INTERNATIONAL EVIDENCE ON THE FINANCIAL KUZNETS CURVE

ABSTRACT

The results presented in this study provide cross-sectional evidence on the “financial Kuznets curve”, which is the financial counterpart of the environmental Kuznets curve. It is a representation of the “finance curse”, providing a warning signal against over-dependence on the financial sector. By measuring the degree of financialisation in terms of the ratio of publicly-traded shares to GDP, the results show an inverted U-shaped curve between the GDP growth rate and financialisation. The negative effect of financialisation on growth materialises much more quickly in high growth countries.

Keywords: Environmental Kuznets Curve, Financial Kuznets Curve, Finance Curse, Financialisation
JEL Classification: G00, G01

RIASSUNTO

Evidenze internazionali sulla curva della finanza di Kuznets


1. INTRODUCTION

Financialisation is a term that describes the dominance of the financial sector over other sectors of the economy, including manufacturing industry and agriculture. It refers to
“the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international levels” (Epstein, 2002).

Komlilk (2015) describes financialisation simply as

“the ascendancy of finance”, suggesting that it represents “the capturing impact of financial markets, institutions, actors, instruments and logics on the real economy, households and daily life”.

Black (2011) lists the ways in which the financial sector harms the real economy, describing its functions as

“the sharp canines that the predator state uses to rend the nation”.

In addition to siphoning off capital for its own benefit, the financial sector, according to Black, misallocates the remaining capital in ways that harm the real economy.

On the other hand, a modern economy cannot function properly without a financial sector, as economic activity requires the availability of credit and means of payment, which is a function performed by the financial sector. But just like everything else in life, too much of a good thing is not good, and finance is no exception. Excessive levels of financialisation have been found to exert adverse effects on the economy in more than one shape or form. What we are concerned with here is the effect of financialisation on economic growth. Finance is required to support growth, but if too much finance is harmful then the relation between financialisation and growth is unlikely to be monotonic. Rather it is envisaged that this relation is likely to be an inverted U-shaped curve, which resembles the original Kuznets curve and the subsequent environmental Kuznets curve. It is suggested here that if the relation between growth and financialisation assumes an inverted U-shaped curve, then it is legitimate to call it the “financial Kuznets curve”.

The objective of this paper is to present cross-sectional evidence on the effect of financialisation on economic growth for countries with various degrees of financialisation and rates of growth. More specifically, the objective is to find out if there is evidence for the financial Kuznets curve, which would provide support for the “finance curse”.
2. THE ADVERSE EFFECT OF FINANCIALISATION ON ECONOMIC GROWTH

The adverse effects of financialisation have been widely recognised as being mostly related to the accumulation of debt. As the level of debt rises, the corporate and household sectors divert increasing portions of their financial resources to debt service, which in turn become profit for the financial sector. The problem is that the financial sector’s receipts are not turned into fixed capital formation to boost output, but rather they are used to create new claims on aggregate output and income. Increasingly, firms become unable to invest in new physical capital equipment or buildings because they are obliged to use their operating revenue to pay creditors. In a financialised economy, those running the show do not aim at producing physical capital because they are in the business of generating interest, fees and commissions from mergers and acquisitions and other activities that do not involve the creation of new wealth.

Tomaskovic-Devey (2015) argues that

“the concentration of wealth and power in the financial service industry has led to lower living standards and weaker state investment in citizens and infrastructure”,

which means that financialisation of the non-finance sectors leads to a lower level of production. He actually sees financialisation as the move of non-financial firms in more speculative directions, into stock, credit, currency and even derivative markets – this move has been detrimental to value added. His estimates show that

“since 1980 financial investments on Main Street stripped the US economy of at least 3.9 percent of aggregate growth, or about three years of lost growth in GNP”,

compared with the great recession that produced aggregate negative growth of 2.9 percent. The adverse effects of financialisation, he argues, include lower employment, lower capital investment, lower wages and lower tax revenue. The tendency of non-financial firms to channel a big portion of profits to the acquisition of financial assets has been observed by Krippner (2005), Epstein and Jayadev (2005), Lin and Tomaskovic-Devey (2013), Orhangazi (2008), Lin (2013) and Davis (2014).
Financialisation has adverse macroeconomic consequences because it makes the financial sector weaker by boosting leverage, opacity, complexity, spillover effects within and outside financial institutions, and by accelerating debt deflation (Sinapi, 2014). Furthermore, the dominance of finance fuels capital asset price inflation as suggested by Bellofiore (2013). Financialisation is believed to have a depressive effect on productive investment, consumption and aggregate demand. For example, Lavoie (2012) suggests that financialisation is associated with the development of a consumption-led accumulation regime fuelled by increasing household debt as households strive to compensate for their stagnating purchasing power. Given that financial crises cause subsequent recessions and that financialisation leads to a bigger and more unstable financial sector, the link between financialisation and output becomes conspicuous. According to the IMF (2009), recessions associated with financial crises last on average 18 months longer than other recessions and take almost three years to go back to pre-recession output levels.

Cecchetti and Kharroubi (2015) examine the real effects of financial sector growth and conclude that the growth of a country’s financial sector is a drag on productivity growth – that is, rapid growth in the financial sector reduces output growth because the financial sector competes for resources with the rest of the economy. In another paper, Cecchetti and Kharroubi (2012) conclude that financial sector size has an inverted U-shaped effect on productivity growth – that is, there comes a point where further enlargement of the financial sector can retard real growth.

An attempt is made here to find out if cross-sectional data provides any support for the inverted-U-shaped curve as suggested by Cecchetti and Kharroubi (2012). This is similar to the original Kuznets curve when Kuznets (1955) argued that income inequality rose with growth at low levels of income per capita, then declined beyond a certain point (beyond a certain level of income). It is also similar to the notion of the environmental Kuznets curve, proposed, among others, by Grossman and Krueger (1995) and Shafik (1994).

3. DATA AND EMPIRICAL RESULTS

The degree of financialisation can be measured in different ways (see, for example, Leiva and Malinowitz, 2007), but here the choice falls on the ratio of the market value of publicly-traded
shares to GDP. This choice is consistent with the propositions put forward by Tomaskovic-Devey (2015) who observes the move of non-financial firms into more speculative assets such as stocks. It is also consistent with a characterisation of financialisation that it involves a tendency of non-financial firms to channel a big portion of profits to the acquisition of financial assets (for example, Krippner, 2005). The ratio is obtained by dividing the value of traded shares by GDP measured on a PPP basis. Economic growth is measured by the real growth rate of GDP. The data were obtained from www.indexmundi.com.

In all, data on stock trading and other variables were found for 95 countries. In Figure 1 we observe the top and bottom ten countries in terms of the growth and the ratio of stock trading to GDP. There is hardly any correspondence either at the top end or the bottom end between growth and stock trading, but these are the outliers. There is also the possibility that the relation between growth and financialisation works differently in high growth countries than in low growth countries, in the sense that the response of growth to financialisation differs according to whether growth is high or low. For this reason, the sample is adjusted for outliers and divided into three parts comprising (i) high growth countries, (ii) medium growth countries, and (iii) low growth countries. Once this has been done, some evidence appears for an inverted U-shaped curve, as shown in Figure 2.

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1 The web pages for the data on GDP measured on a PPP basis, GDP real growth rate and the market value of publicly traded shares are as follows:
http://www.indexmundi.com/g/r.aspx?t=100&v=67&l=en
http://www.indexmundi.com/g/r.aspx?t=100&v=66&l=en
http://www.indexmundi.com/g/r.aspx?t=100&v=2200&l=en
FIGURE 1 - Top and Bottom 10 in Terms of Growth and Stock Trading
FIGURE 2 - The Financial Kuznets Curve
One issue that arises frequently in the literature on the environmental Kuznets curve is whether the underlying model should be specified in logs or levels. The choice between models with and without logs can produce different results, hence providing an opportunity to support pre-conceived beliefs, which is quite common in empirical work. This problem can be solved empirically by testing the specification without logs against the specification with logs, which can be formulated as non-nested models with different dependent variables. In this case the competing models (M1 and M2) can be written as

\[ g_t = \beta_0 + \beta_1 f_t + \beta_2 f_t^2 + \epsilon_t \]  

and

\[ \log(g_t) = \beta_0 + \beta_1 \log(f_t) + \beta_2 [\log(f_t)]^2 + \epsilon_t \]

This exercise is based on simulation using two selection criteria: Sargan’s likelihood criterion \(S\) and Vuong’s likelihood criterion \(V\) – the latter comes with a p-value. The Sargan (1964) likelihood criterion is used to compare the maximised values of the log-likelihood functions under two models, M1 and M2. When M1 is tested against M2, a positive value indicates that M1 is the preferred model, and vice versa. The Vuong (1989) criterion is constructed such that if M1 and M2 are equivalent, \(V\) is approximately distributed as a standard normal variate. The results

\footnote{For details, see Pesaran and Pesaran (2009).}
presented in Table 1 show that both selection criteria favour M1, the model without logs. The exercise is conducted only for medium and high growth countries because some of the growth rates in the low growth group are negative, in which case the log specification cannot be estimated.

**TABLE 1- Non-Nested Model Selection Criteria for Models without and with Logs**

<table>
<thead>
<tr>
<th>Country Group</th>
<th>$S$</th>
<th>$V$</th>
<th>Preferred Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Growth</td>
<td>0.561</td>
<td>4.749</td>
<td>M1</td>
</tr>
<tr>
<td>High Growth</td>
<td>1.508</td>
<td>8.711</td>
<td>M1</td>
</tr>
</tbody>
</table>

M1 is model without logs; M2 is model with logs. p-values appear in square brackets.

Another issue is that of whether the relation shown in Figure 2 is linear. Non-nested model selection tests can be used to provide further support for the quadratic specification as represented by equation (1). For this purpose, the linear specification is tested against the quadratic specification. These specifications are given respectively by

\[ g_i = \alpha_0 + \alpha_1 f_i + \epsilon_i \]  
\[ g_i = \beta_0 + \beta_1 f_i^2 + \epsilon_i \]  

It should be pointed out that the linear model (M1) cannot be tested against the quadratic model represented by equation (1), which contains both $f$ and $f^2$, because these two models are nested, in which case the tests cannot be carried out. The underlying idea here is that if equation (1) is the correct specification, then both M1 and M2 will be rejected since the correct model requires both of the terms $f$ and $f^2$. For this purpose, four non-nested model selection tests are used: $N$ is the Cox test derived in Pesaran (1974); $NT$ is the adjusted Cox test derived in Godfrey and Pesaran (1983); $W$ is the Wald-type test proposed by Godfrey and Pesaran (1983); and $EN$ is the encompassing test proposed, *inter alia*, by Mizon and Richard (1986). All of these test statistics follow a t distribution, except for the encompassing test statistic that has an F distribution. A description of these tests can be found in Pesaran and Pesaran (2009).
The tests are run both ways by testing M1 versus M2 and M2 versus M1. When M1 is tested versus M2, the null hypothesis is that M1 is a better model (in terms of specification) than M2. A significant test statistic indicates that M1 is not a better model than M2. When M2 is tested against M1, the null is that M2 is a better a model than M1. A significant test statistic indicates that M2 is not a better model than M1. If we get significant test statistics both ways, this means that both models are misspecified. If we get insignificant test statistics by testing M1 versus M2 and significant statistics by testing M2 versus M1, this means that M1 is preferred to M2, and vice versa.

The results reported in Table 2 for low, medium and high growth countries. The results are mixed, in which case the preferred model cannot be picked up easily. For low growth countries, two tests (NT and W) indicate preference for the linear model, but for medium growth countries, the same two tests show preference for the quadratic model. In the case of high growth countries, the same two tests show preference for M1 when M1 is tested against M2 and for M2 when it is tested against M1. What this means is that neither M1 (equation 3), nor M2 (equation 4) represent the correct model specification, which means that the correct model must contain both $f$ and $f^2$ – that is, the correct specification is given by equation (1).

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Low Growth</th>
<th>Medium Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M1 vs M2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>2.21*</td>
<td>-3.44*</td>
<td>1.53</td>
</tr>
<tr>
<td>$NT$</td>
<td>1.75</td>
<td>-2.31*</td>
<td>1.14</td>
</tr>
<tr>
<td>$W$</td>
<td>1.82</td>
<td>-2.20*</td>
<td>1.16</td>
</tr>
<tr>
<td>$EN$</td>
<td>11.14*</td>
<td>10.21*</td>
<td>3.61*</td>
</tr>
<tr>
<td><strong>M2 vs M1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>-3.59*</td>
<td>2.01*</td>
<td>-2.59*</td>
</tr>
<tr>
<td>$NT$</td>
<td>-2.30*</td>
<td>1.66</td>
<td>-1.34</td>
</tr>
<tr>
<td>$W$</td>
<td>-2.20*</td>
<td>1.74</td>
<td>-1.32</td>
</tr>
<tr>
<td>$EN$</td>
<td>13.22*</td>
<td>8.01*</td>
<td>4.35*</td>
</tr>
</tbody>
</table>

M1 is the linear model; M2 is the quadratic model. * Significant at the 5% level.
The inverted U-shaped curve requires the coefficient restrictions $\beta_2 < 0$ and $\beta_1 > 0$ on equation (1). The turning point can be determined by differentiating equation (1) with respect to $f$ and equating the derivative to 0. Thus

$$\frac{dg}{df} = \beta_1 + 2\beta_2 f = 0$$

which gives

$$f = -\frac{\beta_1}{2\beta_2}$$

The results reported in Table 3 show the estimated financial Kuznets curve with the turning points – that is, the level of financialisation after which the relation turns negative. The results show that for all country groups, the coefficient restrictions required for an inverted U-shaped curve are satisfied, and that the fit is best for low growth countries. The estimated turning points show that excessive financialisation materialises at a ratio of 0.47, 0.30 and 0.21 for low, medium and high growth countries, respectively.

### Table 3 - Estimated Financial Kuznets Curve with Turning Points

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Low Growth</th>
<th>Medium Growth</th>
<th>High Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_0$</td>
<td>-6.757</td>
<td>2.516</td>
<td>3.467</td>
</tr>
<tr>
<td></td>
<td>(-4.01)</td>
<td>(8.73)</td>
<td>(2.87)</td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>33.509</td>
<td>6.251</td>
<td>24.399</td>
</tr>
<tr>
<td></td>
<td>(3.63)</td>
<td>(2.83)</td>
<td>(2.08)</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>-35.873</td>
<td>-10.400</td>
<td>-45.152</td>
</tr>
<tr>
<td></td>
<td>(-3.34)</td>
<td>(-3.19)</td>
<td>(-2.90)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.56</td>
<td>0.49</td>
<td>0.21</td>
</tr>
<tr>
<td>Turning Point</td>
<td>0.467</td>
<td>0.301</td>
<td>0.207</td>
</tr>
</tbody>
</table>

$t$ statistics appear in parentheses.

### 4. Conclusion

The results presented in this study present cross-sectional evidence on what may be called the “financial Kuznets curve”, which is a representation of the proposition that the financial sector plays a useful, growth-conducive role in the economy up to a certain point, then any further expansion in its size relative to the economy will have adverse effects on growth. This curve symbolises the “finance curse” resulting from over-dependence on the financial sector.
REFERENCES


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