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ECON 370

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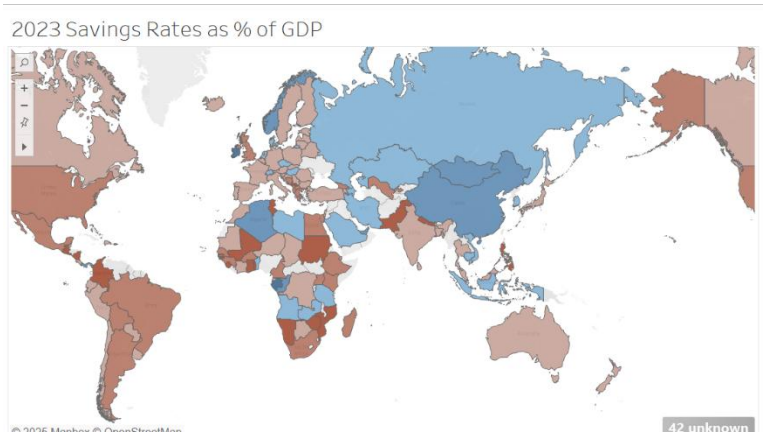
ECON 370 Term Paper

China has one of the highest savings rates in the world, sitting at 44.4% of GDP, a figure that stands out significantly when compared to its global peers. This paper investigates the key drivers behind this unusually high savings rate by looking at long-term economic trends, examining the variables most correlated with high national savings, and comparing China's economic profile to that of other high-income countries. A major focus is placed on the one-child policy and its unintended economic consequences, which uniquely contributed to China's savings behavior. Using data from the World Bank, UN, and theglobaleconomy.com, a regression model was built to determine what variables are most predictive of a country's savings rate. The results show a strong and statistically significant inverse relationship between consumption and savings, in line with traditional economic thinking. The paper concludes by evaluating recent efforts by the Chinese government to transition to a consumption-based growth model, and the importance of addressing structural issues such as income inequality and the Hukou system in order to make that transition successful. All figures within this report – other than figure 7 (The Economist) – were generated using World Bank, UN, and theglobaleconomy.com's data sets, and were created specifically for this report.

To first understand the factors behind China's savings rate, it is important that we first understand just how unique China's rate is. It is by far the highest among the richest countries in the world, and within high-income countries can only be rivalled by small countries that are hubs for investment, such as Singapore, Taiwan, Ireland, etc. The figures below help illustrate the stark difference between China's savings rate and that of other countries – figure 1 gives a color-coded map of the world, with the darkest blue representing the highest savings rate and the darkest red representing the lowest savings rates. Figure 2 gives the savings rates over time for China, the g7 countries (Canada, France, Germany, Italy, Japan, the UK, and the United States), South Korea, and the European Union as a whole. It helps demonstrate how unique China's savings rate is compared to its peers, being much higher than any country China sees as a peer.



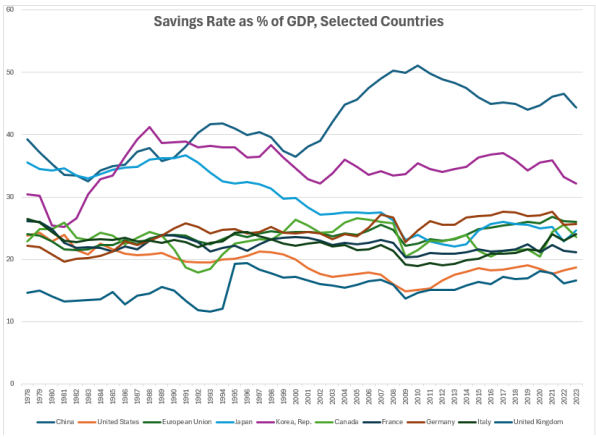


Figure 1: Worldwide Savings rates as % of GDP

Figure 2: Savings Rate Measured as % of GDP in Selected Countries

Under traditional economic thought, a high savings rate is generally seen as a good thing that will contribute to quick economic expansion for a country. For example, in the Solow model, which assumes savings rates to be constant, a higher savings rate will significantly raise a country's long run steady state GDP[1]. However, a high savings rate for a country like China is not necessarily a good thing, and many would argue that a lower, steady level is preferred. This is because as the savings rate increases, consumption usually decreases consummately, meaning a higher savings rate leads to less economic activity and consumption within the domestic market. China is gradually moving away from being an export-based economy and towards becoming a service-based economy (prioritizing technology, financial services, and manufacturing[2]). As they make this transition, it will be incredibly important that they find ways to boost domestic consumption and in turn lower savings rates.

There are many factors for the high savings rate, with the majority of them being structural, and tied to the set up of the Chinese economy. However, there is one factor contributing to the high savings rate that is completely unique to China – the one child policy. Implemented in 1979 and officially lasting until 2015, the one child policy was a strict population control policy that limited households to one child, with some exceptions for rural families that had a girl as their firstborn. There were a number of social and financial sanctions the Chinese government employed to punish those who broke the one child policy, and these punishments worked to incredible effect, with the policy estimated to have prevented nearly 400 million births[3]. The one child policy was consistent with economic thought, wherein a lower population growth rate translates to higher per-capita GDP and growth figures. In addition to lowering the population growth rate, it allowed for better education and training for these new generations, as they This relationship is demonstrated in the Solow Model, where a higher population growth rate directly leads to a lower steady state per-capita output, and vice versa for lower growth rates. However, despite the strong economic theory behind the one-child policy, there were unintended consequences that directly led to the increased savings rates we observe today.

A joint study between collaborators from Yale University, the London School of Economics, and SciencesPo found that of the 20% rise in aggregate savings since the implementation of the policy, the one-child policy can directly account for between 33% and 60% of it. Regardless of the magnitude, it is evident that the one child policy had a significant effect upon the rise in savings rates in the three decades following the implementation of the policy. They estimate that, if a two-child policy had been implemented instead of the one-child policy, the aggregate savings rate in 2009 would have been 6.5% lower[4]. While some of the impacts of the policy remain to be seen – the influence these well-educated only children of this generation exert on the economy, it is indubitable that the one child policy had a strong effect in raising the aggregate savings rate in China. Another unintended consequence of the one child policy has been a gender imbalance in births, with China now having significantly more young

[1] albany.edu
[2] World Economic Forum
[3] Kenton, Will
[4] Song, Zheng, et al.

males than females. This is due to families prioritizing having boys, as in theory their economic earning potential is greater due to gender gaps in pay, and in rural areas they are vital for family-run farms. This has contributed to declining birth rates in recent years, as many young people struggle to find partners.

In order to see what variables are the most important in predicting a countries savings rate, we collected data from the world bank, the UN, and theglobaleconomy.com, giving us 2023 savings rates, per capita GDP, consumption expenditure as a % of GDP, HDI index, life expectancy, and expected years of schooling. To measure high-income countries only, we filtered the data so that we are only measuring countries with a per capita GDP over $14,005 – the world banks' definition of a high-income country. Once this was completed, we ran a linear regression with savings rate as the dependent variable, using per capita GDP, consumption, HDI index, life expectancy, and expected years of schooling. The results of this can be seen in figure 3 below.

```
Residuals:
   Min     1Q Median     3Q    Max
-8.869 -2.270 -0.723  1.653 10.041

Coefficients:
                 Estimate    Std. Error t value          Pr(>|t|)
(Intercept)  144.49465411   24.93580585   5.795 0.000001089073169 ***
GDP            0.00013798    0.00003694   3.735          0.000614 ***
Consumption   -0.83403907    0.07449291 -11.196 0.000000000000135 ***
HDI         -102.47911870   31.78169771  -3.224          0.002594 **
lifeEX         0.20552024    0.31498260   0.652          0.518019
school        -0.10671256    0.43659302  -0.244          0.808220
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3.85 on 38 degrees of freedom
  (3 observations deleted due to missingness)
Multiple R-squared:  0.8805,    Adjusted R-squared:  0.8647
F-statistic: 55.97 on 5 and 38 DF,  p-value: < 0.00000000000000022
```

Figure 3: Results From Linear Regression of GDP, Consumption, HDI, Life Expectancy, Avg. Years in School on Savings Rate

From this output, we can see this is clearly a statistically significant result, with the model having a p-value well below 1%, and an adjusted r^2 of 0.8647, meaning that the model explains 86.47% of variance in savings rates. It is important to note that the adjusted r^2 was lower than the raw r^2 making it likely that one or more of the independent variables are not contributing to the predictions of the model. It is interesting to note that there is a clear inverse relationship between Savings and Consumption, with both being measured as a % of GDP and the coefficient for consumption being -0.834, meaning that for every 1% rise in consumption the savings rate is expected to drop by -0.834%. The p-value associated with consumption is also below 1%, meaning that it is incredibly statistically significant. To explore this relationship more, I ran a linear regression on savings rate using consumption as the only independent variable. The results are in figure 4 below.

```
Coefficients:
            Estimate Std. Error t value            Pr(>|t|)
(Intercept) 75.35031    3.70982   20.31 <0.0000000000000002 ***
Consumption -0.89716    0.06851  -13.10 <0.0000000000000002 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.756 on 44 degrees of freedom
  (1 observation deleted due to missingness)
Multiple R-squared:  0.7958,    Adjusted R-squared:  0.7912
F-statistic: 171.5 on 1 and 44 DF,  p-value: < 0.00000000000000022
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Figure 4: Results From Linear Regression of Consumption on Savings Rate

This regression gave p-values for both variables and for the model of well below 1%, along with an adjusted r^2 of 0.7958. Based upon this output, we have proved even further that there is an extremely strong inverse relationship between consumption and savings rate, keeping with both traditional economic thought and common sense. Below is a scatter plot demonstrating the relationship between savings and consumption.

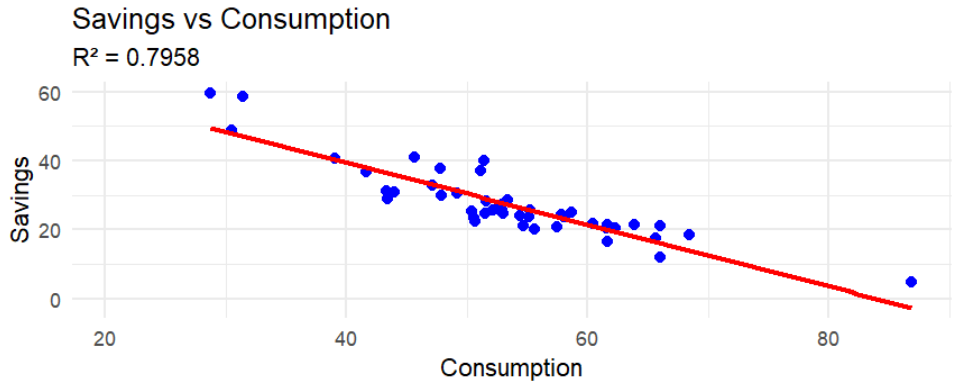

Figure 5: Scatter Plot of Savings vs Consumption with Line of Best Fit

The single most important factor in lowering the savings rate in China will be moving to a consumption-based growth strategy and away from the current export-based growth, which has been slowing significantly over the past decade. Moving away from an export-based economy will not only stop this slowdown of growth but will also protect the Chinese economy from shocks such as a trade war, which they have recently been experiencing. With a consumption-based economy, there is a greater domestic market, and the economy is able to be more self-sufficient and loosening reliance on trading partners buying Chinese exports.

It is clear through both words and actions that the Chinese government has recognized this slowing of growth and is actively taking measures to stimulate domestic consumption while also making. In 2013, the As shown in figure 7 below, there has been a significant lowering in savings rate throughout the 2010’s, along with a significant increase in consumption that is shown by figure 6 (though this growth in consumption slowed with COVID).

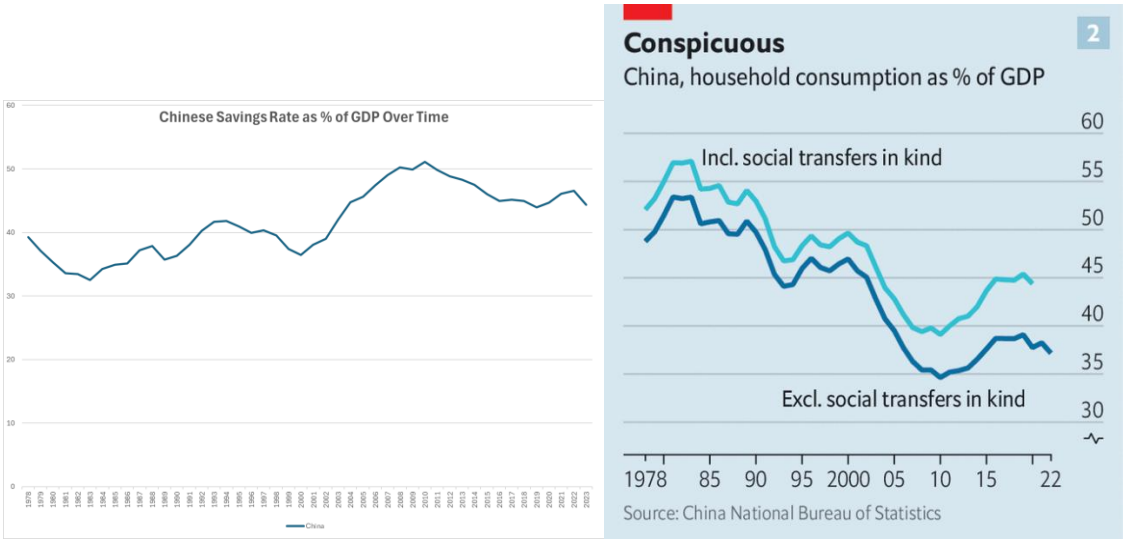

Figure 6: Chinese Consumption as % of GDP over Time (Source: The Economist)

Figure 7: Chinese Savings Rate as % of GDP, Over Time[5]

Chinese fiscal policy has largely been designed to encourage as much consumption and spending as possible – since 2000 interest rates (set by the Peoples Bank of China) have been below 3%. Lower interest rates will typically increase consumption, as the reward people receive from investing will be lower, and the present-day money will therefore be more valuable. This is a tool that has been used by the US federal reserve to great effect twice in recent decades, cutting interest rates to or below zero during the 2008 global financial crisis and for a short period during COVID. However, in China, with interest rates already so low there is little room for tangible effect to be felt through the cutting of interest rates. With this tool exhausted the options the government has are much more limited. At some point there must be a major fiscal overhaul, which includes tax policy, government spending, and prioritizing social spending over investment-driven growth. Overall, the government needs to, at some point, change its priorities in spending in order to successfully move to a consumption-based economy. Only through increased social spending and tax overhauls to increase and reward consumption will China be able to make the transition successfully.

The Required Reserve Ratio is one tool the Chinese government can use in order to free up more capital to be used in investment and lending, hopefully boosting consumption. The Required Reserve Ratio is the percentage of deposits that financial institutions in China are required to hold at the central bank. This has been lowered in recent years, with large financial institutions now having a Required Reserve Ratio of 9%, compared to a high of over 21% in 2011[6]. By lowering the Ratio, more capital is freed up to be invested, lent, and spent – all of which will help in boosting consumption. This downward trend has likely contributed to both the lowered savings rates and increased rates of consumption that have been empirically observed over the last decade and a half.

[5] *The Economist*.
[6] MacroMicro

Another key factor to addressing the savings rate and boost domestic demand is fixing the rural-urban divide in China. There is a significant disparity in GDP per capita between primarily urban and rural provinces. For example, Zhejiang, one of the most urbanized provinces, has a GDP per capita of $17,275. On the other hand Gansu, one of the most rural and poorest provinces has a GDP per capita of only $6,185[7]. This disparity leads to many rural provinces that have very low levels of economic activity, especially consumption. Closing this gap would allow for a much more engaged consumer base throughout all of China, with all people able to consume to a high level.

To close this gap, the Chinese government is taking several steps. Chief among them is the effort to significantly improve access to healthcare and quality education in rural areas. The Chinese government is also strongly encouraging urbanization, but certain systems severely limit the mobility and opportunities many rural-to-urban migrants have. The Hukou system is a form of household registration, where residents are classed as either rural or urban, and have their educational, healthcare and fiscal opportunities affected accordingly. Holders of a rural Hukou who emigrate to an urban area will receive significantly less opportunities than holders of an urban Hukou, maintaining the rural-urban divide and even worsening it in some cases by stifling the opportunities of many rural-to-urban migrants and deflating their earning potential. There have been some reforms made to the Hukou system, such as granting urban residency to rural-to-urban migrants who emigrate to smaller and mid-sized cities. However, these reforms have not nearly been enough and there is a clear need for further Hukou reform in order to prevent stunted opportunities for so many rural-to-urban migrants.

In conclusion, it is clear that the main contributor to China's exceptionally high savings rate is not just cultural or economic structure, but also long-standing policies that have had unintended long-term effects. The one-child policy stands out as a major driver, with strong evidence showing its role in shaping household behavior and raising the aggregate savings rate in the decades following its implementation. While structural factors also play a role, it is the lack of domestic consumption that is holding back the transition to a more sustainable, service-based economy. Through both statistical analysis and visual representation, this paper has shown a strong, statistically significant inverse relationship between savings and consumption, with consumption being by far the most important predictor of savings in the model.

China has already taken several important steps to boost domestic demand—such as keeping interest rates low and promoting urbanization—but these efforts must be followed by more comprehensive reforms. Addressing the rural-urban divide, reforming the Hukou system, and increasing government social spending will be key to creating a more consumption-oriented economy. Moving away from an export-driven model is not just preferable—it is necessary for long-term stability and growth. Only through structural reform and policy reorientation will China be able to lower its savings rate in a meaningful way and unlock the full potential of its domestic market.

[7] Cheung Kong Graduate School of Business

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