

Discussion of ‘Macroeconomic Crises since 1870’, by Robert Barro and José Ursúa *

Olivier J. Blanchard[†]

May 26, 2008

Even if one is not into the equity premium puzzle, the paper by Barro and Ursua (BU in what follows) will prove extremely useful. Understanding the economic implications of disasters, whether natural or man-made, is both essential and fascinating. Like the celebrated Barro-Lee growth data set, the data set that they have put carefully together will be widely used. I had fun playing with it, and so will others.

I shall organize my comments around two points.

The first is that macroeconomic crises—what BU call consumption disasters—come in very different forms, with different implications for output, consumption, and rates of return on bills, bonds, and stocks.

The second is that, if the focus is on the equity premium, and if we take seriously the claim that we now have a representative sample of disasters, looking at the determination of the equity premium through the lens of the Lucas model does not seem like the best way to proceed.

* Brookings Panel, April 10, 2008.

[†] MIT and NBER. I thank Antoine Bozio for information about the French stock market, and the authors for providing me with their data.

1 The many incarnations of consumption disasters

What I was most struck by, looking at the “consumption disasters” identified and documented by BU, was how different these disasters in fact were. Going through the list, it was fairly clear that they should put in different boxes. Here is a tentative set of boxes:

1.1 Wars on one’s own soil

For obvious reasons, such wars lead to a large decline in output and consumption: Part of the country is invaded, production in the rest of the country is seriously disrupted. The stock market, if it remains open, does poorly. Depending on the extent of rationing, inflation may be high, real bill returns are likely to be low.

A good example is France during World War II. From 1937 to 1944, output per capita in France decreased by 51% (using log differences); not until 1947 did it return to its 1937 level. From 1938 to 1943, consumption per capita decreased by 86% (this seems extremely large); not until 1949 did it return to its 1938 level.¹

The German invasion closed the stock market. It reopened under the Vichy regime, but, not surprisingly, volume remained very low during the war.² (This raises the issue of what one should assume for stock returns when the market is closed. Could one reasonably argue that, if one cannot sell one’s stock, the rate of return in such years is -100%?) Leaving 1940 and 1941 aside, the average yearly rate of return on stocks from 1938 to 1947 was -10%.

Despite widespread rationing, average inflation during the war was high. From 1938 to 1944, CPI inflation averaged 18.7%, leading to large negative

1. All the numbers on GDP, consumption, stock and bond returns are taken from the BU data base.

2. BU assume that it was closed during both 1940 and 1941. My historian French friends tell me that it was only closed for a few weeks in 1940.

bill and bond returns. (Rationing also raises the issue of whether it makes sense to use the first order condition of consumers. This condition relies on a thought experiment in which a larger return on the asset allows one to increase consumption at the margin. This increase may not be feasible under rationing.) As is often the case, the immediate post-war period was associated with a burst of inflation, leading to even larger negative bill and bond returns. Average inflation from 1945 to 1948 was 58.7%, bill and bond returns were negative and very large.

1.2 Wars on foreign soil

Wars on foreign soil have a very different economic profile. With the increase in defense spending, output is likely to increase, but its composition is likely to change drastically. Whether through rationing or other means, consumption is likely to go down. After the initial bad news that a war is imminent, the stock market, pushed by defense stocks, is likely to do well. Depending on the form of rationing and the extent of forced saving, inflation is likely to go up, while nominal rates of return are kept low, leading to negative bond returns.

The standard example here is the United States during World War II. From 1941 to 1945, US output per capita grew by 37%. Consumption per capita dipped by 3% from 1941 to 1942, but was still 5% higher in 1945 than in 1941. The small consumption decrease in 1942 is not large enough to make the “consumption disaster” BU list. Interestingly (and I return to this below), the United States makes the “GDP disaster” list, but for the period 1944 to 1947! The reason: the return of the US economy to a more normal level of output.

With the economic boom, and the increase in defense spending, US stock returns were high during the war. From 1941 to 1945, stock returns averaged 12%; from 1942 to 1945, they averaged 20.9%. Despite price controls,

inflation ran at an average 5% a year from 1941 to 1945. Coupled with very low nominal rates aimed at limiting the burden of increasing government debt, the result was negative rates of return on government bonds. As in France, the immediate aftermath of the war was characterized by a burst of inflation. Inflation reached 18% in 1946, leading to large negative returns on nominal assets.

1.3 Civil wars

Civil wars offer yet another pattern of comovements between output, consumption, stock and bond returns. A leftist revolution, for example, may lead to an initial shift in income distribution, an initial increase in consumption, followed later on by lower output and lower consumption. Companies are likely to be nationalized, and stock returns are likely to suffer. Loss of revenues is likely to lead to high money growth, high inflation, and large losses on nominal assets.

Portugal provides a nice example. In 1974, after a long dictatorship and the loss of Portugal's colonies, a bloodless coup put leftist colonels in charge. Political and economic turmoil ensued, together with large scale nationalization. While output decreased from 1973 to 1974, consumption increased by 8% (one may however reasonably question whether the consumption of stockholders went up as well). The measured labor share exceeded 100% of GDP, and so it is no great surprise that both output and consumption declined in following years. Not until 1978 did they exceed their 1973 level.

Not surprisingly, the stock market did not do well. BU show no data for 1976 to 1977, and I do not know whether the stock market was closed during part of that period. Measured stock returns were negative and large in 1975 and in 1978. But bill returns did not fare much better. Inflation averaged 20% from 1974 to 1978, and remained above 20% until 1985. Nominal interest rates were substantially lower, implying large negative

real returns.

1.4 Other types, and implications

One could go on. Another box would include fiscal crises. Fiscal crises cum hyperinflations are likely to feature low output and low consumption. Stock returns may be dismal, but so are bill and bond returns. Here, German hyperinflation is the obvious example. Using the BU dates for this consumption disaster, stock prices declined by 69%. But the real rate of return on bills was -97%. Another box would include banking crises, such as that in Finland in the early 1990s, and so on.

In going through these cases, I have done what BU precisely do not want us to do. I have tried to think about each data point, and told a specific story. BU are about general patterns, and the use of a large sample of disasters to uncover them. This makes sense, however, only if all these disasters are realizations from the same underlying process. This seems unlikely. Conditioning on the probability of a war at home will not imply the same set of conditional correlations as conditioning on a war fought abroad: They imply very different patterns of correlations. And if the probabilities of these different events vary across countries and time, the implications of an unconditional approach are likely to be misleading.

To take an example, and venturing further than I should, it is likely that, in the US, the probability of a war at home (say, the explosion of an atomic bomb) has decreased with the end of the cold war (terrorism, and dirty bombs, are unlikely to create disasters on the same scale). But one may argue that the probability of wars abroad has increased. One may also argue that probabilities of a hyperinflation or a financial crisis have changed substantially over time. If this is the case, then the unconditional equity premium derived by BU is likely to be misleading.

2 Do we need the Lucas tree model?

Having collected their data, BU analyze it through the lens of a Lucas-tree model, augmented for a small probability of disaster a la Rietz. This requires them to estimate the probability of a disaster, p , and the size of the relative consumption disaster, b .

I do not understand why they force themselves to look at the data through this particular straightjacket. Doing so forces them to choose dates for the start and the end of each consumption disaster, to ignore the length of the disaster, to make assumptions about returns on bills, and so on. The way in which they map the data into the inputs of the model is sensible, and given the mapping constraint, they do the best job available, but the results are sometimes surprising. The choice, for example, of peak-to-trough fractional declines larger than 10% as a criterion for consumption or GDP disasters seems perfectly reasonable. But it leads for example to defining a consumption disaster for France from 1938 to 1943, although consumption was below its 1938 value until 1949. (Remember, from above, that the high inflation, and the very low bill returns come from 1945 to 1948, thus after the BU consumption disaster, but before consumption is back to its pre-war level. This may be relevant to the way we think about asset pricing.) It leads to defining a GDP disaster for the US from 1944 to 1947, something which may have come as a surprise to participants at the time. Given a mechanical rule, one has to accept the discipline of the rule, and the consequences. The question is whether the rule is needed.

The motivation for using the Lucas-Rietz model until now was twofold. The first was to clarify the potential role of small-probability events in asset pricing; the model has just the right level of simplicity and complexity, to give non-trivial insights. The second was that we surely did not have a universe, or a representative sample, of disasters. Thus, we could not be too ambitious in describing correlations during crises, and the simple p and

b approach seemed properly humble and transparent.

The point of this paper is however to give us a much larger sample, indeed the universe of consumption disasters which we can hope to measure. In this case, I see no reason not to go back to asset pricing formulas which just rely on the first order intertemporal condition of consumers and no additional assumptions. As is well known, this condition can be written, for any asset, as:

$$ER = (1/EM)(1 - \text{cov}(M, R))$$

where M is the marginal rate of substitution over any period, R is the gross rate of return on the asset, be it stocks, bills, or bonds, over the same period, and $E(\cdot)$ is a conditional expectation.

Given a specification of utility and thus of the marginal rate of substitution, that condition can be used to compute conditional or unconditional required returns on stocks, bills, and bonds, and the implied equity premium. This computation does not require taking a stand on starting and ending dates for consumption disasters, nor treating bills as riskless or risky. It naturally deals with disaster length issues, which are central to the computation in the Lucas-Rietz framework. It allows us to explore how the bursts of inflation which often follow consumption disasters are relevant to the equity premium. In short, it seems to simplify work, and get around a number of issues which come up with the current formalization. I hope the authors explore this route in the future.