Coping with Rising Inequality in Asia: How Effective Are Fiscal Policies?*

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Abstract

This paper discusses the role and effectiveness of redistributive fiscal policies and provides estimates of the effects of taxation and government expenditure on income inequality in Asia. Tax systems around the world tend to be progressive, but government expenditure is generally found to be a more effective tool for redistributing income. In Asia, government spending on social protection has a distinctive differential distributive impact. Social protection spending appears to increase income inequality in Asia, whereas it reduces it in the rest of the world. Government expenditure on housing is also adversely affecting the distribution of income in Asia. Policy options for improving the redistributional effectiveness of fiscal policies in Asia are discussed.

1. Introduction

Over the past two decades many countries in Asia have experienced rapid economic growth, which has resulted in a substantial reduction in poverty and a dramatic improvement in welfare and the standard of living for a large proportion of the population. From 1990 to 2010 the region's average per capita GDP in 2005 PPP terms rose from US$ 1,633 to US$ 5,133, while the proportion of people living on less than US$ 1.25 a day fell from around 54 percent to below 22 percent, lifting more than 715 million people out of poverty (ADB 2012). But widening income inequality is emerging as a concern as the

performance in economic growth and reduction in poverty have been accompanied with rising income disparity in several developing Asian countries. At the same time, unequal access to basic social services, such as education and health, is seen as a significant problem that may be exacerbating growing income inequality.

The main purpose of this paper is to investigate the impact of redistributive fiscal policies in Asia, and compare that impact to what is observed in a broad set of other countries outside the continent. More specifically, the paper analyzes the effectiveness of taxation and selected government expenditure in reducing income inequality in Asia and in the rest of the world, and the fiscal policies that might be adopted in Asian countries to help reduce income disparity.

The rest of the paper proceeds as follows. Section 2 summarizes the literature on the role and effectiveness of redistributive fiscal policies. Section 3 discusses empirical estimates of the impact of taxation and government spending on income inequality in Asia. Section 4 reviews how the effectiveness of fiscal policies in Asia may be improved. The last section concludes with some policy lessons.

2. Review of the literature on the role and effectiveness of redistributive fiscal policies

A great deal of research has gone into conceptualizing and measuring how the revenue and expenditure sides of government budgets affect the distribution of income among households and individuals and how effective they are in helping the poor. Formally, the study of these effects is known as tax and expenditure incidence. This section reviews the different approaches that have been used in the literature and summarizes the main empirical findings.[1]

2.1 Tax incidence analysis
Tax incidence analysis investigates who ultimately bears the burden of government taxes in an economy. There are several key concepts. First is the distinction between "statutory" (or legal) incidence and "economic" incidence, or those taxpayers who are by law required to pay the tax versus those taxpayers who ultimately bear the tax burden. The latter is, of course, what really counts. The "shifting" of taxes happens because the agents statutorily responsible to pay the taxes can alter their economic behavior and transfer or shift the burden of taxes to other agents via changes in prices charged to consumers, wages paid to workers, or the return paid on invest-

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[1] Some parts of this section draw on Martinez-Vazquez (2008) and Cuesta and Martinez-Vazquez (2011).

ments. The degree of shifting depends on the elasticities of demand, supply, and substitution in the use of inputs of production among the economic agents interacting in the activity or market being taxed. Economic agents with lower elasticities—that is, lower ability (or willingness) to react—are more likely to ultimately bear the burden of taxes. Because adapting or reacting to taxes takes time, the economic incidence of taxes tends to be different in the short and long run. For example, capital owners may bear the burden of increased profit taxes in the short run, but this burden can be shifted to workers in the longer run as decreased investment leads to lower productivity and wages, and higher unemployment.

Second, taxes impose total burdens that go beyond the amounts actually collected by governments. This difference receives the name "excess burdens" of taxes or "deadweight losses." The excess burdens arise because taxes lead to less efficient uses of economic resources and lower output and income in the economy as taxes distort the choices of economic agents. For example, income taxes affect labor–leisure choices and saving and investment decisions.

Third, a significant difficulty in measuring the impact of taxes is to figure out the appropriate "counterfactual" (i.e., the situation before the taxes were implemented that should be used as the benchmark in the measurement of the impact) and to approximate the distribution of income that would have taken place in that counterfactual setting.

Fourth, to have a complete view of tax incidence we need to take into account the impact of tax expenditures, negative income taxes, and in-kind transfers. Tax expenditures, which take the form of exemptions, rebates, special deductions, tax credits, and special lower tax rates, can make a tax system more progressive (i.e., increase income equality) or more regressive (i.e., reduce income equality), depending on a variety of public choice issues such as lobbying power. Moreover, an important consideration is that tax expenditures cannot help the poor unless they pay taxes. And many of the poor do not pay taxes. This point highlights some of the limitations of redistributional policies from the tax side of the budget.

An important amount of redistribution can be implemented via negative taxes. These cash transfers are targeted to the poor and are by nature highly progressive. There are some caveats in their application, however. To minimize fraud, a sophisticated tax administration is required. In addition, stigma among the recipients can lead to low and uneven take-up of benefits, which may affect the progressivity of this type of transfer.

For in-kind transfers, their incidence typically depends on the degree of participation by income groups. In-kind transfer programs such as food stamps tend to be quite progressive. But not all in-kind transfer programs are progressive. For example, voucher programs for higher education tend to benefit higher income groups more than lower income groups because their uptake of higher education typically is proportionally higher, and so in general voucher programs are regressive.

2.2 Three general methodologies for determining the impact of taxes on income distribution

Three approaches have been used to estimate the distributional impact of taxes. The first, and most widely used, is microsimulation analysis, which utilizes consumer or household data and conventional assumptions of tax incidence. The second is based on computable general equilibrium models for the entire economy and just a few representative individuals, and the third is based on econometric estimation models with more aggregate data.

Microsimulation models of tax incidence   These models allocate tax burdens to different income groups, ordered from rich to poor by deciles or quintiles of the population, on the basis of a series of assumptions about who bears the final burden of taxes. For each tax, a portion of the revenues collected is imputed as tax burden to each income group in a way that exhausts the total revenues collected. For example, the revenues from excise taxes on tobacco products are allocated to different income groups in proportion to their relative share in the consumption of tobacco products. To arrive at an estimate of the incidence for the entire tax system, the incidence for each tax is calculated separately for each income group. These results are added up across all taxes for each income group to arrive at the total burden for each income group. Typically, the total burden is expressed as an average total tax rate—that is, the proportion of income paid in taxes by each income group. The information on total income, sources of income, and expenditure patterns are generally obtained from data in household or consumer income and expenditure surveys. Taxes collected are obtained from the tax administration authorities.

The microsimulation approach to tax incidence presents advantages and disadvantages. On the plus side, the methodology is relatively simple and easy to implement, the underlying assumptions are transparent, and the implications of alternative assumptions can be easily compared. The analysis can also include large samples of taxpayers. On the minus side, good information on income distribution is not always available, and general equilibrium second-round feedback effects are typically ignored. More importantly, the assumptions about who bears the final burden of

taxes that play a critical role in the results have been criticized for "stipulating" the incidence of various taxes (Devarajan, Fullerton, and Musgrave 1980).

General equilibrium models of tax incidence   This approach to tax incidence was pioneered by Harberger (1962). It analyzes the incidence of taxes within the context of a general equilibrium model of the economy, without making explicit assumptions about who bears the final burden of taxes. Instead, tax incidence is determined by the initial structure of the economy with the final outcome measured by observing the differences in the vector of equilibrium prices before and after a tax change. Harberger's model was operationalized by the development of computable general equilibrium models. They are numerically solved general equilibrium models using data from the national income accounts, household expenditure surveys and taxpayer filings (e.g., Fullerton et al. 1979; Ballard et al. 1985). General equilibrium models capture all the parameters that should play a role in final tax incidence among different income groups: different demand patterns, different endowments in resources, and variations in capital–labor ratios in different economic sectors.

The general equilibrium approach also has its advantages and disadvantages. On the positive side, it uses an explicit structural model of the economy with utility/demand functions and production/supply functions. It offers transparency in how incidence results are linked to assumptions on fundamental parameters, such as the elasticity of substitution in production and the incidence results include measures of excess burdens. Moreover, general equilibrium models take into account indirect or second-round feedback effects of taxation or government expenditure changes. On the minus side, general equilibrium models are operationally intensive and the number of taxpayers represented needs to be small. And even though the approach does not stipulate incidence results it does stipulate a long list of critical parameters, including elasticities of substitution in production and demand and supply (Fullerton and Rogers 1991).

Regression-based estimates of the impact of taxes on income distribution
A limited number of recent studies have used multivariate econometric analysis to investigate the impact of the tax structure on the distribution of income across countries, typically measured via Gini coefficients. For example, Weller (2007) uses cross-country data from 1981 to 2002 and finds positive effects of progressive taxation on income distribution. Gwartney and Lawson (2006) use panel data on changes in marginal tax rates from 1980 to 2002 to examine their impact on the distribution of income and find that countries with the most significantly high tax brackets rate reductions have experienced the largest increases in inequality over the sample

period. Duncan and Sabirianova Peter (2008) derive a measure of income tax progressivity and find that inequality in the distribution of income is significantly affected by their measure of progressivity. Similarly, Martinez-Vazquez, Vulovic, and Liu (2011) find that higher reliance on direct over indirect taxes improves the income distribution over time for a large number of countries.

On the plus side, the econometric approach allows analyzing the impact of large variations in the level and structure of taxes across countries, variations that are unlikely observed within a single economy. Moreover, it has fewer data requirements than the microsimulation and general equilibrium approaches and uses information typically available for most countries including developing economies. A disadvantage of the approach, however, is that the impact of the different elements of the structure of taxes on income distribution cannot be examined in any detail, at least not to the extent allowed by the general equilibrium approach and especially microsimulation models. In all, the econometric approach should therefore be considered a complement rather than a substitute for the other two approaches.

2.3 Expenditure incidence analysis

From the perspective of redistributional policies, it is important to understand the incidence of public spending programs. The key difficulty in measuring the impact of public expenditure on individuals and households, however, is that with some rare exceptions, we are not able to measure output from government expenditures. How public expenditures impact different groups depends, among other things, on the composition of public expenditures, what programs are being implemented, and how much funding is going to each, such as basic education versus university-level education, or primary health care versus tertiary hospitals. The impact of public expenditure on the distribution of income depends also on the efficiency of government spending, the cost effectiveness of funds in delivering services, and the matching of real needs.

The basic problem in expenditure incidence is how to measure the benefits accruing to individuals from public goods and services. In the case of private goods and services, even though marginal private benefits are not directly observable we can infer them from market prices. In the case of public goods and services, many are provided without direct charges, and even when there is a fee or service charge, this price cannot be interpreted in general as the marginal benefit for individuals, because the supply of most public goods and services is subsidized or rationed, and it does not respond directly to demand.

2.4 Three general methodologies for determining the impact of government expenditures on income distribution

Three general approaches have been used in the estimation of expenditure incidence. The first is the benefit incidence approach, which measures how much the income of households or individuals would have to be raised if they had to pay for subsidized public goods and services at full cost. The second is the behavioral approach, which derives estimates of households' and individuals' willingness to pay for those goods and services. The third approach uses econometric techniques with aggregate data to analyze their differential impact on income distribution.

The benefit incidence approach   This approach, which is also known as the classic or the nonbehavioral approach, was pioneered by twin World Bank studies by Selowsky (1979) for Colombia and Meerman (1979) for Malaysia. The essence of the approach is to use information on the cost of publicly provided goods and services together with information on their uses by different income groups to arrive at estimates of the distribution of benefits. Individual beneficiaries are typically grouped by income level, but they can also be grouped by geographical area, ethnic group, urban and rural location, gender, and so on. Information on individual or household use of the public goods and services is typically obtained from surveys, and it is fundamental to know how effectively public expenditure programs target the poor. Because of the required information on unit costs in the provision of public goods and services and the rate of use of those services by different individuals, in practice, benefit incidence has been estimated for three main categories of public goods and services: education, health, and some types of infrastructure.

The benefit incidence approach has several strengths but it also has weaknesses. On the positive side, it provides simplicity and transparency of estimation procedures and allows study of which public expenditure programs are most effective in reaching and improving the status of the poor. On the negative side, the cost measures may not be a good enough approximation of true benefits or marginal valuations of the public good or service provided, and it cannot incorporate changes in the behavior of individuals in response to changes in public expenditure. For example, we may find that poor households do not send their children to school, but benefit incidence cannot explain why that may be the case, nor does it provide a course of policy action. Moreover, the scope is limited to public expenditure programs for which private beneficiaries can be identified. The approach can also ignore important interaction effects with the private sector. For example, if the private education sector is able to attract a higher number of wealthier students, the benefit incidence of public education becomes more progressive. On the other hand, if the quality of education depends, among other things, on peer effects, the lower number of children of better

educated and wealthier families in public schools may reduce the quality of public education for the poor.

The behavioral approach: Marginal willingness to pay   In essence, this approach uses individual preferences to derive marginal willingness to pay as the measure of individual benefits from public expenditures. This approach was first used in the estimation of net fiscal incidence of taxes and expenditures at the local level by Aaron and McGuire (1970) and Martinez-Vazquez (1982) and more recently in expenditure incidence studies pioneered by Gertler and van der Gaag (1990), Gertler and Glewwe (1990), and Younger (1999). Econometric methods are used to exploit variation in behaviors in the use of public goods and services, prices, incomes, and other household characteristics across individuals, and time to estimate demand functions for public goods and services. These demand functions generate price elasticities and willingness to pay, generally varying by income group. With that information, one can estimate the incidence of public spending programs, in particular whether they have a pro-poor incidence and whether the poor may have a more elastic response to any changes in costs associated with the use of the public good or service.

The behavioral approach also has several strengths and weaknesses. On the positive side, it is more theoretically sound with clear foundations in microeconomics, and allows the estimation of incidence for public expenditures for which specific users cannot be identified. Furthermore, it incorporates individual behavioral responses and therefore can provide concrete guidance for policy reform to better target expenditures to the poor. On the negative side, this approach is more data-intensive and methodologically more complex.

Regression-based estimates of the impact of government expenditures on income distribution   Using cross-country or panel data, this approach investigates the impact of government expenditures on the distribution of income, typically measured via Gini coefficients. Regression-based estimates, going as far back as Tanzi (1974), have shown that what in many instances would seemingly be perceived as redistributive government spending may do nothing to improve income inequality and may actually worsen it. For example, de Mello and Tiongson (2006) in a cross-country analysis (the sample running from 27 to 56 countries depending on availability of data) of the impact of government spending on income distribution find the overall effects of expenditures to be unequalizing. In fact, those countries where redistribution is most needed due to high inequality are also less likely to have effective redistributive policies in place. In a country case study for Brazil, Clements (1997) similarly finds that government social expenditures have in fact exacerbated income inequality. On the other hand, Jao (2000) finds that in the

case of Taipai, China, public expenditures on social assistance and social insurance contributed positively to reducing income inequality. Using panel data for a large number of countries, Martinez-Vazquez, Moreno-Dodson, and Vulovic (2012) find that aggregate public expenditures on social welfare, education, health, and housing have a significant effect on reducing income inequality.[2]

The multivariate regression approach to the analysis of public expenditure incidence also has some clear advantages and disadvantages, and therefore should be considered a complement rather than a substitute for the benefit incidence and behavioral approaches. It can analyze the impact on income distribution of large variations in levels of expenditures and their composition across countries, variations that are often not observed within the context of country case studies. Multivariate analysis also allows examining the evolution over time of the impact of different government expenditures on income distribution within countries, and is less data-intensive. On the other hand, the analysis of income distribution at the aggregate country level does not allow the introduction in the analysis of specific details of policies and institutions that can make a significant difference on the effectiveness and overall impact of public expenditure policies. For example, two countries can have similar expenditures on primary education and health, but one of these countries may put greater effort into targeting the access to these services by poor rural or urban families. This type of information is typically not available for a large number of countries and therefore is likely to be ignored in multivariate regression studies. If the information is available, there may be the possibility of using dummy variables to account for those effects. Also, to the extent that institutions and policy approaches do not change over time, their impact can be controlled for by using fixed-effect panel estimation.

2.5 Summary of findings of incidence analysis

Although different tools and data have been used in the incidence literature, some general results and findings about the effectiveness of redistributive fiscal policies seem to hold across the different methodological approaches.

Most tax systems tend to show a mildly progressive incidence impact. Around the world, however, taxes have not been an effective means of redistributing income. This is partly because of the potentially large excess burdens or economic losses associated with highly progressive taxation. The international experience shows that

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2 The data set covers a slightly shorter period, 1970–2006, than the one used in this study for which the results are reported in the next section. The estimation also does not differentiate Asian economies.

the expenditure side of the budget (including transfers) can have a more significant impact on income distribution. Direct cash transfers and in-kind transfers can be quite progressive, unless there are serious targeting problems. Moreover, expenditure programs in the social sectors (education and health) are more progressive the more is spent in relative and absolute terms on those goods and services more frequently used by the poor (basic education and primary health care). The effective targeting to lower income groups in expenditure programs is hard to design and to implement, however. Whether these general findings and conclusions about the effectiveness of redistributive fiscal policies also hold for Asian countries is discussed next.

3. Empirical estimates of the impact of fiscal policies on income inequality in Asia

This section presents estimates of the impact of fiscal policies on income inequality in Asia. They are derived from multivariate regression analysis and quantify the effects of taxation and selected government expenditures on income distributions.

3.1 Methodology and data
Using data from 150 developed, developing, and transition economies between 1970 and 2009, Claus, Martinez-Vazquez, and Vulovic (2012) estimate the impact of fiscal policies on income distributions measured by Gini coefficients.[3] Of the 150 economies, 22 are from Asia.[4] To identify Asia-specific tax and government expenditure effects, dummy variables are used. Different regressions are estimated to assess the effects of taxes and government expenditures individually and jointly using fixed-effect panel estimation methodology proposed by Blundell and Bond (1998).

All regressions include lagged inequality to capture the persistence of income inequality over time, various tax and government expenditure variables, and a set of observable control variables that are commonly used in the literature to explain income inequality. Based on data availability, the following control variables are included: population growth, youth dependency, old-age dependency, a globalization index, GDP per capita, long-term unemployment, perception of corruption,

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3 Gochoco-Bautista et al. (2013) examine the relationship between income inequality and income polarization in Asian countries.

4 Economies in Asia included are Bangladesh; Bhutan; Cambodia; the People's Republic of China; Hong Kong, China; India; Indonesia; Japan; the Republic of Korea; the Lao People's Democratic Republic; Macao, China; Malaysia; the Maldives; Mongolia; Myanmar; Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Thailand; and Vietnam.

schooling, and size of government. The estimations also include dummy variables to account for differences in the computation of Gini coefficients across countries.[5]

The following tax variables are considered: personal income tax, corporate income tax, social security contributions and payroll taxes, general taxes on goods and services, and excises and customs duties—all measured as a percent of GDP.

Personal income taxes are generally thought to reduce income inequality. When evaluating their impact on income disparity, however, it is important to take into account the progressivity of income tax scales (i.e., how fast the average tax rate rises with income). As a result, personal income tax revenue is interacted with a comprehensive personal income tax progressivity measure (*progressivity*) constructed by Sabirianova Peter, Buttrick, and Duncan (2010).

When assessing the impact of corporate income taxes on inequality, it is important to take into account that the progressivity of corporate income taxes may be affected by countries' openness. In a closed economy, the owners of capital tend to bear the full burden of corporate income taxes. But in an open economy, where capital can flow freely across international borders, the burden of corporate income taxes is likely to be shifted to workers. To allow for these effects, the corporate income tax variable is interacted with a globalization index.

Social security contributions and payroll taxes are commonly shared between employees and employers. But employers tend to almost entirely shift the burden to employees in the form of lower wages. Social security contributions and payroll taxes are expected to increase income inequality if there is a cap on income for contribution. The lower the cap, the more regressive are the taxes.

The evidence for the impact of taxes on goods and services, including value-added taxes and excises, on income inequality is mixed. Studies that analyze current income generally find that they are regressive, but this regressivity is reduced substantially and may even become neutral when analyzed over a longer time frame. The sign on the coefficient for general taxes on goods and services and excises could therefore be negative or not significantly different from zero. For lack of better information, customs duties are expected to have the same direction of effect on income inequality as general taxes on goods and services.

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5 Gini coefficients are computed from income/consumption distribution data. They can be based on gross or net income (i.e., income before or after the deduction of taxes and social contributions) or expenditure.

On the government spending side, four types of expenditure are considered: on social protection, education, health, and housing—all expressed as a percent of GDP. Ideally, subcomponents of these expenditure categories would have been included (e.g., basic education versus university-level education, or primary health care versus tertiary hospitals), as they are likely to affect income groups differently. Internationally comparable disaggregated data on government spending are not available, however. Bearing this in mind, it is possible that higher aggregate government spending may in fact increase income inequality (e.g., in the case where that expenditure is directed toward higher education), even though the intuitive expectation is that it would reduce it.

The empirical analysis consists of three sets of estimation. The first set focuses only on the effects of taxation and personal income tax progressivity on income inequality. Similarly, the second set of estimates investigates only the effects of government spending on income distributions, and the third set includes both taxation and government expenditure to evaluate their joint effect on income inequality in Asia and other countries. The results from the first two sets of estimation are replicated in Appendices A and B and discussed next. Those from the joint estimation are not replicated as they confirm the general findings. For a detailed description of the data and methodology and the results from the joint estimation see Claus, Martinez-Vazquez, and Vulovic (2012).

3.2 Taxation and income inequality

Table 1 reports the estimated marginal impact of taxation on income inequality from alternative tax instruments. Table 1 shows that personal income taxes (PIT) have the expected negative impact on income inequality and that the effect is significantly higher in Asia than in the rest of the world. A one-percentage-point increase in PIT revenue as a percent of GDP in Asia reduces income inequality by around 0.573 percentage points compared with 0.041 percentage points in the rest of the world. The finding of a greater redistributive effect of personal income taxation may be due to a larger number of people not paying income tax in Asia because their income is below a tax-free threshold. A larger share of informal employment may also be a contributing factor.

The overall impact of progressive income tax scales is modest and somewhat smaller in Asia than in the rest of the world. A one-percentage-point increase in PIT interacted with the progressivity measure reduces income inequality by around 0.002 percentage points in Asia compared to 0.005 in the rest of the world.

Including corporate income tax (CIT) revenue as a percent of GDP in the estimation suggests that corporate income taxation reduces income disparity in the rest of the

Table 1. Estimated marginal impact of taxation on income inequality (in percentage points)

	Asia	Rest of the world
Personal income tax	−0.573	−0.041
Personal income tax*progressivity	−0.002	−0.005
Corporate income tax	0.598	−0.338
Corporate income tax*globalization	−0.017	0.005
Social security and payroll taxes	1.324	0.165
General taxes on goods and services	0.666	0.768
Excises	0.609	−0.059
Customs duties	0.174	0.651

Source: Claus, Martinez-Vazquez, and Vulovic (2012).

world, but that it is regressive in Asia.[6] A one-percentage-point increase in CIT raises income inequality by around 0.598 percentage points. This regressivity of CIT in Asia may be due to larger tax concessions and subsidies for firms. Interacting CIT with globalization, however, reverses the sign. CIT interacted with globalization lowers inequality, which is the opposite from what is expected and what is observed in the rest of the world. The finding may be due to profit shifting by multinational corporations to Asian countries.

Social security contributions and payroll taxes are typically shifted to employees in the form of lower wages and are expected to result in increased income inequality when capped at higher incomes. The results in Table 1 provide support for this hypothesis, especially in Asia where the estimated effect of social security contributions and payroll taxes as a percent of GDP (SSC+Payroll) on income inequality is substantially larger than in the rest of the world (1.324 compared with 0.165). The larger coefficient in Asia is likely due to two effects. First, social security contributions are capped at relatively low incomes. Second, they are deductible for income tax purposes in several Asian countries, which raises the tax burden for low income people with earnings below a tax-free threshold.

Empirical evidence regarding the effect of general taxes on goods and services on income inequality is mixed. The results for Asia and for the rest of the world support the hypothesis that they are regressive. The results suggest that a one-percentage-point increase in general taxes on goods and services as a percent of GDP (GTGS) increases income inequality by around 0.666 percentage points in Asia compared with 0.768 in the rest of the world. Somewhat less regressive GTGS could be due to lower tax compliance in Asia. Moreover, Asia may have a greater number of small businesses not charging value-added taxes (VAT), for example, because their sales are below VAT registration thresholds.

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6 The correlation coefficient between the Gini coefficient and CIT in Asia is about 0.06.

Table 2. Estimated marginal impact of government spending on income inequality (in percentage points)

	Asia	Rest of the world
Social protection	0.490	−0.276
Education	−0.486	−0.034
Health	−0.241	−0.330
Housing	2.162	−0.614

Source: Claus, Martinez-Vazquez, and Vulovic (2012).

Excises and customs duties are also found to be regressive in Asia. The results in Table 1 show an estimated effect of 0.609 percentage points for excises and 0.174 percentage points for customs duties.

3.3 Government spending and income inequality

Table 2 reports the estimated marginal impact of the different types of government spending on income inequality. The estimates suggest that a one-percentage-point increase in social protection expenditure raises income inequality in Asia by 0.49 percentage points. In the rest of the world, social protection spending has the expected negative sign (i.e., it reduces income inequality).

Social protection expenditures consist of two components: (i) services and transfers provided to individuals and households, and (ii) expenditures on services provided on a collective basis (IMF 2001). Collective social protection services include formulation and administration of government policy, formulation and enforcement of legislation and standards for providing social protection, and applied research and experimental development into social protection services. Asian countries provide relatively few services and transfers, and the second component is likely to dominate. The unexpected positive effect of social protection on income inequality suggests that government policies and legislative enforcement, and so forth—the second component of social protection expenditure—may benefit higher-income households and individuals more than those with a lower income.[7] Moreover, the unexpected positive effect of social protection may be due to a narrow benefit coverage and a lack of targeting to the poor for the few services and transfers that Asian countries provide.

For education, the results suggest that government expenditures in Asia have a larger negative effect on income inequality than education spending in other countries. In the case of expenditures on health, this type of expenditure has a somewhat lower negative effect on income inequality in Asia than in the rest of the world. On

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7 To test this hypothesis, information on the structure of social protection expenditures would be needed, which, however, is not available.

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the other hand, the estimates suggest that a one-percentage-point increase in housing expenditure raises income inequality in Asia by 2.162 percentage points, compared with the rest of the world where housing spending has the expected negative sign (i.e., it tends to reduce income inequality). The adverse effect likely reflects the housing challenges facing governments in developing Asia that are arising from rapid urbanization. So far, large-scale government programs of direct housing provision have only been successful in a few countries (e.g., Hong Kong and Singapore) and nearly a third of households in Asia continue to live in slums and informal settlements (UN-HABITAT 2011).

4. Improving the effectiveness of fiscal policies in Asia

The review of the literature and the empirical results for Asia and the rest of the world suggest that more effective redistributional policies can be implemented with spending programs on social welfare and the social sectors, such as health and education policies, than with taxes. Taxation, however, is crucial to raise financing for government expenditure to achieve distributional objectives. This section discusses the effectiveness of tax systems and tax administration in collecting tax revenue in Asia. Our focus is on corporate and personal income taxation and value-added taxes, as payroll and social security taxes are less important in Asian countries and tax revenues from foreign trade taxes, including custom duties, are declining with rising trade liberalization. The section also briefly discusses government spending policies on education, health, and social protection to throw more light on the empirical findings presented in the previous section. Housing is excluded from the discussion because of a lack of readily available data and information.

4.1 Tax systems

Taxes create economic costs because they distort economic behavior. A theoretically optimal tax that minimizes the behavioral impact of taxation is one that taxes activities according to their varying response elasticities to the tax. In practice, however, such an approach is not feasible because it is constrained by principles of fairness and simplicity, and because of the difficulties to reliably measure the tax sensitivity of particular activities. Practically speaking, an efficient tax system is one that reduces the disincentive effects of taxation to work, save, and invest by using broad bases and low, fairly uniform rates. A broad-base, low-rate system also lowers administration and compliance costs, leaving more resources for productive activities, and is often seen as fairer than a narrow-base system because of horizontal equity considerations (i.e., taxpayers who have the same income should pay the same amount in taxes) and vertical equity (i.e., people with different incomes should pay different amounts of tax).

Figure 1. Corporate income tax and corporate income tax rate (2009 or latest available year)
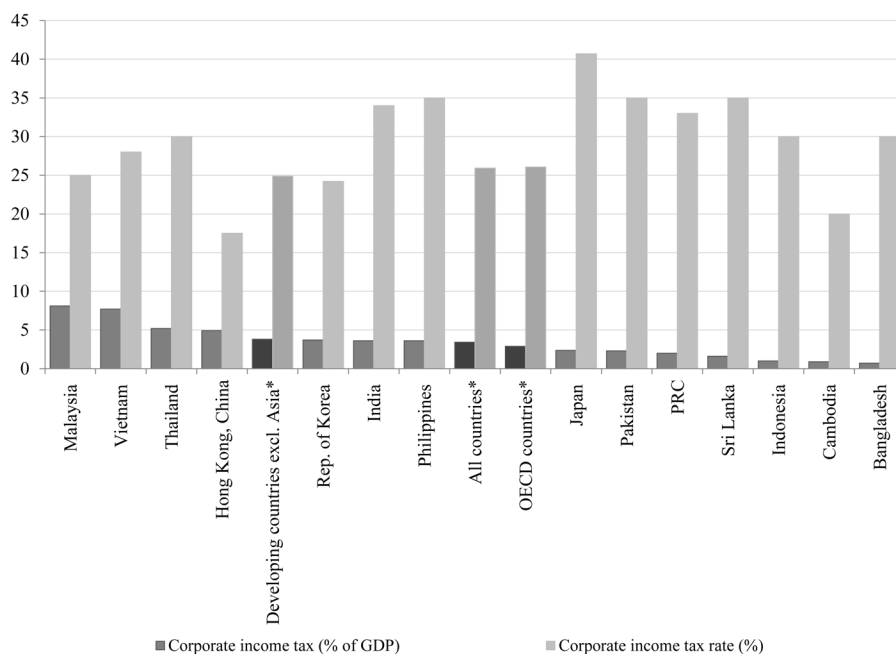
Legend: ■ Corporate income tax (% of GDP)   ■ Corporate income tax rate (%)

Source: International Monetary Fund, KPMG, OECD, United Nations Economic Commission for Latin America and the Caribbean.
Note: Sorted from highest to lowest tax revenue as a percent of GDP.
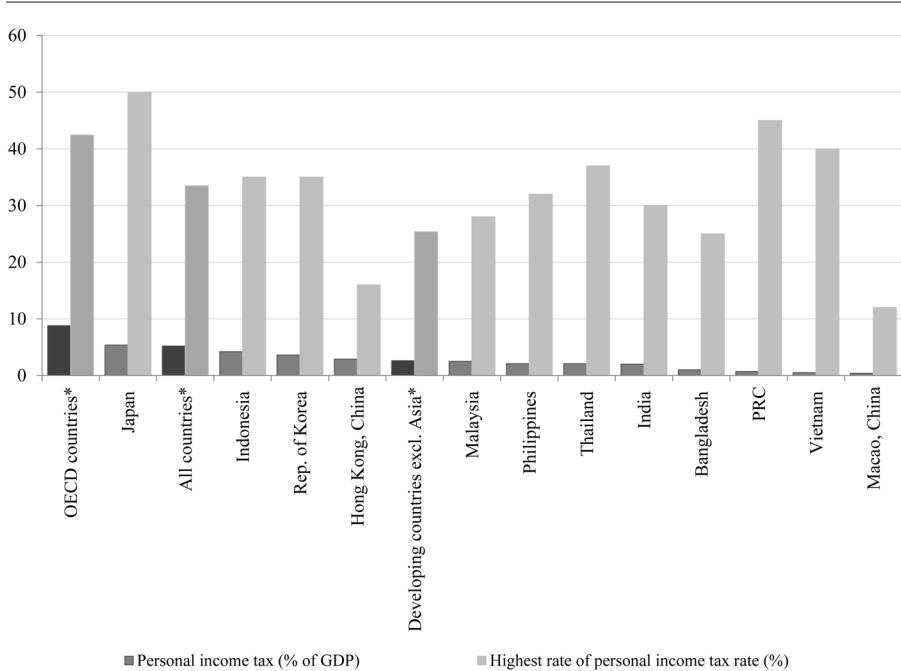**Unweighted average.*
GDP = gross domestic product; OECD = Organization for Economic Co-operation and Development; PRC = People's Republic of China.

4.2 Composition of taxes

Corporate income taxation is an important part of countries' tax systems. Figure 1 plots corporate income tax revenue as a percent of GDP and (statutory) corporate income tax rates in Asia compared with three country averages: all countries, OECD countries, and developing countries excluding those in Asia. It shows that Malaysia at 8.1 percent and Vietnam at 7.7 percent have the highest level of CIT, and Indonesia, Cambodia, and Bangladesh have the lowest, at 1.0 percent, 0.9 percent, and 0.7 percent, respectively. Corporate tax collection is low in Indonesia and Bangladesh despite relatively high tax rates, partly because of various tax incentives and concessions that governments often provide for attracting investment and for activities seen as having social or economic merit.

Besides reducing tax revenue collections, there are other potential costs to tax incentive schemes. Tax incentives often become politicized with resources being captured

Figure 2. Personal income tax and top personal marginal income tax rate (2009 or latest available year)

*Note:* Sorted from highest to lowest tax revenue as a percent of GDP.
*Unweighted average.
GDP = gross domestic product; OECD = Organization for Economic Co-operation and Development; PRC = People's Republic of China.

by interest groups. If lobbying power is concentrated among high-income groups, tax incentives and concessions would be expected to reduce the redistributive impact of corporate income taxation. Another difficulty with tax incentives schemes is that they are often poorly targeted and to a large extent just subsidize activities that firms would have undertaken regardless of the policies.

Personal income taxation is another important part of countries' tax collection. Figure 2 plots personal income tax revenue as a percent of GDP and the top personal (statutory) marginal income tax rate. It shows that PIT collection is low in Asia compared with the rest of the world, OECD countries, and developing economies excluding those in Asia. On average, Asian countries collect about 2.2 percent of personal income taxes as a percent of GDP compared with an all-country average of

Figure 3. Ratio of tax free threshold/individual allowance or deduction to gross national income per capita (2012)
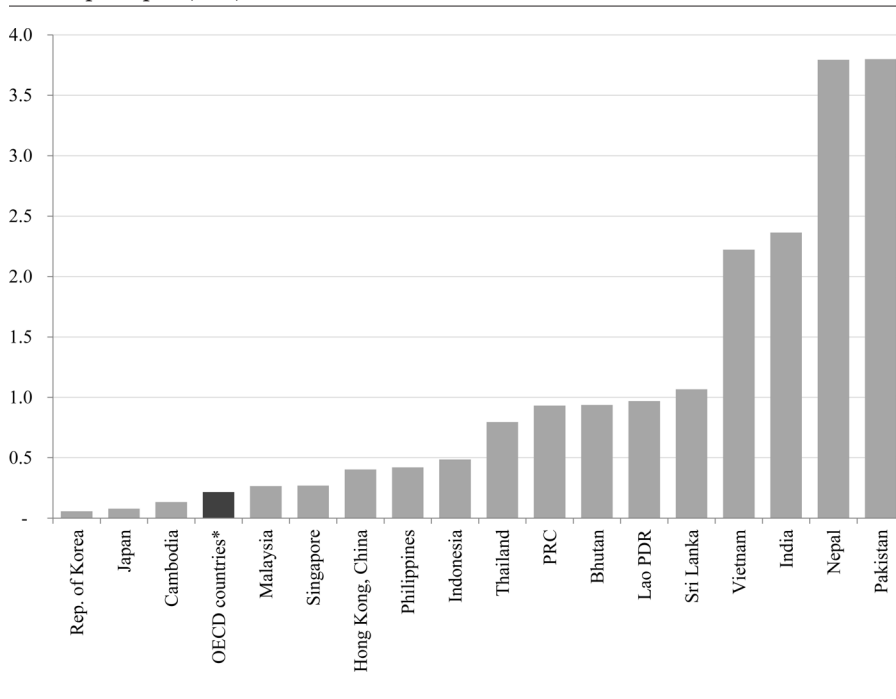
Source: International Bureau of Fiscal Documentation, Asian Development Bank, authors' calculations.

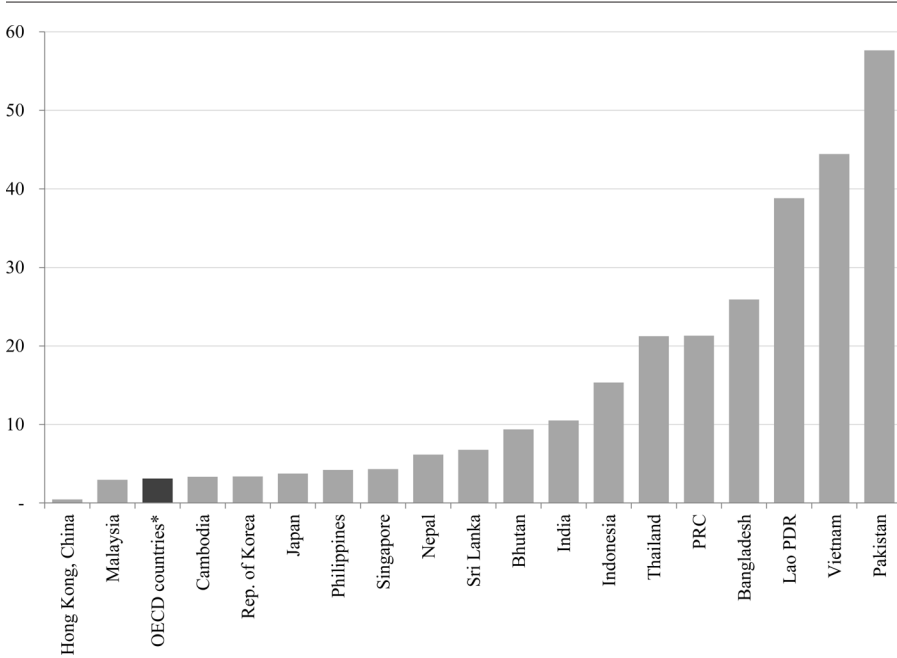*Note:* Gross national income per capita for Asian countries is assumed to grow at the 2000–10 rates.

*Unweighted average, data are for 2009 or 2008, no data are available for Turkey.

Lao PDR = Lao People's Democratic Republic; OECD = Organization for Economic Co-operation and Development; PRC = People's Republic of China.

5.2 percent, and 8.8 percent, and 2.7 percent, respectively, in OECD and developing countries excluding those in Asia. Partly contributing to this relatively low tax take are higher tax-free (minimum exempt) thresholds and a higher threshold of income, above which the top marginal personal income tax rate applies.

Figure 3 plots the ratio of the tax-free threshold/individual allowance or deduction to gross national income per capita. It shows that Nepal at 3.8 and Pakistan at 3.95 have the highest ratios. Only Cambodia, the Republic of Korea, and Japan have ratios below the average of OECD countries. The higher the tax-free threshold, the larger tends to be the number of lower-income people exempt from income taxation and the larger the redistributive impact of personal income taxes, but the higher the statutory tax rates that are needed to finance government expenditure.

Figure 4. Ratio of top personal income tax threshold to gross national income per capita (2012)

*Note:* Gross national income per capita for Asian countries is assumed to grow at 2000–10 rates.

*Unweighted average, data are for 2009 or 2008, no data are available for Turkey.

Lao PDR = Lao People's Democratic Republic; OECD = Organization of Economic Co-operation and Development; PRC = People's Republic of China.

Figure 4 plots the ratio of the top personal income tax threshold to per capita gross national income. At 0.45, Hong Kong, China, has the lowest ratio, and the Lao People's Democratic Republic, Vietnam, and Pakistan have the highest thresholds with ratios of 38.8, 44.4, and 56.7, respectively. A higher threshold, all else equal, would be expected to increase the redistributive impact of personal income taxes.

Also contributing to the relatively low personal income tax take in some Asian countries are narrow tax bases, which exempt certain types of income or tax them at lower rates. In the People's Republic of China (PRC), for example, only certain listed types of income (11 categories) are liable to tax. Some of these categories are taxed at progressive rates, whereas others are taxed at a flat rate. For labor income, wages and salaries are taxed at a progressive rate with a top marginal rate of 45 percent, but the remuneration of personal services is taxed at a flat rate of 20 percent after a

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Figure 5. General taxes on goods and services and indirect tax rate (2009 or latest available year)
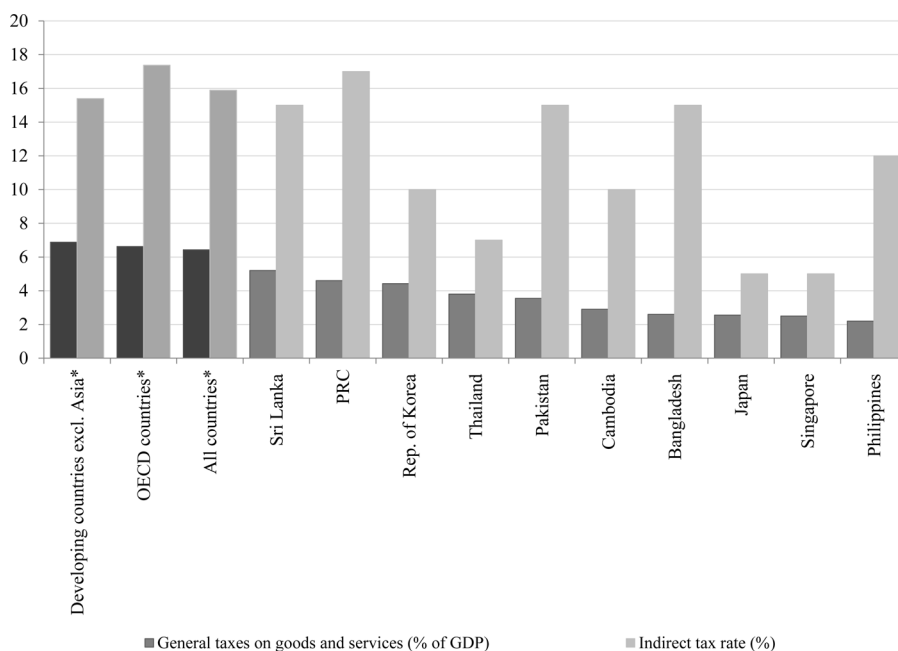
Legend: ■ General taxes on goods and services (% of GDP)   ■ Indirect tax rate (%)

Source: International Monetary Fund, KPMG, OECD, United Nations Economic Commission for Latin America and the Caribbean.

Note: Sorted from highest to lowest tax revenue as a percent of GDP.

Unweighted average.

GDP = gross domestic product; OECD = Organization for Economic Co-operation and Development; PRC = People's Republic of China.

deduction of 20 percent of the payment as deemed expense. Interest is also generally taxed at a flat rate (20 percent), whereas royalties and rental and lease income are taxed at 20 percent and 10 percent, respectively, with a 20 percent deduction being allowed. Moreover, certain types of income (e.g., monetary awards, interest on government bonds and on savings in a deposit account with banks in the PRC) and certain benefits in-kind (e.g., provision of or reimbursement for reasonable expenses on accommodation, travel expenses, and allowances for children's education) are exempt from personal income taxation altogether. Tax concessions reduce the redistributive impact of personal income taxes if they are mainly captured by higher-income people.

A further important contributor to countries' tax collection is general taxes on goods and services, which include value-added (goods and services) taxes, general sales taxes, and turnover taxes. They are plotted in Figure 5 as a percent of GDP together
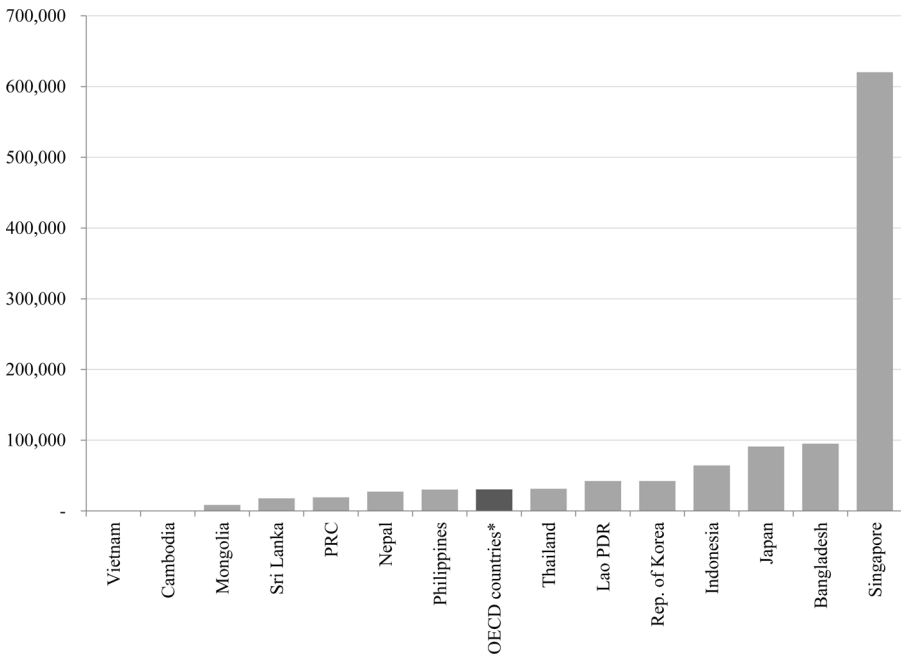
Figure 6. VAT efficiency ratio (2009 or latest available year, percent)
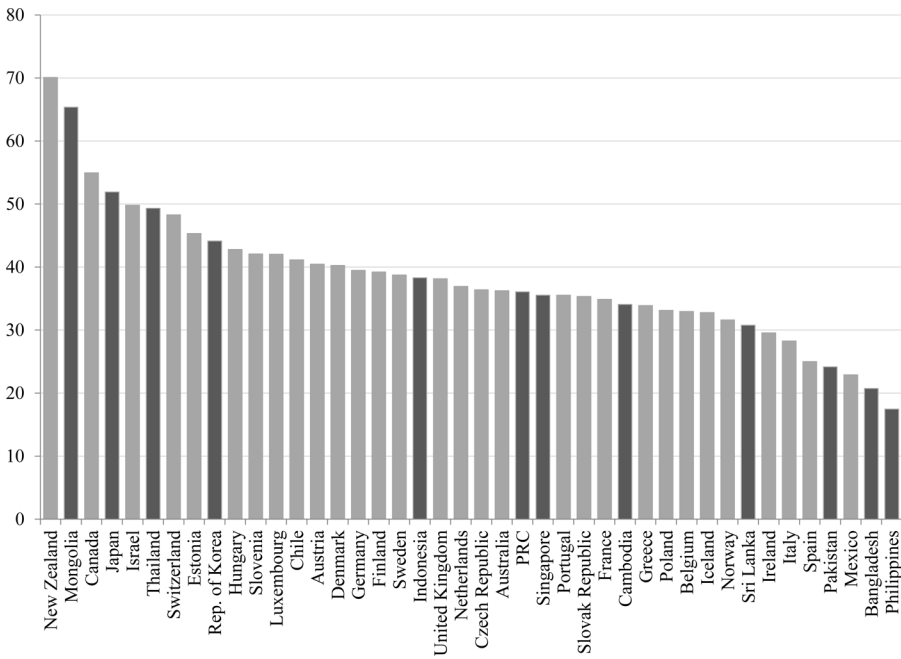
Note: PRC = People's Republic of China; VAT = value-added tax.

with countries' indirect tax rate, which generally coincides with the VAT standard rate. The figure shows that revenues from general taxes on goods and services, similar to personal income taxes, are low in Asia, averaging 3.3 percent of GDP compared with an all-country average of 6.4 percent, and 6.9 percent and 6.6 percent, respectively, in developing countries excluding those in Asia and the OECD economies. This lower tax take partly results from lower indirect tax rates. Among Asian countries, Japan and Singapore, both at 5 percent, and Thailand, at 7 percent, have some of the lowest indirect tax rates in the world.

At 2.2 percent of GDP, the Philippines has the lowest collection of general taxes on goods and services (consisting of VAT) despite its 12 percent indirect tax rate. The low VAT revenues are largely due to a low efficiency of the VAT system. An efficiency ratio, plotted in Figure 6, can be calculated as VAT revenues to GDP divided by the standard statutory VAT rate (expressed as a percentage). A low efficiency ratio is taken as evidence of erosion by exemptions, reduced rates within

Figure 7. VAT registration threshold (2012, US$)

the tax law, and/or low taxpayer compliance. Bangladesh has the second least efficient VAT system in Asia.

Singapore also has a relatively low efficiency given the breadth of its VAT base, resulting from an extremely high registration threshold of annual taxable turnover above SG$ 1 million or about US$ 620,000 (Figure 7).

Although the number of countries with a VAT system has been rising rapidly (Martinez-Vazquez and Bird 2011), several Asian economies have not adopted a VAT. They include Bhutan; Hong Kong, China; Macao, China; Malaysia; and Myanmar. India also does not have a VAT in the traditional sense.

Less reliance on value-added taxes in Asian countries is likely to increase the economic costs of taxation as value-added taxes are one of the least distortionary taxes.

Figure 8. Tax administration expenditure (2009, percent of GDP)
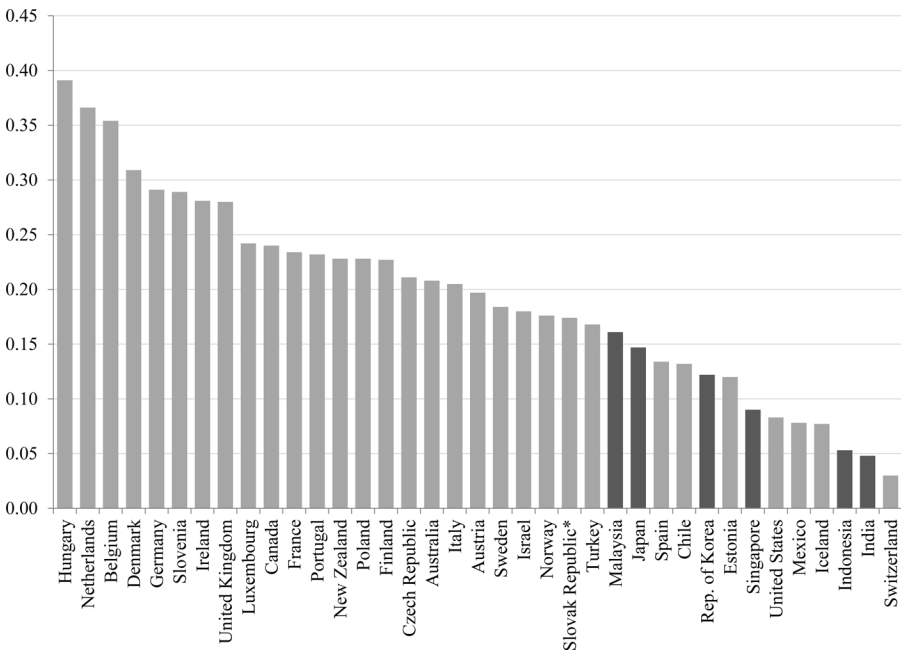
Source: Organization for Economic Co-operation and Development.
Note: GDP = gross domestic product.
*Data are for 2007.

The economic costs of value-added taxes are lower because, typically, VAT is charged at a uniform, relatively low rate to a (more or less) comprehensive and broad base. This reduces the economic costs of taxation, which tend to increase with higher tax rates and narrower tax bases. Moreover, value-added taxes, in theory, do not distort business or export decisions. This is because the tax paid on production inputs and exports is deductible. Also, value-added taxes are less distortionary than other taxes because they do not affect savings and investment decisions—that is, they do not distort choices between current and future consumption.

4.3 Tax administration and compliance costs

Limited information is available on tax administration costs in Asian countries. Figure 8 plots tax administration expenditure as a percent of GDP for six Asian countries (India, Indonesia, Japan, the Republic of Korea, Malaysia, and Singapore) and the OECD economies. It shows that administration costs in Asia are relatively low, at least in the countries for which data are available. This is partly because of less revenue collection. Also contributing to the low tax administration expenditure

Figure 9. Tax administration costs to net revenue collections (2009, costs per 100 units of revenue)
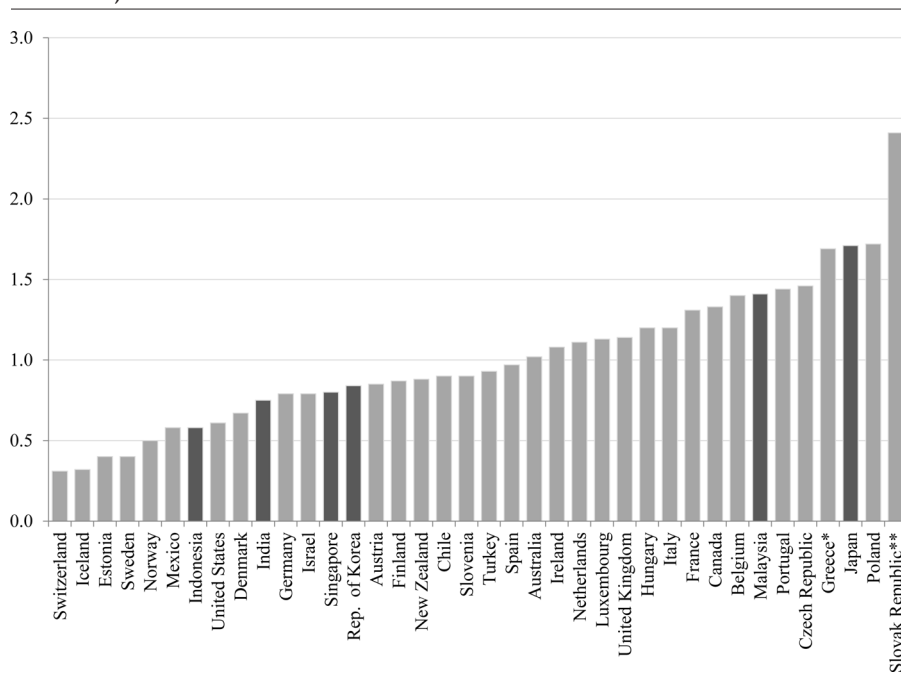
Source: Organization for Economic Co-operation and Development.
*Note: *Data are for 2004.*
**Data are for 2007.*

in Indonesia, India, the Republic of Korea, and Singapore is an efficient tax administration. This can be seen in Figure 9, which compares the administrative costs of collecting 100 units of revenue. Indonesia has the 7th lowest costs, India the 10th lowest, whereas Singapore and the Republic of Korea rank 13th and 14th, respectively.

The ease with which taxpayers are able to comply with the tax system also varies across countries. Figure 10 plots the total time to comply with taxes in hours per year. Compliance costs in Asia are lowest in the Maldives (largely because in 2009 the Maldives did not levy taxes on goods and services or income taxes other than on the net profit of banks based on their annual financial statements); Hong Kong, China; and Singapore. They are highest in the PRC, Pakistan, and Vietnam, partly because of complicated tax systems in these countries.

Complicated tax systems increase tax administration and compliance costs as well as the opportunity for tax planning and tax avoidance. Moreover, narrow-base,

Figure 10. Total time to comply with taxes (2012, hours per year)
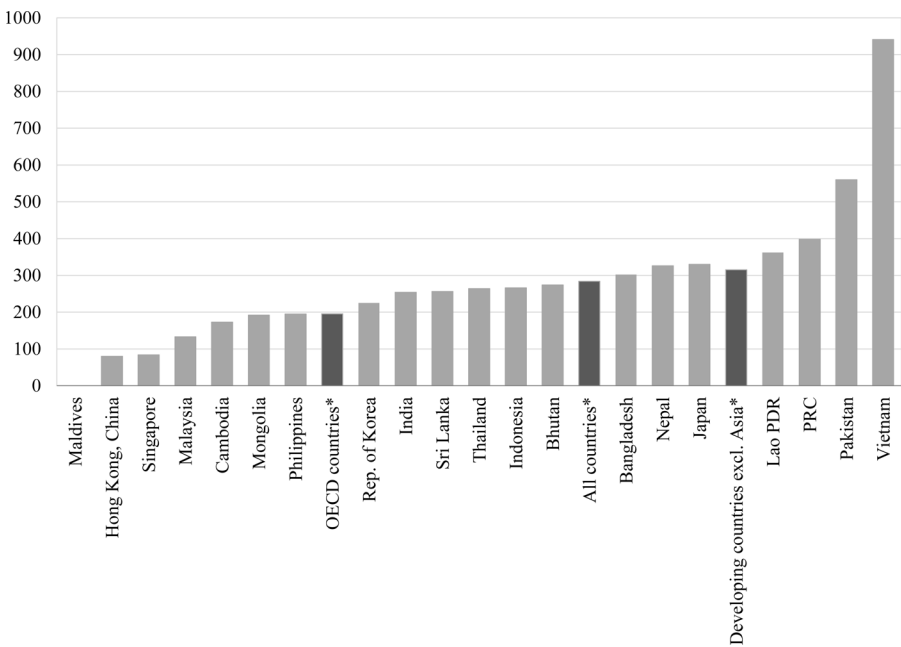
high-rate tax systems are often seen as unfair because higher-income taxpayers generally have greater scope and resources to shift income to avoid higher tax rates. Unfair tax systems can reduce individuals' and businesses' willingness to pay taxes and hence the government's ability to raise financing to fund government expenditure.

4.4 Government expenditure policies

Turning to government expenditures, Asia has made considerable progress in improving education and health outcomes and toward achieving the Millennium Development Goals (MDGs).[8] The second MDG focuses on education (achieving universal primary education) and goals 4–6 center on health (reducing child mortality; improving maternal health; and combating HIV/AIDS, malaria, and other diseases). Progress in Asian countries has been substantial, particularly in education.

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8 The MDGs were adopted by world leaders in September 2000 to reduce extreme poverty with a deadline of achieving a series of targets by 2015.

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Primary school enrollment and the number of students who start first grade and reach the last grade of primary education have been rising, and several countries have achieved or are expected to reach the set goals by 2015. Moreover, literacy rates in Asia are high. Most Asian countries have rates that are above the world average, and those economies with rates below (Bangladesh, Cambodia, India, the Lao People's Democratic Republic, Nepal, and Pakistan) have made considerable progress to raise them. These achievements are likely to be a contributing factor in the finding that education expenditure is reducing income inequality in Asia as government spending on primary education has been found to be progressive.

Progress has also been made toward improving health conditions. Maternal death rates have fallen sharply in Asia, with better attendance at birth of trained health professionals and improved antenatal care. Infant and child mortality rates are also falling, although only a few countries so far have reached the MDG target. The progress that has been made is likely to have benefitted poor families in particular, as infant and child mortality is closely related to household wealth. Infants in poor households are often less than half as likely to survive their first year of life as those in higher-wealth households (ADB 2011). Death and incidence rates of tuberculosis have also been declining. But HIV/AIDS remains a problem, with the percentage of the population with comprehensive, correct knowledge about the illness and the percentage of the population with advanced HIV infection who have access to anti-retroviral drugs both being relatively low and only rising slowly in some countries from a low base.

For social protection, overall coverage remains relatively low in Asia and generally only available to formal sector workers in the civil service or large enterprises. Moreover, the availability of social protection programs does not necessarily imply that they are well designed or have wide coverage. Few countries have income support systems for the unemployed (e.g., the PRC; Hong Kong, China; Japan; the Republic of Korea; Mongolia; Thailand; and Vietnam) with coverage rates in terms of the proportion of unemployed who receive benefits being less than 10 percent on average (ILO 2010). Effective coverage of work-related accidents and diseases is also low with only a proportion of accidents being reported and compensated. In the informal sector, unemployment coverage is virtually nonexistent, working conditions and safety are typically poor, and work-related diseases are widespread.

With regard to income security in old age, although some Asian countries have made efforts to extend coverage beyond the formal sector, the proportion of the working-age population covered by contributory programs remains low at around 20 percent (ILO 2010), and few countries have social pensions to provide safety net

retirement income for people who were not members of a formal scheme. Moreover, pension systems in Asian countries, outside the OECD, are often quite generous due to early retirement ages and relatively high pension levels (OECD 2012). According to OECD estimates, replacement rates, which measure the value of a person's pension as the percentage of their earnings when working, are well above OECD levels for men in Asia, especially in the PRC, Pakistan, and Vietnam. The high replacement rates are partly due to nearly all defined-benefit schemes being based on final salaries rather than average earnings. Such schemes tend to be particularly regressive because the higher paid typically have salaries that rise more rapidly with age, whereas the earnings of lower paid workers generally remain flat or rise less fast. Furthermore, the OECD estimates that the expected amount of time that people spend in retirement, which can be calculated by combining information on national pension ages and life expectancy, is relatively high in Asia. Pension eligibility ages are particularly low for both men and women in Malaysia and Sri Lanka and for women in the PRC and Thailand.

This discussion offers some potential explanation for the finding that education and health expenditures in Asia have reduced income inequality, whereas social security spending has mainly benefitted those with a higher income. Basic education and health services seem to be fairly universally available, whereas social protection spending has been restricted to those already likely to be better off (i.e., people employed in the formal sector). This suggests that labor market reform that moves workers from informal to formal employment may offer the greatest scope for reducing income inequality in Asia. Higher formal employment should also raise personal income tax collection, which could further assist governments in achieving redistributive objectives.

5. Conclusions and policy lessons

This paper assessed the impact of government fiscal policies on income inequality in Asia. It discussed the role and effectiveness of redistributive fiscal policies and provided estimates of the effects of taxation and government expenditure on income distributions in Asia and other countries.

Government expenditures on health and education have reduced income inequality both in Asia and the rest of the world, but public spending on social protection shows a distinctive differential distributive impact. Social protection expenditure in Asia appears to increase income inequality, whereas it reduces it in the rest of the world. Also adversely affecting the distribution of income in Asian countries is government expenditure on housing.

For taxation, policies in Asia have a less distinctive differential distributive impact. Empirical estimates provide some evidence that personal income taxes are more progressive in Asia than in the rest of the world, possibly because of a larger number of people not paying income tax. Corporate income taxes, on the other hand, may be less progressive. This could be due to larger tax incentives, exemptions, and concessions for Asian firms.

Although taxes by themselves are less effective in redistributing income, taxation is crucial to raise financing for government expenditure to achieve distributional objectives through spending programs on social welfare and the social sectors, such as health and education policies. The discussion in this paper suggests that taxes could be raised more efficiently in some Asian countries. Practically speaking, an efficient tax system is one that reduces the disincentive effects of taxation to work, save, and invest by using broad bases and low, fairly uniform rates. A broad-base, low-rate system also reduces administration and compliance costs and is often seen as effectively more fair than a narrow-base system because of horizontal equity considerations (taxpayers who have the same income should pay the same amount in taxes) and vertical equity concerns (people with different incomes should pay different amounts of tax).

The tax systems in several Asian countries are characterized by relatively high tax rates and narrow bases. Moreover, there seems to be greater reliance on corporate income taxation, which tends to be more distortionary (because of internationally mobile capital) than personal income taxation and VAT. Tax reform in Asia could focus on lowering income tax rates while broadening the tax base (i.e., abolishing tax incentives, exemptions, and concessions). This would reduce the economic, compliance, and administrative costs of taxation and likely lead to increases in tax revenue. Increases in tax revenue, in turn, would allow greater government expenditure to achieve distributional objectives. Further gains could be achieved in some countries by shifting the tax burden from income taxation to VAT and broadening the VAT base. Currently, VAT exemptions and/or reduced tax rates for necessities are often used to address the potential regressivity of VAT. These are costly, however, and not well targeted to the poor. A more effective policy would be direct cash transfer payments to those in need.

With respect to government spending policies, Asia has made considerable progress in improving education and health outcomes. Social protection policies generally remain limited in Asia, however, and in countries where they exist they tend to have a narrow benefit coverage and lack targeting to the poor. For instance, unemployment benefits are typically restricted to those in formal employment and do not include

the large proportion of those working in the informal sector. Pensions are another example. In Asian countries, outside the OECD, pension systems are often quite generous due to early retirement ages and relatively high pension levels, but they are typically only available to a privileged minority.

Appendix A. Taxation and income inequality in Asia

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gini$_{-1}$	−0.071***	0.078*	0.159***	0.005	0.020	0.273***	−0.029*
	(0.009)	(0.043)	(0.019)	(0.023)	(0.015)	(0.012)	(0.017)
Net	4.257***	3.558**	4.768***	3.073**	5.771***	6.079***	3.691*
	(0.494)	(1.517)	(0.676)	(1.217)	(1.794)	(0.588)	(1.950)
Gross	3.829***	6.633***	3.863***	3.580**	5.091***	7.178***	3.981**
	(0.557)	(1.766)	(0.741)	(1.522)	(1.587)	(0.821)	(1.713)
Population growth	−0.084	−0.269	−0.139	0.351**	0.051	0.063	−0.178**
	(0.060)	(0.466)	(0.125)	(0.179)	(0.179)	(0.081)	(0.077)
Youth dependency	−0.015	0.114**	−0.076***	−0.027	0.041**	−0.075***	−0.017
	(0.022)	(0.044)	(0.024)	(0.029)	(0.018)	(0.027)	(0.024)
Old-age dependency	−0.197**	−0.360	−0.238*	−0.290**	−0.512***	−0.278***	−0.511***
	(0.079)	(0.270)	(0.126)	(0.138)	(0.178)	(0.062)	(0.119)
Schooling	−0.481***	−0.094	−0.494***	−0.208**	−0.675***	−0.528***	−0.395***
	(0.028)	(0.125)	(0.064)	(0.081)	(0.105)	(0.059)	(0.070)
Unemployment	0.093***	0.069**	0.067***	0.105***	0.139***	0.089***	0.097***
	(0.010)	(0.029)	(0.019)	(0.013)	(0.017)	(0.009)	(0.012)
GDP per capita	2.410***	1.046	0.671	0.860	3.025***	0.017	4.462***
	(0.710)	(1.800)	(1.095)	(1.014)	(0.838)	(0.409)	(0.942)
(GDP per cap)^2	−0.192***	−0.108	−0.048	−0.083	−0.242***	0.072*	−0.335***
	(0.074)	(0.198)	(0.123)	(0.102)	(0.079)	(0.043)	(0.085)
Globalization	0.101***	0.103***	0.078***	0.103***	0.115***	0.099***	0.102***
	(0.007)	(0.023)	(0.012)	(0.011)	(0.008)	(0.008)	(0.012)
Corruption	0.405***	0.013	0.306***	0.395***	0.328***	0.172***	0.348***
	(0.028)	(0.068)	(0.020)	(0.057)	(0.043)	(0.037)	(0.030)
Inflation	0.094***	0.098***	0.033**	0.069***	0.101***	0.079***	0.068***
	(0.007)	(0.014)	(0.013)	(0.012)	(0.016)	(0.022)	(0.012)
Total revenues	−0.015	0.040**	−0.014	−0.046***	−0.113***	0.000	−0.053***
	(0.011)	(0.018)	(0.015)	(0.018)	(0.012)	(0.007)	(0.013)
PIT		−0.041					
		(0.105)					
PIT*Asia		−0.532**					
		(0.222)					
PIT*Progress		−0.005***					
		(0.000)					
PIT*Progress*Asia		0.003					
		(0.011)					
CIT			−0.338*				
			(0.193)				
CIT*Asia			0.936**				
			(0.394)				
CIT*Globalization			0.005**				
			(0.003)				
CIT*Globalization*Asia			−0.022***				
			(0.007)				
SSC+Payroll				0.165			
				(0.145)			
SSC+Payroll*Asia				1.159			
				(0.919)			
GTGS					0.768***		
					(0.134)		

Appendix A. *(Continued)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GTGS*Asia					−0.102		
					(0.313)		
Excises						−0.059	
						(0.042)	
Excises*Asia						0.668***	
						(0.228)	
Customs							0.651***
							(0.165)
Customs*Asia							−0.477
							(0.575)
Constant	33.404***	22.215***	30.954***	31.699***	29.774***	25.715***	34.261***
	(1.296)	(4.094)	(2.440)	(2.747)	(3.144)	(1.556)	(1.831)
Number of observations	907	539	822	844	879	804	842
Number of countries	77	53	74	72	76	70	73
Sargan (p-value)	0.785	0.741	0.799	0.789	0.810	0.863	0.885
AR2 (p-value)	0.374	0.349	0.344	0.344	0.418	0.235	0.319

*Note: Standard errors are in parentheses. ***p < 0.01. **p < 0.05. *p < 0.1.*

For Asian countries the marginal effect of a variable is equal to the estimated coefficient of the variable plus the estimated coefficient of the variable interacted with the dummy variable that equals one if the country is in Asia and zero otherwise.

Appendix B. Government expenditures and income inequality in Asia

	(1)	(2)	(3)	(4)
$Gini_{-1}$	−0.102***	−0.048***	−0.048***	−0.158***
	(0.012)	(0.016)	(0.014)	(0.026)
Net	7.155***	5.902***	−0.021	6.192***
	(1.991)	(1.411)	(2.340)	(1.348)
Gross	6.249***	3.087**	−1.404	4.657***
	(2.298)	(1.483)	(2.213)	(1.336)
Population growth	0.038	0.430**	0.510***	2.419***
	(0.232)	(0.170)	(0.191)	(0.648)
Youth dependency	0.027	−0.035	0.042	0.141***
	(0.040)	(0.060)	(0.038)	(0.037)
Old-age dependency	−0.244	−0.678	−0.473**	−0.436
	(0.154)	(0.440)	(0.188)	(0.286)
Schooling	0.135	−0.393***	−0.512***	−0.189
	(0.174)	(0.121)	(0.144)	(0.172)
Unemployment	0.123***	0.076***	0.119***	0.109***
	(0.022)	(0.014)	(0.012)	(0.021)
GDP per capita	2.190	1.562	3.186***	0.106
	(1.540)	(1.705)	(0.973)	(1.605)
(GDP per cap)^2	−0.282	−0.177	−0.288***	−0.150
	(0.182)	(0.152)	(0.102)	(0.135)
Globalization	0.080***	0.137***	0.141***	0.239***
	(0.019)	(0.020)	(0.019)	(0.020)
Corruption	0.116	0.133	0.211**	0.274**
	(0.113)	(0.112)	(0.105)	(0.128)
Inflation	0.096***	0.089***	0.068***	0.003
	(0.019)	(0.015)	(0.023)	(0.022)
Total revenues	−0.053**	−0.052**	−0.000	0.019
	(0.023)	(0.022)	(0.012)	(0.018)
Social protection	−0.276***			
	(0.058)			
Social protection*Asia	0.766			
	(0.591)			

Appendix B. *(Continued)*

	(1)	(2)	(3)	(4)
Housing		−0.614*** (0.144)		
Housing*Asia		2.776*** (0.974)		
Education			−0.034 (0.133)	
Education*Asia			−0.452 (0.566)	
Health				−0.330*** (0.089)
Health*Asia				0.089 (1.474)
Constant	31.406*** (3.561)	39.847*** (7.068)	35.601*** (4.293)	19.474*** (4.476)
Number of observations	596	625	672	482
Number of countries	64	65	70	60
Sargan (p-value)	0.801	0.731	0.756	0.798
AR2 (p-value)	0.345	0.307	0.300	0.405

*Note: Standard errors are in parentheses. ***p<0.01. **p<0.05. *p<0.1.*

See table footnote in Appendix A for the interpretation of the interaction terms.

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