INSIGHTS #17
February 2024

The "Crux of Corporate Taxation": Do more profitable firms pay more corporate taxes? What do negative cash effective tax rates reveal?

Concerns about corporate tax avoidance have become salient. Crux of Capitalism data reveals a clear positive relationship between a company's economic profitability and its net tax payments. While the percentage of firms with negative cash effective tax rates exhibit cyclical variation, there is an overarching upward trend. In the United States, the share of firms with negative cash ETR rose by 14 percentage points from 2005 to 2022. In China, 13% of listed firms received net tax refunds in 2022.

By 2023 over 140 governments worldwide were collaborating on the 'BEPS' (Base Erosion and Profit Shifting) initiative, positioned as an 'International collaboration to end tax avoidance'. Declining effective tax rates (ETR) raised worries among policymakers, some of whom view this trend as indicative of escalating tax avoidance. Recent research, such as Drake et al 2020, suggests that concern about widespread increase in tax avoidance might be overstated. What do the facts say about the amount of taxes publicly-listed firms actually pay? What insights can be gleaned from instances of negative corporate tax rates? The Crux of Capitalism database, which includes data of over 40,000 firms, provides one way to address these questions.

We define the cash ETR as the ratio of corporate income taxes paid over the company's pretax income. Unlike the GAAP ETR (which are the standard accounting rules used in the United States), cash ETR reflects the actual taxes paid to authorities in a given time frame. In other words, cash ETR includes the tax benefits of employee stock options but is not affected by valuation allowance or tax cushions (Dyreng et al. 2008). Cash ETR can turn negative either if a company reported pretax income losses or if tax refunds received exceed the corporate income taxes paid.

We focus our analysis on the world's four largest economies—the United States, China, Japan, and Germany. Our sample is restricted to 18,969 publicly-listed firms with available data on both corporate income taxes paid and pretax income between 2005 and 2022. Three findings stand out:

First, the downward trend of the average cash ETR among the world's four largest economies between 2005 and 2022 is confirmed (figure 1). Over this period, the United States experienced a 4 ppt, Japan a 6 ppt, and Germany a 2 ppt reduction in average cash ETR. Due to an unexpected jump in taxes paid by Chinese listed firms from 2013 to 2014, we have excluded data before 2014. The observed 14 ppt reduction in Chinese cash ETR from 2014 to 2022, should be interpreted cautiously. The Covid-19 induced crisis caused ETRs to dip in all four economies with little or no recovery in some cases.

Second, the more profitable a firm is—measured by the Crux of Capitalism economic profit (EP) measure—the higher absolute tax contributions it pays to governments (figure 2). In 2022, for three of the four largest economies, there was a robust positive linear relationship between firms' EP and their corporate income taxes paid, suggesting the most profitable firms make the largest tax contributions. The correlation is particularly pronounced in the United States and in Germany, where firms' economic profitability accounts for 78% and 60% of the variance in taxes paid, indicating that firms face similar tax rates. The lower left quadrant of each plot in figure 2 shows the number of economic value-destroying firms that received tax refunds in 2022. These are most notable in China where 7% of firms fell into this category.

Third, there has been a clear upward trend in the proportion of firms with negative ETR values in the United States and China over the last two decades (figure 3a). The trend is most pronounced in China, where this share increased by 16 ppt from ~17% in 2005 to ~33% in 2022. Germany, Japan, and the United States show a strong anti-cyclical component: the number of firms with negative cash ETR increased when GDP growth declined.

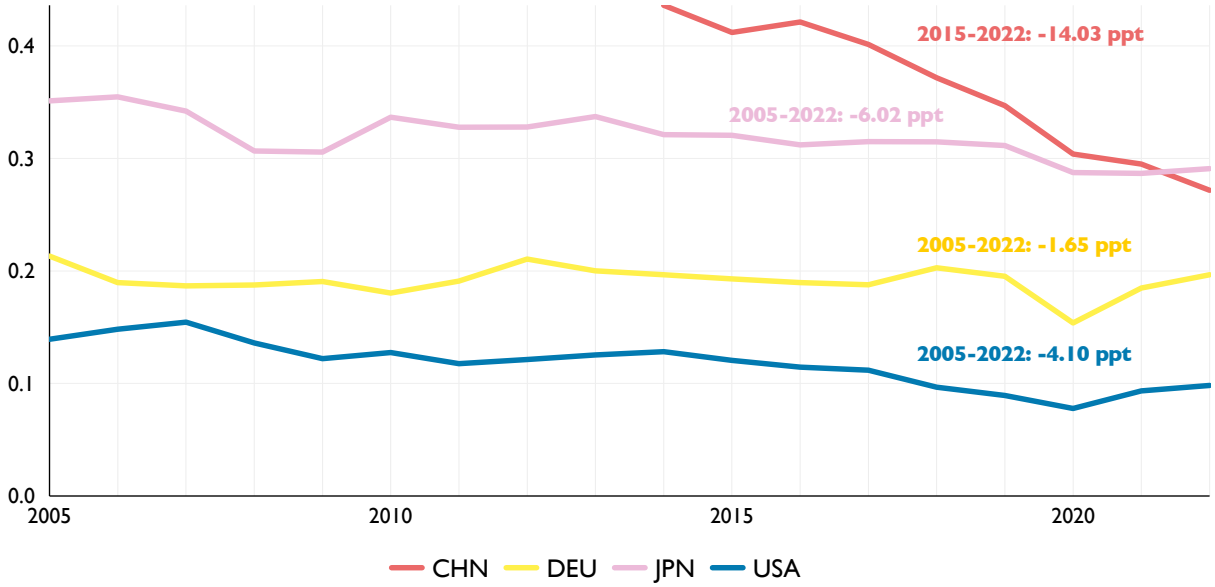
Two factors push ETR into negative territory: 1) government measures such as additional tax credits, tax deductions, or deferred tax payments to support businesses, and 2) an increase in companies reporting pretax losses, reducing taxable corporate income. In all four economies, the second factor appears to be the predominant reason for negative cash ETR values (figure 3b). For instance, in 2020, 62% of firms in the United States had a negative cash ETR, with ~95% attributable to negative pretax income. In comparison to its peer countries, China registered consistently the highest number of firms where tax refunds exceeded taxes paid. In 2022, tax refunds were issued to 13% of all firms, accounting for approximately 40% of the instances of negative cash ETR observed in China. The definition of negative pretax income of companies, however, might vary substantially due to cross-country differences in tax codes (e.g., different tax-deductible expenses).

While we confirm a downward trend in cash ETR across the four largest economies, it is still the case that more economically profitable firms pay more taxes. Yet, the fraction of firms with negative cash ETR is remarkably high in China, Germany, and the United States—largely driven by a growing number of companies reporting pretax losses. This trend could undermine the anticipated revenue gains from implementing BEPS 2.0, which mandates a 15% minimum tax rate for multinationals effective January 1, 2024. Our findings provide a baseline against which future corporate tax outcomes can be compared.

Insights #17 was prepared by Sára Czégé, Camilla Erencin, Simon J. Evenett and Felix Reitz
with empirical and technical support provided by Adam Novak

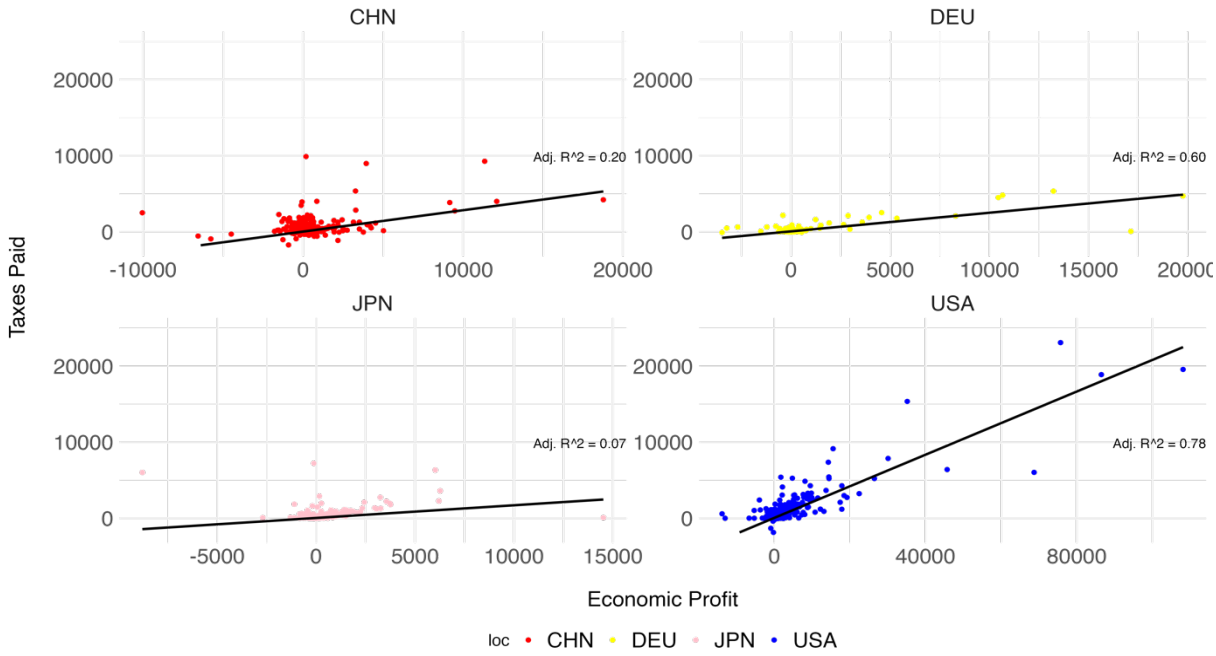
Cash ETR definition: *Cash payments for corporate income taxes (taxes levied on profits of a company that do not include social security contributions, sales-taxes, and property taxes) to federal, state, local and foreign governments divided by pretax income of a firm representing operating and nonoperating income before provisions for corporate income taxes and minority interest. Source: Compustat North America–WRDS*

Figure 1: Average cash ETR in the top 4 largest economies declined from 2005 to 2022



Note: Average cash ETR is calculated by averaging firm-level ETRs in year t in country x. Cash ETR equals corporate income taxes paid divided by pretax income. Missing corporate income taxes paid values are imputed by total corporate income taxes minus deferred taxes. Observations with continued missing corporate income taxes paid or pretax income (~2,222) are excluded. ETR values of observations with negative corporate income taxes paid and negative pretax income are turned to zero (~5,912). We restrict ETR values to a [0,1] unit interval (impacting ~23% of 212,416 observations). In 2022, ETR data covers 5,682 Chinese firms, 472 German firms, 3,080 Japanese firms, and 3,817 US firms. Data source: Crux of Capitalism database as of 11.01.2024

Figure 2: More economically profitable firms in fact paid more taxes in 2022



Note: Economic profit is calculated by adding back voluntary expenditures to accounting profit measures, subtracting taxes paid, and the opportunity cost of capital. Taxes paid represent the cash payments for corporate income taxes in 2022 (ETR numerator). Taxes paid are expressed in millions of USD. Missing values are imputed

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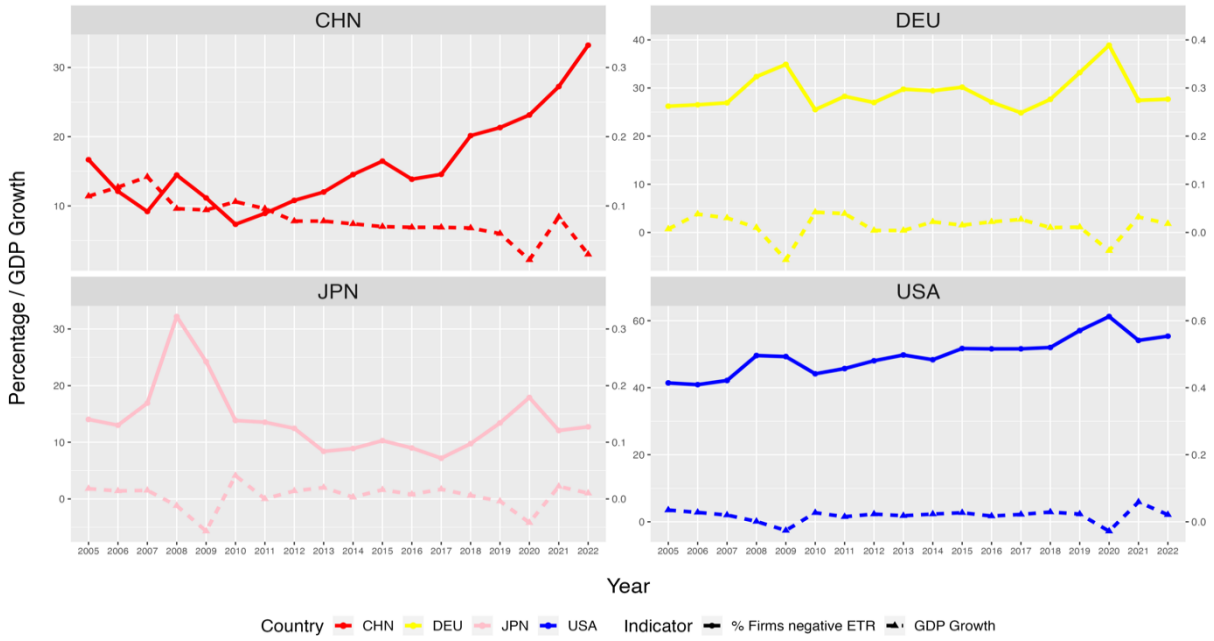
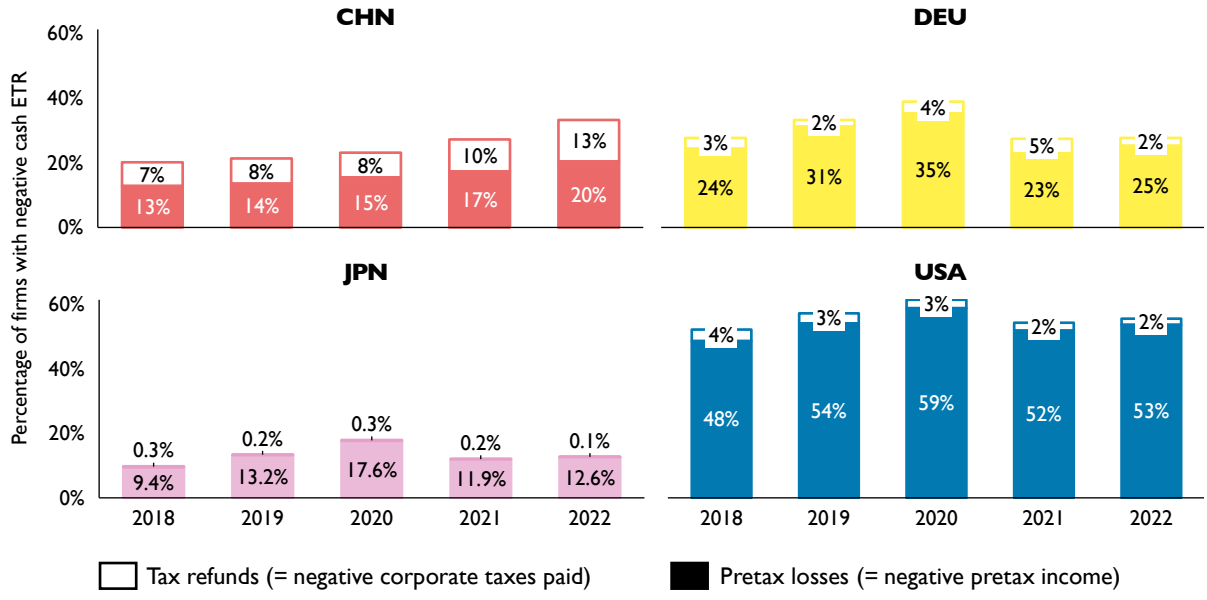
by total corporate income taxes minus deferred taxes. Taxes paid are regressed on economic profits using ordinary least squares method. The R squared value has been adjusted for the number of predictors in the model (1 in this case). The qualitative findings of these regression analyses are in line with the rank correlation coefficients computed on the underlying data. Data source: Crux of Capitalism data as of 11.01.2024

Figure 3a: Share of firms with negative cash ETR tends to increase when GDP growth declines



Note: Real GDP growth is the annual percent change of the gross domestic product of country x at time t. Percentage of firms with negative ETR is the sum of the number of firms in year t in country x with negative pretax income or negative corporate income taxes paid divided by the total number of firms. Missing corporate income taxes paid values are imputed by total corporate income taxes minus deferred taxes. Observations with negative corporate income taxes paid and negative pretax income are turned to zero (~5,912). Data source: IMF DataMapper and Crux of Capitalism as of 11.01.2024.

Figure 3b: Share of firms with negative cash ETR by cause, 2018-2022



Note: Tax refunds refelct the percentage of all firms with negative corporate taxes paid. Pretax losses reflect the percentage of all firms with negative pretax income. The sum of both equals the percentage of firms with negative cash ETR (see definition in note Fig 3a). Data source: Crux of Capitalism data as of 11.01.2024

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