IMF Working Paper

Advancing Inclusive Growth in Cambodia

By Niels-Jakob Harbo Hansen and Albe Gjonbalaj

INTERNATIONAL MONETARY FUND

IMF Working Paper

Asia and Pacific Department

Advancing Inclusive Growth in Cambodia

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Authorized for distribution by Alexandros Mourmouras

September 2019

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Abstract

We evaluate the impact of fiscal reforms on growth and inequality in Cambodia using a calibrated general equilibrium model with heterogeneous agents (Peralta-Alva et al., 2018). Over the last two decades, Cambodia's consumption inequality and poverty have declined. However, income inequality is higher, and large gaps remain between urban and rural residents. At the same time, domestic revenue mobilization has improved substantially, but collection of tax revenue is biased towards non-progressive sources. We use the model to evaluate the growth and inequality impact of reforms that increase infrastructure spending by raising (i) VAT, (ii) property tax, or (iii) personal income tax. We find that using property taxes delivers the largest increase in GDP and reduction in inequality. Reaping the gains from property taxation will however require additional investments in tax administration.

Contents

I.   INTRODUCTION

1.   **Growth in Cambodia has been solid, and inequality has declined.** Over the last two decades real GDP per capita growth in Cambodia has averaged 6 percent, well above the ASEAN average of 4 percent (Figure 1). This has brought GDP per capita up to 11 percent of the ASEAN average in 2017 from 6 percent in 2001. Inequality in Cambodia has also fallen. According to data from the Standardized World Income Inequality Database, Gini coefficient for consumption has fallen from 40.4 percent in 1997 to 29 percent in 2012 (Section II). This level is well below the ASEAN average. Government policies such as increased spending on education and social transfers could also have played some role.[2] (Figure 1).
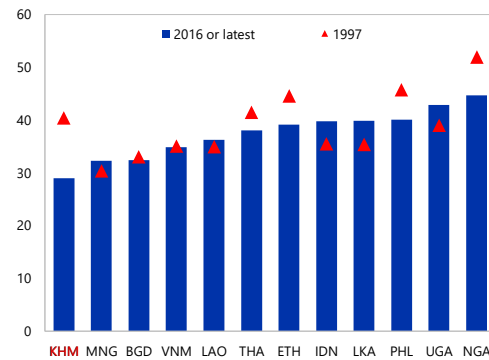
Figure 1: GDP Growth and Inequality of Consumption

Growth in Real GDP per Capita

(In Percent)
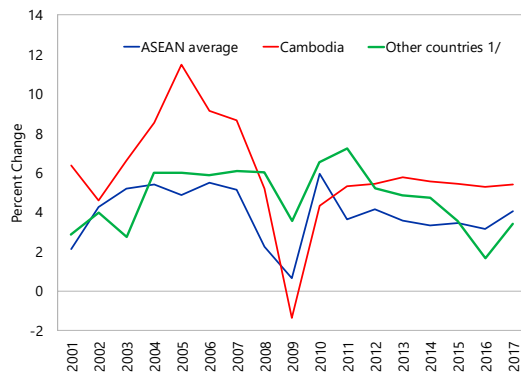
Gini Coefficient

(In Percent)

Education Expenditure and Subsidies

(In Percent)
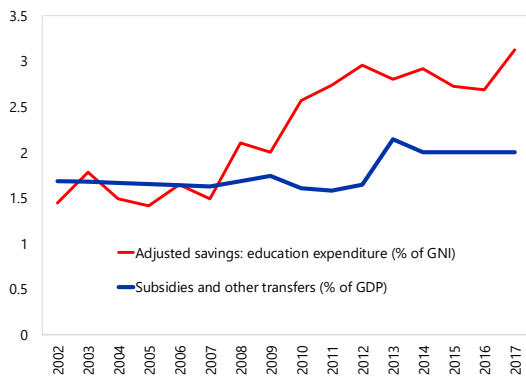
Urban and Rural Population

(In Percent of Total Population)
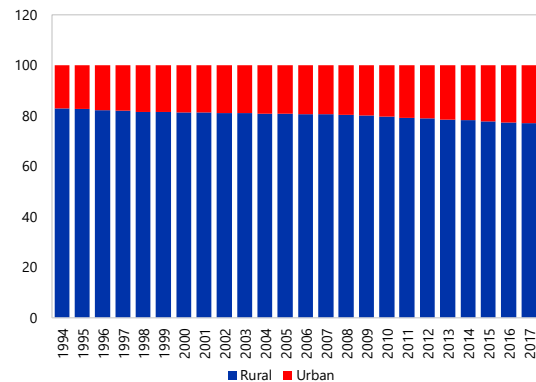
Sources: National authorities; IMF, *World Economic Outlook*; *SWIID 6.1; World Bank, WDI; IMF* staff calculations. Note: Real GDP growth of ASEAN countries is PPP GDP weighted. Gini is based on consumption data. Due to data unavailability, data points closest to 1997 and 2016 were used. Latest data point available for KHM, THA, VNM and PHL is based on 2015, 2013, 2014 and 2015. Data point closest to 1997 for THA and VNM (1998) for IDN and BNG (1996) and LKA (1995). The average for other countries on the first chart indicates the growth rate on real GDP per capita for Mongolia, Bangladesh, Ethiopia, Sri Lanka, Uganda and Nigeria.

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[2] Government spending on education increased from 1.3 percent of GDP in 1997 to 1.6 percent in 2012. Spending on subsidies and other transfers increased from 1.5 percent of GDP in 1997 to 3 percent in 2012.

2.   **Despite progress, obstacles to growth persist and income inequality between regions remains a concern.** Infrastructure gaps in Cambodia are substantial. Only 10.5 percent of all roads are paved, which is low compared to regional peers (Section III). At the same time, income disparities between regions are considerable. On average, household income in rural regions, representing nearly 80 percent of the population, is only 60 percent of that in urban area.

3.   **We analyze how inclusive growth could be advanced further by closing infrastructure gaps financed by progressive taxes.** Enhanced infrastructure could help raise income, especially in rural areas, by improving market access and factor mobility. Financing these investments through progressive income taxation, such as property taxation, can help reduce inequality further. This paper analyzes the effect of such a reform package using a general equilibrium model with heterogeneous agents (Peralta-Alva et al., 2018). We calibrate this model to Cambodia using aggregate and micro data. Using the calibrated model, we evaluate the effects on GDP and inequality of an increase in infrastructure spending financed by either (i) higher property taxes, (ii) higher Value-Added Taxation (VAT), or (iii) an increase in labor market taxation.

4.   **Related literature.** The paper relates to and draws on three strands of literatures: (i) the strand that assess the growth impact of infrastructure investments, (i) the literature that assesses the macroeconomic impact of different tax instruments, and (iii) the strand that studies the distributional impact of various taxes. Closest is the work by Peralta-Alva et al. (2018) who develop a model that allows for the analysis of both macroeconomic and distributional impact of fiscal policies. We calibrate their model to Cambodia and use it for policy experiments. In addition, we rely on the literature that assess the growth impact of infrastructure investment on growth, e.g. Calderon, Easterly, and Serven (2003), Briceno-Garmendia, and Estache (2004) and Calderon et al. (2015). Finally, our paper relates to the work by Ghazanchyan et al. (2017) who use a small open economy model to explore the macroeconomic impact of increases in public investments in three Southeast Asian economics, including Cambodia. We compliment this paper by analyzing the distributional impact of such policies.

5.   **The remainder of the paper is analyzed as follows.** Section II describes recent developments in Cambodian inequality, while Section III presents the policy tools used for redistribution in the country. Section IV briefly describes the model by Peralta-Alva et al., (2018) that we use for policy experiments, while Section V explains how we calibrate it to Cambodia. In Section VI we use the calibrated model to conduct a range of policy experiments. Section VII concludes.

II. INEQUALITY IN CAMBODIA

6.   **From 1997 to 2012 inequality in consumption and income declined in Cambodia.** According to data from the Standardized World Income Inequality Database (SWIID 6.1), the Gini coefficient for consumption has fallen from 40.4 percent in 1997 to 29 percent in 2012. At the same time, the Gini coefficient for disposable income declined from 36.7 percent in 1997 to 33.9 in 2012 (Solt, 2016). From 2012 to 2015 the inequality in consumption appears to have

been broadly unchanged, while the inequality in income has risen somewhat.[3] Migration is one potential driver behind this decline with urban population increasing from 17 percent in 1994 to 23 percent in 2017 (Figure 1). The reduction in inequality has coincided with a decline in absolute poverty from around 17 percent in 2007 to 2.2 percent in 2012.

Figure 2: Inequality of Consumption and Income

Gini Coefficient for Consumption
(In Percent)
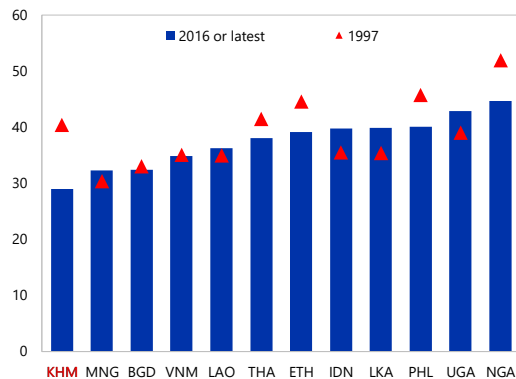
Gini Coefficient for Disposable Income
(In Percent)

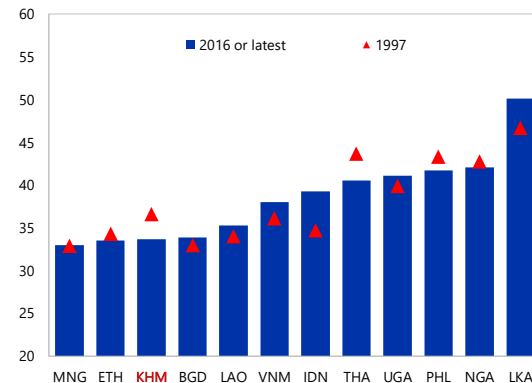*Source:* SWIID 6.1; 8.0.
Note: Gini is based on consumption and income data, respectively. Due to data unavailability, data points closest to 1997 and 2016 were used. The 2012 value for the consumption Gini for Cambodia is calculated based on the Socio-Economic Survey and reported by Warr et al., 2015. Imputed rent for owner-occupied housing is counted as an expenditure and durable goods are partially included in the calculation.

7.   However, inequality in income is larger than in consumption. Figure 3 shows the distribution of monthly income and consumption across Cambodian households. Average income is 12 percent larger than average consumption.[4] At the same time, income is less evenly distributed with less density around the mean and more in the tails. This is consistent with the finding that the propensity to consume tends to fall with income, which implies that inequality generally will be larger in income than consumption. One probable reason is hedging behavior, which causes households with high income to save to insulate themselves from income shocks.[5] Access to lending can also help households smoothen income shocks.

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[3] This is based on analysis of the consumption survey microdata from 2015.

[4] The gap between median income and consumption is smaller.

[5] See *e.g.* Krueger and Perri (2006) who formulate a model where households hedge against volatile labor income risk.

Figure 3: Monthly Income and Consumption

Monthly Income and Consumption
(In Thousand Riels)
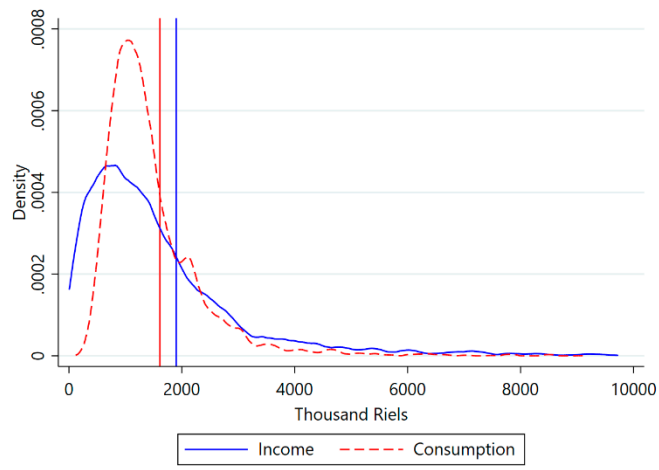
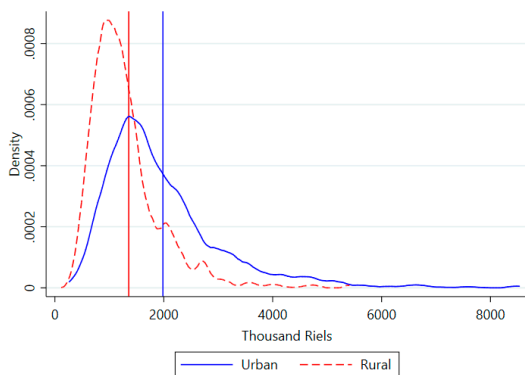*Source:* Cambodia Socio-Economic Survey, 2015.Note: Average monthly household income is 1712 and consumption is 1513 thousand riels.

8.   Gaps in income and consumption remain, especially between urban and rural households. On average, household income in the rural area, accounting for around 80 percent of the population (World Bank, 2018; and National Institute of Statistics, 2016), is only 60 percent of that in the urban area (Figure 4). At the same time, average rural consumption is only 70 percent of that in the urban area.[6]

Figure 4: Monthly Income and Consumption by Region

Monthly Consumption by Region
(In Thousand Riels)

Monthly Income by Region
(In Thousand Riels)
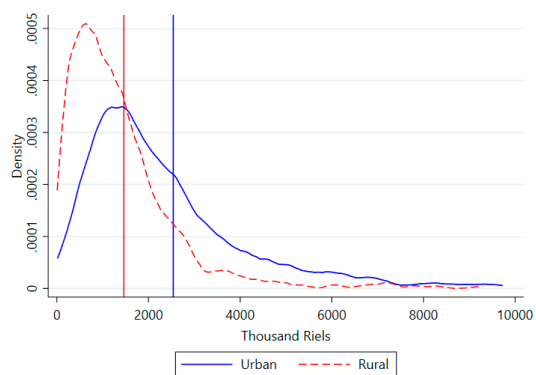
Source: Cambodia Socio-Economic Survey; and IMF staff calculations.

9.   The consumption gap between urban and rural households is seen across all product groups except health. Gaps in consumption between the urban and rural sectors are prevalent in housing-related spending, transportation, food and non-food consumption as

[6] The household survey's consumption measure includes the estimated value of home-production and gifts.

illustrated in Figure 5. Health-related expenditures are higher among rural households. This is likely related to generally worse health conditions in rural areas, inter alia caused by larger gaps in sanitation facilities and nutrition (Fernandes Antunes et al., 2018; World Bank, 2017).[7]

10.   **The rural-urban income gap is driven by differences in income sources.** While the average rural household derives the largest share of income from self-employment, the average urban household derives its largest income from salary (Figure 5). The average salary in the urban area is almost double that in the rural sector. Similarly, income from self-employment is on average 1.13 times larger in the urban area. Rural households rely relatively more on net income transfers than urban households (Figure 5).

Figure 5: Income and Consumption Sources

Share of Income Sources by Region
(In Thousand Riels)
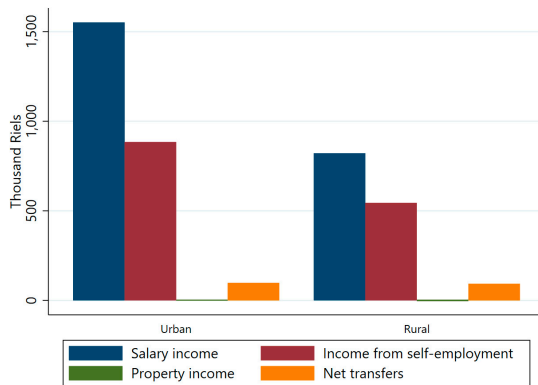
Consumption Sources by Region
(In Thousand Riels)
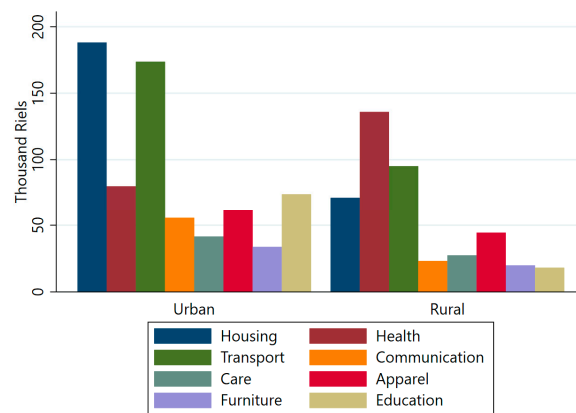
Source: Cambodia Socio-Economic Survey, 2015; and IMF staff calculations.

III. POLICIES WITH DISTRIBUTIONAL IMPACT

11.   **Cambodian tax policies rely heavily on non-progressive income sources.** Cambodia's revenue mobilization has improved markedly in recent year. In 2007, tax revenue amounted to less than 10 percent of GDP, while in 2017 had increased to around 17 percent (Figure 6). This is among the highest levels in ASEAN. However, Cambodia's revenue sources are skewed towards VAT and import taxes (Figure 7). Out of total tax revenue (16.9 percent of GDP), 61 percent of total tax revenue is generated by the VAT. This is a relatively high share compared to regional peers (e.g. Vietnam, Lao P.D.R. and Philippines), with the share only being higher in Vietnam. VAT is usually considered among the most regressive sources of taxation, since consumption makes out a larger share of income for poorer households (Peralta-Alva et al., 2018). On the other hand, revenue in Cambodia relies relatively little on progressive income sources such as the personal income tax (PIT), income and capital gains, or property taxation. Revenue from personal income taxation and capital income and capital gains only make up 4.2 percent of GDP in Cambodia, which is the lowest among peers (Figure 7). Similarly, revenue from property

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[7] Only 30.5 percent of population in rural areas have access to sanitation facilities versus 88.1 percent in urban areas (World Bank, 2017).

taxation accounts for only 0.1 percent of GDP, which is also very low compared to regional peers (e.g. Indonesia, Philippines and Malaysia). This is despite the progressive profile of property taxation, which is predominantly levied on richer households in the urban area (Figure 7).

Figure 6: Tax Revenue

Source: IMF, World Economic Outlook
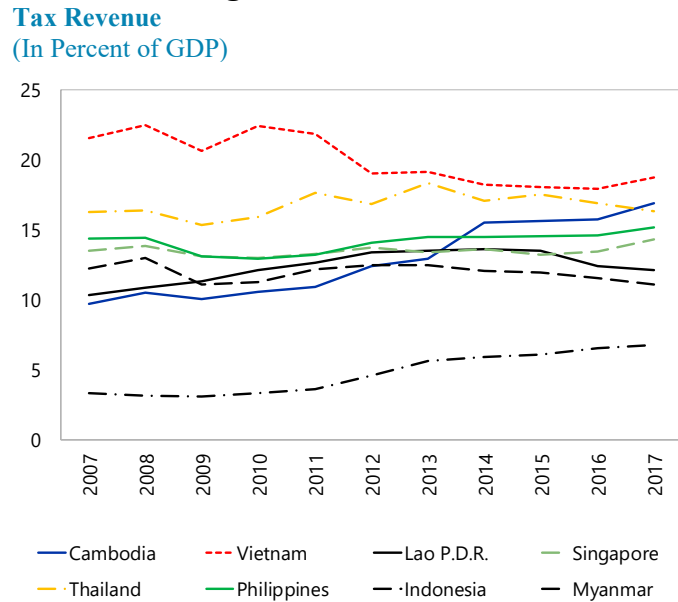
12.   Social transfers reduce inequality, but the social safety net remains under-developed. Figure 8 shows how overall income transfers[8] in 2015 contributed to a 0.7 and 1.4 percentage point reduction in the Gini coefficient for the urban and rural area, respectively. Generally, income transfers are found to be more effective in reducing income inequality than taxes.[9] However, Cambodia's spending on social assistance is only 0.3 percent of GDP. This is well below both the average for ASEAN and Low-Income Developing Countries (LIDCs) (Figure 8).

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[8] Income transfers include pensions, work assistance and training support, remittances and scholarships.

[9] In a study based on micro household income data across 36 countries, Wang and Caminada (2011) find that, on average, transfers reduce inequality by a higher magnitude than taxes.

Figure 7: Tax Policies in Cambodia

VAT Rates, Revenues, and C-Efficiencies
(In Percent of GDP)
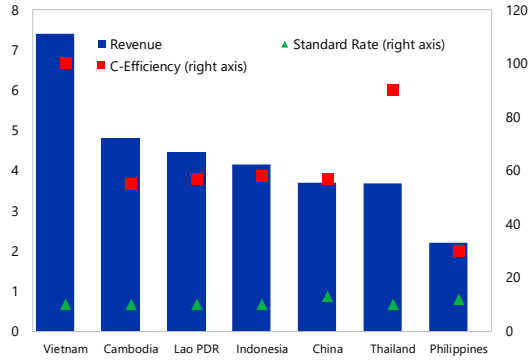
PIT Revenues, Thresholds and Top Rates
(In Percent of GDP)
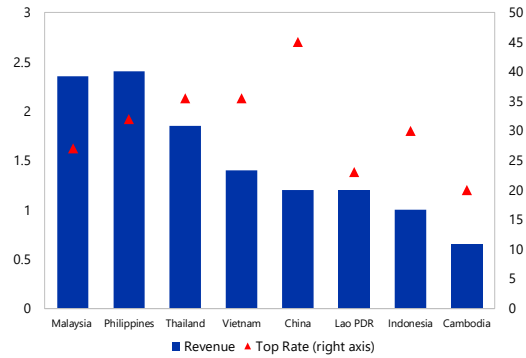
Recurrent Property Tax Revenues
(In Percent of GDP)
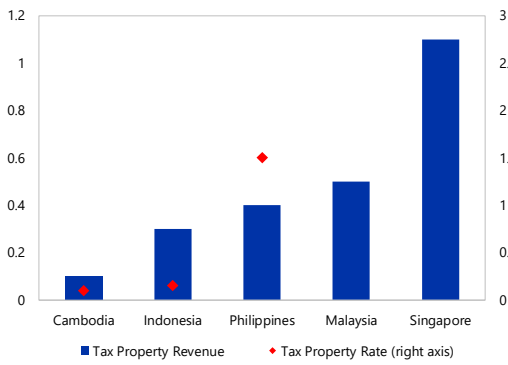
Total Tax Revenue
(In Percent of Total)
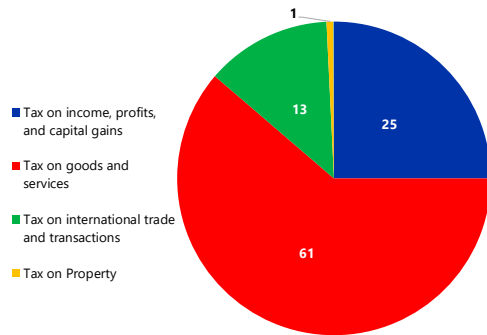
Source: Authorities data; OECD and IMF Staff estimates.

Source: Authorities data; and IMF Staff estimates.

Property Tax Across Income Deciles
(In Percent of Total Income)
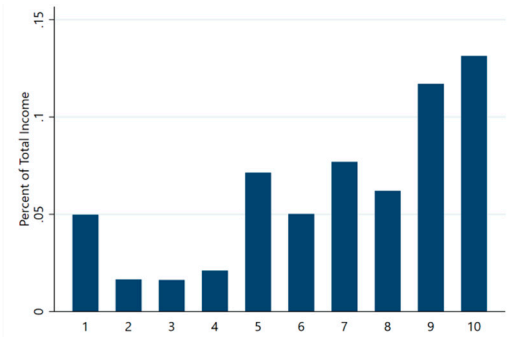
Total Tax Revenue
(In Percent of Total)
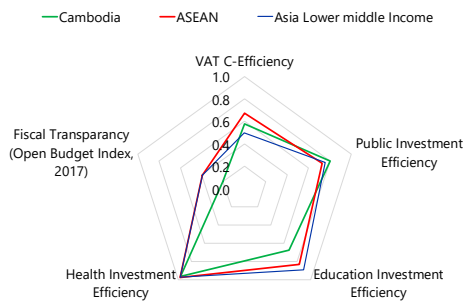
Source: Authorities data; OECD and IMF Staff estimates.

Sources: International Budget Partnership and; IMF staff calculations.

Figure 8: Social Transfers and Income Inequality

Reduction in Income Gini after Transfers
(Percentage Points)
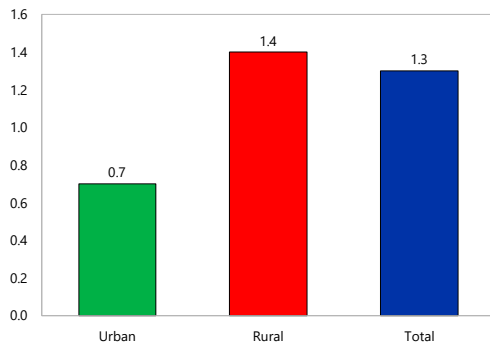
Social Assistance Spending
(In Percent of GDP)
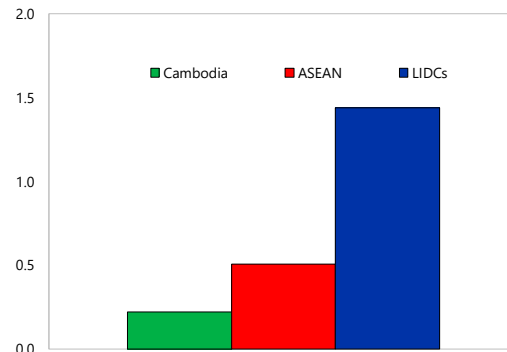
Sources: Cambodia Socio-Economic Survey, 2015; Expenditure Assessment Tool (FAD); and IMF staff calculations.
Note: Income from self-employment is (i) agriculture and (ii) non-agriculture income. Disposable income is (i) wages,
(ii) income from self-employment, (iii) property income and (iv) net transfers.

13.   At the same time, remaining infrastructure gaps hold back further inclusive growth.
Despite recent progress, infrastructure gaps in Cambodia are considerable. Only 10 percent of
total roads are paved according to World Bank data (Figure 9). The share of the population with
access to safe drinking water, basic sanitation services, and electricity also remains relatively
low. Empirical evidence suggests that improvements in the stock of infrastructure could help
boost growth further (Calderon et al., 2015) especially in the rural sector, by enhancing market
access and factor mobility. Higher quality of infrastructure in rural areas can also increase rural
households' human capital by increasing access to education, health services and jobs, all crucial
for improving income prospects and welfare (Gannon and Liu, 1997). However, the
effectiveness of additional investments would benefit from improvements in the public
investment framework to achieve efficient spending and avoid leakages.

Figure 9: Infrastructure Gaps

Total Transport Spending, 2016 or latest
(In Percent of GDP)
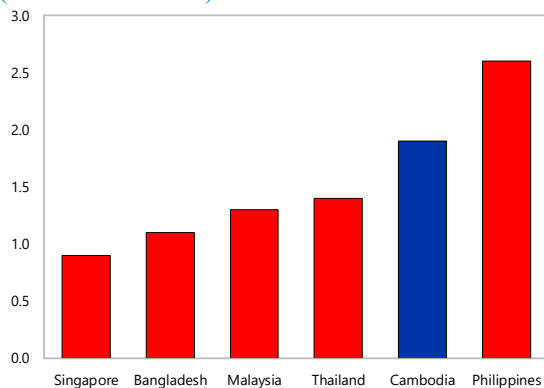
Paved Roads, 2016 or latest
(In Percent of GDP)
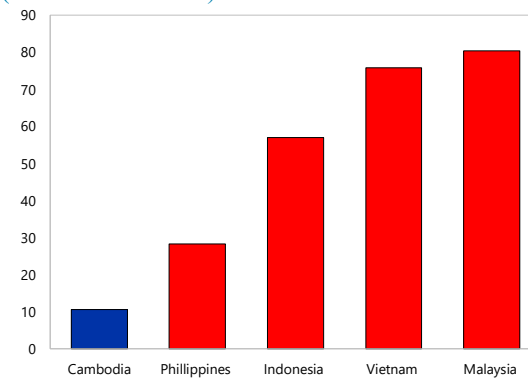
Source: World Bank, 2017.

IV. THE MODEL

Figure 10: General Equilibrium Model with Heterogenous Agents
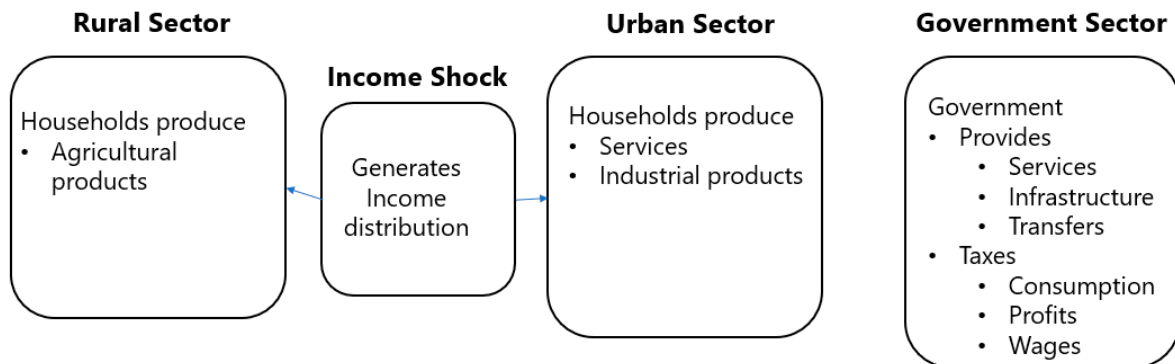
Source: Peralta-Alva et al., 2018.

14.   To analyze how fiscal policies can help advance inclusive growth in Cambodia we use a small open economy model with heterogeneous agents. The model is developed in Peralta-Alva et al. (2018). Below we give a short non-technical description of the main elements of the model, drawing heavily from Peralta-Alva et al. (2018), and we refer to this paper for additional details. The model has an urban and rural region, respectively, with fixed household shares.[10] Within these regions households work in agriculture, manufacturing or services. Households in both regions face income shocks, which generates a distribution of income. The parameter of the income shock differs between the two regions, which enables the model to generate different income distributions.

15.   Households. Households in both sectors are infinitely lived and maximize expected utility over sequences of consumption of agricultural, manufacturing, and service goods. Food is subject to a subsistence constraint, such that it cannot go below a certain level. In the urban area, households allocate working hours between formal work in the manufacturing sector and informal work in the service sector. Similarly, households in the rural sector allocate their hours between formal work for a wage in large farms or informal work in their own plots. The total amount of working hours for each household is fixed, as the model does not contain any labor/leisure choice.

16.   Income shock. Wage income from formal markets within the rural and urban area is subject to idiosyncratic shocks that reflect fluctuations in the efficiency of supplied working hours. These shocks generate uneven distribution of income within the rural and urban area. The efficiency of working hours within the informal sectors is not subject to shocks.

17.   Sectors. The model has two sectors within both the rural and urban area, respectively. In the rural area, one sector is producing agricultural products for domestic consumption. This is done informally by workers laboring informally on their own land plots. In the other rural sector, large farmers engage workers to produce agricultural products for both the domestic and international market. In the urban area, a manufacturing sector produces manufacturing goods by

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[10] The model abstract from urban-rural migration.

employing workers and capital rented by households. In the other urban sector, households work informally to produce service goods.

18.   Government. The model contains a government, which can levy a value added tax (VAT) on food and manufacturing goods, a personal income tax (PIT) on household income from formal markets, or a corporate income tax (CIT) on manufacturing firms and large farmers. The revenue from these taxes can be spend on (i) income transfers, or (ii) infrastructure investment boosting private sector productivity. The government is assumed to run a balanced budget every period. Property taxes are not included per se in the model. For the results below involving property taxes we rely on microdata simulations.[11]

19.   Modelling of infrastructure investment. The effect of an increase in public infrastructure investment is modelled as an increase in total factor productivity, which lifts productivity across all sectors. An important parameter in this calculation is the elasticity of GDP with respect to infrastructure investment.[12] We will consider the impact of a *permanent* increase in infrastructure investments. That is, we will compare the productivity level under the steady infrastructure level under current investment rates, to the steady state level implied by alternative investment rates.[13]

V.   Calibration

20.   The model has two groups of parameters. First, several parameters relate to parametrization of preferences and technology. These parameters are taken from the literature as described in Peralta-Alva et al. (2018) and reproduced in Table 1. Second, another group of parameters are calibrated to match moments specifically in the Cambodian data. These parameters are shown in Table 2 and described in more details below.

21.   Parameters specific to Cambodia. Several parameters are set to ensure that the model generates moments for consumption and output shares, tax structure, and inequality consistent with those in the Cambodian data.

- **Consumption shares.** The food share of consumption in the bottom quintile of the income distribution stems from the Cambodian Socio-Economic survey data from 2015 (National Institute of Statistics, 2016) and is matched in the model by modifying the parameter governing the subsistence level of food consumption. The empirical share of manufacturing and service in the consumption bundle is also observed in the

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[11] Specifically, we use information on the distribution of property taxes and disposable income across households, and compute how the income distribution would change if property taxes were scaled up. Further, we assume that these taxes will not impact the labor decision of households.

[12] E.g. if the elasticity is 0.1, then a 10 percent increase in the level of infrastructure turns into a 1 percent increase in GDP.

[13] Following equation (7)-(8) in Holt-Eakin and Schwartz (1995) the steady state increase in infrastructure from k_g to $\tilde{k}_g$ is $(\tilde{k}_g/k_g)^{1/(1-\beta)}$, while the increase in steady state labor productivity is $(\tilde{k}_g/k_g)^{\beta/(1-\beta)}$, where k_g is infrastructure investment in percent of GDP and β is the elasticity of GDP with respect to infrastructure investments.

consumption survey and matched by adjusting the parameters in the utility function governing the relative preference towards food, manufacturing products, and services.

- **Population shares.** The share of the population living in urban and rural areas, respectively, is assumed both in data from the World Bank Development Indicators (World Bank, 2018) and the national household survey (National Institute of Statistics, 2016). These shares are set exogenously in the model.

- **Income distribution.** The distribution of consumption within the urban and rural area, respectively, is computed from underlying microdata to the socio-economic survey, as done above in Section II. In the model exercise, the corresponding distributions, as summarized by the Gini coefficient, within each region are generated by adjusting the parameter governing the variance in the income process for employment in the manufacturing and formal agricultural sector. A fuller representation of the empirical consumption and income distribution is shown in Figure 10.

- **Tax structure.** The data on the tax structure is provided by the authorities, and the shares are matched through adjustment of the parameters relating to the tax system in the model. The revenue from the corporate income tax is computed as the sum of taxes on dividends and payables by corporations and other enterprises. The income tax is approximated by payables by individuals. Imports taxes are not included as a tax source in the model.

- **GDP shares.** For agriculture and manufacturing in percent of GDP we rely on the national account data from Cambodia, which is compiled from the supply side, and match these shares by appropriately adjusting the relative size of the productivity parameters in the model.

Table 1: Exogenously Calibrated Parameters

Variables	Parameters	Value
Discount Rate	β	0.96
Depreciation Rate	δ	0.06
Land Share in Food Production	α^a	0.49
Labor Share in Services Production	$1 - \alpha^s$	0.37
Capital Share in Manufacturing Production	α^m	0.37
Land Share in Cash Crop Production	α_1^*	0.49
Labor Share in Cash Crop Production	α_2^*	0.32
Relative Land Size of Food Farm	d^r	0.27
Persistence of Urban Income Shocks	p^u	0.92
Persistence of Rural Income Shocks	p^r	0.92
Urban Population Share	μ^u	0.28
Rural Population Share	μ^r	0.69
Large Farmer Share	μ^f	0.03

Source: Peralta-Alva et al., 2018.

Table 2: Endogenously Calibrated Parameters

Data Targets	Model	Data
Service Share in Consumption	0.43	0.40
Manufacturing Share in Consumption	0.16	0.17
Service Share in GDP	0.34	0.35
Agriculture Share in GDP	0.32	0.32
Agriculture Exporting Share in GDP	0.03	0.02
Manufacturing Share in GDP	0.31	0.31
Tax Revenue as a fraction of GDP	0.11	0.15
Share of Corporate Tax in Tax Revenue	0.36	0.30
Share of Personal Tax in Tax Revenue	0.13	0.12
Elasticity of Infrastructure Investments	0.07	0.07
Urban Population Share	0.21	0.21
Rural Population Share	0.79	0.79
Urban Consumption Gini	0.30	0.294
Rural Consumption Gini	0.30	0.285

Sources: National authorities; World Bank, WDI; SWIID; Calderon et al. (2015); Cambodia Socio-Economic Survey, 2015; and IMF staff calculations.

Figure 11: Expenditure by Quintile and Region

Average Household Expenditure by Quintile, 2015
(In Thousand Riels)
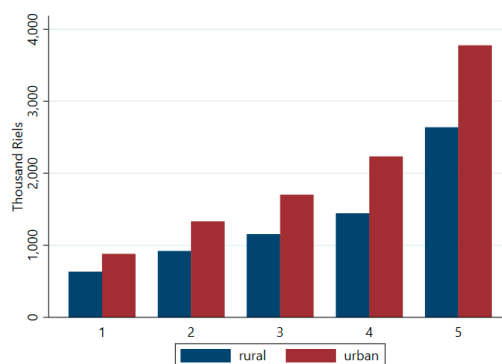
Source: Cambodia Socio-Economic Survey, 2015; and IMF staff calculations.

22.   Elasticity of output with respect to infrastructure investment. A necessary parameter for the policy experiments below is the elasticity of GDP to infrastructure investments. To guide this choice, we rely on empirical evidence from Calderon et al. (2015) who find long-run elasticities for infrastructure investments across developing and developed countries in the range 0.07-0.10.[14] To be conservative, we use 0.07 in the simulations below.

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[14] An elasticity of e.g. 0.10 implies that a 1 percent increase in infrastructure investments turns into a 0.1 percent increase in GDP.

VI.   POLICY SCENARIOS

23.   In this section, we use the calibrated model to evaluate an increase in infrastructure investment. Specifically, we consider the option of permanently raising infrastructure investments in Cambodia by 0.5 percent of GDP from 1.9 percent to 2.4 percent (World Bank, 2017). This would entail an increase of the steady state stock of infrastructure capital by 29 percent.This asssumes a multiplier of GDP to infrastructure of 0.07 (Section V).[15] In addition, to a general incrase in infrastructure investments we also consider a targeted spending within the rural sector.

24.   For mobilizing financing we consider three different tax options. [16]

- First, we consider financing the increase through an increase in property taxation. This could be brought about through a general increase in the property tax from its current level of 0.1 percent of GDP to 0.6 percent, close to the current level in Philippines, Malaysia and Indonesia (Figure 7). A revaluation of property prices, increases in the stamp duty and/or improvements in tax administration could reduce the necessary rate increase.

- Second, we consider securing the necessary financing through an increase in the effective VAT rate. The necessary increase to generate 0.5 percent of GDP in revenue would be about 1.2 percentage points. Reducing VAT exemptions and/or improvements in tax administration could reduce the necessary rate increase.

- Third, we consider raising revenue from wage taxation from its current level of 1.0 of GDP to 1.5 percent.

Implementation of such measures would be eased by administrative improvements in the tax collection process such as (i) an updated taxpayer register, including on property values, (ii) an improved process for VAT refunds, and (iii) broader coverage of the existing personal income taxation.

A.   Higher Infrastructure in Both Rural and Urban Areas

25.   An increase in infrastructure investment financed by higher taxation could increase GDP by up to 2.7 percent. GDP is increased as the higher infrastructure investments are assumed to raise productivity across all sectors. This impact is partly dented, however, through the distortions created by the higher taxation. The impact on GDP is largest (2.7 percent), when financing is secured through higher property taxation (Figure 12). The impact on GDP is smaller (1.8 percent) when financing is coming from higher VAT, and even smaller (0.3 percent) when labor market taxation is raised to generate the necessary revenue.

[15] In a growth model augmented with infrastructure the increase in steady state can be computed as $[(2.4/1.9)^{\wedge}(1/(1-\beta))-1]$ where β is the elasticity of GDP to the stock of infrastructure (Holtz-Eakin and Schwartz, 1994). We set it equal to 0.07 (Section V).

[16] We abstract from derived dynamic effects on tax revenue from higher infrastructure investments.

26.   Financing through property taxation yields the largest impact on GDP since it is less distorting. Generally, the impact on GDP is partially dented by the distorting effects of higher taxation. However, the property taxation is least distorting, as increasing it does not change the workers' labor market choice. This modelling assumption is supported by empirical evidence suggesting that property taxation has the lowest negative effect on growth (Arnold et al., 2011; Blöchliger, 2015). A higher VAT is assumed to distort the labor market choice, as it induces workers to engage more in less effective self-production exempt from VAT. Finally, a higher rate of labor market taxation will distort the labor choice even more, as the tax is only levied on formal employment. This will provide incentives for workers to allocate more hours in the (less productive) informal sector.

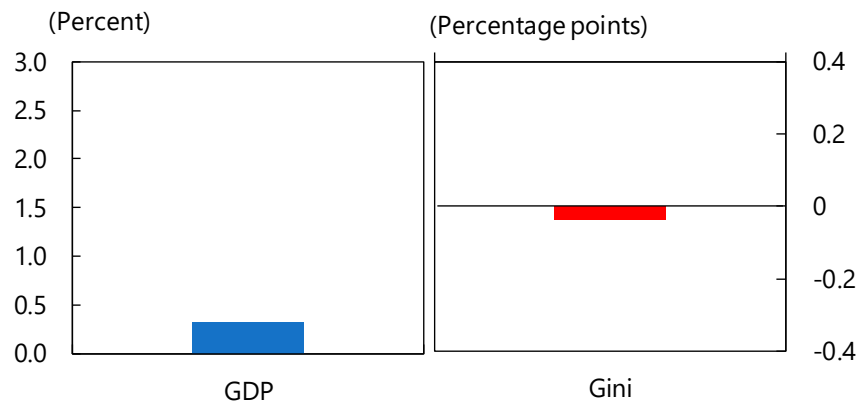# Figure 12: Macroeconomic Reform Impact
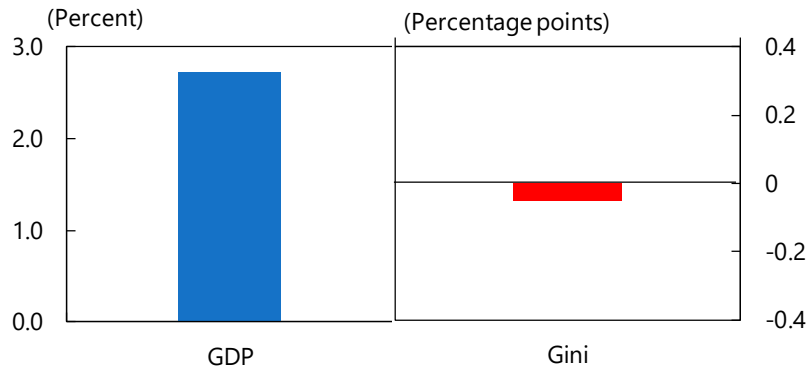
A. Higher Property Taxation

B. Higher Value-Added Taxation
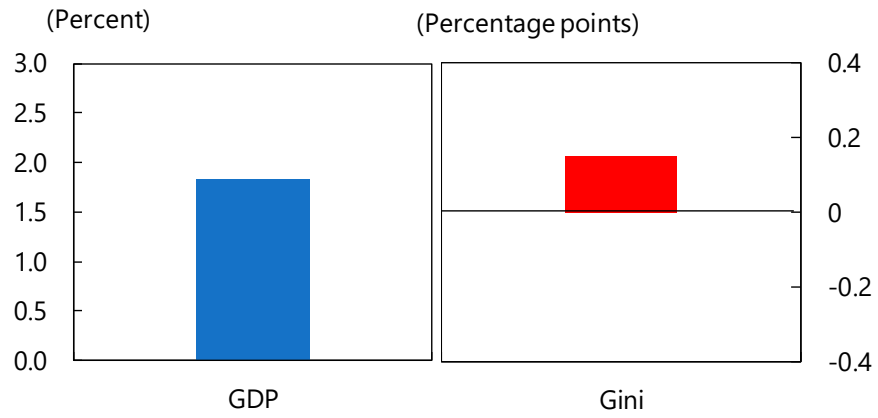
C. Higher Personal Income Taxation

Source: IMF staff calculations.

27.   The Gini coefficient is estimated to fall by up to 0.1 percentage points. Inequality as measured by the Gini coefficient falls the most (0.1 points), when the source of higher taxation is the property tax. The Gini coefficient falls marginally less when the revenue source is labor market taxation, while it increased by 0.2 percentage points when financing is secured through a higher VAT.

28.   Mobilizing financing through the property tax generates the largest effect on inequality. The positive effect on inequality from the property taxation stems from the fact that Cambodian households with higher income tend to pay a larger share of their total income in property taxation (Figure 11). Inequality also falls, albeit by less, when higher revenue is attained from higher labor market taxation. On the other hand, inequality tend to rise when a higher VAT is used to generate additional revenue. This regressive feature of the VAT owes to the fact that the share of consumption in total income generally is higher among poorer households.

B.   Focusing Higher Infrastructure Investment in Rural Areas

29.   To explore if inequality reduction can be reduced further, we also consider an alternative policy package, where the additional infrastructure projects are undertaken in the rural areas. Specifically, we assume that the infrastructure projects are undertaken in such a way that only rural productivity is raised. Figure 13 illustrates the estimated impact of this policy scenario.

30.   This alternative policy package delivers a lower effect on GDP. The impact on GDP is up to 1.7 percent, where the investments are only undertaken in the rural area. This implies an aggregate impact in GDP which is smaller than the 2.7 percent impact observed in Section VI.A where the additional infrastructure spending was broad based. The difference owes to the fact that the increase in productivity associated with better infrastructure in the alternative policy package is confined to the rural area. As in Section VI.A, the impact on GDP is largest when financing is secured through property taxation, and smallest when labor market taxation is used to generate financing.

31.   The reduction in inequality is larger. The Gini coefficient falls by up to 0.2 percentage points. This is because the rural area is poorer than the urban area, why the income boost coming from better infrastructure will benefit the poorer households relatively more. This effect comes on top of the redistributive effect achieved from the tax changes observed in Section VI.A. Again, the largest reduction in inequality is achieved when taxation is secured through the property tax, while inequality increases when the VAT is used.

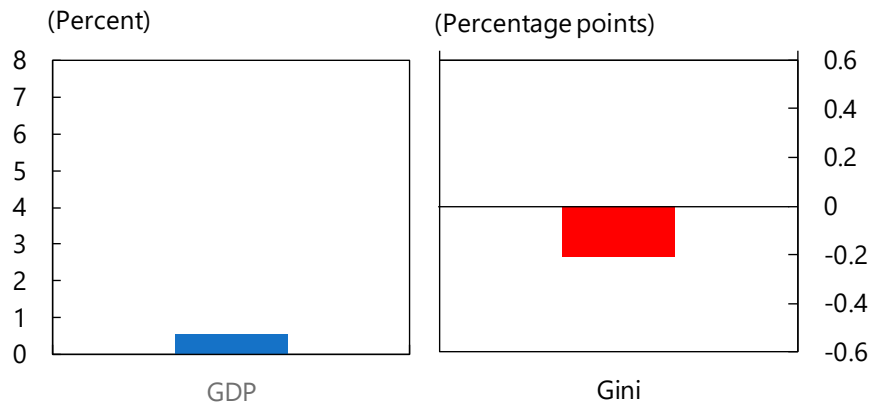# Figure 13: Macroeconomic Reform Impact
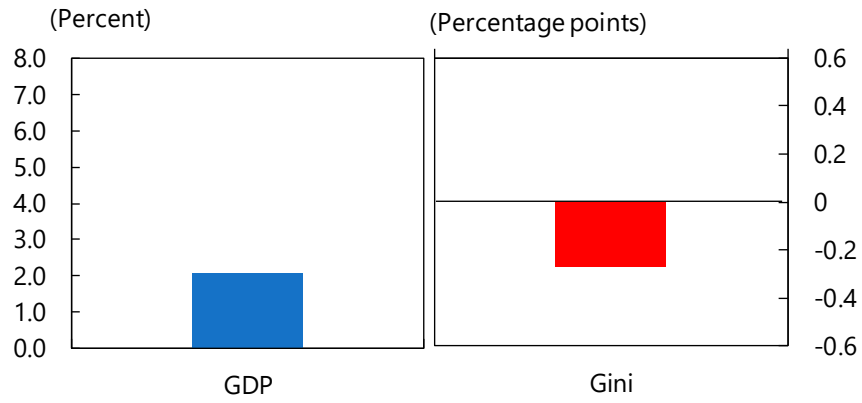
A. Higher Property Taxation

B. Higher Value-Added Taxation
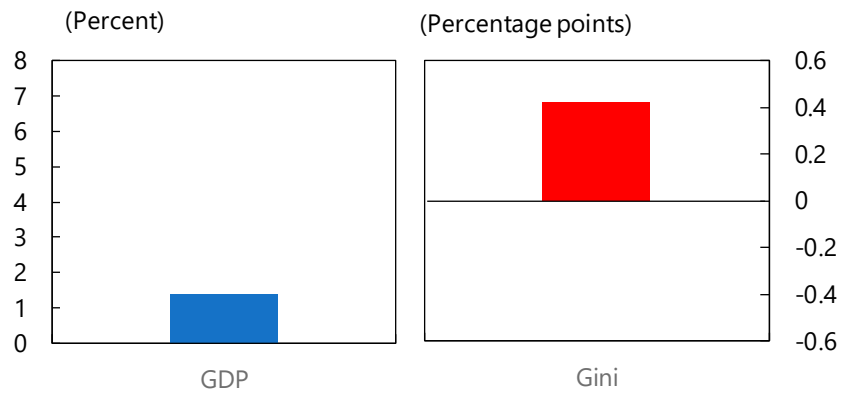
C. Higher Personal Income Taxation

Source: IMF staff calculations.
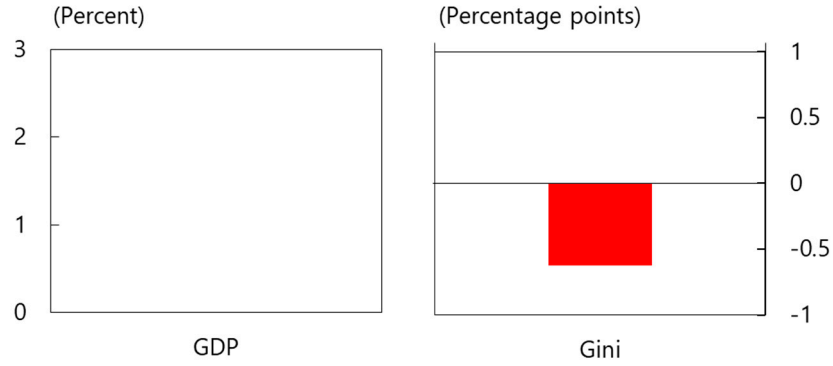
C. Targeted Transfers

32.   We also consider a policy package with transfers to poor rural households. In this package the added tax revenue is used to finance targeted cash transfers to the poorest households in rural area. Figure 14 illustrates the estimated impact of this policy scenario on inequality and GDP.

33.   This policy package delivers a larger reduction in inequality. The Gini coefficient falls by up to 0.6 percentage points under the policy package. The drop in inequality is largest when financing is done with property taxation and smallest when done with VAT. The fall in inequality is driven by two effects. First, the higher taxation is mainly shouldered by the richer households – except for when financing is secured by VAT. Second, the targeted transfers only benefit the poor rural households. The first effect is also at play in the other simulations above, while the latter effect contrasts with the across-the-board increase in income generated by the enhanced infrastructure stock.

34.   But the impact on GDP is zero or negative. GDP falls by 4 percent when financing is secured through labor market taxation, and 1.9 percent when VAT is used. This contrasts with the positive impact seen in the two other policy scenarios (Section VI.A- VI.B). The weaker impact on GDP is because social transfers, unlike infrastructure, do not deliver an increase in productivity and thus GDP. Yet, the increased taxation still creates distortions that reduce GDP. As above, these distortions are largest for labor taxation and VAT, while the increased property taxation does not affect GDP negatively.

Figure 14: Macroeconomic Reform Impact

A. Higher Property Taxation

(Percent)   (Percentage points)

GDP   Gini

B. Higher Value-Added Taxation

(Percent)   (Percentage points)

GDP   Gini

C. Higher Personal Income Taxation

(Percent)   (Percentage points)

GDP   Gini
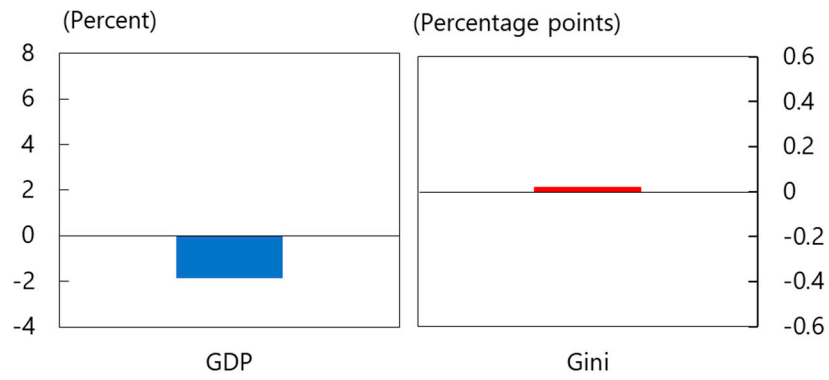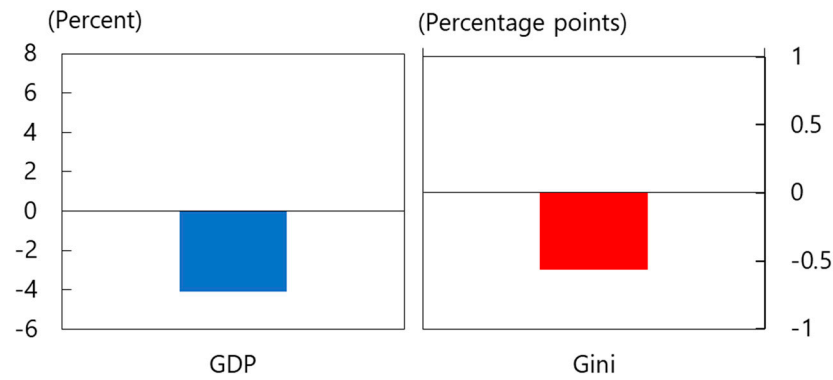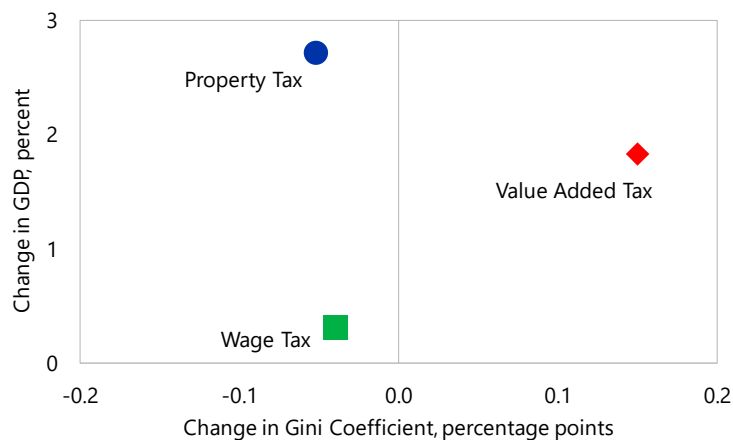
Source: IMF staff calculations.

VII. CONCLUSION

35.   In this paper, we have evaluated various reform options to advance inclusive growth in Cambodia. Specifically, we have analyzed how GDP and inequality would be affected by a permanent increase of 0.5 percent of GDP in infrastructure investment financed by either (i) higher property taxation, (ii) higher VAT, or (iii) higher income taxation. We have conducted this analysis using a general equilibrium model with heterogeneous agents calibrated to Cambodian aggregate data and micro data from the Cambodian household income survey.

36.   Our results highlight the trade-off faced by policy makers in designing a reform package. Figure 15 summarizes our main findings from Section VI.A. It shows the simulated effects on GDP and inequality of the permanent increase in infrastructure spending of 0.5 percent of GDP, when the financing option varies. According to our results, the reform option based on higher property taxation dominates. This reform generates both the largest positive effect on GDP and the largest reduction in inequality. This is because property taxes are inherently progressive: wealthier households own more and valuable property and will thus also pay a higher property tax. At the same time, property taxes do not distort the incentive to supply labor or undertake investments. Reaping the gains from property taxation will however require additional investments in tax administration. On the other hand, the relative ranking of financing through VAT and labor income taxes is ambiguous. Financing through VAT deliver the largest increase in GDP, while labor income taxes yield the largest reduction in inequality.

37.   The reduction in inequality is generated by the tax reform. It is the increase in the progressive taxes (property and personal income taxes) that generates the fall in inequality under the reform package. This implies that a tax reform shifting tax revenue towards the progressive taxes, but without the additional infrastructure spending, would Therefore

Figure 15: The Growth Equality Trade off

Reform Impact: The GDP Equality Trade-off

Sources: IMF staff calculations.

38.   Inequality can be further reduced by targeting infrastructure spending to rural households or by complementing it with more and more efficient social spending. The reduction in inequality achieved through the baseline reform package (Section VI.A) is limited -- less than 0.1 percentage points reduction in the Gini coefficient. The increase can be increased somewhat (to up to 0.2 percentage points) by targeting the infrastructure spending to the rural area (Section VI.B). However, this comes at the cost of a lower impact on GDP. Additional inequality reduction (up to 0.6 percentage points) could be achieved through targeted social transfers (Section VI.C).

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