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2022 DINA Regional Update for East Asia

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1 Taiwan

For this year, there's significant improvement of data quality for Taiwan. Specifically, research teams working on Taiwan Distributional National Accounts (DINA) obtained access to both micro-files of exhaustive annual Family Income Surveys (1981-2017) and micro tax data for the entire universe of Taiwanese tax filers and non-filers (2001-2017).

Survey-Based Inequality Series Construction

For the first sub-period (1981-2000), annual fiscal income tax tabulations are interpolated and extrapolated by adopting the generalized Pareto interpolation method developed by Blanchet, Fournier, and Piketty (2022). Then we use the annual Family Income Survey (FIS), corrected with tax-tabulation statistics according to the method proposed by Blanchet, Flores, and Morgan (2022), to prepare the survey microdata. We then distribute national income to the prepared survey data based on the simplified DINA guidelines.

Tax-Based Inequality Series Construction

For the second sub-period (2001-2017), the detailed administrative individual tax data become available. Specifically, These tax micro-files include 10 income categories and approximately 6 million tax units and 11 million individual tax-filers, as well as 4 million individual non-filers. The research team construct the tax microdata and distribute national income using the detailed DINA approach.[1]

DINA Series available on WID.world

After the survey-based inequality series and the micro-tax-based inequality series were produced for separate periods, we proceed to combine the two series following the subsequent methodology. Based on the underlying assumption that individual income tax data are more accurate and survey data typically underestimate true inequality, we use

[1] For more details on the exact construction procedure on Taiwan DINA, please refer to the WIL working paper: Chu, Chen, Lin, and Su (2022).

the tax inequality series for the period from 2001 to 2017 as the benchmark. From 1981 to 2000, we shift up the survey inequality series by adding the average difference between the tax and survey inequality series from 2001 to 2017. As such, the combined inequality series will serve as the ultimate benchmark Distributional National Accounts (DINA) series for Taiwan on **WID.world**.

Extrapolation

Ultimately, we extrapolate the income inequality series for the years from 2018 till 2021, assuming the income shares[2] are consistent with the previous base year (2017).

2 Mainland China and Hong Kong SAR

Top Wealth Correction for Mainland China - Hurun Rich Lists

For mainland China, due to increasing data unavailability in recent years, we mainly used National Billionaire Rich Lists[3] to correct for the very top of the wealth distribution.

The current wealth inequality series for mainland China is based on the results from Piketty et al. (2019), which have already been top-corrected with Hurun Billionaire Rich Lists from 2001 to 2016, and the following years (2017-2021) are linearly extrapolated based on the past wealth inequality trends in China. As such, we further top-correct the aforementioned wealth distribution by using newly available Hurun Rich Lists data from 2017 till 2021, following the new top wealth correction methodology from Bajard et al. (2021). Essentially it consists in a top correction of the last (127^{th}) percentile in a generalized Pareto distribution (Blanchet, Fournier, & Piketty, 2022).

The Hurun Rich List presents many advantages compared to the Forbes Rich List used in the past for top wealth correction. It encompasses a much larger universe of billionaires[4] and also better represents the top wealth dynamics in contemporary China.

[2]Specifically, bottom 50%, middle 40%, top 10%, top 1%, and top 0.1% income shares.

[3]Namely the Hurun Rich Lists which compiles the top billionaires in China annually.

[4]For instance, for the year of 2017, Hurun includes around 2122 Chinese billionaires, while the Forbes list only contains 319 individuals. Indeed the net worth threshold to be included in the Hurun List (300

Furthermore, the correction performed with rich lists in top wealth concentration could also affect the rest of the wealth distribution given that the wealth total is fixed and the fact that the past wealth inequality series constructed in Piketty et al. (2019) only relied on the survey micro-files for a few key years of interest.[5] As such, it would be important to further smooth out the rest of the wealth distribution (in particular the bracket wealth averages which could affect the construction of the bottom 50% wealth share and the middle 40% wealth share) to avoid kinks in particular years. Specifically we smoothed out the rest of the wealth distribution between the years of 2002 and 2010 for this year's update, as the change in the underlying survey datasets occurred between these two key years of interest.

One final issue that remains is how to treat Hong Kong and mainland China together in top wealth correction. To clarify our methodology, we construct three separate updated wealth share series, one series for mainland China, another for Hong Kong SAR separately, and ultimately we also produce a unified series combining the previous two series together.[6] In order to construct the wealth share series for mainland China alone (which is to be utilised as the benchmark wealth share series for China), we solely rely on the Hurun Rich Lists, and also exclude from the Hurun List the Hong Kong billionaires who start to be included in the Hurun List from 2021 onward.

Top Wealth Correction for Hong Kong SAR - Forbes Rich Lists

Secondly, in order to construct the wealth share series for Hong Kong alone (which is to be utilised as the benchmark wealth share series for Hong Kong), we have to construct a series for total net personal wealth for Hong Kong to begin with. Due to data limitation, we extrapolate the values of net personal wealth based on the total private housing assets estimated in Piketty and Yang (2022), by further assuming a constant or linearly

million US dollars) is lower compared to that of the Forbes List (1 billion US dollars).

[5]Namely they harnessed the survey micro-files of China Household Income Project (CHIP) for the years of 1995 and 2002, then the micro-files of China Family Panel Studies (CFPS) for the years of 2010 and 2012.

[6]We do not produce wealth share series for Macao SAR in this update as there are way too few billionaires from Macao (single digit) included in either the Hurun List or the Forbes List. It will be updated in the future when the availability of wealth data for Macao improves.

interpolated ratio of total housing assets (wealth) out of total private assets (wealth) in Hong Kong.[7] In the next step, lacking better-quality data, at the baseline before any top wealth correction, we assume that wealth inequality in Hong Kong follows the same distribution as in mainland China (which should be regarded as a lower bound of wealth inequality in Hong Kong). We then correct the top wealth (the 127^{th} generalized percentile) bracket with Hong Kong billionaires appearing in the Forbes Rich Lists, again following the methodology proposed in Bajard et al. (2021) to arrive at a smoothed wealth distribution for Hong Kong.

Unifying Wealth Distributions of Mainland China and Hong Kong SAR

In order to create a unified wealth share series for China, we first have to adjust the total Chinese net personal wealth to include that of Hong Kong. Subsequently, we also have to exclude the Hong Kong billionaires who concurrently appear in both the Hurun Rich Lists and the Forbes Rich Lists for the years of interest in this update (2017-2021), the proportion of whom represents around 10% to 15% of the total top Hong Kong billionaires in both lists.

Income Inequality Extrapolation for China

Last but not least, the income inequality series for China (2017-2021) is also updated by assuming the same **growth trends** as the evolution of wealth inequality after top-correction with Hurun Rich Lists. The existing non-extrapolated income share series for China ends in 2015. Consequently, for the years of 2016-2017, income shares are extrapolated based on the annualized growth rates taken from the **updated** wealth inequality series over the same period of time.

[7] Such ratios are taken from Hong Kong Affluent Studies conducted by Citigroup Inc. for a few years of interest such as 2012 and 2018, and for the other years the ratio values are either linearly interpolated or extrapolated.

3 South Korea

We update the Korea Income Inequality series, using the equal-split household income, corrected by fiscal data and adjusted by the national accounts. We explain the type of data we use and the update process in details below.

Data Sources

In the 2022 update of South Korea's DINA, we use the micro-data of Household Income and Expenditure Survey (HIES), Farm Household Economic Survey (FaHES) and Fishery Household Economic Survey (FiHES). The main data source is HIES, which excluded the farm and fishery households until 2019. It is the reason why we use all three household surveys for our estimates. These surveys are the homogeneous national household surveys, all conducted by Statistics Korea, which are of better quality than PovcalNet survey tabulations used for the previous WID estimates.

Fiscal Correction

Following Blanchet, Flores, and Morgan (2022), we correct the underestimated top incomes in the household survey data by income tax data. Given the unique income tax data structure in South Korea, for this correction, we need to combine the withholding data of earned income and global income tax data (Kim et al., 2018). We follow the approach based on Kim et al. (2018) and Moriguchi and Saez (2008).

Matching to National Income

To match our income estimates with National Income, we have to take into account the incomes that are absent from tax and survey data. The two main types of income we adjust are imputed rent and undistributed corporate profits. In South Korea, we have the imputed rent data for individuals in the household survey data. However, compared to the national accounts, it seems to represent rather housing service output. So, we adjust this number by multiplying it by the ratio of operating surplus to housing service

total output from the national accounts in the referenced year. For the undistributed corporate profits, unfortunately, the detailed data is not available. Hence, we approximately distributed this income, based on the available measures of household survey and national accounts.

Filling Gaps

Our base years are 2006, 2008, 2010, 2012, 2014, and 2016. We interpolate and extrapolate our estimates to the remaining years from 2006 to 2021, assuming the income shares[8] are consistent with the previous base year. For example, for the year 2007, with the national income and adult population of 2007, we keep the income shares same as 2006 and use generalized Pareto interpolation from Blanchet, Fournier, and Piketty (2022) to estimate the rest of the income distribution.

[8]Specifically, bottom 50%, middle 40%, top 10%, top 1%, and top 0.1% income shares. It is the same approach we extrapolate the Taiwan Income Inequality series for 2018 onward.

References

Bajard, F., Chancel, L., Moshrif, R., & Piketty, T. (2021). *Global wealth inequality on wid.world: estimates and imputations* (Tech. Rep.). World Inequality Lab.

Blanchet, T., Flores, I., & Morgan, M. (2022). The weight of the rich: improving surveys using tax data. *The Journal of Economic Inequality*, *20*(1), 119–150.

Blanchet, T., Fournier, J., & Piketty, T. (2022). Generalized pareto curves: Theory and applications. *Review of Income and Wealth*, *68*(1), 263–288.

Chu, C., Chen, C.-Y., Lin, M.-J., & Su, H.-L. (2022). Distributional national accounts of taiwan, 1981-2017. *World Inequality Lab Working Paper*.

Kim, N.-N., et al. (2018). *Top incomes in korea: update, 1933-2016* (Tech. Rep.). HAL.

Moriguchi, C., & Saez, E. (2008). The evolution of income concentration in japan, 1886–2005: evidence from income tax statistics. *The Review of Economics and Statistics*, *90*(4), 713–734.

Piketty, T., & Yang, L. (2022, 10). Income and Wealth Inequality in Hong Kong, 1981–2020: The Rise of Pluto-Communism? *The World Bank Economic Review*. Retrieved from https://doi.org/10.1093/wber/lhac019 (lhac019) doi: 10.1093/wber/lhac019

Piketty, T., Yang, L., & Zucman, G. (2019). Capital accumulation, private property, and rising inequality in china, 1978–2015. *American Economic Review*, *109*(7), 2469–96.

Table 1: New Data in the 2022 Update for East Asian Countries/Regions

Country/Region	New Data	Type of Data	Years Available	Years (Extrapolated)
China	Billionaire Lists	Wealth	2017-2021(annual)	None
Hong Kong	Billionaire Lists	Wealth	1995-2021 (annual)	None
South Korea	Fiscal Tabulations and Micro Files of Survey Data	Income	2006-2016	2017-2021 (annual)
Taiwan	Micro Files of Tax Data and Survey Data	Income	1981-2017(annual)	2018-2021

This table lists all the newly available data for the main countries and regions in East Asia. "Type of Data" refers to what kind of update is produced with the data available. "Years Available" indicates the years for which the data are available. "Years (Extrapolated)" indicates the years for which the series are extrapolated.