Original Article

The tobacco excise system in Indonesia: Hindering effective tobacco control for health

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Abstract Comprehensive tobacco control policies include high taxes. This paper describes the tobacco excise structure in Indonesia from 2007 to 2009. The design of the tobacco excise system contributes to neutralizing the effect of a tax increase on consumption. Wide gaps in tax rates allow for the availability of low-priced products, and consumers can substitute to cheaper products in response to price increases. There has been no systematic increase in the tax rates, which promotes affordable of tobacco products. Firms can reduce their prices at point of sale and absorb the tax increase instead of passing it onto consumers. Tiered tax rates by production scale allow firms to evade paying the highest tax brackets legally, thereby increasing profit margins while reducing prices at point of sale. Increases in tobacco excise rates in Indonesia may not have a large health impact under the current system of tax administration.
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Introduction

Tobacco price and tax increases are considered the most cost-effective means to reduce consumption and address the burden of tobacco-attributable morbidity and mortality. Demand for tobacco products responds to changes in price. A tax increase passed onto consumers in the form of increased prices will result in a decline in consumption. Surveys of the economic literature have found that price elasticity of demand falls between –0.25 and –0.50 in high-income countries, or that a 10 per cent increase in the price of tobacco products results in 2.5–5.0 per cent reduction in consumption.[1,2]

Theory predicts that demand would be more responsive to prices in low-income countries, and this is largely confirmed by empirical evidence.[3,4]

The objective of this paper is to describe the tobacco excise system in Indonesia, and its design and implementation that may reduce or negate the impact of a tax increase on consumption and health. Low real cigarette prices, population growth, rising household incomes, and mechanization of the *kretek* industry have contributed to sharp increases in tobacco production and consumption in Indonesia since the 1970s. Nearly all tobacco users (98 per cent) are smokers, and the vast majority of smokers (88 per cent) use *kreteks* – or cigarettes made of tobacco and cloves. Smoking prevalence is 34 per cent, and 63 per cent of men smoke. Per capita adult tobacco consumption increased by 9.2 per cent between 2001 and 2004.[5] Given the delay of up to 25 years between smoking uptake and the onset of cancers and smoking-related chronic diseases, the negative health effects of increases in cigarette consumption are only now being seen. Based on epidemiological data from other countries,[1] it is assumed that up to one-half of Indonesia's 57 million smokers will die of tobacco-related illnesses.

Cigarette prices and tax rates in Indonesia are low relative to other countries, and cigarettes have become 50 per cent more affordable in real prices between 1980 and 1998.[3] A review of studies about cigarette demand in Indonesia using both aggregate and household data have reported price elasticities ranging from −0.29 to −0.67, and income elasticities ranging from 0.32 to 0.76.[5] An unpublished study of aggregate data, however, reported that increases in tobacco excise rates in 2001 did not significantly reduce cigarette demand.[6] This suggests that the tax may not have been fully passed onto consumers in the form of higher prices, consumers switched to lower priced products, or increases in household income offset price increases.

Reductions in consumption resulting from an increase in the tobacco tax depend on several factors, including the structure and implementation of the tax, the extent to which consumers substitute cheaper tobacco products, and industry responses to tax increases. We find that the design of the tobacco excise system in Indonesia promotes a wide range of prices at point of sale. Generally, the system has become more complex over time. In addition, the

tiered tax rates by production scale allow firms to evade the highest tax brackets legally, thereby reducing prices at point of sale. We conclude that increases in tobacco excise rates in Indonesia may not have much health impact under the current system of tax administration. If the government wishes to expand the use of tobacco taxes beyond revenue and employment goals to achieve better health outcomes, we propose modifications to the excise system.

Data Sources

We describe the current tobacco excise structure, tax incidence, and industry responses to the tax system. Historic and current excise tax and price structure for tobacco products were obtained from published Ministerial Decrees of the Excise Tax Directorate, Ministry of Finance.[7] Brand-specific rates for 2008 and 2009 are derived from surveys, published data in market reports, and data reported in presentations by the Ministry of Finance.[8–10] Average tax rates were estimated for the three main types of cigarettes based on household data about consumption and prices, industry figures for total production by type of cigarette, and tax bureau statistics about excise revenues by type of cigarette.[5,8,11] Information about the industry's response to the excise tax structure and tiered production levels come from the Ministry of Industry reports, market analyses, and academic studies.[11–15] Indonesian rupiah values are expressed in 2007 US dollar values unless otherwise indicated.

Results

The structure of the tobacco tax system

The tobacco excise structure varies by 11 types of tobacco products, mode of cigarette production (hand-rolled or machine-made), and firm size as measured by production level (the number of sticks produced per year). The tax is based on the government's retail sales price Harga Jual Eceran (HJE), also called the banderol price, and derived from reports made by each firm detailing the cost components (tobacco, cloves, 'sauce' or flavoring, filters and packaging, transportation, and overhead) for each brand produced.

The banderol price is comprised of the factory price inclusive of taxes, profit, and transaction costs. Before 2007, the system of excise for tobacco applied solely an *ad valorem* tax (based on value); in 2007 and 2008, both an *ad valorem* and a specific per stick tax were applied (Table 1). In February 2009, a large specific per stick tax was put into effect, which varies by newly established tiered cut-off points for banderol prices, by each type of tobacco product. For cigarettes, the specific tax and tiered banderol prices also vary by firm production scale (Table 2).

To achieve their annual revenue targets, the Ministry of Finance can adjust the *ad valorem* or specific per stick taxes, banderol prices, categories for tobacco products, the number of firm production scales, and the cut-off points for firm production scales. In 2009, important changes include the reduction in firm production scales from three to two for all machine-made cigarettes, and the replacement of the *ad valorem* rates with a large specific tax that varies by banderol price. There is no systematic change in the rates, and adjustments in the tax structure can be made once or more, or not at all, during a single year for a given tobacco product or firm production scale. In the past, adjustments have been made that result in increases or decreases in tax rates for different products, depending on revenue and employment goals. From 2003 to 2006, there were no changes in the *ad valorem* rates for any cigarette product; however, since 2007, changes have been made annually. Neither the tax rates nor the government retail prices are adjusted to keep pace with inflation. However, in addition to an import duty, a different excise scale is applied to imported cigarettes, based on the same tobacco product types. However imported cigarettes constitute a small part of consumption; the ratio of imported cigarettes to domestic production was less than 1 per cent in 2005.

The current excise rates

The customs law caps excise rates for tobacco at 57 per cent of the government's banderol price (HJE), which is firm and brand specific. However, ministerial regulations for schedules implemented in 2007 and 2008 reported the minimum HJE for the brand-specific range by type of product and firm production scale. This information can be used to estimate the maximum excise rate applied as a percent

Table 1: Tobacco excise scales for domestically produced and consumed products by product type and firm production scales, 2007 and 2008

Tobacco product	*Firm production scale (no. of sticks per year)*		*2007*			*2008*		
			Minimum HJE[a] (Rp per stick)	*Ad valorem tax (%)*	*Per stick tax (Rp)*	*Minimum HJE[a] (Rp per stick)*	*Ad valorem tax (%)*	*Per stick tax (Rp)*
Machine-made *kreteks* (SKM)	I	>2 billion	550	40	7	600	36	35
	II	>500 million – ⩽2 billion	450	36	5	383	35	35
	III	⩽500 million	440	26	3	374	22	35
Machine-made white (tobacco only) cigarettes (SPM)	I	>2 billion	345	40	7	375	34	35
	II	>500 million – ⩽2 billion	265	36	5	225	30	35
	III	⩽500 million	255	26	3	217	15	35
Hand-made *kreteks* (SKT)	I	>2 billion	475	22	7	520	18	35
	II	>500 million – ⩽2 billion	395	16	5	336	10	35
	IIIA	>6 million – ⩽500 million	380	8	3	234	0	30
	IIIB	⩽6 million[b]	275	4	3	—	—	—
Hand-made *kreteks* filters (SKTF)[c]	I	>2 billion	—	—	—	600	36	35
	II	>500 million – ⩽2 billion	—	—	—	383	35	35
	IIIA	⩽500 million	—	—	—	374	22	35

Table 1: *Continued*

Tobacco product	*Firm production scale (no. of sticks per year)*		*2007*			*2008*		
			Minimum HJE[a] (Rp per stick)	*Ad valorem tax (%)*	*Per stick tax (Rp)*	*Minimum HJE[a] (Rp per stick)*	*Ad valorem tax (%)*	*Per stick tax (Rp)*
Other cigarettes (KLB, KLM, SPT)[d]	I	>6 million	215	8	NA	180	8	NA
	II	⩽6 million[b]	180	4	NA	—	—	—
Sliced Leaves (TIS)	I	>2 billion grams	50	20	NA	50	20	NA
	II	>500 million −⩽2 billion grams	50	16	NA	50	16	NA
	IIIA	>50 million-< 500 million grams	50	8	NA	40	8	NA
	IIIB	< 50 million grams[b]	40	4	NA	—	—	—
Cigars (CRT)	NA[e]		275	20	NA	275	20	NA
Other (HPTL)	NA		275	20	NA	275	20	NA

Notes: Ministry of Finance Regulation No. 134/PMK.04/2007, No. 43/PMK.04/2005, No. 203/PMK.11/2008.[7]
[a]Government retail price or the banderol price. Minimum refers to the lowest level in the brand- and firm-specific range of HJE.
[b]These production tiers were eliminated in the 2008 regulation.
[c]Hand-made kretek filters were added as a new category of cigarettes in 2008.
[d]KLB: cornhusk-wrapped cigarettes; KLM: incense-clove cigarettes; SPT: hand-rolled tobacco only cigarettes.
[e]Not applicable.

Table 2: Tobacco excise scales for domestically produced and consumed products, 2009

Tobacco product	*Production levels (no. of sticks per year)*		*HJE*[a] *(Rp per stick)*	*Tax (Rp per stick)*
Machine-made *kreteks* (SKM)	I	>2 billion	>660	290
			631–660	280
			600–630	260
	II	⩽2 billion	>430	210
			381–430	175
			374–380	135
Machine-made white cigarettes (SPM)	I	>2 billion	>600	290
			451–600	230
			375–450	185
	II	⩽2 billion	>300	170
			255–300	135
			217–254	80
Hand-made *kreteks* (SKT) and white cigarettes (SPT)	I	>2 billion	>590	200
			551–590	150
			520–550	130
	II	>500 million–⩽2 billion	>380	90
			350–380	80
			336–349	75
	III	⩽500 million	⩾234	40
Hand-made *kreteks* filters (SKTF) and white filters (SPTF)	I	>2 billion	>660	290
			631–660	280
			600–630	260
	II	⩽2 billion	>430	210
			381–430	175
			374–380	135

Table 2: *Continued*

Tobacco product	*Production levels (no. of sticks per year)*	*HJE*[a] *(Rp per stick)*	*Tax (Rp per stick)*
Cornhusk-wrapped cigarettes (KLB)	NA[b]	>250	25
		180–250	18
Incense-clove cigarettes (KLM)	NA	⩾180	17
Sliced Leaves (TIS)	NA	>250	21
		150–250	19
		40–149	5
Cigars (CRT)	NA	>100 000	100 000
		50 001–100 000	20 000
		20 001–50 000	10 000
		5001–20 000	1200
		275–5000	250
Other (HPTL)	NA	⩾275	100

Notes: Ministry of Finance Regulation No. 203/PMK.011/2008.[7]
[a]Government retail price or the banderol price.
[b]Not applicable.

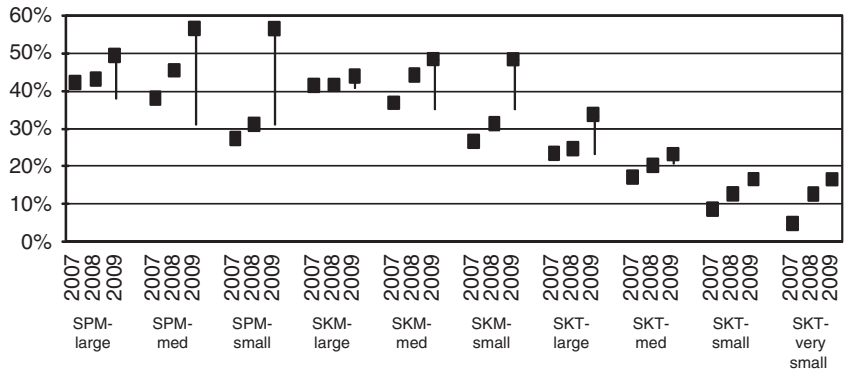


Figure 1: Maximum cigarette excise incidence as a percent of the banderol price for the three main types of cigarettes by firm production scales (2007–2009).
Notes: SPM: machine-made white cigarettes, SKM: machine-made *kreteks*, and SKT: hand-made *kreteks*. Size based on firm production levels as reported in Tables 1 and 2. Maximum excise incidence reported for 2007 and 2008, based on the minimum government banderol price (HJE) in the brand- and firm-specific range.[7] The values reported for 2009 are based on the range of specific taxes by banderol prices as specified in the regulation.

of the HJE by type of tobacco product. For the 2009 regulation, the HJE and specific tax for cigarettes varies by production scale and tobacco product. This information can be used to estimate the maximum excise incidence and range of values for 2009 for a 3-year comparison.

Three main types of cigarettes account for 97 per cent of cigarette production: machine-made white cigarettes (SPM), machine made *kreteks* (SKM), and hand-made *kreteks* (SKT). Figure 1 illustrates the maximum excise incidence for 2007 to 2009 by the three main cigarette types and firm production level. For all but SPM, the maximum excise rate applied is well below the 57 per cent cap. Machine-made products (SPM and SKM) face the highest excise incidence in comparison with SKT, which have consistently been taxed at the lowest rates. At the same time, the maximum rates for SKT increased substantially between 2007 and 2009. The smallest producers across all three cigarette types experienced the greatest tax increases over the 3-year period, particularly in 2009 given the elimination of the special rates for firms producing fewer than 6 million sticks per year. For example, the maximum incidence for very small firms producing SKT was 5.1 per cent in 2007 compared with

17 per cent in 2009. In comparison, large SKM producers experienced a relatively stable tax environment.

It is important to recall that the banderol prices are brand and firm specific. The banderol prices (HJE) reported in the government regulations for 2007 and 2008 represent the lower bound of the brand-specific range. The regulation states that the price at point of sale must be the same or lower than the HJE; therefore, the HJE is a maximum price at point of sales in practice. Actual sales price per pack varies by retailer and location, based on circulars issued by manufacturers to retailers. Based on small-scale surveys, the HJE is estimated to be 17–22 per cent higher than the actual price at point of sale.[8] Using household data based on prices paid by smokers for the three main types of cigarettes, excise incidence as a percent of actual sales price averaged 37 per cent in 2005, ranging from 21 to 46 per cent.[5] The lowest rates applied to hand-rolled *kreteks* and the highest to machine-made *kreteks*. However, these figures do not take into account the tax hikes in 2007 to 2009.

We illustrate the implications of the 2009 tax increase on sales prices using data describing the major cigarette brands that account for a large percent of market share. As indicated in Table 3, a handful of machine-made *kretek* (SKM) brands hold an estimated 53 per cent of market share.[12] *Gudang Garam* SKM brands, for example, are estimated to hold nearly one-third of market share (International and Surya) . Although the banderol prices vary by firm production level, 80 per cent of SKMs are produced by Tier 1 firms that produce more than 2 billion sticks per year.[11] Therefore, we used the rates and banderol prices from survey data for Tier 1 firms in this table.[9,10] As noted earlier, SKM manufactured by large firms faced relatively small changes in taxes between 2007 and 2009. Therefore, excise incidence as a percent of banderol price increased by only 3–5 per cent for International and *Surya*, as well as the other SKM Tier 1 brands. With a higher banderol price under the 2009 regulation, International brand experienced a slightly higher tax increase between 2008 and 2009.

The prices at point of sale vary by geographic location and type of retail sales outlet. Previous studies have reported that the difference between the actual sales price and the banderol price could be substantial.[8,15] In this example, we use data from an opportunistic survey among small street vendors in Jakarta, indicating that the

official premium for *Surya* is 25 per cent higher than the sales price.[8] Given that the banderol price is higher than the price at point of sale, excise incidence for *Surya* in 2009 was estimated at 43 per cent of HJE and 53 per cent of sales price.

In the past, firms have been willing to reduce their prices at point of sale, absorb excise tax increases, and reduce their margins to maintain or increase market share.[12,13] We can illustrate this with brands from some of the smaller producers (Table 3). Using brand- and firm-specific data from the Ministry of Finance, the banderol price for Bentoel's hand-rolled *kreteks*, *Sejati*, was surveyed as 79 per cent higher than the actual sales price.[10] Similar price reductions at point of sale could be seen for new or copycat brands, where a reduction in sales price is used as a part of cigarette promotions. For these brands, effective excise incidence as a percent of sales price could reach 70 per cent or higher.

Industry responses to tiered taxes by production levels

The tobacco market is an oligopoly, with three large companies (*Gudang Garam, Djarum*, and Sampoerna/Philip Morris) holding 71 per cent of market share.[5] Industry mechanization is one of the most important factors affecting employment in cigarette manufacturing in Indonesia. Since mechanization came to cigarette manufacturing in the 1970s, there have been a series of government policies to protect small firms, including the tiered rates by firm production level. The excise incidence is much higher for machine made *kreteks* (ranging from 36 to 49 per cent of HJE) compared with hand-rolled non-filter *kreteks* (ranging from 17 to 34 per cent). Before 2007, the excise system consistently applied higher rates to firms with the highest production scales. The rationale was to protect small firms, by reducing demand for products from large firms through increases in their retail prices.

There have been several responses by the industry to the differential scales for tax rates. Differential tax rates by production scales provide an incentive for firms to reduce their production levels to fall within lower tax brackets. Bird (1999) uses firm production data to show the industry's response to the government's change in tax by production levels.[14] He shows that changes in the highest production thresholds prompted firms to reduce production below

Table 3: Excise incidence as a percent of the government retail price (HJE) and sales price for major cigarette brands, 2008 and 2009

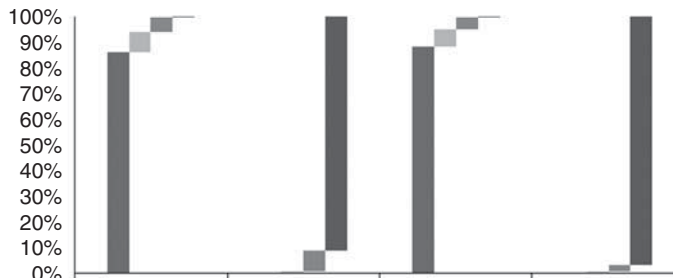
Company and Brand	*Estimated market share (%)*[b]	*HJE per stick (Rp)*	*Estimated sales price (Rp)*	*Official premium/ sales price*[c]	*Excise incidence*[a]			
					2008		*2009*	
					HJE (%)	*Sales price (%)*	*HJE (%)*	*Sales price (%)*
Machine-made kreteks (SKM), Tier 1[d]								
Gudang Garam International	32	671	627	1.07	41.3	44.2	43.2	46.2
Gudang Garam Surya		656	525	1.25	41.3	51.6	42.7	53.4
Philip Morris/Sampoerna A-Mild	11	656	551	1.19	41.3	49.2	42.7	50.8
Djarum Super	10	671	627	1.07	41.3	44.2	43.2	46.2
Machine-made white cigarettes (SPM), Tier 1								
Philip Morris Marlboro	7	530	438	1.21	40.6	49.1	43.4	52.5
Hand-rolled kreteks (SKT), Tier 1								
Philip Morris/Sampoerna *Dji Sam Soe*	NA[e]	742	721	1.03	22.8	23.4	27.0	27.7
Gudang Garam Merah	NA	554	479	1.16	24.4	28.2	27.1	31.3
Philip Morris/Sampoerna *Hijau*	NA	571	524	1.09	24.2	26.3	26.3	28.6
Smaller producers and price promotions[f]								
Betoel *Sejati*, SKT, Tier 1	NA	521	292	1.79	24.8	44.2	25.0	44.6
Bentoel Country, SPM, Tier 2[g]	NA	375	268	1.40	43.3	60.7	45.3	63.6
Bentoel X Mild, SKM, Tier 2	NA	600	366	1.64	41.8	68.6	43.3	71.1
Gelora Djaja Wismilak, SKM, Tier 3[h]	NA	333	250	1.33	32.5	43.4	40.5	54.1

[a]Excise tax rates from Ministry of Finance, official regulations applied in 2008 and 2009.[7]
[b]Estimated brand market share for 2003.[12]
[c]Official premium/sales prices from opportunistic survey from sales vendors in Jakarta and Depok for all brands except price promotions.[8]
[d]Tier levels refer to firm production with Tier 1 for the highest production.
[e]NA = Not available.
[f]Data used for the examples of price promotions from Ministry of Finance, 2008.[10]
[g]Tier 2 for medium production.
[h]Tier 3 for the lowest production levels based on 2008 Ministry of Finance definitions.[7]

the given threshold, thereby incurring lower excise rates on its products and increasing profit margin.

More recently, there was a shift between 2005 and 2006 in the number of firms in the small (IIIA) and very small (IIIB) production scales, when the most favorable tax rates were in place for the firms in the lowest production scales (Figure 2). During this time, there was a decline from 252 to 96 firms in the IIIA tier, and an increase from 2941 to 3841 firms in the IIIB tier. No changes in the definitions applied to the production scales.

As Figure 2 also suggests, the very low tax rates before 2009 for very small firms producing fewer than 6 million sticks per year appears to have provided incentives to establish new small firms. Different sources provide different figures about the number of firms involved in cigarette manufacturing. Industry reports cite a doubling of the total number of cigarette firms from 1500 to more than 3000 between 2001 and 2004.[12] They claim that many of these firms produce at a very small scale and avoid paying excise tax duties to keep prices low. In 2006, the excise tax directorate reported 3834 very small cigarette firms producing fewer than 6 million sticks annually – an increase of nearly 900 very small firms from 2005.[11]



	2005		2006	
	% excise contribution	No. of firms (n=3217)	% excise contribution	No. of firms (n=3961)
≤6 million	0.2%	91.4%	0.2%	96.8%
>6 million - ≤ 500 million	5.7%	7.8%	4.8%	2.4%
>500 million - ≤ 2 billion	8.0%	0.6%	6.7%	0.6%
>2 billion	86.1%	0.2%	88.3%	0.2%

Figure 2: The number of cigarette firms by production and their contribution to excise revenues, 2005–2006.
Notes: Ministry of Industry (2007).[11]

In addition, large cigarette firms may buy up or contract production to small firms, which incur lower tax rates. Subcontracting production to small firms is officially recognized and permitted by the Ministry of Finance. The smaller firms are treated as separate legal entities, enabling them to incur lower tax rates.

Realizing that tiered pricing policies by firm production levels are inefficient, the excise policy changed in 2009. While hand-rolled non-filtered *kreteks* produced by small firms continued to enjoy the lowest tax rates in 2009, large increases occurred for firms producing fewer than 2 billion machine-made white cigarettes and *kreteks* per annum.

Discussion

Price and tax measures are an integral part of tobacco control policies for better health. The assumption in promoting higher tobacco taxes is that the tax results in higher prices at point of sale. This paper presents data from Indonesia showing that the structure and implementation of the excise system can reduce or negate the impact of a tax increase on consumption. The excise structure has become more complex over time, although efforts were made in the recent regulation to simplify the system by applying a specific tax and reducing the number of production tiers for machine-made cigarettes.

The design of the Indonesian excise system maintains the affordability of tobacco products. Despite tax increases in 2009 for small producers, large differences in rates remain by type of product and firm production scale, which translate to differences in prices at point of sale. These differences allow for a range of prices for tobacco products, which makes tobacco affordable for all income groups. Research has consistently demonstrated that low-income households in Indonesia consume more hand-rolled *kreteks* with lower sales prices on average compared with machine-made *kreteks* or machine-made white cigarettes sold at higher sales prices.[5] In 2008, a pack of hand-rolled *kreteks* produced by a very small firm could cost as low as Rp 2000 per pack (approximately US$0.22).

Changes in the tax rates are applied differently to each type of product and production scale. This increases – rather than reduces – the gaps in rates by type of product. In response to the increase in

price of any one given product, consumers can readily substitute to a wide range of cheaper tobacco products available side-by-side in the market. While tax increases were applied to small producers in 2009, for example, rates for large firms producing machine-made *kreteks* (SKM) remained stable between 2007 and 2009. SKM products from large firms faced a lower tax hike (approximately 3–5 per cent of HJE), and a handful of SKM brands represent well over half of market share.

Moreover, there is no annual or systematic increase in the rates. No increases in the *ad valorem* rates occurred between 2003 and 2007 for any type of cigarette, and the retail prices are not pegged to a price indicator. The lack of a systematic or annual increase has resulted in the increasing affordability of tobacco products over time in real terms relative to other goods and services.[3] Tax increases that aim to reduce consumption need to be higher than the general rate of inflation, which is expected to reach 7 per cent in 2009.[16] It should also be large enough to offset increases in growth, given that consumption of tobacco products increases with income in Indonesia.

Rates are linked with government retail prices (HJE), or banderol prices, and firms are required to sell at or below the official premium. Relatively large reductions in price at point of sale have occurred in the past for specific brands to maintain market share, or for new or copycat brands.[13] Under the current system, effective excise incidence for some brands could be relatively high – even reaching the global benchmark of 70 per cent of sales price. This does not necessarily have an impact on consumption and health because the tax may be absorbed by the firm rather than passed on to consumers in the form of higher prices.

The Ministry of Finance has presented data showing brand-specific tax incidence (excise and value-added tax) as high as 60–90 per cent of actual sales prices.[10] The highest rates were reported for new brands, in which price reductions are typically used as discount promotions. In this case, the simple target of achieving a high tax rate as a percent of sales price may be misleading in terms of having an effect on consumption and health. Given that thousands of different brands are produced, it is also necessary to systematically collect household data to accurately estimate the tax incidence on average. Despite practices such as cigarette price promotions, excise

incidence as a percent of sales prices in Indonesia averaged 37 per cent in 2005 – one of the lowest in the region and globally.[5]

At firm level, the tiered tax rates by production scale allow firms to legally evade the highest tax brackets, by reducing their production levels. The system also provides incentives to establish new small firms that are either independent or subsidiaries of larger firms as well as buy or contract production to smaller firms. The tiered tax rates by production levels and the proliferation of very small firms are also thought to contribute to illegal manufacturing and sales, such as the sale of products with no excise paid, the production of fake excise ribbons, and the purchase of excise ribbon from small companies for resale to larger companies.[12,15] All of these factors can result in lower sales prices for cigarettes and contribute to the availability of cheap tobacco products.

The rationale behind the tiered excise rates by firm production levels is to generate employment and promote small industry. Previous studies have noted, however, that the contribution from small firms to total production has declined – despite favorable excise policies – and employment growth in tobacco manufacturing has not matched growth in the manufacturing sector as a whole.[5] It is unclear, therefore, whether using the excise system to protect small firms from competition is the most efficient way to promote employment relative to other programs and policies. This topic is discussed in more detail elsewhere.[5,14,15]

To have an impact on consumption and health, the tobacco excise system could be simplified in several ways. The brand- and firm-specific banderol prices could be replaced by a more uniform system, and this change could reduce the administrative burden substantially. Despite the existence of some 4000 cigarette firms and thousands of brands, six large firms generate 88 per cent of total excise revenues and five brands hold nearly 60 per cent of market share.[11,12]

Eliminating the firm production tiers could close the loophole by which firms legally evade the highest tax rates. Recognizing that multiple firm production levels promote inefficiency, the Ministry of Finance in 2009 has already eliminated the lowest production tiers for machine-made products. However, firms producing hand-made non-filter *kreteks* (SKT) are still taxed under a system that differentiates three production levels, and firms that produce machine-machine cigarette products are divided into two production

tiers. An important change implemented in 2009 was the imposition of a large specific, rather than *ad valorem*, tax. This tax, however, is not uniform and varies by banderol price, tobacco product, and firm production scale. Substantial variation in tax rates remains across tobacco products.

We conclude that increases in tobacco excise rates in Indonesia may not have a large health impact under the current system of tax administration. At present, the government's rationale for modifying the system is based on revenue and employment targets. Given that the system is highly flexible, substantial changes could be made if the government wants to expand the use of tobacco taxes beyond revenue and employment goals to achieve better health outcomes. This study suggests that excise administration is a key consideration is using price and tax measures to promote reductions in tobacco consumption.

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