Background: There have been increasing interests on studying the consequences of trade-related policies on individual or household welfare (Borusyak and Jaravel, 2018; Faber, 2014; Edmonds and Pavcnik, 2005; Chen and Ravallion, 2004). Although the aggregate impacts on communities are equally important, this topic remains relatively underexplored (Feler and Senses, 2017), especially the role of government in mitigating the risk of exposure to trade policies in developing countries.

This paper: I investigate whether income shocks driven by an increase in rice price affect the distribution of local policies as measured by public good provision and development projects across Indonesian villages.

Data: Census (village, agriculture, and population) and rice suitability at village level. Period: 2000-2014.

Method: Combine plausible exogenous variations in rice price at province over time and cross-sectional variation in rice suitability at village level.

$$Y_{vt} = \beta_0 + \beta_1 Price_{vpt} + \beta_2 Price_{vpt} \times RiceSuit_v + \theta X_{vt} + \gamma_v + \delta_t + \sigma_d t + \epsilon_{vt}$$

Key coefficient β_2 captures differential effect of rice price change which translates to aggregate income shock. Include village and year fixed-effects and district-specific time trends. Standard errors clustered at district level. Analysis at village-year level.

Findings:

- Rice price hike has larger positive aggregate effects on income for villages with higher rice suitability, as indicated by increased nighttime lights intensity and lower demand for public services for the poor (e.g., health insurance).
- Income shocks have negative relationship with probability of having health facilities, but positive for public schools. No evidence that income shocks have any effect on the number of *any* public goods. Suggesting redistribution of public goods.

- Income shocks increase number of development projects.
- Villages have relatively more controls over development projects than public goods provision, which are largely determined by the district government.
- Heterogeneity treatment analysis reveals that the main results appear to be driven by less ethnically diverse, more unequal, and rural villages.

Income Shock, Heterogeneity, and Local Policy Responses: Evidence from Indonesia

Armand Sim *

PRELIMINARY AND INCOMPLETE: PLEASE DO NOT CITE OR CIRCULATE

Abstract

This paper investigates the role of government in mitigating the risk of exposure to trade policies through local policy responses in Indonesian villages. I study the consequences of sudden and major rice import restriction that imposes sharp increase and considerable variation in domestic rice price across provinces. I combine variation in rice price with geographic variation in rice suitability as an indirect measure of income shock at village level. I find some evidence that rice price hike has larger positive aggregate effects on income for villages with higher rice suitability, as indicated by increased nighttime lights intensity and lower demand for public services for the poor (e.g., health insurance). I find that income shocks: 1) reduce probability of having health facilities but increase probability for public schools, 2) have no effect on changes in the intensive margins of *any* public goods, and 3) increase the number of development projects. Overall results suggest that adverse income effects improve the distribution of local policies. Heterogeneity analysis reveals that the main results appear to be driven by less ethnically diverse, more unequal, and rural villages.

Keywords: income shock, trade policy, import restriction, public goods, development project.

JEL Classification: H4,H7,O1,O2,R1.

*Dyson School of Applied Economics and Management, Cornell University: aas354@cornell.edu

1 Introduction

There have been increasing interests on studying the consequences of trade-related policies on individual or household welfare (Borusyak and Jaravel, 2018; Faber, 2014; Edmonds and Pavcnik, 2005; Chen and Ravallion, 2004). Although the aggregate impacts on communities are equally important, this topic remains relatively underexplored (Feler and Senses, 2017), especially the role of government in mitigating the risk of exposure to trade policies in developing countries.

In this paper, I investigate local policy responses to a trade protection policy that has broad economic consequences in Indonesia. I estimate causal effects of income shocks resulting from the unexpected and stringent rice import restriction on public good provision and development projects at the village level. I use two plausibly exogenous variations. I exploit the fact that the policy has imposed permanent increase and considerable spatial and temporal variations in domestic rice price across provinces. I combine price variation with geographic time-invariant variation in rice suitability at the village level to obtain an indirect measure of aggregate income shock across villages.

Studying the consequences of rice import restriction provides an ideal environment to address my research questions for two main reasons. First, it causes large income shocks to a large proportion of Indonesian population because rice is a staple food.[1] Second, the policy was implemented during the decentralization era, where district governments have the authorities to allocate resources to villages. Furthermore, decentralization era ushered in democratic reforms that allow freedom of expressions, which had been suppressed during the President Soeharto's regime. [2] These two factors suggest that rice import restriction could have important implications on the distribution of public goods and development projects. Indeed, studies have documented that income shocks may affect political aspiration and demand for redistributive policies (Di Tella and Rodrik, 2019; Becker et al., 2016; Brückner and Ciccone, 2011).

[1] Existing studies attribute increased poverty rate to increased price of rice (e.g., Warr and Yusuf, 2014; McCulloch, 2008)

[2] The authoritarian President Soeharto ruled for more than three decades, 1967-1998. The 1997/1998 Economic crisis induced massive protests that ended with him resigning in 1998. Ever since then, Indonesia has had a series of political reforms to provide wide-ranging autonomies to district governments to distribute fiscal and public good resources to villages.

The main results show some evidence that rice price hike has larger positive aggregate effects on income for villages with higher rice suitability, as indicated by increased nighttime lights intensity and lower demand for public services for the poor (e.g., health insurance). Negative income shocks increase the probability of having health facilities, but not public schools, especially secondary schools. There is no evidence that income shocks affect changes in the number of any public goods. On the other hand, income shocks are negatively associated with the number of development projects. One potential explanation is that villages have relatively more controls over development projects than public goods provision, which are largely determined by the district government. Overall, these results suggest that negative income shocks increase redistributive policies, especially when villages have more controls over resources. Heterogeneity treatment analysis reveals that the main effects appear to be driven by less diverse, more unequal, and rural villages.

This paper connects to several strands of literature. First, this study is related to a body of research that studies resource allocation and public good provision within communities. Studies have documented evidence that connect income with support for redistributive programs. Moene and Wallerstein (2003) investigate consequences of income inequality on welfare spending in advanced industrial countries. They distinguish redistribution from insurance program and find that expenditures on redistributive programs (e.g., pensions and health care) are largely uncorrelated with income inequality, while spending on insurance or income replacement programs (e.g., unemployment insurance) are negatively correlated with income inequality, which is consistent with predictions from theories on redistributive social insurance programs.

This study also contributes to the vast literature on determinants of public good provision, such as decentralization or federalism (Besley and Coate, 2003), ethnic diversity (Alesina et al., 1999; Miguel and Gugerty, 2005), composition of government and coalition formation (Bandiera and Levy, 2011), and types of local revenues (Cassidy, 2019).

This study is also related to research linking economic hardship resulting from trade policies with a broad range of political economy outcomes. For example, Autor et al., 2016 find that districts with more exposure to trade competition with China are more likely to vote for extreme

politicians. This study complements the evidence in this literature by focusing on the consequences of import restriction on policy choices at the lowest administrative unit in a developing country.

The remainder of this paper is organized as follows. Section 2 discusses the context: rice import restriction and village institutional settings. Section 3 discusses data and measurement. Section 4 discusses estimation framework. Section 5 discusses main results. Section 6 concludes.

2 Context

The first part of this section discusses the importance of agriculture and rice in Indonesia and the evolution of rice trade policies leading to the import ban. The second part focuses on village institutional settings, public goods, and financial resources.

2.1 Rice Import Restrictions

The last three decades have witnessed a decline in importance of agricultural sector in Indonesian economy in terms of its contribution to GDP. In 1985, agriculture contributed 23% to the Indonesia GDP, but it dropped to 13% in 2005 and remained relatively stagnant until 2015. Nevertheless, agriculture remains central for labor market. In 2005, more than 40% of Indonesian adult workforce are employed in agricultural sector. The number dropped in 2015, but it still accounted for more than one-third of the adult workforce, 34%.

Rice is the most important agricultural commodity in terms of its proportion to expenditure, income, and employment. First, rice is the staple food for the majority of Indonesian population, and it constitutes more than 20% of the food expenditure of the poorest 40% of the population (McCulloch, 2008).[3] Second, rice is an important source of income and employment among farmers. The 2003 agricultural census reveals that 55% of agricultural households are rice farmers, more than any other commodities. Out of those rice growing households, more than 70% are net

[3] As in many developing countries, food constitutes a large share of total expenditure in Indonesia: well above 60% for more than half of the Indonesian population (McCulloch, 2008)

producers (McCulloch, 2008).

Given the importance of rice, the government has long been obsessed with policies to increase domestic production and limit its dependency on international market through various rice intensification programs (e.g., mass guidance program or *Bimas*) or other protection measures like tariff or non-tariff measures (Timmer, 2005). Despite those policies, Indonesia has regularly been a net importer, as seen in Figure 1.[4]

Before the 1997/1998 economic crisis, the state logistic agency, *Bulog* (Badan Urusan Logistik), was the sole importer.[5] Following financial agreement with the IMF in 1998, the government was forced to abolish *Bulog*'s monopoly role and allow private sectors to participate in rice import business. However, the policy only lasted for less than two years. The growing influence of pro-farmers groups purportedly pressured the government to implement a series of rice import restriction policies aiming to protect farmers.

In 1999, the government introduced a 20% tariff for imported rice, which was sharply raised to approximately 75% in 2003 (Warr, 2005; Fane and Warr, 2008). In 2004, importing rice was effectively banned. While private sectors were completely prohibited to import rice, *Bulog* could import limited quantities of rice only during certain periods with the goal to secure rice supply (Warr, 2005; Warr, 2011). The ban was originally intended to be a seasonal policy to protect rice farmers,[6] but the policy had been repeatedly extended and had not been completely revoked (Warr and Yusuf, 2014).[7] Figure 1 shows that Indonesia's net rice import fell sharply following the ban. The surge in 2007 and 2011 was almost entirely due to emergency supply and buffer stock reasons. It seems that there was no major problem with the domestic production as yields continued to increase.

Indonesia had rarely imported rice exceeding 5% of total national consumption, but the import managed to stabilize domestic price (Dawe, 2008). It is, thus, unsurprising that the domestic

[4]For a comprehensive overview on historical Indonesian rice cultivation and related policies, see Mears (1984) and Simatupang and Peter Timmer (2008).

[5]In addition to rice, *Bulog* controlled other commodities, such as sugar, maize, and soybeans.

[6]The Ministry of Trade and Industry regulation No.9/MPP/Kep/1/2004 stipulates that rice import was prohibited one month prior to, during, and two months after the harvest season.

[7]Instead of lifting the ban, the government has been imposing import quotas which vary over time depending on, for example, domestic rice supply and demand.

rice price increased significantly following the ban. Figure 2 shows that domestic price started to climb in 2005 as the stocks of rice from previous year were starting to thin.[8] Between 2000 and 2014, domestic rice price increased annually by 10%, as shown in Panel B of Table 1. Some estimates suggest that import ban contributed to the price hike by 37% and 64% in 2006 and 2015, respectively (Fane and Warr, 2008; Marks, 2017).[9]

2.2 Village Institutional Setting

Political Context The political context during the period of this study corresponds to the decentralization reform period that started in 1999. Following the fall of the President Seoharto's authoritarian regime (1967-1998) — known as the New Order —, there was a massive urge to decentralize political power to local government. The reform allows districts and villages to merge or proliferate to form a new district or village. This resulted in a significant increase in the number of the new governments at all level.[10]

Governance Structure By 2014, Indonesia is divided into 34 provinces and 511 districts. Each district is divided into subdistricts that are further divided into villages. There are two types of villages based on observable characteristics: *desa*, which is more rural, and *kelurahan*, which is more urban. While the head of *desa* is decided through local election, the head of *kelurahan* is directly appointed by district mayor. Following the decentralization reform in 1999, the number of villages increased significantly from more than 66,000 in 2000 to more than 80,000 in 2014, where well above 85% of them are *desa*.[11]

The categorization of villages into *desa* and *kelurahan* were initiated after the passage of the Village Law No.5 of 1979. The law stipulates that all villages were *desa*, and some of them were categorized as *kelurahan* by the central government. The conversion of *desa* into *kelurahan*

[8]Due to heavy reliance on domestic supply, the increasing trend in domestic price appears unaffected by the brief period of sharp increase of the global rice price between 2008-2011.

[9]The estimates in both studies are measured in terms of nominal rate of protection (NRP), which measures the effect of the government trade policy at any given nominal exchange rate compared to a situation in absence of said policy. See Fane and Warr (2008) and Marks (2017) for details.

[10]See Fitrani et al. (2005) for more details on decentralization.

[11]Decentralization reform, which marked the end of Soeharto government in 1998, provided massive far-reaching autonomy to local governments, including fiscal responsibility and splitting or forming new local government.

stopped in 1992 mainly due to financial reasons (Niessen, 1999).[12] In addition, the law imposed a homogenous governance structure. All villages were required to have a village head and village assembly and had their budgets approved and supervised by district governments. The law practically dismantled village autonomy (Antlöv, 2003).[13]

Public Goods The decision-making process for the provision of public goods in Indonesian villages have evolved since the fall of the New Order era. Before the decentralization reform, the main source of funding for village public goods came from the national budget and was highly centralized. Virtually every important decision regarding village budget and public goods provision required approval from the district mayors (Antlöv, 2003; Tajima et al., 2018).[14]

Decentralization reform changed the process for public goods provision in villages, especially the roles of district and village governments. District governments play a central role in funding and distributing public goods, especially those related to education and health (Cassidy, 2019). On the other hand, village governments play an important role in initiating and leading maintenance and upgrades of local infrastructure projects, such as roads and bridges (World Bank, 2010).

To some degree, villages relied on higher-tier governments for public goods provision both before and after the decentralization reform. However, this does not rule out the influence of villages in improving the level of public goods provision. Despite top-down and centralized approach in the New Order era, recent studies find that villages could actually affect the level of public goods provision through the roles of educated heads (Martinez-Bravo, 2017) and inter-village competition indirectly induced by the level of ethnic segregation (Tajima et al., 2018). The influences are theoretically larger after decentralization, and this has been documented in an extensive longitudinal local level institutions study covering 40 villages over more than a decade

[12]See Martinez-Bravo (2014) for more detailed explanation on the historical formation and differences between *desa* and *kelurahan*.

[13]The implementation of the law did not go as smoothly as expected. Many villages outside of the Java island, which is the most populated island, expressed their disobedience towards the law. For example, all villages were mandated to have election to choose a village head, but many villages outside Java did not abandon the practice of selecting their leaders based on hereditary or other local traditional practices (Antlöv, 2003).

[14]In addition to budget allocation from the central government, villages could submit a proposal to the National Development Planning Process (P5D) for public goods provision. However, village officials were mainly unaware of this mechanism hampering them to submit high-quality proposals that led to undesirable outcomes for their village. (Evers, 2000).

(Wetterberg et al., 2014).[15] The study finds that, among other factors, income shocks, shifts in sources of income, and distribution of power and assets within a village contribute to the collective capacity of villagers that can affect level and choice of public goods and development projects. Collective actions and mass mobilization were suppressed and almost unheard of during the New Order era.

Financial Resources Village financial sources have been evolving over time. Following the first major political reform concerning village governance, Law 5/1979 stipulated that each village received block grant from district government. The massive decentralization reform provided more financial sources to villages. Law 22/1999 stipulated that each village had the autonomy to raise its own revenues in addition to receiving block grants from district government. In 2004, each village was set to receive additional grants from the central government, as mandated by Law 32/2004. The most recent regulation Law 6/2014 provides broad legal framework for additional financial resources for villages (excluding kelurahan) from the central government, which is known as village funds or Alokasi Dana Desa (DD). [16]

In summary, there are two broad sources of village financial resources: village own-source revenues and transfer grants (from district and central governments). Villages raise own incomes through the following sources: own-managed traditional markets, charges on small scale public transportation vehicles that pass through their jurisdictions, and other fees related to administrative services (Antlöv et al., 2016). Most of village revenue comes from transfer grants from higher-level government, especially district government.

3 Data and Measurement

This section presents information on data sets and measurement, construction of the study sample, descriptive statistics, and estimation framework. I combine multiple data sets that include

[15] Local-level Institution study is a study on the relationship between local institutions, poverty, and village governance in rural areas in Indonesia combining descriptive and quantitative methods. The study was conducted in 3 provinces, 6 districts, 40 villages, and 1,200 households. It has been conducted three times: 1996/1997, 2000/2001, and 2012.

[16] The amount of DD is based on the discretion of the central government.

population and village census as well as gridded data to form the basis of the main empirical analysis. The unit of analysis is at village-year level.

3.1 Public Goods and Development Projects

The data on the main outcomes, public goods and development projects, come from the village census (PODES). This dataset has been collected roughly three times every decade starting in 1980.[17] In each wave PODES collects rich information on village characteristics, such as the land size, geographic location, population and other demographic information, existing infrastructure projects, public goods, violence, village budget, and development projects.[18] The information comes from the official village documentation and interviews with the village head. The PODES sample size has increased over time following the decentralization reform that allow villages to split and merge to form a new village. The 2000 wave covers more than 66,000 villages, but it has expanded to 82,000 in 2014. For the purpose of this study, I use the 2000, 2003, 2005, 2008, 2011, and 2014 waves.

The main outcomes include sets of public goods and development projects variables. In general, the end products of development projects can include both public and excludable goods (Chavis, 2010; Araujo et al., 2008). For example, in PODES, village development projects provide some public goods, such as maintenance or building road infrastructure, and excludable goods, such as capital assistance to the eligible villagers. To avoid confusion, I separate these two outcomes in the analysis even though some products of the development projects are public goods.

I focus on the main public goods that are considered important and relevant for the villagers well-being as well as consistently collected across waves (Cassidy, 2019; Tajima et al., 2018; Martinez-Bravo, 2014). These include health care personnels (medical doctors), health care

[17]The latest wave was recently completed in 2018. PODES has three main themes which alternate every wave: agriculture, economy, and population. For example, the 2003 wave focuses on agriculture. In that year, PODES collects detailed information on village agriculture, such as production yields of cash crops and land plots allocated for each crop. The agriculture module was not collected in the 2006 wave, for example, because in that year PODES focuses on village economy and collects more detailed information on the small enterprises, for instance.

[18]There are some information that are not consistently collected every wave. For example, detailed information on village budget allocation, such as for construction or maintenance of infrastructure, and development projects were only available starting in 2008. The number of health facilities and officials were not collected in 2008.

centers (*Puskesmas*),[19] schools (primary and secondary level schools), the main road quality indicators for whether the road is asphalt or passable by motor vehicles all year long,[20] and access to safe drinking water.[21] The large health centers are staffed by at least one doctor and roughly five nurses, while the small ones are staffed by one nurse because small centers only provide basic services.

The development project consists of three broad sets of outcomes. First, infrastructure project. This project includes maintenance or construction of the following public infrastructures: road, bridge, schools, sanitation, traditional market, irrigation, and other economic support facilities. Second, capital assistance project. This project aims to increase village economic capacity by providing loans for agriculture, non-agriculture, and other types of enterprises. Third, employment assistance project. This project includes training program to increase production and marketing capacity as well as enhancement of civic engagement. To be consistent across waves, I restrict the sample to projects that are not funded by the special government projects (i.e., the National Community Empowerment Program, *PNPM*).[22] In addition to the *PNPM* project, development projects are generally funded by external sources, such as grants from higher level government, and internal sources, i.e., village revenues. While it is useful to be able to distinguish financial source for each project, the data does not allow me to do it.

Flow and Stock Variables Changes in public goods and development projects are examined in its extensive and intensive margins.[23] For intensive margins analyses, I follow Cassidy (2019)

[19] I divide health centers into two: large (*Puskesmas*) and small (*Puskesmas pembantu*). The main difference lies on the quantity of the facilities and staff. The large or main health centers have more staff and provide more complete services, while the small ones are only equipped to provide more basic services (Tajima et al., 2018). Along with the INPRES primary schools, health centers were also part of the expansion of basic public services during the Soeharto era in the 1970s (Shah et al., 1994).

[20] I separate these two indicators because the road that is passable by motor vehicles is not necessarily asphalt.

[21] A village has access to safe maining water if most households access their water from a pump or a water company. Unsafe water sources include natural well, rain, river or other source.

[22] Information on development projects was introduced in 2008. The information on development extracted in the 2008 wave differs in several dimensions from the 2011 and 2014 waves. For example, the 2008 wave only records development projects funded by the non-*PNPM*, whereas the latter waves distinguishes projects by the funding sources. In addition, the number of development projects in each category in the 2008 wave are less than that in the 2011 and 2014 waves.

[23] In addition to the three broad measures of development project, I also create two additional variables: 1) an indicator variable for whether a village receives any kind of project in particular year (extensive margin) and 2) a continuous variable that sums up all projects that are available in a village (intensive margin).

by dividing the outcomes into stock and flow variables. Flow variables include variables that are probably only present for limited time, such as development project and health personnel outcomes. For example, the funds for development projects or contracts for medical doctors might not be perpetually renewed. In contrast, stock variables, such as school buildings or health care centers, might remain indefinitely. Thus, by definition, both variables are constructed differently to reflect changes between periods. The outcome flow variables Y_{vt} at village v at the end of period t reflects the number of the variable at that period. On the other hand, the annual change in stock variables in period t must take into account the stock of that variable in the previous period, t_0, which is calculated as follows:

$$Y_{vt} = \frac{1}{t_1 - t_0}\left(Y_{vt_1} - Y_{vt_0}\right) \tag{1}$$

3.2 Rice Price and Suitability

Rice Price The monthly domestic rice price data is collected by the central bureau of statistics (BPS) from a major representative city in each province. This price data collection practice is common in many developing countries (Deaton, 1997). Because data on commodity and food crop prices at village level is not available, I assume that villages within the same province are exposed to the same price. I further assume that provincial price is exogenous to each village. This assumption is reasonable because a single village is less likely to determine the price of rice at the province level.

I use the monthly retail price data spanning from January 2000 to March 2014. While it is probably more ideal to use farmgate than retail price, regional farmgate price data is not available. Figure A.1 shows that it might not pose an estimation problem because the movement of retail price is highly correlated with that of farmgate price.

Using the monthly price data, I construct a key independent variable, price change, to measure the consequences of the rice import restriction on domestic rice price. The variable is defined as the annualized growth in the log rice price index between PODES waves. For example, to examine the effects on village outcomes in 2003, the price change measures growth January 2000 to March

2003. For outcomes in 2005, price shock is constructed from April 2003 to March 2005. Price shocks for subsequent waves follow the same construction method.[24]

Figure 5 provides motivation for my approach. The figure shows that there was relatively negligible variation in domestic rice price pre-ban in contrast to that of the post-ban, which indicates a lack of arbitration by domestic traders in the post-ban era. This can plausibly be attributed to three factors. First, a weaker role of the state logistic agency, *Bulog*, in stabilizing domestic price. Second, a disruption to the thriving relationship between the private and international traders during the more liberal trade regime prior to 2004 (Bazzi, 2017).[25]

Rice Suitability Data for rice suitability, which measures potential or maximum attainable yields (ton/hectare) of rice, comes from the FAO-GAEZ project.[27] This measure is arguably exogenous as it is climate-driven productivity, not observed by the actual pattern of production. The climatic record is based on daily weather records observed in each year from 1961 to 1990, which provides good approximation for historical condition (Fiszbein, 2017; Costinot et al., 2016; Nunn and Qian, 2011). To obtain rice suitability information at the village level, I aggregate the suitability information across grids using area weights, i.e., the total area of the grid overlapping with the village, divided by the total village area. Figure 3 describes geographic variation of rice suitability in Indonesia, where darker shades indicate higher values. Rice suitability appears to be a good proxy for rice production (ton/hectare), at least for Indonesian villages, as illustrated by Figure 4.

3.3 Other Variables

To investigate whether an increase in rice price leads to an increase in income, I estimate the effects on village economic well-being. Because economic indicators at the village level are not

[24]Data collection for PODES generally commenced in the first quarter of the year, around March or April.

[25]Bazzi (2017) demonstrates that areas closer to domestic ports and shipping distance to Bangkok and Ho Chi Minh experienced higher increases in price suggesting high dependency to import rice. Third, the overall low elasticity of supply (0.2-0.4); it varies across regions depending on soil characteristics and land types. As a comparison, the elasticity of demand for Thailand's rice exports varies between -2.5 to -5 (Warr, 2005).[26]

[27]The FAO-GAEZ project provides worldwide grid cells information on predicted yields on various crops by combining various high-resolution geographic data with agronomic models, described in detail by Costinot et al. (2016).

available, I use several proxy variables. First, I follow the standard approach in the literature by analyzing nighttime lights, which has been increasingly shown to be a reliable indicator for economic development, especially in areas with shortage of quality data (Henderson et al., 2012). I measure extensive margins — indicator for presence of lights — and intensive margins — intensity of lights — of nighttime lights. The data comes from the National Oceanic and Atmospheric Administration (NOAA) Defense Meteorological Satellite Program. The data used in this paper spans from 2000 to 2011.[28]

Second, the number of identification card for the poor issued in the last year (*Surat Keterangan Tidak Mampu*, SKTM). This special ID card aims to serve as a proof of household's financial condition that can be used primarily to apply for school tuition waiver or need-based scholarships.[29] Third, the number of health card (*Kartu Sehat*) issued in the last year. The health card program was launched in 1998 as part of the social safety net program (*Jaringan Pengaman Sosial*) intended to protect the poor during the economic crisis. The benefits of health card beneficiaries include various free services at public health care providers, such as outpatient and inpatient care (Bah et al., 2018; Sparrow, 2008). Both variables come from PODES.

I use two other datasets to construct additional village agriculture and demographic characteristics. First, the complete records of 2003 agricultural census to construct inequality in land ownership and other agricultural-related variables.[30] Second, the complete records of the 2000 population census to construct ethnic diversity measures.

3.4 Sample Construction and Summary Statistics

The main analysis is based on a balanced panel of 53,152 villages out of 298 districts and 26 provinces matched across the PODES waves. In total, the final sample has 318,912 village-year observations. To improve accuracy and quality of the data I impose some restrictions. First, I exclude Papua and West Papua provinces due to unreliable data. Second, I drop villages that amal-

[28]The latest available data is 2013, but to allow comparability with the PODES waves, I only use the data up to 2011.

[29]Salary slips and other documents on household finances are required to obtain the ID card.

[30]The agricultural census has been conducted every decade since 1963 with the latest wave completed in 2013. The 2003 wave records landholding information on 40 million households.

gamated within the study period. To maintain comparability of institutions, I exclude provinces with special autonomy status which may affect provision and distribution of public goods and development projects.[31] To maintain a consistent unit of observation, village outcomes are aggregated up to the 2000 borders.

Table 1 displays summary statistics. An average district is divided into more than 270 villages. On average, each village has a total population of more than 3,500. The Gini coefficient of 0.55 in landholdings indicates high wealth inequality within a village. Primary school is the most ubiquitous form of public school, where almost every village has one.[32] This is in contrast to secondary school, where there is roughly only one school for every three villages. The state of public health services does not seem better than education, where only 20 % and 44 % of villages have at least one doctor and health care center. However, development projects are well distributed. Almost every village has at least one development project (84 %), where infrastructure maintenance project is the most popular (70 %). Additional village characteristics are presented in Table A.1.

4 Estimation Framework

To estimate the causal effects of income shock on local policy responses at the village level, I require plausibly exogenous income shocks that vary across time and villages. The time variation comes from the movement in annual rice price. I exploit a sudden and major rice import restriction that generates substantial rice price variation across provinces, which is arguably exogenous to villages because national rice production and consumption are not driven by a small fraction of villages. The cross-sectional variation comes from geographic variation in rice suitability across villages. I interact both time and spatial variations as an indirect way to measure income shocks at the village level. This approach assumes that villages with higher rice suitability are more likely to benefit from higher rice price. However, this assumption is not guaranteed because an

[31] Provinces with special autonomy status include the capital of Indonesia, DKI Jakarta, Nanggroe Aceh Darussalam, and DI Yogyakarta.

[32] This is most likely the legacy of massive construction effort of INPRES school buildings in the 1970s. See Duflo (2001) for more details on INPRES program.

increase in rice price does not necessarily translate to an increase in income. Theoretically, it depends on whether a household is a net producer or a net consumer. Price hike benefits net producers but hurts net consumers (Deaton, 1989).

Because variable that informs net-producer status at village level is not available, I use a proxy variable indicating whether the majority of farmers in a village both sell and consume agricultural products. This variable is conditional on a village being an agricultural village.[33] The 2003 and 2005 PODES document that more than eight out of ten villages are mainly agricultural suggesting that the proxy variable is quite representative at the national level. More importantly, Figure A.2 shows that rice suitability is positively correlated with the majority share of farmers selling and consume their products suggesting that my approach is sensible.

This leads to an empirical strategy that is similar in spirit to the standard difference-in-difference method but with continuous treatment intensity, i.e., interaction between changes in rice price and rice suitability. Equation 2 presents the estimating specification:

$$Y_{vt} = \beta_0 + \beta_1 Price_{vpt} + \beta_2 Price_{vpt} \times RiceSuit_v + \theta X_{vt} + \gamma_v + \delta_t + \sigma_d t + \epsilon_{vt} \tag{2}$$

where Y_{vt} denotes public goods and development projects variables in village v and year t. $RiceSuit_v$ is time-invariant measure of rice suitability, measured in thousands of tons per hectare. $Price_{vpt}$ is the annualized log growth of domestic rice price in province p. $\boldsymbol{X}_{vt}$ are time-varying covariates that include (log) population to account for scale effects and access to public goods and projects, (log) distance to district capital and (log) distance to sub-district capital to account for political influence of physical distance on local resources (Henn, 2018; Campante and Do, 2014; Stasavage, 2010).[34] I also control for the interaction between the following time-invariant variables and year fixed effects: (log) village size and (log) harvested lands for rice.[35] These covariates respectively control for changes in the pattern of usage of lands and incentives to plant rice that

[33]This variable comes from the 2005 PODES. While it does not have information on specific agricultural products being sold and consumed, it is reasonable to assume that rice drives up the number given that it is the most dominant agricultural product among Indonesian farmers McCulloch (2008).

[34]Distances between village and district and sub-district capital vary because village and district splits over time.

[35]Total village size (in km^2) and total harvested lands for rice (in thousands of hectare) are constructed from the village map in 2000 and the FAO-GAEZ project, respectively.

may affect outcomes.

Village fixed effects, γ_v, and year fixed effects, δ_t, account for time-invariant village characteristics and common nationwide shocks, respectively. District-specific time-trends, $\sigma_d t$, account for potential omitted variables at district level that may cause upward trends in the distributive policies (e.g., public goods provision), such as shifts in political preferences.[36] Robust standard errors ϵ_{vt} are clustered at the district level to control for potential serial correlation over time and across villages within a district. This approach is somewhat stringent given that the cross-sectional variation in the key independent variable is at the village level.

This empirical strategy examines whether changes in rice prices affect outcomes disproportionately in villages with higher rice suitability, which is captured by the key coefficient of interest, β_2. This approach is commonly used to analyze the effects of commodity or food price shocks (Sviatschi, 2018; McGuirk and Burke, 2017; Dube and Vargas, 2013).

In all specifications, $\beta_2 > 0$ implies that positive income shock leads to an increase in public goods and development projects. Changes in outcomes are estimated in extensive and intensive margins whenever possible. Following McGuirk and Burke (2017), I standardize β_2 for easier interpretation in all specifications.

5 Results

In this section, I discuss the main results from estimating equation 2. First, I discuss the differential effects of rice price changes on income. Then I turn to results on public goods and development projects.

5.1 Effects on Income

Before examining the effects of income shock on public goods and development projects, I show that rice price hike has larger positive aggregate effects on income in villages with higher suitability in rice. Table 2 shows the effects on outcome variables indicating income and welfare

[36] As a robustness check, I substitute district-specific time-trends with village-specific time trends

changes at the village level. Columns 1 and 2 show the results on extensive and intensive margins of nighttime lights. Columns 3 and 4 show the results on changes in the number of identification cards and health cards issued for the poor. As we can see, the interaction coefficient on $Price \times Suitability$ is statistically significant and positive in the first two columns and negative in the last two. In addition to the income effects, reduction in the number of special identification card and health card for the poor also reflect lower demand for public services. Overall, these results confirm that, in aggregate, rice price hike disproportionately benefits villages with higher suitability in rice.

5.2 Effects on Public Goods

Having established the existence of aggregate income effects of rice price hike, I examine whether income shock has any effects on public goods provision. Figure 6 summarizes the effects of income shock ($Price \times Suitability$) on changes in extensive margins (Panel A) and intensive margins (Panel B). The first part of Panel A shows that villages that experienced negative income shock were more likely to have health care center (total), driven by the small centers. This increase in health facility, however, did not automatically translate to the likelihood of the presence of a doctor, which is consistent with the fact that doctors are not assigned to the small health centers.

The second part of Panel A indicates that the likelihood of having public schools, especially secondary level schools (significant at 10% level), built in adversely affected villages is lower than the positively affected ones. Taken together, these findings suggest that negative income shocks might have negative implication on health and education reflected by the increased demand for health services but decreased demand for secondary-level education. This is consistent with studies that find negative relationship between aggregate income shock and children‘s human capital, such as health, nutrition, and school enrollment (e.g., Cogneau and Jedwab, 2012). Moreover, economic hardships have also been documented to force children to work (Edmonds, 2007; Edmonds and Pavcnik, 2005) that could worsen their human capital growth (Sim et al., 2017). Interestingly, I do not find evidence of the effects of income shock on the changes in intensive margins of any public goods (Panel B). Taken together, I interpret these results as suggestive evidence that nega-

tive income shock helps improve redistribution of public goods. Regression results are presented in Table 3.

In addition to public schools and health facilities and personnels, I also examine the effects on the improvement in the quality of main road and access to safe drinking water. The main coefficients are presented in the third part of Panel A, while the complete regression results are presented in Table 4. The results show significant negative relationship between income shock and indicator whether the main village road is passable by motor vehicles. I do not find significant effect on asphalt road. One potential explanation is that the cost to upgrade the quality of road to become passable should be cheaper than to cover the road with asphalt.

5.3 Effects on Development Projects

Figure 7 summarizes the effects of income shock on changes in extensive margins (Panel A) and intensive margins (Panel B) of development projects. The results show somewhat different patterns than those of public goods. Panel A indicates that income shock is negatively correlated with probability of having a capital assistance project (significant at 5% level). Unlike the effects on public goods, income shocks have significant effects on the number of development projects (Panel B). One potential explanation is that villages have relatively more controls over development projects than public goods so that the income shocks can be better translated into effects. Regression results are presented in Table 5.

5.4 Robustness

I conduct the following robustness tests to address several concerns.

- Excluding control variables: to show the naive estimates with minimal specification.
- Including provinces with special autonomy status: to address concerns of sample selection bias.
- Including village-specific trends instead of district-specific trends: to address concerns of omitted variable bias that may cause upward trends of the outcomes at village level.

- Including rainfall shock, which is calculated as the deviation from its long-term mean, as an additional covariate: to address concern that the results are partially driven by transitory shocks.
- Using alternative price change definition: to address concerns that the results are sensitive to price change definition, I constructed alternative definition. For example, price change in 2003 is calculated as $Price_{2003}$ - $Price_{2000}/Price_{2000}$.

The robustness tests show that my results hold and my conclusion is not changed. Due to space concerns, results are presented in the online appendix.

5.5 Heterogeneity

To shed lights on mechanisms of the main results, I conduct heterogeneity analyses — below and above median groups — based on ethnic diversity, land ownership inequality, and urban/rural status. Figure 8 summarizes the results on changes in extensive margins of public goods and development projects. Figure 9 summarizes results on changes in intensive margins. Overall, the results suggest that less diverse, more unequal, and rural villages seem to drive the main results even though some effects are statistically indistinguishable.

5.6 Channels

In an ongoing works, I plan to turn to household surveys to explore more direct channels. Specifically, I will investigate whether income shock has any impacts on trust, voluntary contribution, and collective capacity. These factors have been documented to improve public goods and infrastructure projects in the local level institution study in a handful of Indonesian villages.

6 Conclusion

Negative income shock induced by rice import restriction Indonesia improves distribution of public goods provision and development projects across villages. The results appear stronger in less diverse, more unequal, and rural villages.

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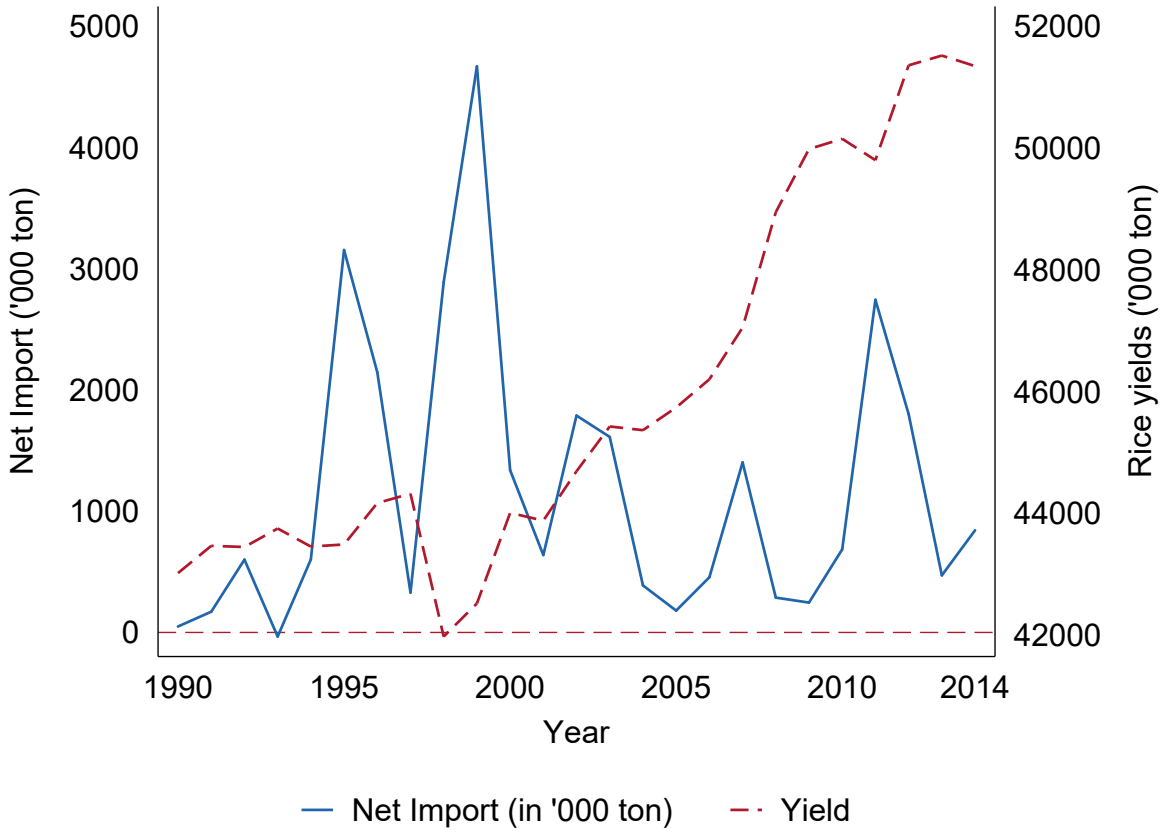
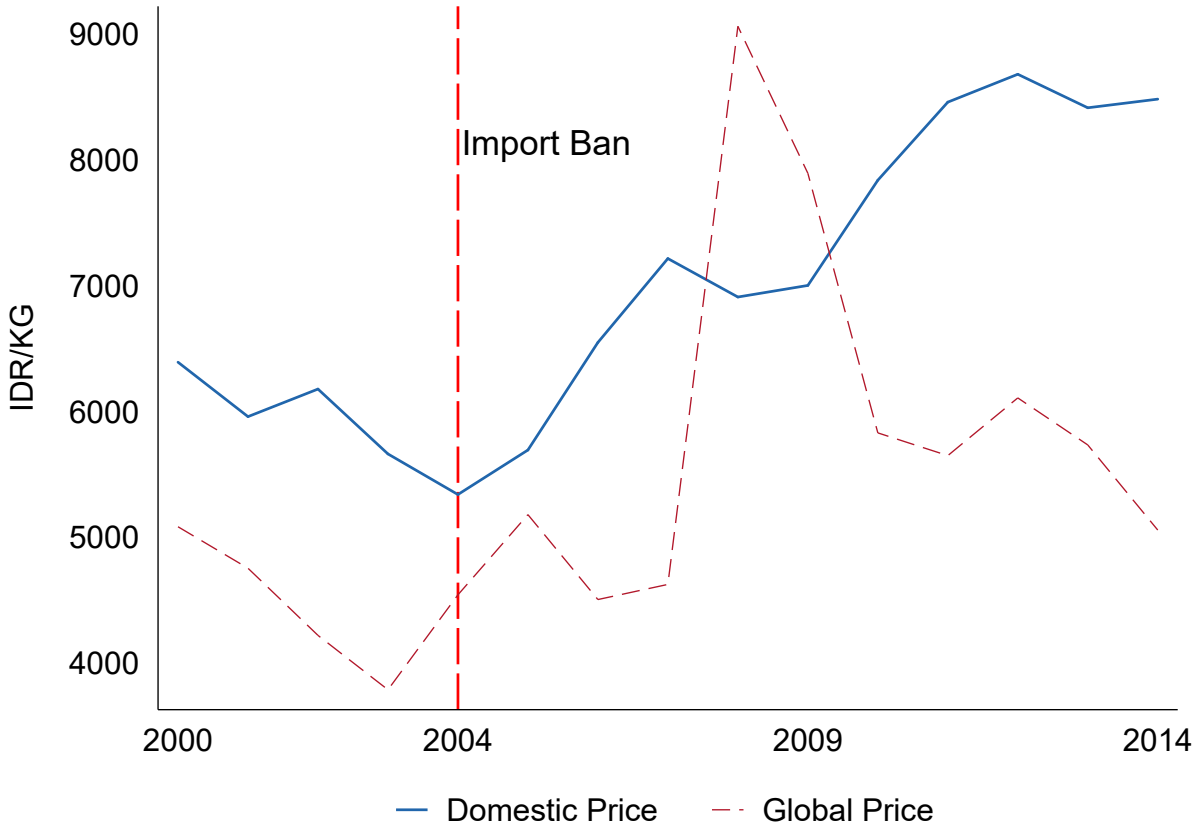
Figures

Figure 1: Net Rice Imports and Rice Yields, 1990-2014.



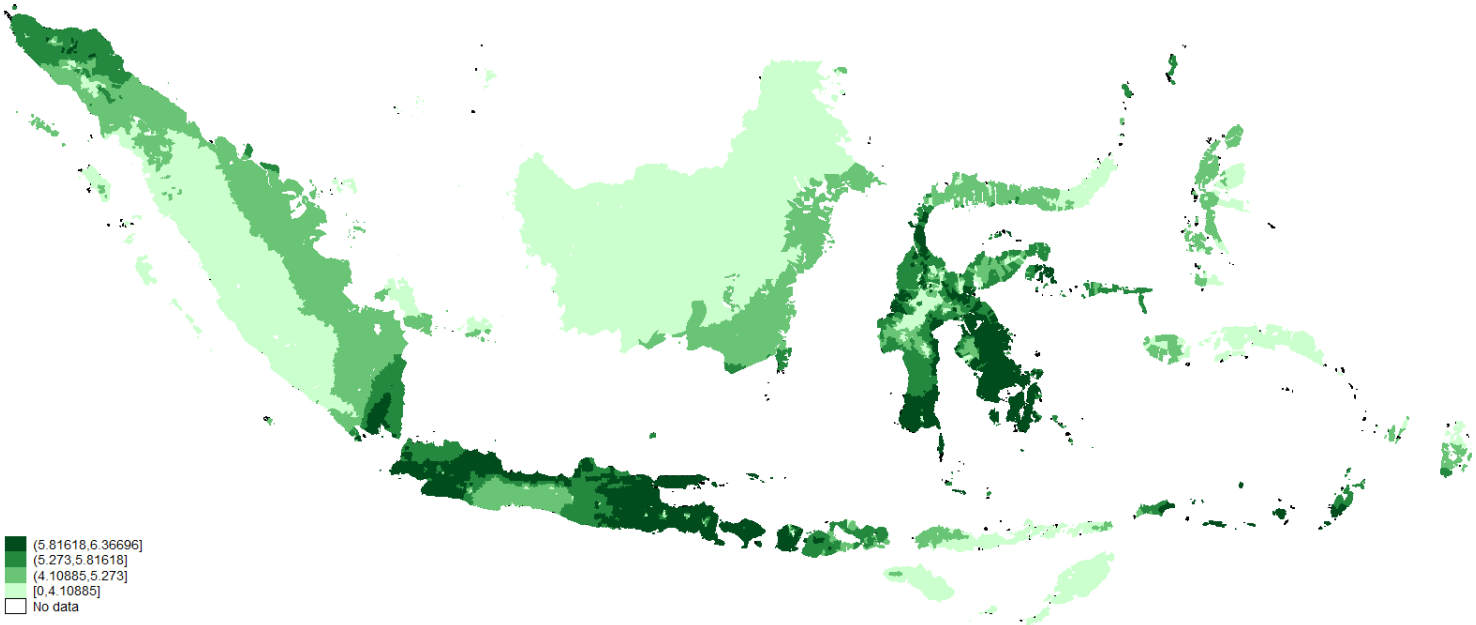
Note: This figure shows Indonesia's net import of rice and rice yields from 1990 to 2014. The rice yields reflect the amount of rice after going through a drying and milling process that converts 100 kilograms of wet paddy to roughly 55 kilograms of rice. Source: FAOSTAT.

Figure 2: Domestic and Global Prices of Rice, 2000-2014



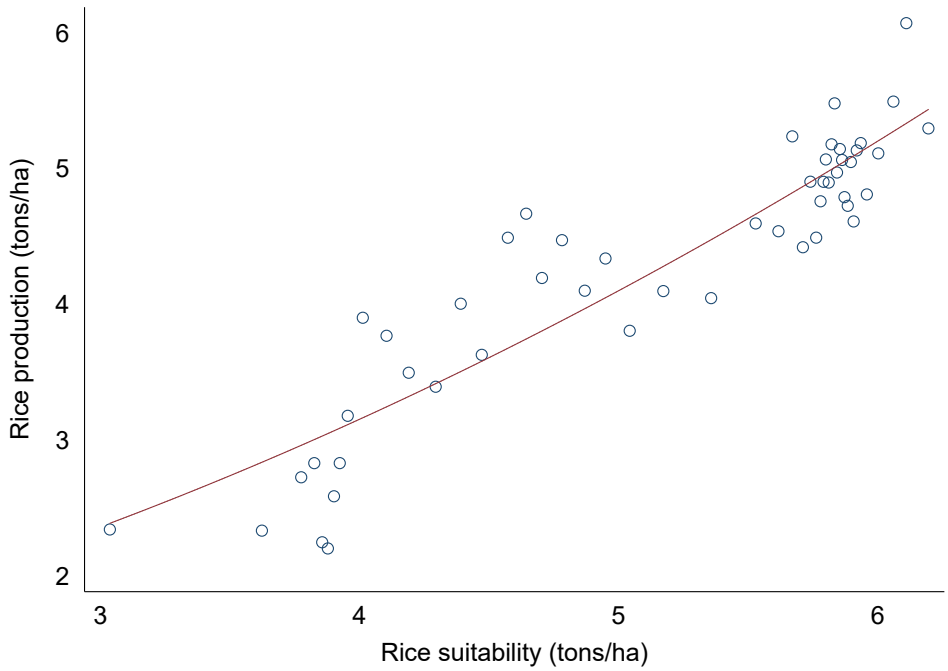
Note: This figure shows the movement of domestic and global rice price from 2000 to 2014. Global price and domestic rice price are in IDR/Kilogram. Global price refers to price of Thailand milled rice in US $ converted to IDR in current prices using market exchange rate and converted to retail price by adding $20/ton for shipping and a 10 % of mark-up from wholesale to retail (Dawe, 2008). Domestic price is the average of retail prices collected from major markets. Source: Central Bureau of Statistics (BPS) obtained via CEIC database for domestic price and IMF Statistics for global price and market exchange rate (IDR/USD).

Figure 3: Rice Suitability Distribution.



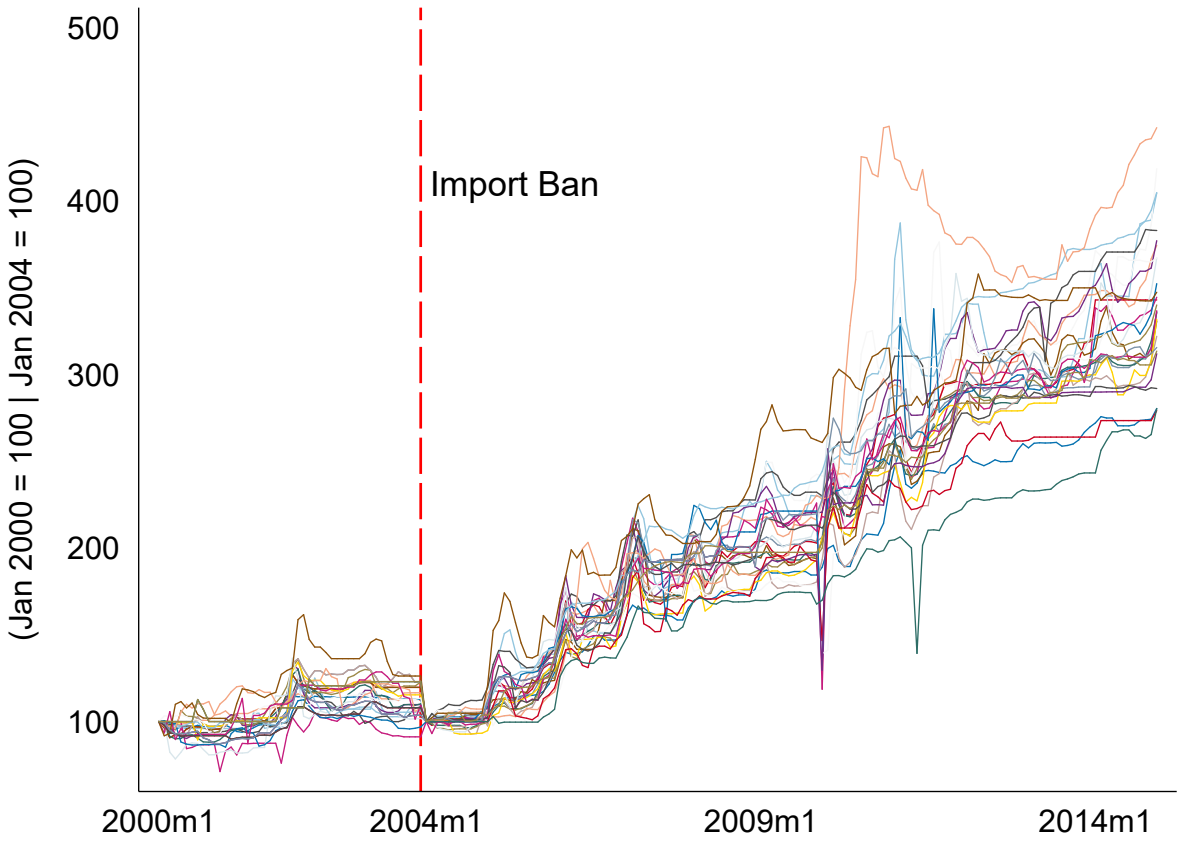
Note: This figure shows distribution of rice suitability in Indonesian villages in 2000, excluding Papua island. Rice suitability measures potential or maximum attainable yields in tons per hectare. Source: FAO-GAEZ.

Figure 4: Rice Production and Rice Suitability



Note: This figure summarizes relationship between rice suitability and actual rice production. Both variables are measured in tons per hectare. Source: rice suitabiltiy (FAO-GAEZ) and rice production (PODES 2003).

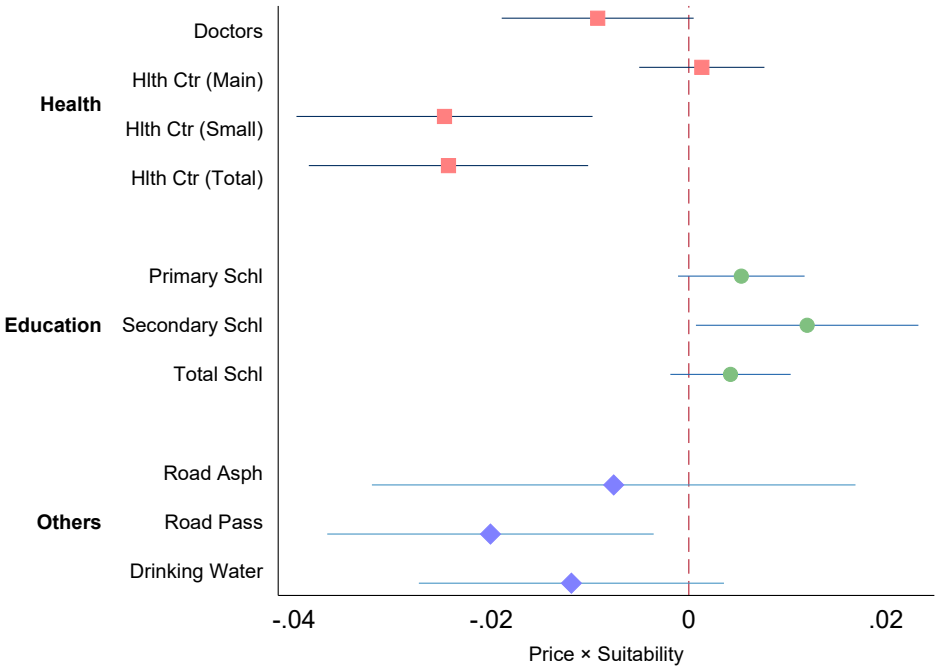
Figure 5: Domestic Price Evolution, 2000-2014



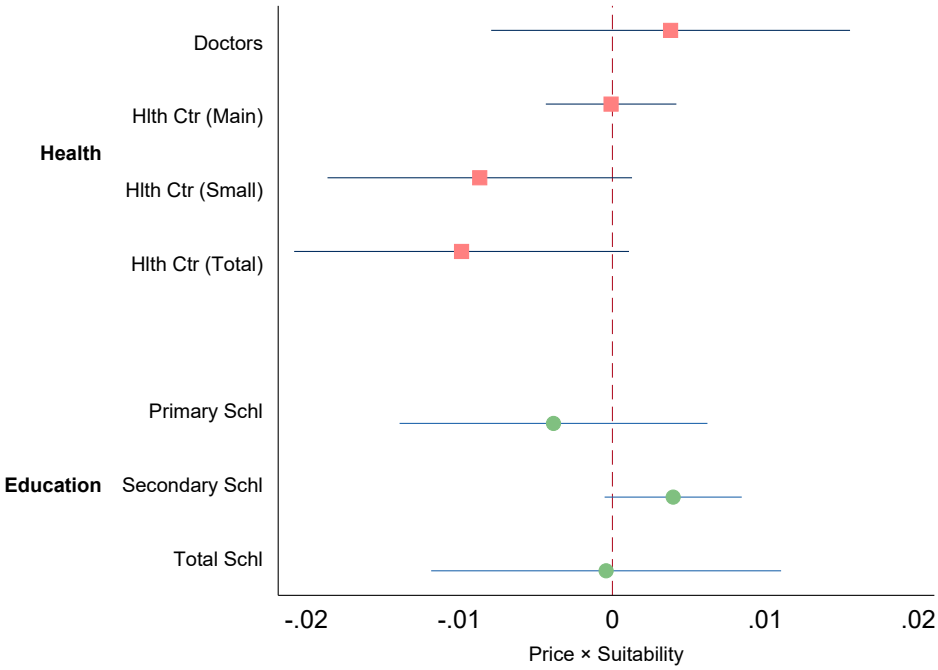
Note: This figure shows monthly price of rice in Indonesia across cities in Indonesia, 2000-2014. Prices are normalized to 100 in January 2000 and again in January 2004 to emphasize the evolution of price. Source: Central Bureau of Statistics (BPS) obtained via CEIC database.

Figure 6: Effects on Public Goods

(a) Extensive margins



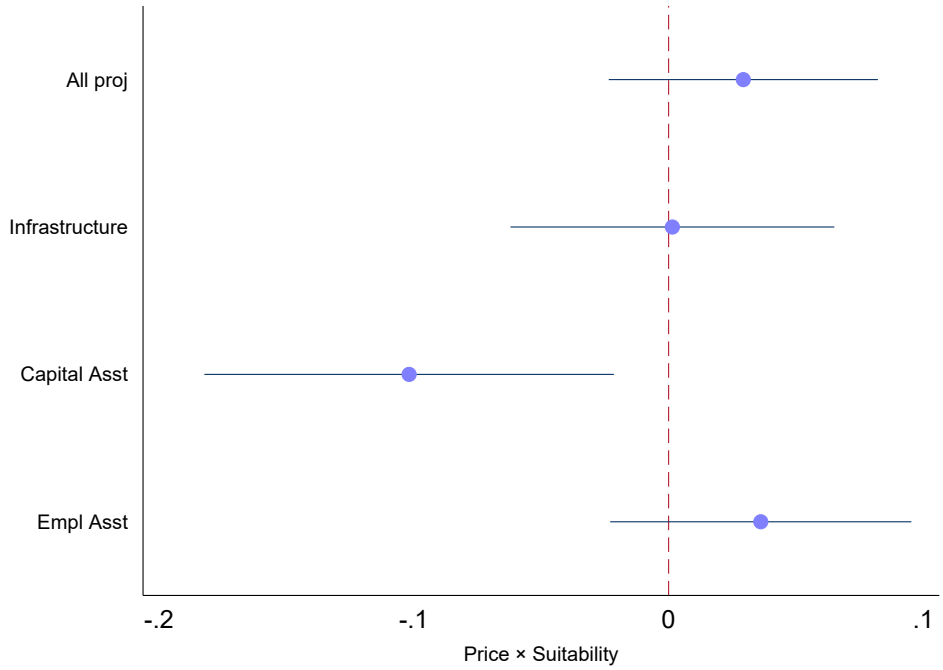
(b) Intensive margins



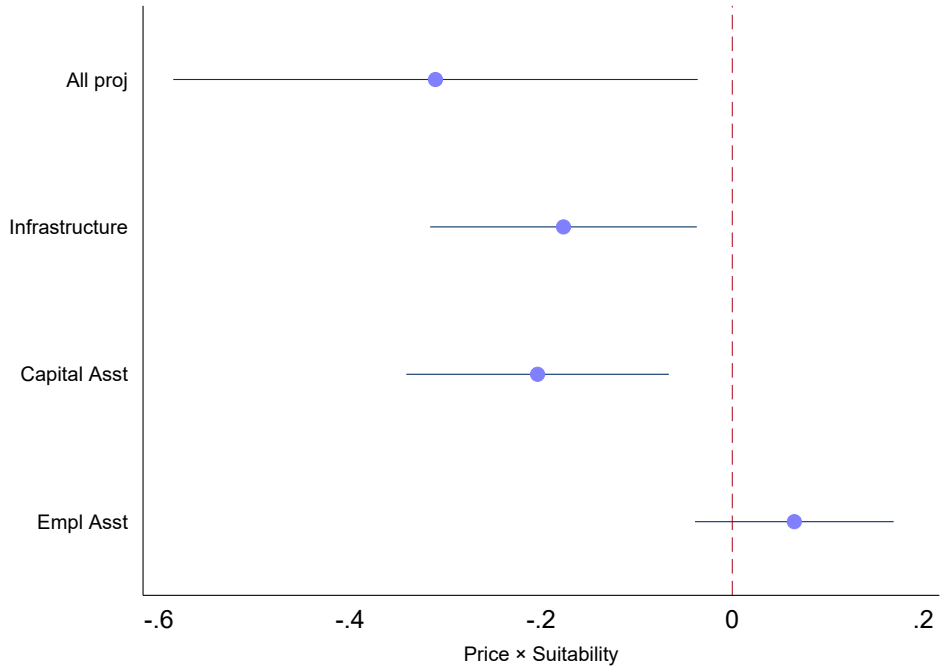
Note: This figure plots regression coefficients of estimating equation 2. Each coefficient comes from each regression conducted separately. Panel (a) plots effects on changes in the presence of public goods - from zero to nonzero. Panel (b) plots effects on changes in the number of public goods. Standard errors are clustered at the district level with 90% confidence interval.

Figure 7: Effects on Development Projects

(a) Extensive margins

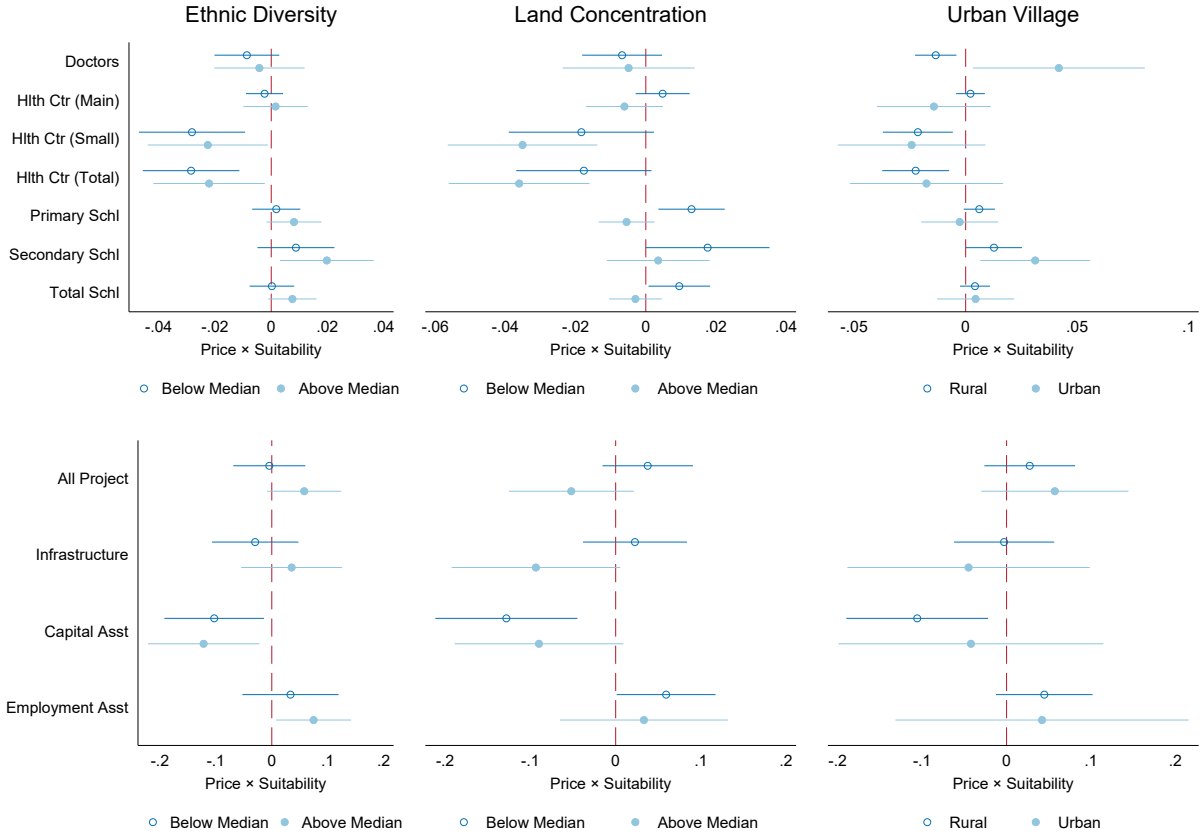


(b) Intensive margins



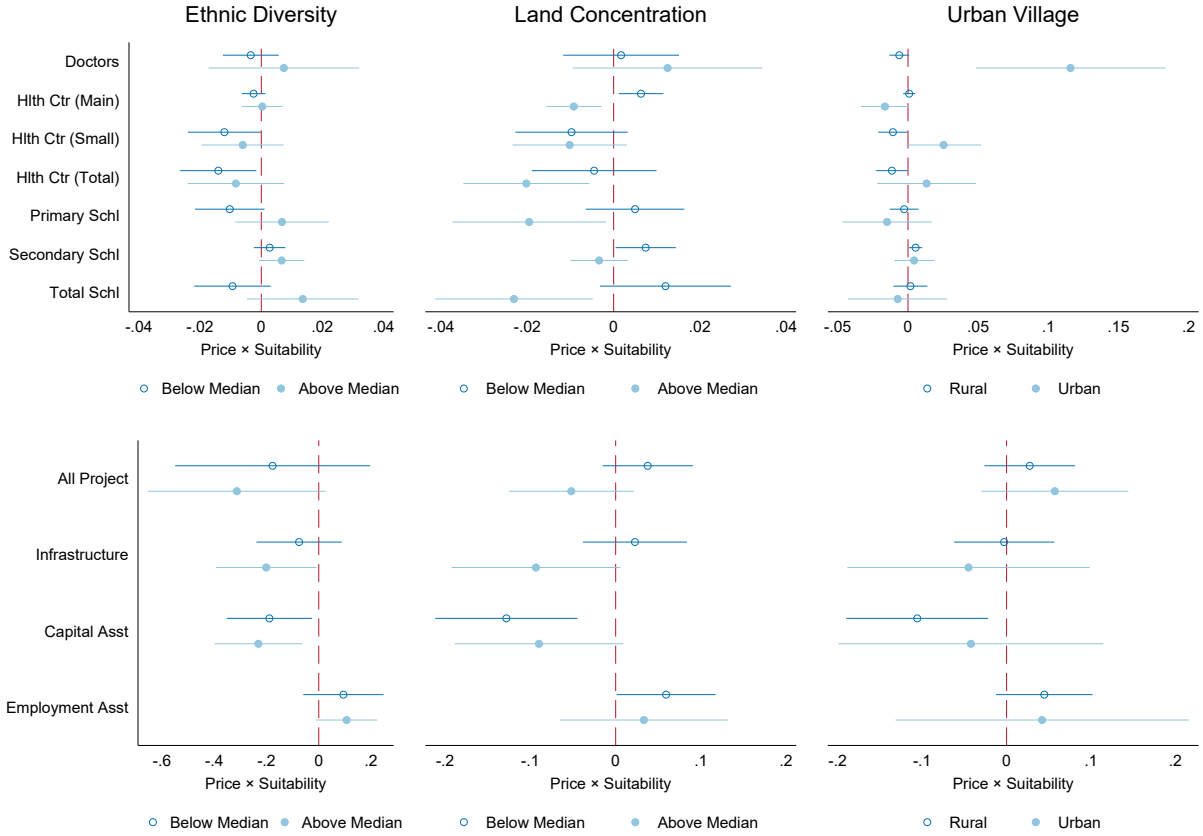
Note: This figure plots regression coefficients of estimating equation 2. Each coefficient comes from each regression conducted separately. Panel (a) plots effects on changes in the presence of development project - from zero to nonzero. Panel (b) plots effects on changes in the number of development project. Standard errors are clustered at the district level with 90% confidence interval.

Figure 8: Heterogeneity Analysis: Public Goods and Development Projects – Extensive Margins



Note: This figure shows heterogenous treatment effects by ethnic diversity, land ownership inequality, and urban/rural status.

Figure 9: Heterogeneity Analysis: Public Goods and Development Projects – Intensive Margins



Note: This figure shows heterogenous treatment effects by ethnic diversity, land ownership inequality, and urban/rural status.

Tables

Table 1: Summary Statistics

	Mean	SD	Obs.
Panel A: Demographic and administrative characteristics			
Number of population (thousands)	3.59	4.21	318912
Number of villages (hundreds)	2.71	1.31	318912
Ethnic fractionalization	0.18	0.24	317418
Proportion of high education (> primary school)	0.23	0.15	317418
Proportion of Muslim	0.84	0.33	317418
Urban village	0.17	0.38	318899
Distance to district capital (km)	41.31	45.84	318629
Distance to subdistrict capital (km)	8.66	11.91	318580
Panel B: Agricultural characteristics			
Price change (annual growth), 2000-2014	0.10	0.06	265285
Potential rice yields (suitability) (tons/ha)	5.06	0.89	309786
Paddy production (tons/ha)	4.26	3.98	252801
Paddy harvested area (thousands ha)	0.57	0.58	316896
Gini coefficient of land ownership	0.54	0.18	301128
Panel C: Public goods and development projects			
Presence of...			
Doctors	0.20	0.40	318912
Health center (Main)	0.13	0.33	318912
Health center (Small)	0.33	0.47	318912
Health center (Total)	0.44	0.50	318912
Primary school	0.93	0.26	318912
Secondary school	0.26	0.44	318912
Church	0.27	0.44	318912
Mosque	0.87	0.34	318912
Mushola	0.73	0.44	318912
Development project (Total)	0.84	0.37	159456
Infrastructure project	0.71	0.46	159456
Capital asst. project	0.64	0.48	159456
Employment asst. project	0.27	0.45	159456
Number of...			
Doctors	0.54	1.53	265760
Health center (Main)	0.13	0.33	265760
Health center (Small)	0.35	0.50	265760
Health center (Total)	0.47	0.56	265760
Primary school	2.15	1.59	318912
Secondary school	0.33	0.63	318912
Public school	2.49	1.91	318912
Church	0.71	1.61	318912
Mosque	3.81	4.03	318912
Mushola	8.46	11.23	318912
Development project (Total)	3.14	2.61	159456
Infrastructure project	1.68	1.56	159456
Capital asst. project	1.04	1.04	159456
Employment asst. project	0.40	0.76	159456

Note: Number of observations varies due to variation in availability of some variables in village census (PODES) waves

Table 2: Night Light Intensity and Health Insurance Enrollment for the Poor

	Δ Presence of Lights (1)	Δ Lights Intensity (2)	Δ ID Card Poor (3)	Δ Health Card (4)
Price	-2.342***	-1.143***	58.857*	506.316**
	(0.429)	(0.176)	(32.435)	(198.090)
Price × Suitability	0.136***	0.071***	-3.241*	-33.382***
	(0.023)	(0.010)	(1.960)	(11.807)
Village FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
District-specific Trend	Yes	Yes	Yes	Yes
N	188076	188076	237063	237063
R-Squared	0.143	0.299	0.116	0.295
Mean of Dep. Var.	0.663	1.329	57.737	416.494

Note: This table presents the results of changes in the presence and intensity of nighttime lights as well as changes in the number of membership of health insurance and identity card for the poor. The sample for dependent variables in columns 1 and 2 are only up to 2011. All regressions include population (log), distance to district capital (log), distance to sub district capital (log), village area (log) interacted with year fixed effects, harvested areas (log) allocated for planting rice interacted with year fixed effects. Standard errors, reported in parentheses, are robust to heteroskedasticity and clustered at district level..
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Public Goods: Health Facilities and Personnel and Schools

	Δ Presence						
	Doctors (1)	Health Center (Main) (2)	Health Center (Small) (3)	Health Center (Total) (4)	Primary School (5)	Secondary School (6)	Total School (7)
Panel A: Extensive Margins							
Price	0.141	-0.054	0.461***	0.413***	-0.105	-0.202*	-0.084
	(0.093)	(0.067)	(0.153)	(0.149)	(0.068)	(0.115)	(0.065)
Price × Suitability	-0.008	0.002	-0.025***	-0.024***	0.005	0.012*	0.004
	(0.006)	(0.004)	(0.009)	(0.009)	(0.004)	(0.007)	(0.004)
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District-specific Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	237060	237060	237060	237060	237060	237060	237060
R-Squared	0.080	0.096	0.075	0.073	0.062	0.114	0.065
	Δ Number						
Panel B: Intensive Margins							
Price	-0.101	-0.008	0.150	0.161	0.071	-0.079*	-0.001
	(0.126)	(0.044)	(0.097)	(0.109)	(0.101)	(0.046)	(0.116)
Price × Suitability	0.004	0.000	-0.008	-0.009	-0.004	0.004	-0.000
	(0.007)	(0.003)	(0.006)	(0.007)	(0.006)	(0.003)	(0.007)
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District-specific Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	190379	188956	188956	188956	237060	237060	237060
R-Squared	0.131	0.155	0.130	0.137	0.105	0.125	0.119

Note: This table presents the effects on changes in public good provision in health facilities and personnels and schools. Panel A presents estimation results of changes in extensive margins. Panel B presents results of changes in intensive margins. All regressions include population (log), distance to district capital (log), distance to sub district capital (log), village area (log) interacted with year fixed effects, harvested areas (log) allocated for planting rice interacted with year fixed effects. Dependent variables in columns 1 to 4 of Panel B are not available in PODES 2008. Standard errors, reported in parentheses, are robust to heteroskedasticity and clustered at district level. $*\ p < 0.10, **\ p < 0.05, ***\ p < 0.01$.

Table 4: Public Goods: Road Quality and Access to Safe Drinking Water

	Δ Road Asphalt (1)	Δ Road Passable (2)	Δ Drinking Water (3)
Price	0.101	0.262	0.087
	(0.252)	(0.179)	(0.153)
Price × Suitability	-0.007	-0.020**	-0.012
	(0.015)	(0.010)	(0.009)
Village FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
District-specific Trend	Yes	Yes	Yes
N	237060	237060	237060
R-Squared	0.143	0.280	0.090
Mean of Dep. Var.	0.652	0.921	0.221

Note: This table presents the effects on changes in the quality of road and access to safe drinking water sources. Column 1 measures whether the main road is asphalt. Column 2 measures whether the main road is passable by motor vehicles but may not necessarily asphalt. Column 3 measures whether villagers have access to safe drinking water, such as tap water or access to pump. All regressions include population (log), distance to district capital (log), distance to sub district capital (log), village area (log) interacted with year fixed effects, harvested areas (log) allocated for planting rice interacted with year fixed effects. Standard errors, reported in parentheses, are robust to heteroskedasticity and clustered at district level.. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Development Projects

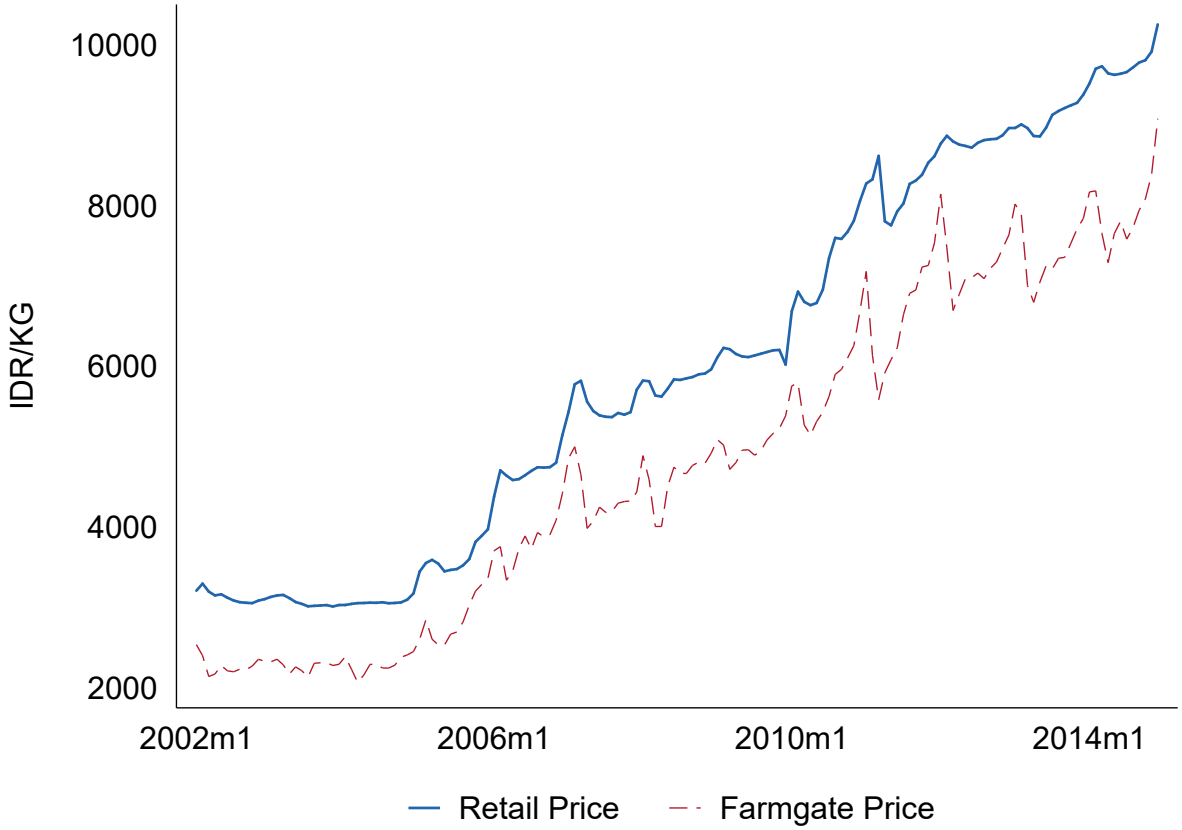
	Δ Presence of...				Δ Number of...			
	All project (1)	Infrastructure (2)	Capital Asst (3)	Employment Asst (4)	All project (5)	Infrastructure (6)	Capital Asst (7)	Employment Asst (8)
Price	-0.066	0.120	1.695**	-0.598	4.006	1.801	3.317**	-1.074
	(0.510)	(0.635)	(0.781)	(0.599)	(2.675)	(1.346)	(1.329)	(1.052)
Price × Suitability	0.030	0.002	-0.102**	0.036	-0.309*	-0.174**	-0.205**	0.065
	(0.032)	(0.039)	(0.049)	(0.036)	(0.166)	(0.084)	(0.083)	(0.063)
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District-specific Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	145649	145649	145649	145649	145649	145649	145649	145649
R-Squared	0.563	0.767	0.506	0.455	0.693	0.736	0.560	0.468
Mean of Dep. Var.	0.840	0.705	0.636	0.274	3.144	1.680	1.044	0.403

Note: The sample for all regressions only include PODES 2008 onwards because information on development projects only available starting in 2008. All regressions include population (log), distance to district capital (log), distance to sub district capital (log), village area (log) interacted with year fixed effects, harvested areas (log) allocated for planting rice interacted with year fixed effects. All regressions include village and year fixed-effects as well as district-specific trends. Standard errors, reported in parentheses, are robust to heteroskedasticity and clustered at district level.. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A Appendix

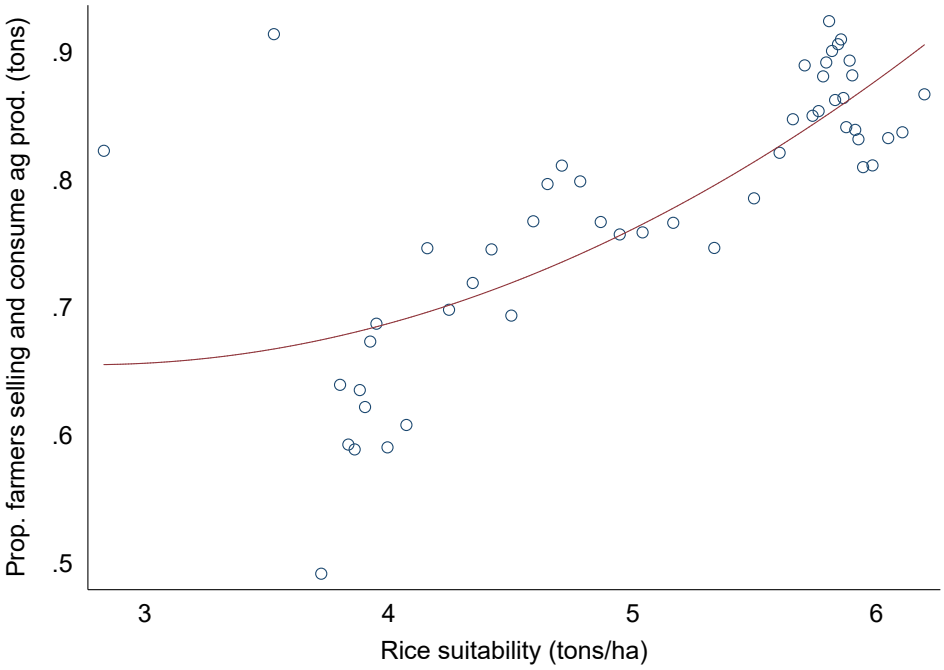
A.1 Figures

Figure A.1: Domestic Retail and Farmgate Price: 2002-2014



Note: This figure shows the close relatonship between national farmgate and retail rice prices from 2002 to 2014. Farmgate prices are quoted in wet paddy. Drying and milling process converts 100 kilograms of wet paddy to roughly 55 kilograms. Source: Central Bureau of Statistics (BPS) and CEIC database.

Figure A.2: Proportion of Producer and Consumer Farmers and Rice Suitability.



Note: This figure summarizes relationship between rice suitability and proportion of farmers selling and consuming their agriculture products conditional on majority of villagers working in agricultural sector. Source: FAO-GAEZ (rice suitability) and PODES 2005 (proportion of farmers sellers).

A.2 Tables

Table A.1: Summary Statistics

	Mean	SD	Obs.
Panel A: Agricultural characteristics			
Share of HH plant sawah (wetland) >0	0.37	0.31	301533
Share of HH plant palawija >0	0.29	0.31	301533
Share farmers sell and consume ag prod.	0.78	0.41	264928
Panel B: Δ Number of public goods and development projects			
Doctors	0.02	0.33	212608
Health center (Main)	0.00	0.06	212608
Health center (Small)	0.00	0.13	212608
Health center (Total)	0.00	0.13	212608
Primary school	-0.01	0.23	265760
Secondary school	0.01	0.12	265760
Total school	0.00	0.26	265760
Church	0.02	0.20	265760
Mosque	0.08	0.43	265760
Mushola	0.10	1.42	265760
Panel C: Other village characteristics			
Total village revenues (in millions)	127.46	193.47	189394
Village own-source revenues (in millions)	64.05	111.17	157430
Transfer grants (in millions)	110.08	183.63	185911
Village head education (years)	11.57	2.97	313183
Village head male	0.96	0.20	313151

Note: This table highlights additional key characteristics of 53,152 villages. Number of observations varies due to variation in availability of some variables in village census (PODES) waves