

Four selected measures of the corporate tax burden in Hong Kong and other advanced economies

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Abstract

Four measures of the corporate tax burden are briefly reviewed in this letter to discuss Hong Kong's corporate tax competitiveness relative to other advanced economies. Although advanced economies enacted a number of corporate tax reforms to cut their corporate tax rates in recent years, all these measures show that the corporate tax burden in Hong Kong remains low when compared to other advanced economies.

四種選定的香港和其他先進經濟體企業稅負量度方法

摘要

本文簡要地檢視四種企業稅負的量度方法，以探討香港企業稅相對其他先進經濟體的競爭力。雖然先進經濟體在近年推行不少稅制改革，減低企業稅率，但這些量度方法均顯示，與其他先進經濟體相比，香港的企業稅負仍然維持於較低的水平。

<p>The views and analysis expressed in this article are those of the author and do not necessarily represent the views of the Office of the Government Economist.</p>

I. INTRODUCTION

1. The corporate tax burden is a vital determinant of the cost of doing business, and a simple tax regime with low corporate tax rates¹ has long been one of the core strengths of the Hong Kong economy. However, a number of corporate tax cuts have been undertaken by other advanced economies² in recent years. For a better understanding of Hong Kong's corporate tax burden relative to other advanced economies, this letter briefly reviews selected measures of the corporate tax burden and discusses Hong Kong's relative performance.

2. In the following sections, we will first discuss the top statutory corporate tax rate, which is the simplest measure of the corporate tax burden across economies. The discussion will then focus on the effective corporate tax burden, which takes into account not only the statutory tax rate but also various tax provisions such as exemptions and deductions. Two well-studied measures of the effective corporate tax burden in the literature are the effective average tax rate and effective marginal tax rate. The discussion will then proceed to the total tax and contribution rate, a World Bank measure of the corporate tax burden from a business perspective; a brief comparison of these measures; and concluding remarks.

II. TOP STATUTORY CORPORATE TAX RATE

3. The simplest way to paint a broad picture of the relative corporate tax burden across economies is to compare top statutory corporate tax rates, which always play an important role in determining the tax rates applicable to corporations in different economies. To take into account the fact that corporate taxes in most economies are levied at both the central and the sub-central government levels, the combined statutory corporate tax rate, compiled by the OECD Tax Database as the central government top rate less deductions for sub-national taxes plus the representative sub-central government top rate, is used for comparison³.

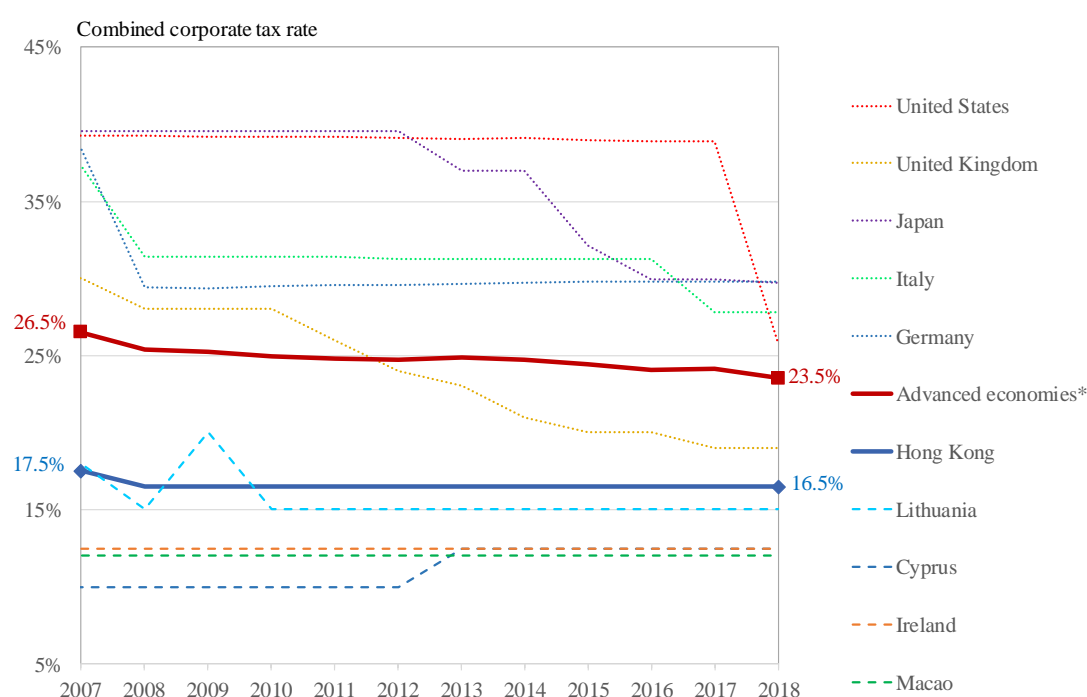
¹ This letter uses the terms “corporate tax” and “profits tax” interchangeably.

² The term “advanced economies” in this letter follows the definition of the International Monetary Fund's World Economic Outlook report (October 2019 edition). It includes Australia, Austria, Belgium, Canada, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Macao, Malta, the Netherlands, New Zealand, Norway, Portugal, Puerto Rico, San Marino, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, the United Kingdom and the United States.

³ The calculation of the representative sub-central government top statutory corporate tax rate is economy-specific. To name a few, for Canada, it is an average of provincial corporate tax rates, weighted by the provincial distribution of federal corporate taxable income. For Korea, it is the surtax rate levied by local governments (i.e. 10% of the central government tax rate).

4. **Chart 1** below shows the combined statutory corporate tax rates in advanced economies in 2007-2018. On average, Hong Kong's lead over other advanced economies has been diminishing, mainly due to corporate tax cuts implemented by other advanced economies. In particular, the most notable reductions of combined statutory corporate tax rates have taken place in the United States, the United Kingdom, Japan, Italy and Germany. Having said that, Hong Kong's combined statutory corporate tax rate in 2018 (16.5%) was still the 5th lowest among the advanced economies (after Macao (12%); Ireland (12.5%); Cyprus (12.5%⁴); and Lithuania (15%)).

Chart 1: Combined statutory corporate tax rates in the advanced economies



Note: (*) Simple average of combined statutory corporate tax rates across the advanced economies. Taiwan, Puerto Rico and San Marino are excluded due to unavailability of data. Hong Kong is excluded for analytical purposes.

Sources: OECD Tax Database and KPMG corporate tax rates table.

5. The preceding comparison is simple and easy to understand. This simplicity, however, means that many other relevant factors are ignored, most notably tax exemptions and deductions as well as the progressiveness of the corporate tax rate schedules in many economies. This motivates the use of other measures of the corporate tax burden in order to give a more complete picture of Hong Kong's corporate tax burden relative to other advanced economies.

⁴ In Cyprus, no corporate tax is levied at the provincial or municipal level. Hence, its top corporate tax rates are equal to its combined statutory corporate tax rates.

III. EFFECTIVE AVERAGE TAX RATE AND EFFECTIVE MARGINAL TAX RATE

6. The effective average tax rate (EATR) is a widely studied measure introduced by Devereux and Griffith (1999⁵, 2003⁶) to assess the impact of taxation on the pre-tax rate of return on a profitable investment. The EATR is defined as:

$$\text{EATR} = \frac{R^* - R}{Y^*}$$

where R^* is the pre-tax net present value of the investment over an alternative; R is the post-tax net present value of the investment over the alternative; and Y^* is the net present value of the investment's pre-tax income stream. The EATR can be used to assess how taxes affect the location decision for investment⁷.

7. The estimation of EATR is, however, a bit sophisticated. A standard approach based on Devereux and Griffith's methodology to estimate the EATRs on a comparable basis for different economies is based on a one-period perturbation of the capital stock, i.e. a hypothetical profit-maximising firm buys one unit of capital in the first period, say period t , and sells it in period $t + 1$ so that its capital stock returns to its initial level. Devereux and Griffith (1999, 2003) showed that R^* and Y^* of the hypothetical investment in period t can be expressed as functions of the real pre-tax rate of investment return (p) and real interest rate (r):

$$R_t^* = \frac{p - r}{1 + r}$$

and

$$Y_t^* = \frac{p}{1 + r}$$

8. The next step is to compute R in period t . It is based on the idea that, in equilibrium (and on a post-tax basis), shareholders will be indifferent between

⁵ Devereux, M., & Griffith, R. (1999). "The taxation of discrete investment choices". IFS Working Paper W98/16. Revision 2.

⁶ Devereux, M. P., & Griffith, R. (2003). "Evaluating tax policy for location decisions". *International Tax and Public Finance*, 10(2), 107-126.

⁷ An example could be a corporation with superior technology deciding on their overseas production location. R^* and Y^* would mainly be determined by the corporation's monopoly power from the superior technology but not the choice of location. However, it may not be wise to produce the product in more than one economy due to the fixed cost of setting up a factory and economies of scale. In this case, the corporation will choose to produce their product in the economy with the lowest EATR.

purchasing equity in the firm making the investment or lending to the market⁸. However, the impacts of taxation on the hypothetical investment with different sources of finance are not the same. Devereux and Griffith (1999, 2003) showed that R in period t can be expressed as the sum of the net present value of post-tax profits of the hypothetical investment that are financed by retained earnings (i.e. by reducing the dividend payment in period t) (R_t^{RE}) and the net present value of the additional cost of raising external finance (issuing new debt or new equity in period t) (F_t):

$$R_t = R_t^{RE} + F_t$$

9. In brief, R_t^{RE} is measured with reference to the capital market equilibrium condition, taking into account the impacts of various taxes and allowances on the hypothetical investment's return and cost as well as dividend payments and shareholder's discount rate. For instance, profits taxes would reduce the investment return, while depreciation allowances would reduce the investment cost. Taxes and allowances considered in the calculation vary across studies. Other possible taxes and allowances include but are not limited to personal taxes on dividend income, tax credits available for dividends paid, and capital gains taxes.

10. As for F_t , additional taxes and allowances come into play when including new equity or debt issued in period t and the corresponding repayments in period $t + 1$. For example, an allowance for capital expenditure would reduce the amount of new equity / debt required to kick off the hypothetical investment. For some economies, new debt is deductible from the corporate tax base. As such, the EATRs for hypothetical investments that are financed by retained earnings, new equity and new debt can be calculated separately.

11. The effective marginal tax rate (EMTR) is another widely studied measure of effective corporate tax burden in the literature. This concept was introduced by King and Fullerton (1983)⁹ to assess the impact of taxation on the required pre-tax rate of return on a marginal investment, or an investment that earns just enough to attract investors. Since a profit-maximising investor would invest in all profitable investments, the EMTR can be used to assess how taxes affect the incentive to expand investment given a fixed location (a lower EMTR means a greater incentive to invest).

12. According to Devereux and Griffith (2003), by solving for the real pre-tax rate of return that makes R equal to zero (\tilde{p}) and substituting it into the expression for the

⁸ In practice, the actual equilibrium condition used to calculate the EATR is quite complex as it must take into account shareholders' personal taxes on interest, dividends, and capital gains in addition to corporate taxes and investment-related tax incentives at the firm level.

⁹ King, M. A., & Fullerton, D. (1983). "The Taxation of Income from Capital: A Comparative Study of the US, UK, Sweden and West Germany". NBER Working Paper No. 1058.

EATR, the EMTR can be written as a special case of the EATR for a marginal investment (i.e. when $p = \tilde{p}$). After derivation, this results in the expression:

$$\text{EMTR} = \frac{\tilde{p} - s}{\tilde{p}}$$

where s is the real post-tax rate of investment return. Their analysis also shows that as the pre-tax rate of return increases, the EATR approaches the statutory corporate tax rate adjusted for shareholder-level taxation.

13. Building on the literature, the OECD has constructed a model to estimate EATRs and EMTRs for different economies with coverage of jurisdiction-specific tax rules pertaining to different asset categories (buildings, machinery, inventories and intangibles) and sources of finance (debt and equity)¹⁰. The composite EATRs and EMTRs are the weighted averages of those for investments financed by equity (65%) and debt (35%), both of which are in turn the unweighted averages of the corresponding tax rates over different asset categories. When estimating the EATRs, the pre-tax rate of return p is fixed at 20%¹¹.

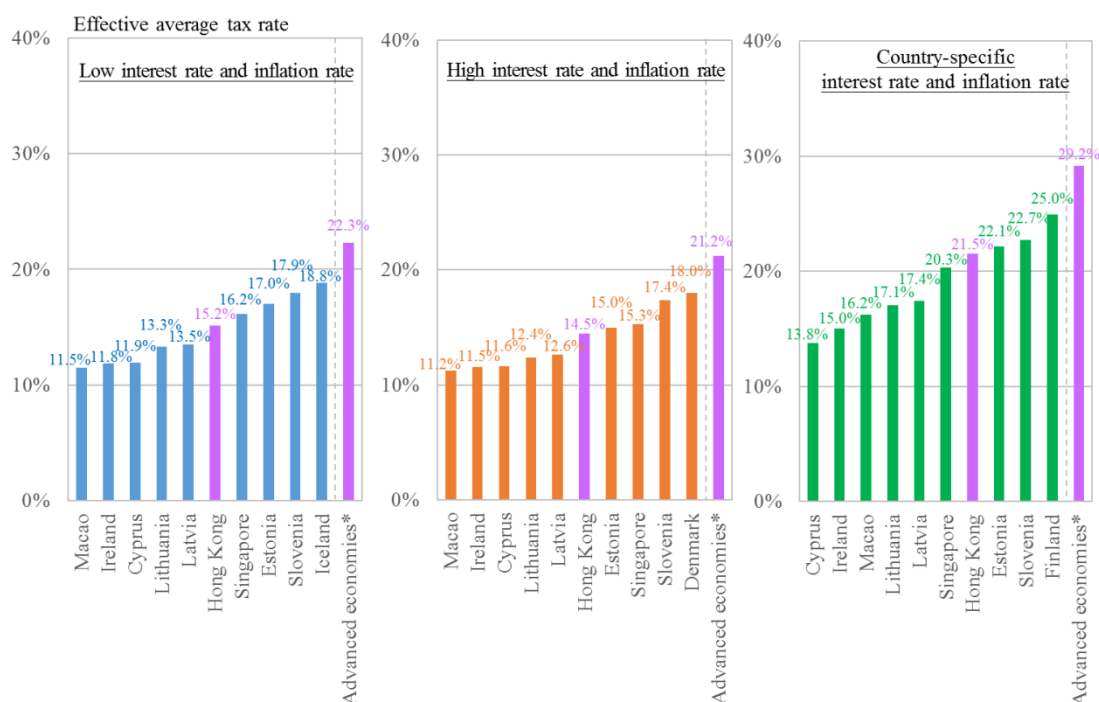
14. Considering the fact that assumptions concerning interest rates and inflation could have significant impacts on the EATRs and EMTRs, the OECD estimates them under three macroeconomic scenarios: low, high and with country-specific interest rates and inflation rates¹². **Chart 2** below depicts the ten lowest EATRs in the advanced economies under all three scenarios in 2017.

¹⁰ For more details, please refer to Hanappi, T. (2018), “Corporate Effective Tax Rates: Model Description and Results from 36 OECD and Non-OECD Countries”, *OECD Taxation Working Papers*, No. 38.

¹¹ The assumed 20% pre-tax rate of return is widely adopted in the literature. According to Devereux and Klemm (2003), a 20% pre-tax rate of return generates an EATR that is different from the EMTR and the statutory corporate tax rate, and this choice of pre-tax rate of return is somewhat arbitrary.
Devereux, M. P., & Klemm, A. (2003). “Measuring taxes on income from capital: evidence from the UK”. IFS Working Papers.

¹² According to the OECD database, in the low scenario, the real interest rate is 3% and inflation is 1%. In the high scenario, the real interest rate is 5% and inflation is 2%. As for the country-specific scenario, real interest rates and inflation rates are retrieved from the *OECD Economic Outlook*, IMF International Finance Statistics or direct contact with delegates.

Chart 2: The advanced economies with the ten lowest EATRs in 2017



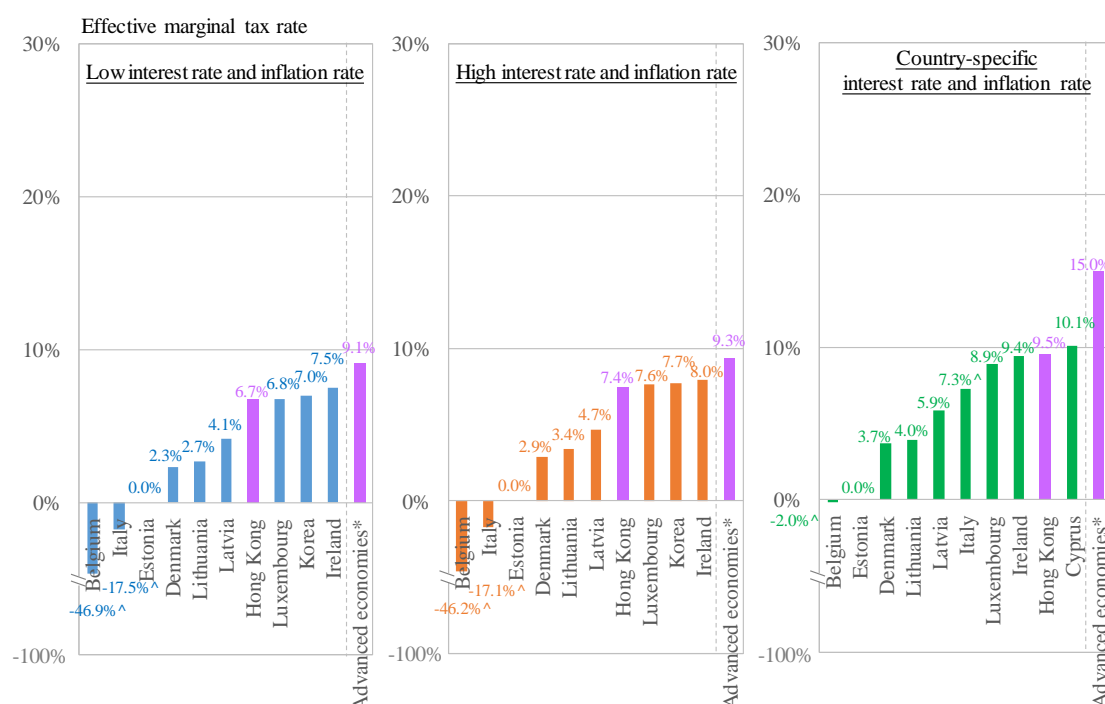
Note: (*) Simple average of EATRs across the advanced economies. Taiwan, Puerto Rico and San Marino are excluded due to unavailability of data. Hong Kong is excluded for analytical purposes.

Source: OECD Tax Database.

15. Under the scenarios with low, high and country-specific interest rates and inflation rates, Hong Kong's EATRs in 2017 were 15.2%, 14.5% and 21.5% respectively, significantly lower than the corresponding averages of advanced economies (22.3%, 21.2% and 29.2%). Also, Hong Kong had one of the ten lowest EATRs among the advanced economies (low scenario: 6th; high scenario: 6th; country-specific scenario: 7th) (**Chart 2**). This reveals that, from a tax perspective, Hong Kong was an attractive location for investment when compared to other advanced economies.

16. **Chart 3** below shows the ten lowest EMTRs in the advanced economies in 2017. Hong Kong's EMTRs in 2017 under the scenarios with low, high and country-specific interest rates and inflation rates (6.7%, 7.4% and 9.5%) were significantly lower than the corresponding averages of advanced economies (9.1%, 9.3% and 15.0%). In addition, Hong Kong's EMTRs in 2017 were among the ten lowest in the advanced economies (low scenario: 7th; high scenario: 7th; country-specific scenario: 9th). These figures indicate that taxes on corporate investment in Hong Kong reduced investment incentives to a lesser extent than in other advanced economies.

Chart 3: The advanced economies with the ten lowest EMTRs in 2017



Notes: (*) Simple average of EMTRs across the advanced economies. Taiwan, Puerto Rico and San Marino are excluded due to unavailability of data. Hong Kong is excluded for analytical purposes.

(^) Both Belgium and Italy have an allowance for corporate equity in their tax code, offering a tax deduction on the increase in equity based on a notional interest rate. For these two economies, the hypothetical notional interest rates in the low / high interest rate and inflation rate scenarios are much higher than the corresponding actual rates, resulting in much higher hypothetical tax deductions and much lower hypothetical EMTRs in these two scenarios as compared to those in the country-specific interest rate and inflation rate scenario.

Source: OECD Tax Database.

IV. TOTAL TAX AND CONTRIBUTION RATE

17. The above three measures of the corporate tax burden are confined to compulsory and unrequited payments to government. The total tax and contribution rate (TTCR) in the World Bank's Doing Business (DB) report, however, measures the corporate tax burden from a business cash flow perspective, i.e. all taxes and contributions that are government-mandated and have an impact on a business's financial statement. Apart from profit taxes, the TTCR includes labour taxes and contributions as well as other taxes (such as municipal fees and vehicle taxes)¹³. The

¹³ To measure imposed charges that affect business accounts, the labour taxes in the DB report include government-mandated contributions paid by the employer to a required private pension fund or worker's insurance fund, which are not included in the traditional definition of a tax.

TTCR is calculated as the ratio of “taxes and mandatory contributions” to “commercial profit”.

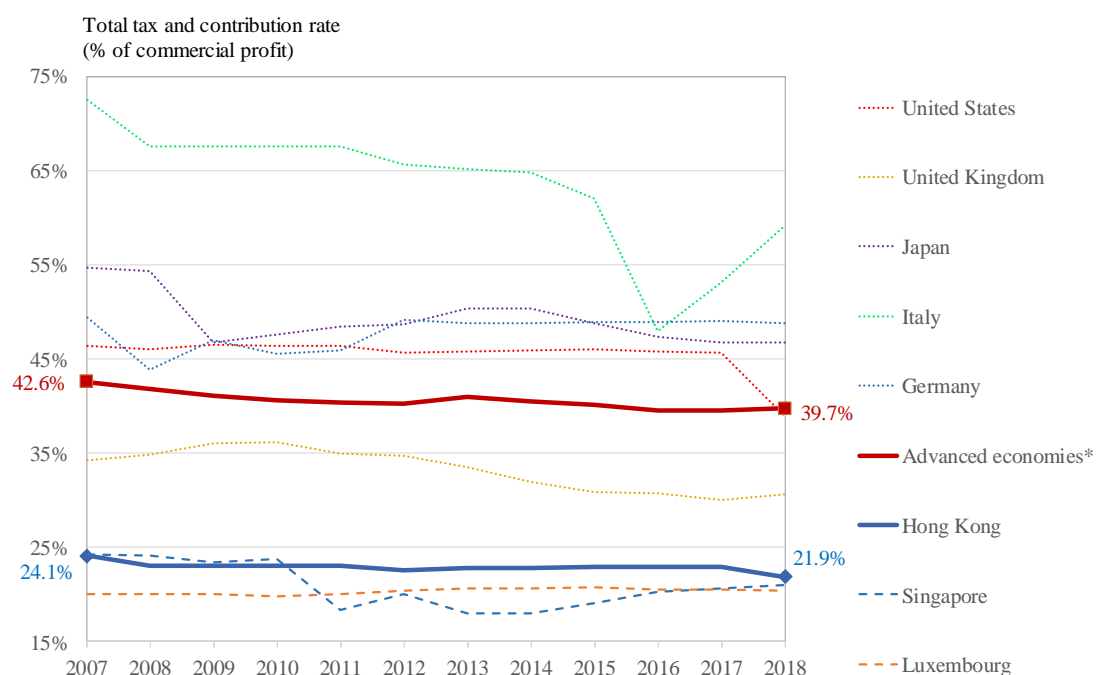
18. To ensure the comparability of TTCRs across economies, the DB report uses a standardised case scenario to compute the amounts of taxes, mandatory contributions and commercial profits in different economies. Under this scenario, the hypothetical corporation is a medium-size limited company operating in the economy’s largest business city, and there are a number of assumptions concerning the corporation’s financial position and transactions made over the course of the year. For instance, the corporation incurs a loss in the first year of operation, but has a pre-tax profit margin of 20% in the second year. Then, tax experts in different economies are asked to compute the amounts of all taxes and mandatory contributions borne by the corporation in its second year of operation, after accounting for relevant tax exemptions and deductions. Taxes and mandatory contributions paid to state and local governments are included where applicable. As for commercial profits, they are assumed to be 59.4 times the income per capita of the economy¹⁴.

19. **Chart 4** below presents the TTCRs in the advanced economies according to the 2020 DB report. Similar to the combined statutory corporate tax rate, the simple average of TTCRs in the advanced economies largely followed a downward trend from 2007 to 2018, and declined by around 3% points over the period¹⁵. In 2018, Hong Kong’s TTCR, at 21.9%, was the 3rd lowest among the advanced economies (after Luxembourg (20.4%) and Singapore (21.0%)), indicating that, from a business cash flow perspective, Hong Kong’s corporate tax burden relative to other advanced economies remains low.

¹⁴ For more details about the case scenario, please refer to the methodology of DB (<http://www.doingbusiness.org/en/methodology/paying-taxes>).

¹⁵ The average profit tax among advanced economies from 2007 to 2018 (retrieved from the 2020 DB report) decreased by 2.7% points. The average labour tax and contributions in 2018 remained at a level similar to that in 2007, while other taxes decreased by 0.2% point on average over the same period.

Chart 4: Total tax and contribution rates in the advanced economies



Note: (*) Simple average of TTCRs across the advanced economies. Macao, Malta, San Marino are excluded due to unavailability of data. Hong Kong is excluded for analytical purposes.

Source: World Bank Doing Business reports, various years.

V. COMPARISON OF THE FOUR SELECTED MEASURES

20. The four selected measures of corporate tax burden mentioned in this letter have their own advantages and limitations, and none of them is dominant over the others. While the top statutory corporate tax rate has the highest level of simplicity and generality, the EATR and EMTR consider more aspects of the corporate tax regime, and the TTCR examines the corporate tax burden from the perspective of business cash flows and the cost of complying with various regulations. That is to say, there is no one-size-fit-all measure of the corporate tax burden.

VI. CONCLUDING REMARKS

21. Four selected measures of corporate tax burden are briefly reviewed in this letter. Notwithstanding the limitations and coverages of each of these measures, they all show from different perspectives that the corporate tax burden in Hong Kong remains at a relatively low level when compared to most other advanced economies despite their tax cuts in recent years.

22. While these measures provide us with a useful snapshot of the relative corporate tax burden across economies, they should not be interpreted as a comprehensive comparison of corporate tax regimes between Hong Kong and other advanced economies. There are many other measurement methods to assess the corporate tax burden, and other characteristics of the corporate tax regime such as simplicity, efficiency and sustainability, though not covered in this letter, are also important.