

Has Japan Failed? Examining The Role of The BOJ in Post-Crisis Japan

Arnav Sherpuri¹ and Jake Organ[#]

¹North Valley Regional High School Demarest, USA

[#]Advisor

ABSTRACT

Over the last 3 decades, Japan has suffered from persistent economic malaise which are without precedent in economic history, and as interesting as the circumstances leading to the demise of Japan as a major economic power are, they are but secondary to the mystery of the constant failure of measures to alleviate the situation. The question that this paper will attempt to answer, with the aid of advanced econometric tools is why the expansionary monetary policy measures taken by the Bank of Japan genuinely failed to stimulate the Japanese economy? The hypothesis I would like to outline is that the Bank of Japan DID fail to ameliorate the economic situation in Japan, due to several shortcomings such as a constant misunderstanding of the economic climate, the sudden drop in effective demand due to the emergence of Asian competitors, and the flawed policy of continually supporting insolvent banks.

A Brief Background

The USD had depreciated against the JPY as a result of the Plaza Accord in 1985, causing a recession in Japan. In addition to this, the BOJ stipulated loan quotas, which led to a rapidly expanding credit supply. This in effect led to easily available loans, which failed to observe the quality of the borrower, in some ways similar to the subprime mortgage crisis of 2008, leading to a massive asset price bubble, likely due to the underestimation of consumer sentiment post-recession by the BOJ. The response to this was tightening that took place in 5 separate rounds. Interest rates originally rose to 5.25% under the BOJ response to the rampant market speculation, and were further raised to 6% to strengthen the JPY in order to offset the rise in fuel price due to the Persian Gulf War. This had the intent of cooling down market, and preventing further depreciation of the Yen. This time, the BOJ had overestimated consumer sentiment, and the measures were widely considered too harsh. Asset prices fell by nearly 40% across Tokyo Prefecture, leading to the bubble bursting, and banks falling deep into debtⁱ, this being considered the beginning of The Lost Decades. Over the period of 1995 to 2007, GDP fell from \$5.33 trillion to \$4.36 trillion in nominal terms, real wages fell around 5%, while the country experienced a stagnant price level. While there is some debate on the extent and measurement of Japan's setbacks, the economic effect of the Lost Decades is well established, and Japanese policymakers continue to grapple with its consequences.

Literature Review

Data and papers on the failure of traditional economics in Japan are present far and wide, with the vast majority considering what started the crisis (broadly agreed to be poor market signals)ⁱⁱ, whether or not BOJ policy has worked (most journals agree that it hasn't)ⁱⁱⁱ, and why it hasn't work, something which this paper attempts to

analyse. Opinions on why BOJ policy has failed vary far more widely than opinions on the preceding two questions but do appear to coalesce on the topic of overleveraged debt in several journals^{iv}, as well as the changing complexion of Japan's exports^v

Data & Methodology

2 separate sets of data, each with their own subsets, were used to confirm the validity of the hypotheses laid out in this paper, and these respective sets were run through a regression analysis program.

The primary set of data was a compilation of quarterly data between November 1989 and May 2012, and the components of this dataset were: M3 (monetary base), interest rates, the USD to Yen spot exchange rate, the Total Credit to Private Non-Financial Sector, and Inflation in Japan. Each set of data was stored as an indexed value ($1/11/1989 = 100$), and was run in several different combinations through a regression analysis program. I believe that by running a program to test the nature and legitimacy of the correlations between these different factors in various combinations enables me to isolate and analyse anomalies in the Japanese economic system. All data was sourced from the Federal Reserve Economic Data website^{vi}. A brief sense of how regression analysis works in our model can be demonstrated through the following example^{vii}:

In the opinion laid out in this paper, we believe a hypothesized relationship between M3 and credit supply may be presented in the form $I = \alpha + \beta E + \varepsilon$ where α = a constant amount (the credit supply when $M3 = 0$); β = the effect in percentage increase of credit supply of every increase in M3, hypothesized to be negative (opposite to the theoretical relationship in an ideal economy, a factor which may be used to explain the failure of the Japanese system); and ε = the error term reflecting other factors that influence credit supply. Variable I is the endogenous variable, IE the dependent variable that is theorized to change as E changed; E the exogenous variable, IE the variable that is being examined for effect; α is the constant term and β the coefficient of the variable E, which quantifies the efficacy of the effect variable E has on I.

In the primary subset of the first dataset, Inflation was run through the program as the Y variable, with M3, Interest Rates, and the Exchange Rate run as X_1 , X_2 , and X_3 variables respectively. In the second subset, Inflation was run as the Y variable, and Credit Supply as the X variable. In the third subset of data Credit supply was run as the Y variable, and M3 run as the X variable. In the fourth and final subset of data, Credit supply was run as the Y variable, and interest rates were run as the X variable.

In the secondary dataset, annual data on Chinese, Japanese and South Korean net exports were converted into index values (1994=100). Data was taken in from 1994 onwards owing to the estimated 5-year lag between the asset crash and its actual effects in Japan. In the first subset of results Japanese real exports were run as the y variable and Chinese and Korean net exports were run as the X_1 , X_2 variables respectively. In the second subset of results Korean Exports were taken as the Y variable and Chinese exports as the X variable.

Results and Analysis

Dataset 1

Various results were of note in this dataset:

M3 had a negative correlation with inflation, opposite to the theoretical relationship expected of the two variables, with a P-value of 0.002, implying only a 0.2% chance of this relationship being spurious. In addition, the correlation between interest rates and inflation had a positive relationship, once more the opposite of the theoretically expected relationship (P-value: $3.9e^{-9}$). M3 was also found to have a negative relationship with credit supply (P-value: $5e^{-41}$). Interest rates were found to have an unexpected relationship with credit supply

(positive) with a P-value in the range of 0.05. The only analysis which yielded a standard relationship was that between Credit supply and inflation (positive correlation).

Regression of Inflation (Subset 1 & 2)

Factor	P-value	Correlation
M3	0.0002	Negative
Interest Rates	0.0000	Positive
Exchange Rate	0.17	Positive
Credit Supply	0.0006	Positive

Regression of Credit Supply (Subset 3&4)

Factor	P-value	Correlation
M3	5e ⁻⁴¹	Negative
Interest Rates	0.043	Positive

The analysis of these results yields symptoms of the true issues in the Japanese economy rather than the actual causes. The 1st subset (the analysis of inflationary data), displayed an unexpected relationship between M3 & Interest Rates and inflation, which shows that the expansion of M3 is not having the effect it should be having, and the cuts in interest rate are failing to sufficiently vivify demand; however when viewed alone the data fails to explain why. The 2nd set of these results (analysis of relationships with Credit Supply), when combined with the first, gave reason to hypothesise, in view of its standard nature, the issue lies in the fact that policy measures appear unable to have the required effect on credit supply. Seeing as exchange rate was disqualified as a relevant factor (as it had a P-value>0.05), we can safely assume the problem is internal, owing to the fact that datasets that exhibit abnormal relationships notably only consists of endogenous Japanese economic data. The importance of the 3rd and 4th subsets of data thus emerge, as observance of their result allows us to validate the hypothesis gleaned from the first two. Credit supply, just as inflation, was found to have a positive relationship with interest rates and a negative relationship with M3, a contravention of standard economic principles. The lack of any other factors or circumstances to explain these relationships, and the information found in the 3rd and 4th paints a clear picture of the various problems dogging the Japanese economic system and would lead to the conclusion that a primary cause of the economic troubles in Japan is negative sentiment.

The Austrian School of Economics, a set of observations laid out by Frederick Hayek^{viii} lays out what is known as Austrian Business Cycle Theory, which claims that a period of widespread and synchronized "malinvestment" is caused by mis-pricing of interest rates thereby causing a period of widespread and excessive business lending by banks, and this credit expansion is later followed by a sharp contraction and period of distressed asset sales (liquidation) which were purchased with overleveraged debt. This is almost perfectly in line with what took place in Japan, and though on the surface it appears to explain the crisis itself, rather than the topic at hand, in pointing out the malady of poorly set interest rates, it helps highlight a major flaw in BOJ economic policy: failure to understand where consumers stand, which goes a long way to explaining the failure of interest rates to have the expected effect on credit supply. The deflationary nature of the economy and the subsequent shift in consumer mindsets caused a reduction in propensity to spend, which according to Friedman's consumption function^{ix}, $C = a + bY^d$, causes reduced consumption, a factor which the BOJ appears to have failed to consider repeatedly. In failing to understand how willing or unwilling consumers are to take loans, the BOJ made the fatal error of mispricing interest rates pre- and post-crisis. Examples of this phenomenon are seen far and wide: In 1991, the crash was triggered by hikes perceived as too harsh by the market, in 2001, as Japan had started to recover, a pre-emptive hike to 50 basis points crashed the market again. As simple as it may seem,

mispriced interest rates and excessive market intervention by the BOJ appear to have sabotaged their own efforts to restart the economy.

On a similar note, it would appear this fatal flaw extended past consumers to bankers as well. The BOJ made expanding M3 their primary goal, and in doing so exposed themselves to the consequences lest M3 expansion not be the solution to their current dilemma, and as it turned out, this was the case. The BOJ had not considered that the crash would trigger a massive mindset change in bankers, and the herd instinct to drastically tighten down on loans that followed; while purely speculation, this would appear to explain at least in part the abnormal relationship between M3 and credit supply, as well as completely explain the relationship between interest rates and credit supply, that bankers simply ceased to give out loans, instead shifting to more profitable and risk-averse enterprises, in the process neglecting their basic function. This would appear to present the closest example of foreshadowing we have in the modern economy as it mirrors the events of 2008-2018 in the United States. The obvious viability of this theory, as well as the data that reinforces it, serve to perhaps confirm the first hypothesis.

Though the former paragraph certainly does explain in part the anomalous nature of the Japanese economy in the years following 1991, it is not the sole explanation for it, and fails to address some of the other ideas laid out by this paper; it is here that a theory promulgated by several foremost economic institutions makes its entry: the Zombie Bank theory. To get an understanding of what this theory really entails, one must go back to the immediate aftermath of the crisis: The fuel for the fire that had been the asset bubble were the irresponsible loans given out by banks across Japan (another parallel to the crisis of 2008), in part due to exceedingly low interest rates, and in part to meet the credit supply quotas set to them by the BOJ (set up in fear of an oncoming recession), and as the asset bubble collapsed, and speculators were swept into debt, many banks now found themselves in possession of billions, or even trillion of Yen in toxic debt, debt which would likely never be paid back even after repossessions, and would wipe out balance sheets, a consequence feared so much by the authorities in Japan that banks were coalesced into 4 national banks, propped up by government reserves. A decade of economic stagnation and financial turmoil followed and these government supported Japanese banks continued in turn to make loans to otherwise bankrupt companies during this crisis. This action likely tied up valuable credit in these unprofitable enterprises. It is theorized that it was this "zombie lending" that prevented more productive companies from gaining market share, strangling a potentially important source of productivity gains for the overall economy.^x The extent of the effect of this zombie lending is of debate^{xi}, but I believe it is of note that the outstanding amount of bank credit fell 21 percent between the fourth quarter of 1998 and the second quarter of 2005, the period of the highest expansion in M3. While there are still several factors to consider, I believe this, along with the BOJ's lack of understanding of consumer and lender mindsets can explain almost completely the failure of the credit supply to expand, and thus by extension, the failure of the Japanese economy to rebound.

Dataset 2

An examination of other exogenous factors, such as Korean and Chinese exports (seen below) was considered necessary to confirm if the results of the previous dataset were truly causal, as well as determine the validity of the third hypothesis, and the data from the initial regression was as follows:

Factor	P-value	Correlation
Korean Real Exports	0.004	Negative
Chinese Real Exports	0.000039	Positive

While it appears that Korean exports affect Japanese real exports, Chinese exports appear not to have any relation, likely due to the fundamental nature of its exports differing from that of Japan, Korea, and other

East Asian nations. This is further confirmed by the lack of a negative relationship between Korean and Chinese Real exports. Wen Yang, Yi-Cheng Liu, and Chao-Cheng Mai produced a paper that examined the evolution of Japanese exports post 1995^{xii}, and argued that Japanese exports shifted to countries with higher political stability, higher degree of economic integration with Japan, and higher incomes, suggesting that Japan was no longer able to compete with its neighbours in the high value market segment that produced and exported cheap electronics. This, as well as the fact that Korean exports increase eightfold, while Japanese exports merely doubled, points to the fact that exogenous factors such as a sudden loss of market dominance by Japanese firms such as Toshiba and Panasonic, both of which experienced debilitating declines in net valuation during this decade, may have played an equally potent role in the death of the Japanese economy.

Conclusion

On the surface it would appear it is a mixture of several unfortunate factors, a perfect storm of sorts, that collectively drag down the Japanese economy; factors that are both endogenous and exogenous, and while I believe the data supports this, I am inclined to lean on the endogenous factors, specifically the poor lending practices post crisis; though on balance the failure of the BOJ to understand mindsets across the economy appears to have the same effect as zombie lending, I believe zombie lending can be painted as the more vicious of the two culprits, as it does in part explain the not only the failure of BOJ policies, but also in part acts as a catalyst for another cause of this failure: Japan's loss of competitiveness, in the sense that it strangled out potentially up and coming firms by shutting them out of the credit supply. Though data can only be extrapolated to isolate causes, and not the truth behind each of these causes, I believe the majority of opinions laid out in this paper can be supported by sound economic theory, as well as similar events on a larger scale that followed in several other economies post-2008. It would do well for central banks to learn from the failures of the BOJ, for in a world where banks are bailed out under the Too Big to Fail dogma of the Federal Reserve, Japan's past runs a severe risk of becoming the world's today.

Acknowledgments

I would like to thank my advisor for the valuable insight provided to me on this topic.

References

-
- ⁱ Kole, L., & Martin, R. (2008). Overview of Japan's Monetary Policy Responses to Deflation. FOMC Secretariat, 31–32.
- ⁱⁱ Okana, K., Shirakawa, M., & Shiratsuka, S. (2001). The Asset Price Bubble and Monetary Policy: Japan's Experience in the Late 1980s and the Lessons. *Monetary and Economic Studies*
- ⁱⁱⁱ Ueda, Kazuo. "Japan's Deflation and the Bank of Japan's Experience with Non-traditional Monetary Policy." *Journal of Money, Credit and Banking* 44, no. s1 (2012): 175-90
- ^{iv} Hyeog Ug Kwon, Futoshi Narita, Machiko Narita, Resource reallocation and zombie lending in Japan in the 1990s, *Review of Economic Dynamics*, Volume 18, Issue 4, 2015,
- ^v A spatial econometric perspective, *Japan and the World Economy*, Volume 41, 2017, Pages 50-58
- ^{vi} Federal Reserve Economic Data. Accessed July 7, 2023. <https://fred.stlouisfed.org/>.
- ^{vii} Sykes, Alan O., "An Introduction to Regression Analysis" (Coase-Sandor Institute for Law & Economics Working Paper No. 20, 1993). Accessed June 8, 2023. https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1050&context=law_and_economics.

-
- viii Hayek, F. A. (1984). 1980's Unemployment and the Union. Institute of Economic Affairs, 80.
- ix Friedman, Milton. Theory of the Consumption Function, Princeton: Princeton University Press, 1957.
- x Caballero, Ricardo J., Takeo Hoshi, and Anil K. Kashyap. "Zombie Lending and Depressed Restructuring in Japan." American Economic Review 98, no. 5 (2008): 1943-77.
- xi Ahearne, Alan G., and Naoki Shinada. "Zombie Firms and Economic Stagnation in Japan." International Economics and Economic Policy 2, no. 4 (2005): 363-81. <https://doi.org/10.1007/s10368-005-0041-1>.
- xii Wen Yang, Yi-Cheng Liu, Chao-Cheng Mai, How did Japanese exports evolve from 1995 to 2014