**}	-2.79^{**}	−1.56	-4.66^{***}
$\times$ ($t \geq 1999$) (δ)	(1.58)	(1.87)	(1.06)	(1.37)	(1.62)	(0.76)
p-value: $\beta^{\text{pre}} = \beta^{\text{post}}$	0.451	0.137	0.015	0.347	0.651	0.027
	Panel B: Controlling for Offshore Booms					
Onshore Endow. × Price	0.46^{***}	0.06	−0.07	0.53^{***}	0.17^{*}	0.26^{***}
(β)	(0.09)	(0.10)	(0.06)	(0.08)	(0.09)	(0.06)
Offshore Endow. × Price	−0.55	-1.11^{*}	0.59	-1.14^{**}	-1.77^{***}	-0.71^{*}
	(0.55)	(0.60)	(0.37)	(0.46)	(0.57)	(0.37)
Fiscal Endow. × Price	−0.91	−0.10	1.04	-1.95^{*}	−1.24	-3.63^{***}
$\times$ ($t \geq 1999$) (δ)	(1.33)	(1.54)	(0.82)	(1.11)	(1.27)	(0.66)
$\beta - 0.3 \cdot \delta$	0.73	0.09	−0.38	1.11^{***}	0.54	1.35^{***}
	(0.46)	(0.53)	(0.30)	(0.39)	(0.44)	(0.25)
Observations	481,795	462,594	481,783	481,783	462,594	480,875
Plants	52,182	51,316	52,182	52,182	51,316	52,084
Districts	278	278	278	278	278	278

Notes: This table presents fixed-effects estimates of the coefficients in modified versions of Equation (1) for $K = 0$. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.17: Log Non-Oil GDP: Robustness to Starting Fiscal Shock in 2001

	Log Non-Oil GDP			
	(1)	(2)	(3)	(4)
Onshore Endow. × Price	−0.02	0.02	−0.00	0.00
	(0.26)	(0.22)	(0.23)	(0.29)
Lag 1		−0.05	−0.05	−0.04
		(0.10)	(0.08)	(0.08)
Lag 2			0.02	0.09
			(0.10)	(0.07)
Lag 3				−0.12
				(0.18)
Sum of Lags 0–K (β)	−0.02	−0.03	−0.03	−0.08
	(0.26)	(0.27)	(0.27)	(0.25)
Fiscal Endow. × Price	4.64^{***}	2.51^{***}	2.07^{***}	1.48^{*}
× ($t \geq 2001$)	(1.29)	(0.85)	(0.80)	(0.87)
Lag 1		2.38^{***}	1.44^{***}	1.19^{***}
		(0.65)	(0.42)	(0.40)
Lag 2			1.60^{***}	0.77^{**}
			(0.62)	(0.39)
Lag 3				2.06^{**}
				(0.88)
Sum of Lags 0–K (δ)	4.64^{***}	4.89^{***}	5.12^{***}	5.50^{***}
	(1.29)	(1.35)	(1.41)	(1.47)
$\beta - 0.3 \cdot \delta$	-1.41^{**}	-1.50^{**}	-1.57^{**}	-1.73^{***}
	(0.59)	(0.62)	(0.64)	(0.65)
Observations	6,041	6,041	6,041	6,041
Districts	288	288	288	288

Notes: This table presents fixed-effects estimates of the coefficients in Equation (3) for $K \in \{0, 1, 2, 3\}$, measuring the fiscal shock as $\boldsymbol{P}_t' \boldsymbol{F}_d \cdot 1(t \geq 2001)$. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.18: Log Non-Oil GDP: Robustness to Omitting High-Leverage Districts

	Log Non-Oil GDP			
	(1) All Districts	(2) Omitting Kutai	(3) Omitting Bengkalis	(4) Omitting Kutai and Bengkalis
Onshore Endow. × Price	−0.11	−0.17	−0.74	−1.50
	(0.30)	(0.32)	(1.21)	(1.71)
Lag 1	0.10	0.07	0.17	0.00
	(0.10)	(0.08)	(0.39)	(0.42)
Lag 2	0.06	0.08	0.15	0.27
	(0.07)	(0.07)	(0.27)	(0.38)
Lag 3	−0.09	−0.03	0.31	0.79
	(0.20)	(0.22)	(0.87)	(1.26)
Sum of Lags 0–K (β)	−0.03	−0.05	−0.11	−0.44
	(0.24)	(0.24)	(1.12)	(1.36)
Fiscal Endow. × Price	2.36^{***}	2.68^{***}	2.62^{***}	2.95^{***}
× ($t \geq 1999$)	(0.77)	(0.87)	(0.90)	(0.88)
Lag 1	0.24	0.48	0.20	0.50
	(0.59)	(0.73)	(0.72)	(0.77)
Lag 2	0.93^{**}	0.91^{**}	0.96^{**}	0.92^{**}
	(0.36)	(0.40)	(0.42)	(0.41)
Lag 3	2.12^{**}	1.49^{*}	1.98^{**}	1.35
	(0.86)	(0.77)	(0.89)	(0.85)
Sum of Lags 0–K (δ)	5.64^{***}	5.56^{***}	5.76^{***}	5.73^{***}
	(1.56)	(1.74)	(1.69)	(1.75)
$\beta - 0.3 \cdot \delta$	-1.72^{***}	-1.71^{**}	−1.84	−2.16
	(0.67)	(0.72)	(1.45)	(1.65)
Observations	6,041	6,020	6,020	5,999
Districts	288	287	287	286

Notes: This table presents fixed-effects estimates of the coefficients in Equation (3) for $K = 3$ and different samples of districts. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.19: Log Non-Oil GDP: Only Using Fields Discovered by 1993

	Log Non-Oil GDP			
	(1) All Districts	(2) Omitting Kutai	(3) Omitting Bengkalis	(4) Omitting Kutai and Bengkalis
Onshore Endow. × Price	−0.11	−0.17	−0.75	−1.60
	(0.31)	(0.32)	(1.32)	(1.92)
Lag 1	0.10	0.06	0.15	−0.06
	(0.09)	(0.08)	(0.42)	(0.47)
Lag 2	0.06	0.07	0.10	0.20
	(0.07)	(0.07)	(0.29)	(0.43)
Lag 3	−0.10	−0.04	0.22	0.70
	(0.20)	(0.21)	(0.93)	(1.42)
Sum of Lags 0–K (β)	−0.06	−0.07	−0.28	−0.77
	(0.24)	(0.25)	(1.21)	(1.49)
Fiscal Endow. × Price	2.37^{***}	2.69^{***}	2.64^{***}	3.00^{***}
× ($t \geq 1999$)	(0.77)	(0.87)	(0.93)	(0.90)
Lag 1	0.24	0.48	0.21	0.52
	(0.60)	(0.73)	(0.73)	(0.77)
Lag 2	0.94^{**}	0.92^{**}	0.98^{**}	0.94^{**}
	(0.37)	(0.40)	(0.44)	(0.43)
Lag 3	2.14^{**}	1.51^{*}	2.05^{**}	1.40
	(0.87)	(0.77)	(0.90)	(0.87)
Sum of Lags 0–K (δ)	5.69^{***}	5.61^{***}	5.87^{***}	5.86^{***}
	(1.58)	(1.76)	(1.72)	(1.78)
$\beta - 0.3 \cdot \delta$	-1.77^{***}	-1.76^{**}	−2.04	−2.53
	(0.67)	(0.73)	(1.55)	(1.80)
Observations	6,041	6,020	6,020	5,999
Districts	288	287	287	286

Notes: This table presents fixed-effects estimates of the coefficients in Equation (3) for $K = 3$ and different samples of districts. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Endowments are based on oil and gas fields discovered by 1993. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.20: Log Non-Oil GDP: Robustness to Changing Covariate Set

	Log Non-Oil GDP			
	(1) All Districts	(2) Omitting Kutai	(3) Omitting Bengkalis	(4) Omitting Kutai and Bengkalis
	Panel A: Controlling for Additional Demographic Covariates			
Onshore Endow. × Price (β)	−0.04	−0.06	0.18	−0.24
	(0.25)	(0.24)	(1.16)	(1.31)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	4.99***	4.67**	4.95***	4.82**
	(1.62)	(1.88)	(1.80)	(1.91)
$\beta - 0.3 \cdot \delta$	−1.54**	−1.46*	−1.31	−1.68
	(0.69)	(0.76)	(1.53)	(1.65)
	Panel B: Controlling for Central Expenditure Proxies			
Onshore Endow. × Price (β)	0.09	0.09	−0.32	−0.49
	(0.31)	(0.30)	(1.12)	(1.49)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	5.03***	5.10***	5.33***	5.33***
	(1.70)	(1.91)	(1.84)	(1.92)
$\beta - 0.3 \cdot \delta$	−1.42*	−1.44*	−1.92	−2.09
	(0.76)	(0.80)	(1.52)	(1.79)
	Panel C: Controlling for Additional Covariates, Central Expenditure Proxies			
Onshore Endow. × Price (β)	0.04	0.03	−0.08	−0.37
	(0.30)	(0.29)	(1.12)	(1.42)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	4.67***	4.52**	4.84***	4.75**
	(1.64)	(1.93)	(1.83)	(1.95)
$\beta - 0.3 \cdot \delta$	−1.36*	−1.33*	−1.53	−1.79
	(0.74)	(0.80)	(1.53)	(1.74)
	Panel D: Omitting All Covariates			
Onshore Endow. × Price (β)	0.15	0.15	0.12	0.17
	(0.22)	(0.22)	(0.92)	(1.33)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	4.76***	4.89***	4.86***	4.92***
	(1.26)	(1.50)	(1.48)	(1.55)
$\beta - 0.3 \cdot \delta$	−1.28**	−1.32**	−1.33	−1.31
	(0.58)	(0.63)	(1.29)	(1.59)
Observations	6,041	6,020	6,020	5,999
Districts	288	287	287	286

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (3) for $K = 3$ and different samples of districts, after adding baseline covariates interacted with year effects. The estimates in Panel A control for the baseline characteristics in Appendix Table A.4, Panel B estimates control for the central expenditure proxies in Appendix Table A.4, Panel C estimates control for both sets of variables, and Panel D estimates omit all covariates. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.21: Log Non-Oil GDP: Robustness to Controlling for Poverty

	Log Non-Oil GDP			
	(1) All Districts	(2) Omitting Kutai	(3) Omitting Bengkalis	(4) Omitting Kutai and Bengkalis
	Panel A: Controlling for Poverty Rate in 1999			
Onshore Endow. × Price	−0.04	−0.06	−0.05	−0.39
(β)	(0.24)	(0.24)	(1.12)	(1.37)
Fiscal Endow. × Price	5.44***	5.32***	5.52***	5.47***
× ($t \geq 1999$) (δ)	(1.55)	(1.72)	(1.68)	(1.75)
$\beta - 0.3 \cdot \delta$	−1.67**	−1.65**	−1.70	−2.03
	(0.66)	(0.72)	(1.46)	(1.66)
Observations	6,041	6,020	6,020	5,999
Districts	288	287	287	286
	Panel B: Omitting Poorest 5 Percent of Districts			
Onshore Endow. × Price	−0.07	−0.05	−0.66	−0.68
(β)	(0.25)	(0.24)	(0.90)	(1.33)
Fiscal Endow. × Price	5.26***	5.41***	5.61***	5.61***
× ($t \geq 1999$) (δ)	(1.48)	(1.64)	(1.61)	(1.64)
$\beta - 0.3 \cdot \delta$	−1.64**	−1.67**	−2.34*	−2.36
	(0.65)	(0.68)	(1.26)	(1.60)
Observations	5,726	5,705	5,705	5,684
Districts	273	272	272	271
	Panel C: Omitting Poorest 10 Percent of Districts			
Onshore Endow. × Price	−0.05	−0.03	−0.61	−0.61
(β)	(0.25)	(0.24)	(0.91)	(1.35)
Fiscal Endow. × Price	5.25***	5.41***	5.58***	5.60***
× ($t \geq 1999$) (δ)	(1.48)	(1.64)	(1.61)	(1.65)
$\beta - 0.3 \cdot \delta$	−1.63**	−1.65**	−2.29*	−2.29
	(0.65)	(0.68)	(1.27)	(1.62)
Observations	5,436	5,415	5,415	5,394
Districts	259	258	258	257
	Panel D: Omitting Poorest 25 Percent of Districts			
Onshore Endow. × Price	0.00	0.02	−0.41	−0.61
(β)	(0.24)	(0.24)	(1.06)	(1.61)
Fiscal Endow. × Price	5.21***	5.14***	5.52***	5.45***
× ($t \geq 1999$) (δ)	(1.54)	(1.70)	(1.71)	(1.75)
$\beta - 0.3 \cdot \delta$	−1.56**	−1.52**	−2.06	−2.25
	(0.67)	(0.71)	(1.43)	(1.92)
Observations	4,512	4,491	4,491	4,470
Districts	215	214	214	213

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (3) for $K = 3$ and different samples of districts, after adding poverty in 1999 interacted with year effects (Panel A) or omitting high-poverty districts (Panels B–D). The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.22: Log Non-Oil GDP: Robustness to Controlling for District Splits

	Log Non-Oil GDP			
	(1) All Districts	(2) Omitting Kutai	(3) Omitting Bengkalis	(4) Omitting Kutai and Bengkalis
	Panel A: Controlling for Post-Split Dummies			
Onshore Endow. × Price (β)	−0.02	−0.03	−0.07	−0.38
	(0.25)	(0.24)	(1.13)	(1.38)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	5.67***	5.60***	5.79***	5.76***
	(1.57)	(1.76)	(1.70)	(1.78)
$\beta - 0.3 \cdot \delta$	−1.72**	−1.71**	−1.81	−2.11
	(0.67)	(0.73)	(1.46)	(1.67)
	Panel B: Controlling for Controlling for Log Number of Districts			
Onshore Endow. × Price (β)	0.05	0.05	−0.03	−0.18
	(0.24)	(0.23)	(1.11)	(1.42)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	5.63***	5.63***	5.80***	5.80***
	(1.57)	(1.73)	(1.70)	(1.76)
$\beta - 0.3 \cdot \delta$	−1.64**	−1.64**	−1.76	−1.92
	(0.66)	(0.70)	(1.44)	(1.70)
	Panel C: Controlling for Ever Split × Year Dummies			
Onshore Endow. × Price (β)	−0.02	−0.04	−0.10	−0.44
	(0.25)	(0.25)	(1.15)	(1.39)
Fiscal Endow. × Price × ($t \geq 1999$) (δ)	5.50***	5.42***	5.62***	5.59***
	(1.61)	(1.80)	(1.75)	(1.82)
$\beta - 0.3 \cdot \delta$	−1.68**	−1.67**	−1.79	−2.12
	(0.69)	(0.75)	(1.50)	(1.70)
Observations	6,041	6,020	6,020	5,999
Districts	288	287	287	286

Notes: This table presents fixed-effects estimates of $\beta = \sum_{k=0}^{K} \beta_k$ and $\delta = \sum_{k=0}^{K} \delta_k$ in Equation (3) for $K = 3$ and different samples of districts after adding controls for district splits. The estimates in Panel A control for a dummy that equals one after the first district split and a dummy that equals one after the first split in the post-decentralization period (1999 and later). Panel B estimates control for the log number of districts contained within original district borders. Panel C estimates control for a dummy for ever splitting during 1975–2014 interacted with year dummies. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.23: Log Non-Oil GDP: Robustness to Omitting Districts with Onshore Endowments

	Log Non-Oil GDP			
	(1)	(2)	(3)	(4)
Fiscal Endow. × Price × ($t \geq 2001$)	5.46**	3.34***	3.10***	2.87***
	(2.30)	(1.16)	(1.01)	(0.88)
Lag 1		2.34*	1.53*	1.54*
		(1.37)	(0.80)	(0.80)
Lag 2			1.20	0.81
			(1.05)	(0.59)
Lag 3				0.74
				(1.14)
Sum of Lags 0–K (δ)	5.46**	5.68**	5.83**	5.96**
	(2.30)	(2.42)	(2.54)	(2.69)
Observations	5,267	5,267	5,267	5,267
Districts	251	251	251	251

Notes: This table presents fixed-effects estimates of $\{\delta_k\}$ Equation (3) for $K \in \{0,1,2,3\}$, omitting districts with any onshore endowments. The sample covers 1993–2013. Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1993 population. Each coefficient therefore represents the percentage change in the outcome due to an increase in the value of the endowment by USD 10,000 per capita. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.24: Fiscal Multipliers: Robustness to Omitting High-Leverage Districts

	Cumulative Multiplier after h Years			
	$h=0$	$h=1$	$h=2$	$h=3$
	(1)	(2)	(3)	(4)
	Panel A: Omitting Kutai			
Multiplier (δ_h)	1.11**	1.32*	1.49*	1.58**
	(0.56)	(0.71)	(0.76)	(0.80)
AR p-value: $\delta_h = 1$	0.829	0.602	0.424	0.342
AR p-value: $\delta_h = 0$	0.040	0.044	0.040	0.042
First-stage F-statistic	5.6	7.8	6.0	5.3
Observations	5,247	4,938	4,630	4,323
Districts	282	282	282	282
	Panel B: Omitting Bengkalis			
Multiplier (δ_h)	1.16**	1.35*	1.50**	1.57**
	(0.58)	(0.70)	(0.75)	(0.78)
AR p-value: $\delta_h = 1$	0.767	0.564	0.401	0.339
AR p-value: $\delta_h = 0$	0.028	0.033	0.032	0.037
First-stage F-statistic	6.0	8.4	6.5	5.6
Observations	5,244	4,934	4,625	4,317
Districts	282	282	282	282
	Panel C: Omitting Kutai and Bengkalis			
Multiplier (δ_h)	1.09*	1.30*	1.49**	1.60**
	(0.56)	(0.69)	(0.76)	(0.81)
AR p-value: $\delta_h = 1$	0.862	0.621	0.423	0.325
AR p-value: $\delta_h = 0$	0.042	0.042	0.038	0.038
First-stage F-statistic	5.9	8.4	6.3	5.4
Observations	5,228	4,920	4,613	4,307
Districts	281	281	281	281

Notes: This table presents instrumental-variables estimates of δ_h in Equation (6). The instrument is $\boldsymbol{P}_t'\boldsymbol{F}_d \cdot 1(t \geq 1999)$, expressed as a cumulative change over h years relative to 1998 non-oil GDP. All regressions control for $\boldsymbol{P}_t'\boldsymbol{E}_d$, expressed using the same transformation. Reported p-values are from the Anderson and Rubin (1949) test, which is robust to the presence of weak instruments. The first-stage F-statistic is the Kleibergen and Paap (2006) *rk* statistic. The sample covers 1994–2013. The five districts in Jakarta are missing, as these districts are managed by the province. Standard errors, reported in parentheses, are clustered at the level of 1993 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.25: Association Between Shocks and District Splitting

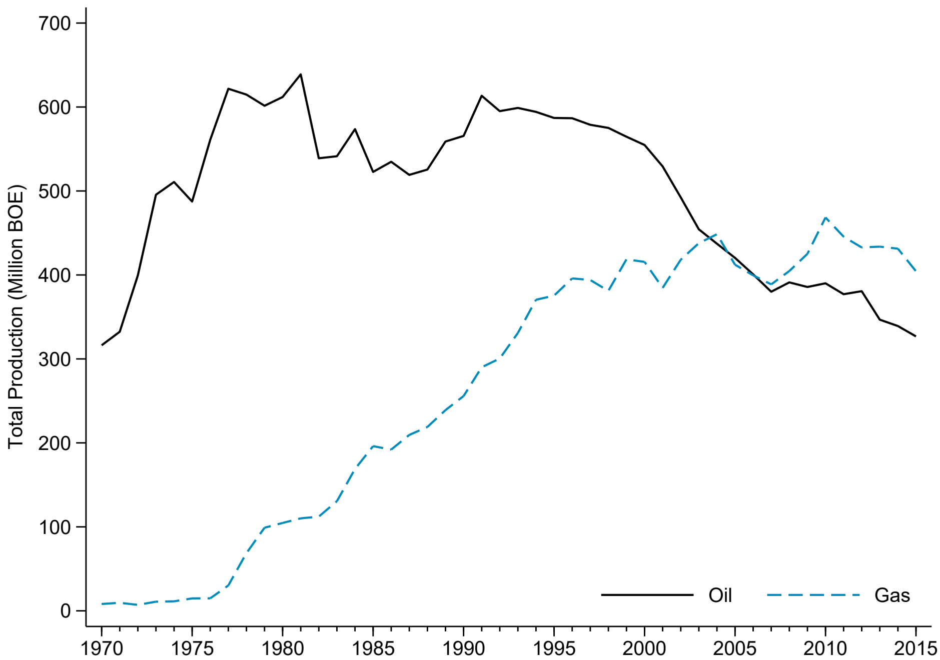
	Cross-Sectional Model		Hazard Model
	(1) Ever Split	(2) Ever Split Post-1999	(3) First Split Post-1999
Onshore Endow. × Price	0.12	0.31	1.03
	(0.71)	(0.73)	(3.24)
Lag 1			−5.14
			(5.41)
Lag 2			4.33
			(3.87)
Lag 3			0.77
			(4.57)
Sum of Lags 0–K (β)	0.12	0.31	0.99
	(0.71)	(0.73)	(0.69)
Fiscal Endow. × Price	2.56	1.23	1.05
× ($t \geq 1999$)	(1.83)	(1.36)	(3.00)
Lag 1			0.17
			(4.44)
Lag 2			1.10
			(6.53)
Lag 3			−1.46
			(6.96)
Sum of Lags 0–K (δ)	2.56	1.23	0.86
	(1.83)	(1.36)	(1.00)
Oucome Mean	0.389	0.368	0.010
p-value: $\beta = 0.3 \cdot \delta$	0.550	0.949	0.351
Observations	271	271	1,105
Districts	271	271	280

Notes: This table reports average marginal effects (AMEs) and sums of AMEs from probit regressions. The estimates in columns 1–2 use the cross-section of districts in the year 2000 and control for region effects. (Nine districts are missing, because all districts in Papua split at some point, so the Papua dummy perfectly predicts the outcome.) The estimates in column 3 are from a hazard model applied to panel data, controlling for region-by-year effects. All regressions control for the baseline covariates included in Equation (1). *Ever Split* is an indicator equal to one if the district experienced a split during 1975–2014, while *Ever Split Post-1999* is an indicator equal to one if the district experienced a split during 1999–2014. *First Split Post-1999* equals zero in years prior to the first split during 1999–2014, equals one in the year the district first split during that period, and is set to missing thereafter. The split year is defined as the first full calendar year following the passage of legislation creating the new district(s). Each endowment × price variable is measured in constant 2010 USD millions per capita based on 1980 population. Standard errors, reported in parentheses, are robust to clustering at the level of 1975 district borders. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

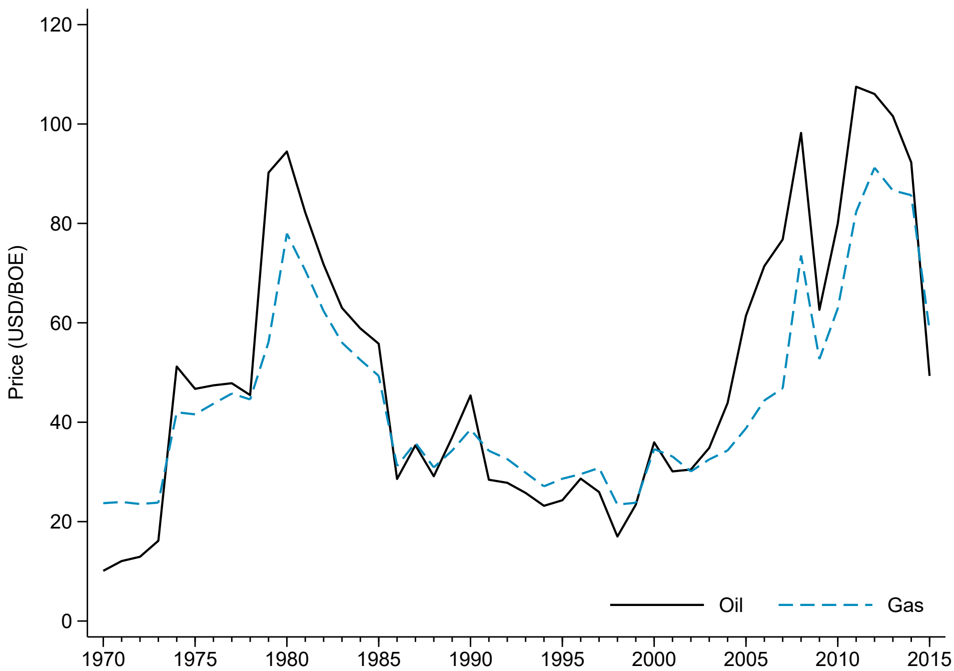
A.5 Additional Results: Figures

Figure A.3: Oil and Gas Production and Prices

(a) Production



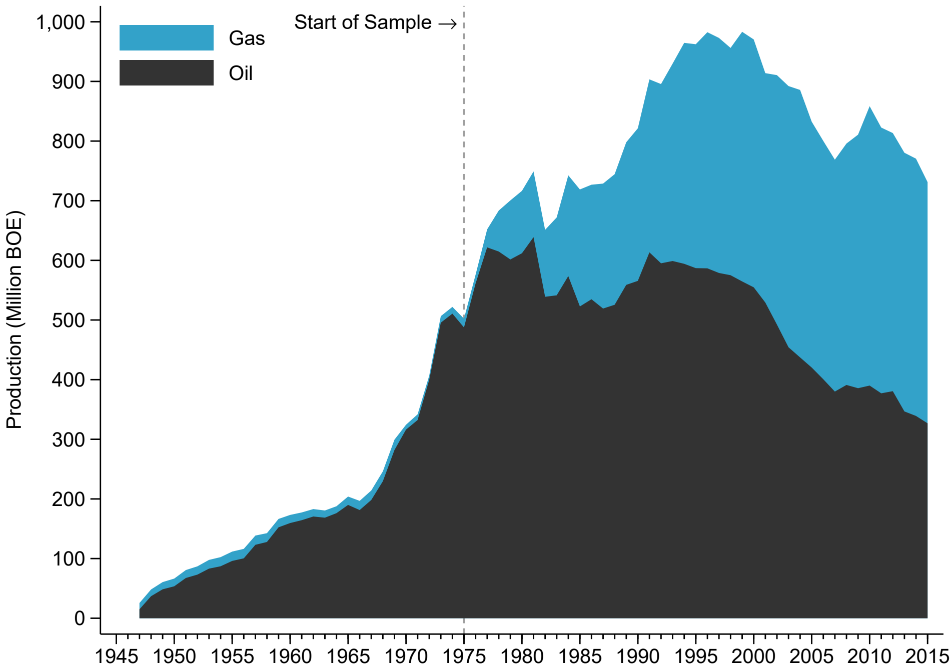
(b) Prices



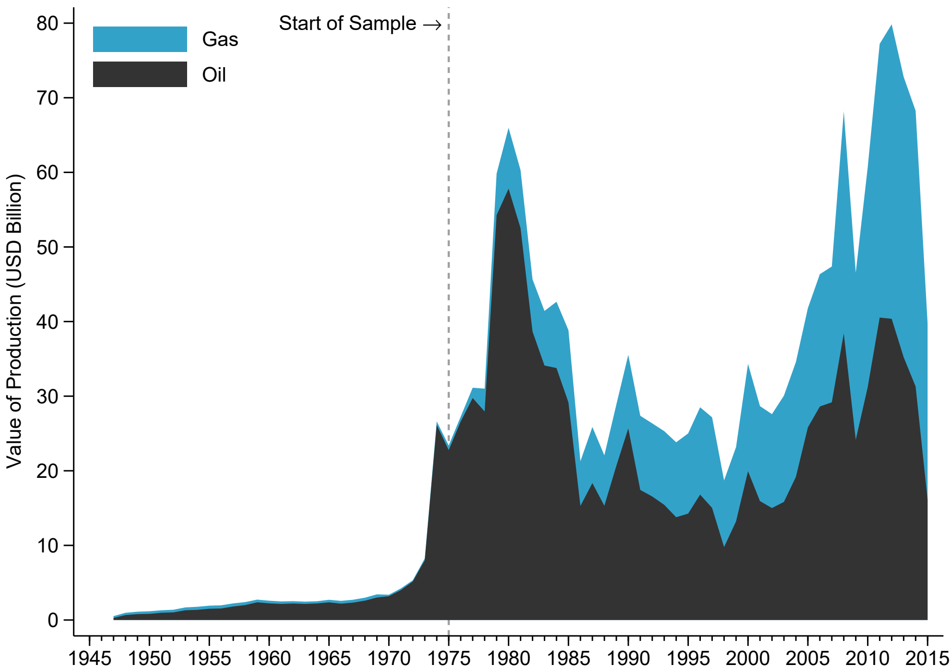
Notes: Prices are expressed in constant 2010 USD.

Figure A.4: Historical Oil and Gas Production

(a) Production

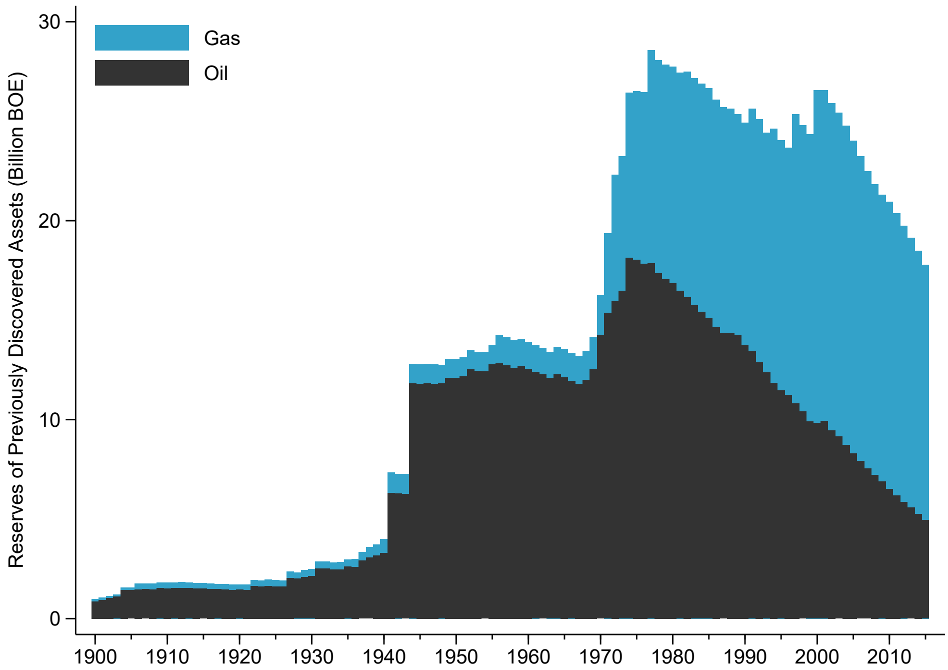


(b) Value of Production



Notes: In Panel (b) production is expressed in millions of barrels of oil equivalent. In Panel (a) the value of production is expressed in constant 2010 USD billions. The production data are missing prior to independence in 1947.

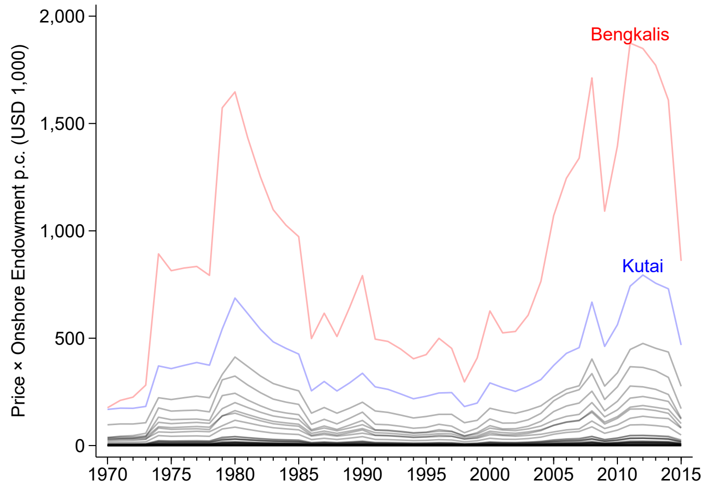
Figure A.5: Historical Oil and Gas Reserves



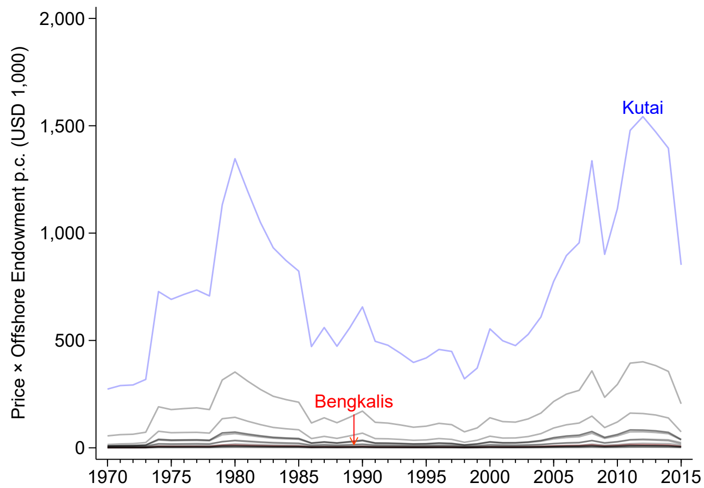
Notes: Reserves are expressed in billions of barrels of oil equivalent.

Figure A.6: Onshore, Offshore, and Fiscal Shocks by District

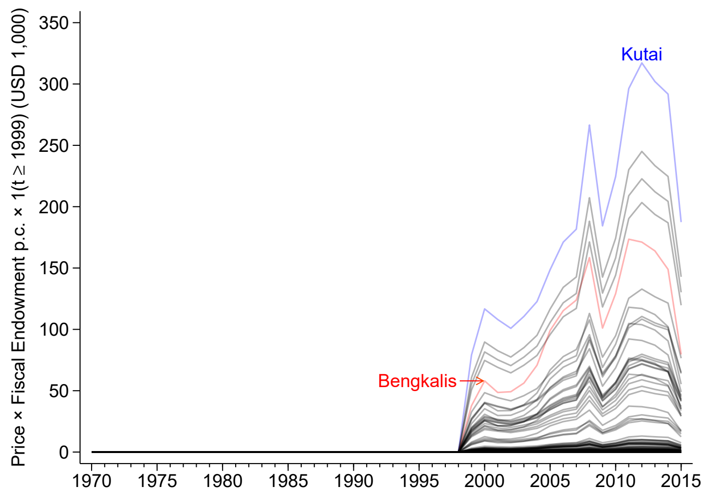
(a) Onshore Shocks



(b) Offshore Shocks



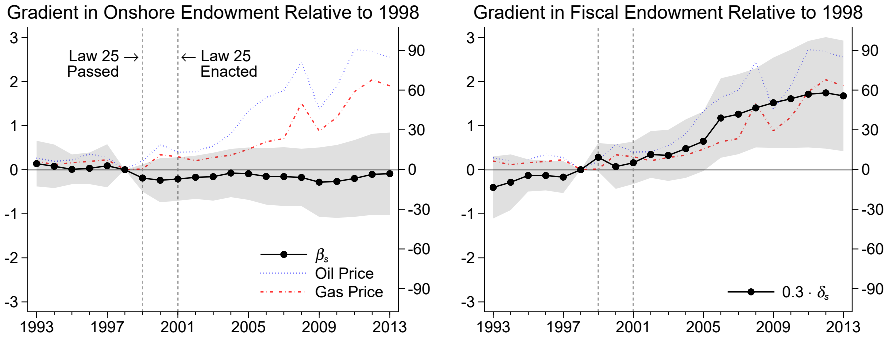
(c) Fiscal Shocks



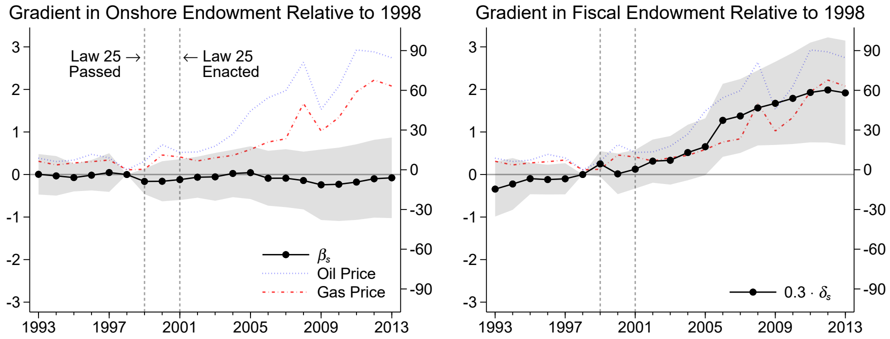
Notes: Panel (a) plots the onshore shock, $\boldsymbol{P}_t'\boldsymbol{E}_d$, separately for each district. Panel (b) plots the offshore shock, while Panel (c) plots the fiscal shock, $\boldsymbol{P}_t'\boldsymbol{F}_d \cdot 1(t \geq 1999)$. Shocks are expressed in constant 2010 USD thousands per capita based on 1980 population.

Figure A.7: Event Study Robustness: Log Non-Oil GDP

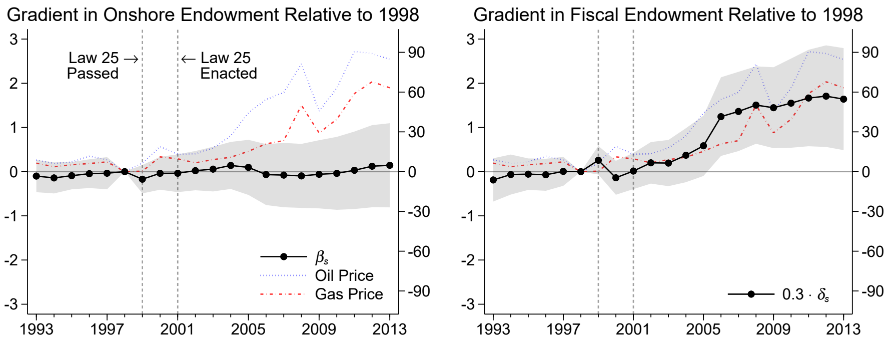
(a) Controlling for Additional Demographic Covariates



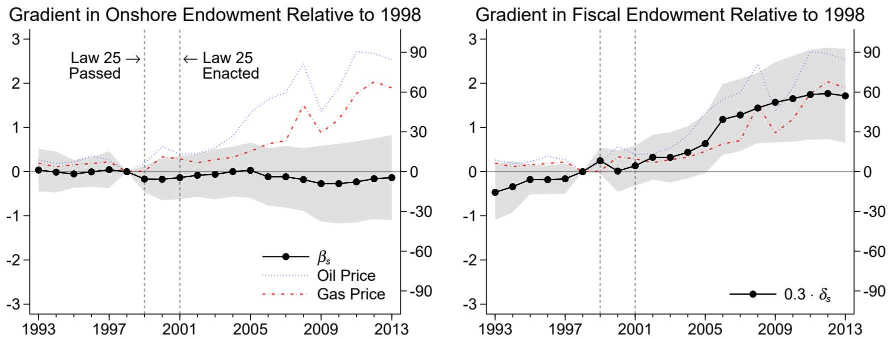
(b) Drop Kota Batam (Administrative Reclassification)



(c) Drop Kabupaten Berau (Several Coal Mine Openings)

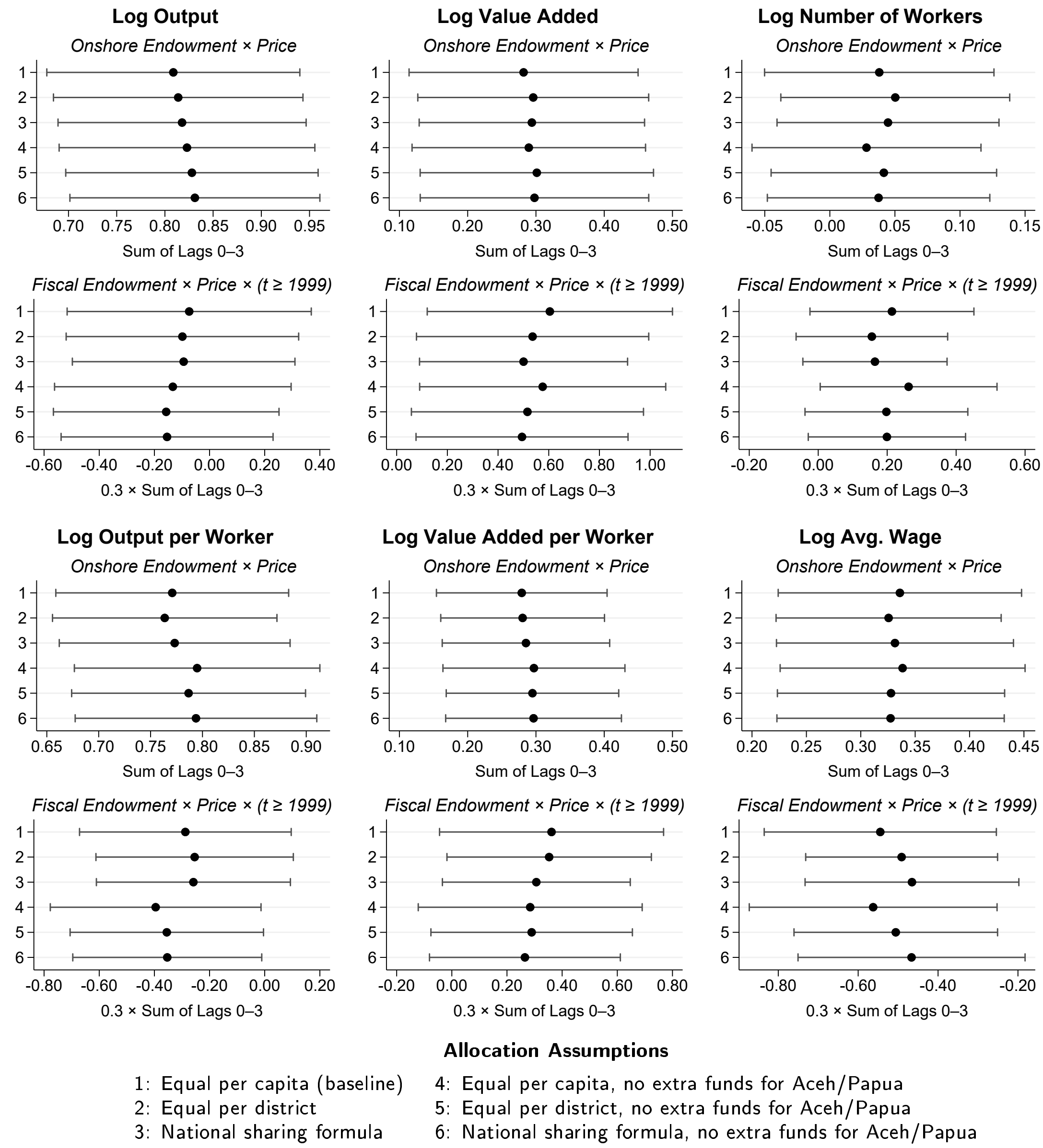


(d) Drop Kabupaten Fak-Fak (Grasberg Gold Mine Opening)



Notes: This figure plots estimates and 95-percent confidence intervals for $\{\beta_s\}$ and $\{0.3 \cdot \delta_s\}$ in Equation (4) (left axis). Vertical dashed lines indicate the years the decentralization law was passed and enacted. The estimates in Panel A control for all baseline characteristics in Appendix Table A.4 interacted with year effects. Panels B–D drop districts that experienced spikes in non-oil GDP due to causes unrelated to oil or gas. Panel B drops Kota Batam, which was converted from an administrative municipality to an autonomous municipality in 1999. Panel C drops Kabupaten Berau, which saw major coal mine openings in 1992, 1995, and 2001. Panel D drops Kabupaten Fak-Fak, which experienced high non-oil GDP volatility due to the massive Grasberg gold and copper mine (located in child district Mimika). Oil and gas prices are expressed in deviations from their 1998 values, in constant 2010 USD per barrel of oil equivalent (right axis). Confidence intervals are robust to clustering at the level of 1993 district borders.

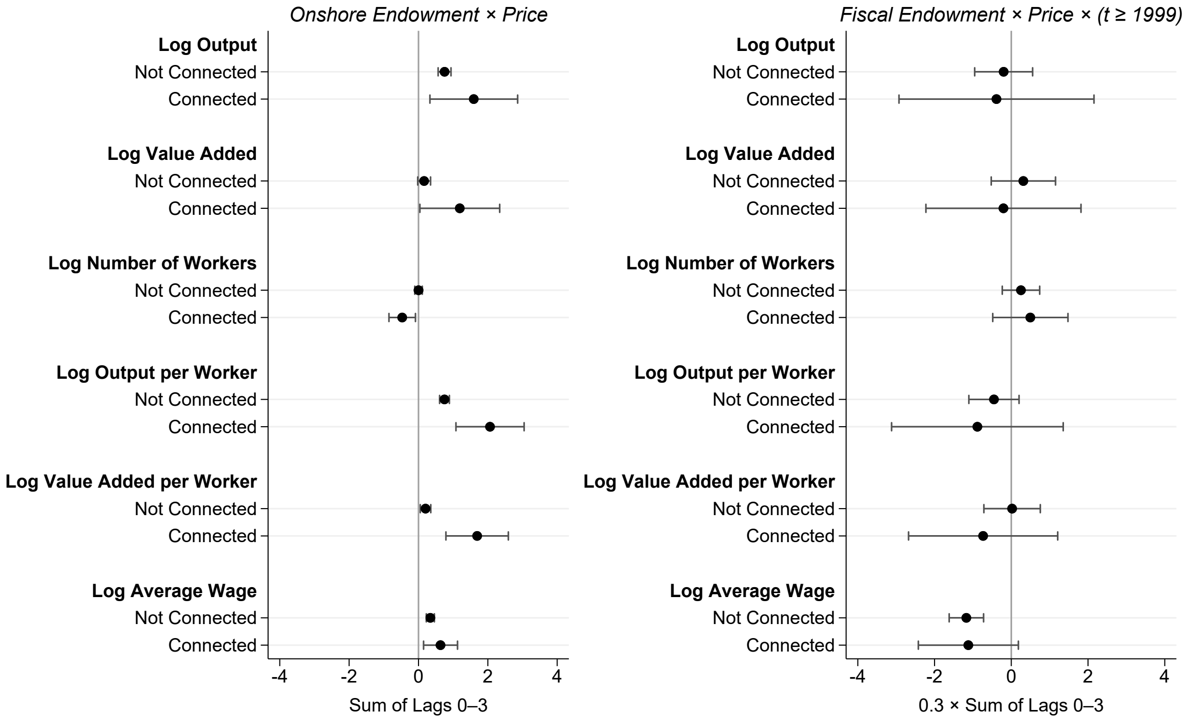
Figure A.8: Varying Assumptions about How Provincial Revenue is Allocated to Districts



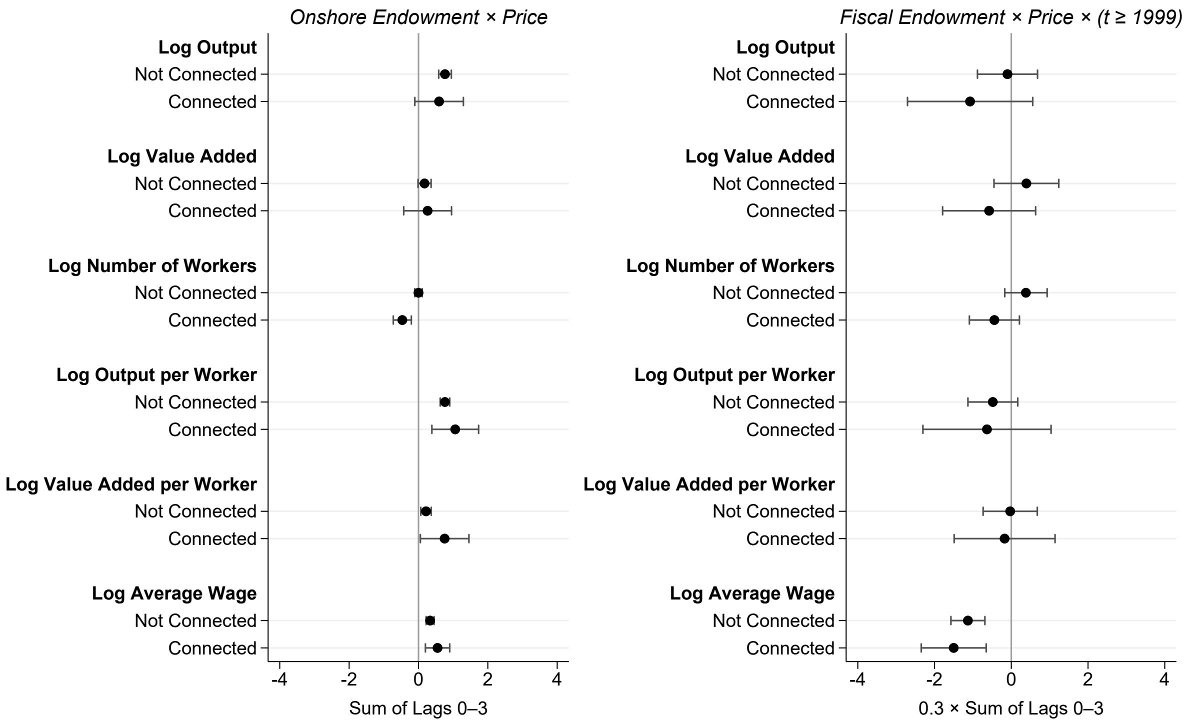
Notes: This figure plots fixed-effects estimates and 95-percent confidence intervals for $\sum_{k=0}^{3}\beta_k$ and $0.3\cdot\sum_{k=0}^{3}\delta_k$ in Equation (1), using six versions of the fiscal endowment variable. Each employs a different assumption about how provincial revenue is distributed across districts. The first three assumptions are: (1) equal per capita amounts (baseline), (2) equal amounts to each district, and (3) greater amounts to producing districts following the national government's sharing formula. Assumptions 4–6 mirror assumptions 1–3, except they apply the same sharing rule to Aceh, Papua, and Papua Barat that is used in the rest of the country, rather than allocating extra revenue to these regions. The fiscal shock coefficients are scaled by 0.3 to facilitate comparison of the effects of typical onshore and fiscal shocks. Confidence intervals are robust to clustering at the level of 1975 district borders.

Figure A.9: Heterogeneous Effects by Oil-Industry Connectedness

(a) Baseline Measure of Oil-Connectedness

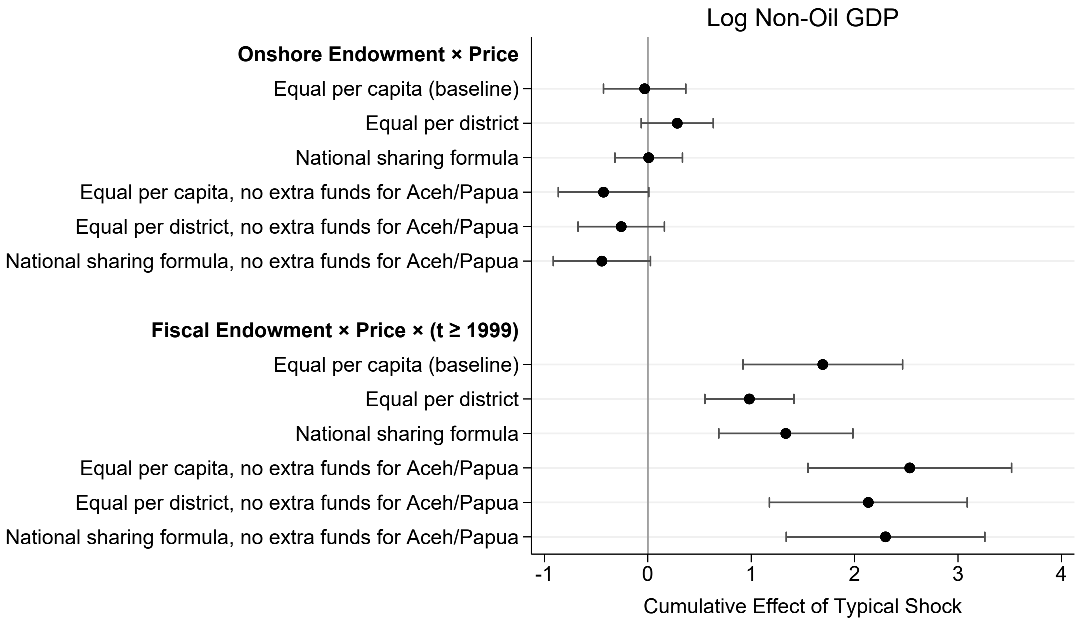


(b) Measure Adding Rubber and Plastic Industry



Notes: This figure plots estimates and 95-percent confidence intervals for $\sum_{k=0}^{3}\beta_k^N$, $\sum_{k=0}^{3}\beta_k^C$, $0.3\cdot\sum_{k=0}^{3}\delta_k^N$, and $0.3\cdot\sum_{k=0}^{3}\delta_k^C$ in Equation (5). In Panel (a) we define oil-connected industries as sectors 23 (fuel, oil and coal refining, petroleum products, and nuclear fuel), 24 (chemicals and chemical products), 27 (basic metal), 28 (metal goods, not machinery and equipment), and 29 (machinery and equipment). In Panel (b) we add sector 25 (rubber and plastic products industry) to the set of oil-connected industries. (See Appendix Table A.1.)

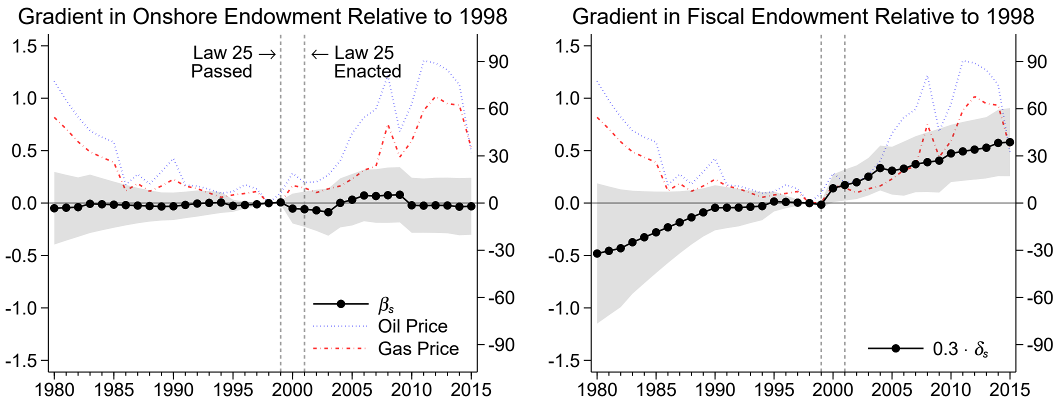
Figure A.10: Varying Assumptions about How Provincial Revenue is Allocated to Districts



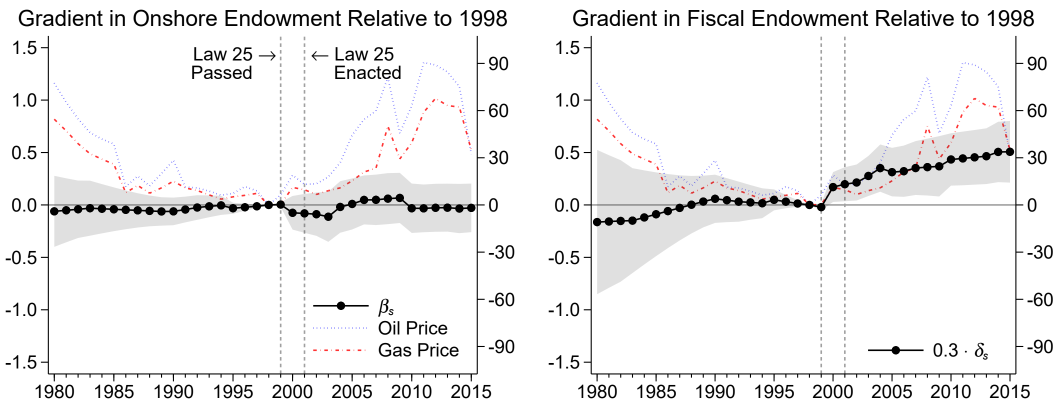
Notes: This figure plots fixed-effects estimates and 95-percent confidence intervals for $\sum_{k=0}^{3}\beta_k$ and $0.3\cdot\sum_{k=0}^{3}\delta_k$ in Equation (3), using six versions of the fiscal endowment variable. Each employs a different assumption about how provincial revenue is distributed across districts. The first three assumptions are: (1) equal per capita amounts (baseline), (2) equal amounts to each district, and (3) greater amounts to producing districts following the national government's sharing formula. Assumptions 4–6 mirror assumptions 1–3, except they apply the same sharing rule to Aceh, Papua, and Papua Barat that is used in the rest of the country, rather than allocating extra revenue to these regions. The fiscal shock coefficients are scaled by 0.3 to facilitate comparison of the effects of typical onshore and fiscal shocks. Confidence intervals are robust to clustering at the level of 1993 district borders.

Figure A.11: Event Study: Log Population

(a) Baseline Specification



(b) Controlling for Additional Demographic Covariates



Notes: This figure plots estimates and 95-percent confidence intervals for $\{\beta_s\}$ and $\{0.3 \cdot \delta_s\}$ in Equation (4) (left axis). Vertical dashed lines indicate the years the decentralization law was passed and enacted. Oil and gas prices are expressed in deviations from their 1998 values, in constant 2010 USD per barrel of oil equivalent (right axis). Confidence intervals are robust to clustering at the level of 1975 district borders.

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