International banks insolvency and Ricardian rent from Texas to Norway

Alfredo D. Garcia and Luis Nicolini-LLosa*

January 11, 2012

Royal Economic Society

2012 Annual Conference

Cambridge University

The main argument is that the industrialized countries endogenously generated insolvent debt due to the redistribution of income towards the owners of natural resources with a low propensity to spend. This phenomenon accelerated with the third 'oil shock' since 2004. Such differential Ricardian rent accumulated into financial assets contributing to the international banks insolvency starting in 2008. There is abundant literature (Ashcraft and Vickery, 2011; Bar-Isaac and Shapiro, 2011; Dewatripont and Tirole, 2010; Griffin and Tang, 2011; He and Strahan, 2011; Mertens and Ravn, 2011) discussing the banks insolvency caused by their rising leverage[1] on insolvent loans, this is banks' insufficient equity to meet the large and adverse mismatch between the net present values of their assets and their liabilities. The literature, however, does not usually discuss the origins of such insolvency crisis. Stiglitz (2010) argues that the origin of

*We are grateful to Michael Ellman for his valuable comments and insights. Errors and omissions are ours. Email: arturo19623@hotmail.com

[1]Leverage or gearing as banks' debt to equity ratio.

the insolvent debt was the redistribution of income towards wealthy agents with a low propensity to spend. Following Keynes, Stiglitz calls these wealthy agents 'financial rentiers' who do not need to invest in production, to hire labour, in order to stay in business. In his General Theory Keynes compared financial rentiers with Ricardo's landowners in that their earnings come out of (financial) property not out of production. Ricardo's rent income, however, was not accumulated nor lent. Ricardian rent was spent in non-essential-commodities, this is goods requiring very little labour to be produced; rentier income was - in Ricardo theory - a waste that hampered growth only if the rent share in national income increased due to land diminishing returns not compensated by productivity gains. In Stiglitz's Keynesian argument rentiers accumulate financial assets by definition (they spend a negligible proportion of their income). These financial assets are deposited in international banks generating loans to wealth-less individuals, which allows sustaining demand and growth by generating insolvent debt. Atkinson and Morelli (2010) discuss the empirical difficulties in verifying Stiglitz's argument. Our work focuses on rent income by owners of natural resources (in this sense they would be Ricardian rentiers), but their income accumulating as financial assets like in Keynes rentiers. Therefore, our argument could be extended to include Stiglitz's, although we do not do this here.

The redistribution of income over the last couple of decades towards frugal spenders took basically three forms: a) the above mentioned rising natural resource rentiers income resulting from higher commodities prices; b) large current account surpluses in countries other than natural resource exporters, like China, Japan and Germany; and c) the benefits out of the money created by banks in the upswing (just like banks destroy money during the de-leveraging in the downswing). The quantification of these three sources of wealth accumulation would be a research project in its own and we do not do it here. Let us simply focus on the theoretical discussion of the first one.

The following highly stylized model depicts our argument about the contribution of the 'third oil shock' to the debt growth of wage earners and peripheral European governments.

(1) $1 = c + i + g$

(2) $w = 1 - \pi - \rho$

(3) $s = (1 - \tau_w)w - c + (1 - \tau_\pi)\pi + \rho$

(4) $\tau = \tau_w w + \tau_\pi \pi$

(5) $dB_w = [(1 - \tau_w)w - c]Y$

(6) $dB_\pi = [(1 - \tau_\pi)\pi - i]Y = 0$

(7) $dB_g = [\tau - g]Y$

(8) $dB_\lambda = -dB_w - dB_\pi - dB_g$

(9) $\rho = f(Y)$ with $\delta\rho/\delta Y > 0$

Exogenous

c : Wage consumption to GDP ratio

g : Government spending to GDP ratio

i : Investment to GDP ratio

Y : GDP and National Income

π : Profit share in National Income

τ_w : Tax ratio on wages

τ_π : Tax ratio on profits

Endogenous

B_w : Wage earners financial assets

B_π : Capitalists financial assets

B_λ : Rentiers financial assets

B_g : Government financial assets

s : Savings ratio

w : Wage share in National Income

τ : Tax ratio in National Income

ρ : Rent share in National Income

Notation

d : Differential operator

Expression (1) defines as exogenous the consumption, investment and government expenditure to GDP ratios c, i and g, respectively. From expression (2) to (9) there are eight equations and eight endogenous variables. Through substitution expression (8) yields macroeconomic balance $s - i = g - \tau$.

The model depicts the western industrialised economies plus the natural resource producers as a single region with several individual governments. Industrialised economies' governments do not levy taxes from rentiers either because these are, or belong to, non-industrialised nation states (i.e. Norway and South Arabia) or because they deposit their rent income in tax heavens. Rentiers' propensity to spend is nihil. All wage earners live in the industrialised economies. Only wage earners consume. Protected by their monopoly power firms need not borrow, thus $dB_\pi = 0$ in (6) which implies $i = (1 - \tau_\pi)\pi$. Mian and Sufi (2011) empirically show the decline in the debt to income ratio of firms and the rise in that of households in the USA since year 2000; the trend decline in the former being milder than the steep rise in the latter, particularly after 2005. Since we do not discuss it we assume the former constant (i.e. $dB_\pi = 0$).[2] Their econometric results verify such rise in household indebtedness financing private consumption (i.e. credit card financed consumption). DeBacker and Vidangos (2011) at the Federal Reserve Board test a permanent increase in inequality for male earnings and household income in 1987-2006 in the USA.

Ricardian differential rent ρY results from production cost differentials relative to the marginal land/deposit/field where the cost price is determined. This rent ρY finances the accumulation of both wage earners (households) debt $-dB_w$ and government debt $-dB_g$, as in[3]

(8') $dB_\lambda = -dB_w - dB_g = \rho Y$

In expression (8') rent income ρY permanently accumulates as financial assets even if the rate of interest is neglected - considering it would only strengthen the argument and open the discussion to Keynes' financial rentier.

Let us consider the following *initial conditions* prior to the third 'oil shock'

$i_0 = s_0$ and $\rho_0 \approx 0$ which imply $(1 - \tau_w)w = c$ and $\tau = g$. Assuming $\rho_0 > 0$ would only reinforce the argument.

[2] We are not discussing wage earners debt generated by the rise in capitalists savings beyond productive investment requirements.

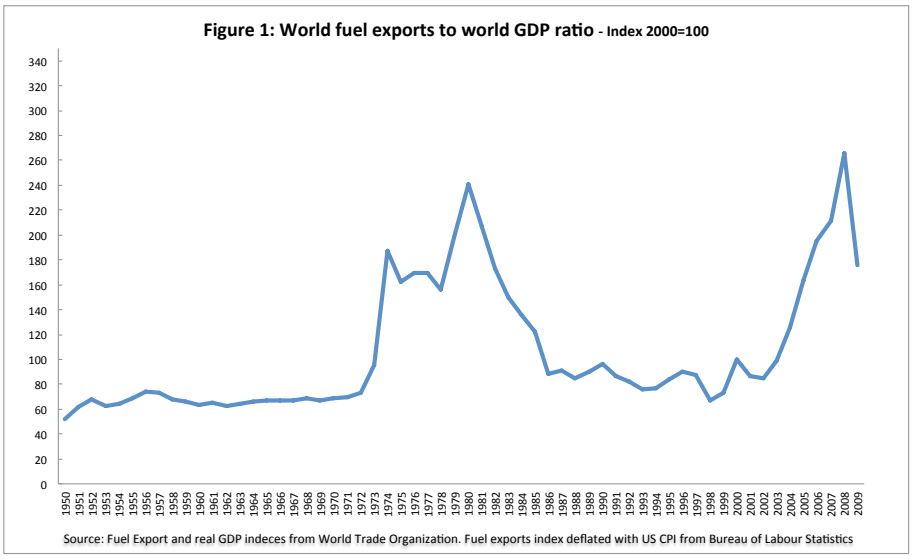
[3] $dB_\lambda/Y = c - (1 - \tau_w)w - (1 - \tau_\pi)\pi + i - \tau + g =$
$= c - w + \tau_w w - \pi + \tau_\pi \pi + i - \tau_w w - \tau_\pi \pi + g =$
$= c - w - \pi + i + g =$
$= 1 - w - \pi = \rho$

As GDP growth raises the rent income share ρ in (9), the accumulation of rentiers' financial assets in international banks grows at an accelerated speed - as it did since 2004 - like in the following expression:[4]

(8") $d^2B_\lambda = d[Y\rho] = (Y\rho + Y^2\frac{\delta\rho}{\delta Y})\hat{Y}$ given $\delta Y/\delta\rho = 0$

$\hat{Y}$: GDP growth rate

The rent share ρ rose sharply during each one of the three 'oil shocks' in 1972-73, in 1980 and from 2004 onwards. Such behaviour of the rent share ρ is illustrated in Figure 1 that depicts the share of world fuel exports to world GDP ratio. Instead of repeating the recessions of the seventies and eighties (Kilian and Lewis, 2011; Nicolini-LLosa, 1985)[5] that had taken pressure off ρ, with the third 'oil shock' the USA consumer and the European peripheral governments borrowed the rent income ρY thus sustaining a high GDP growth rate. The acceleration of financial assets accumulation (8") after 2004 financed both wage earners consumption and also public expenditure. Let us discuss each one of these two effects in turn.



On the one side, the rise in the rent share ρ reduced the wage earners disposable income share by $(1-\tau_w)dw$ - equations (2) and (3). Given a constant consumption ratio c, a fraction $(1-\tau_w)$ of the acceleration in rentiers' financial assets

[4] $d[Y\rho] = \rho_0 dY + Y_0 d\rho = \rho_0 dY + Y_0 \frac{\delta\rho}{\delta Y} dY = [\rho_0 + Y\frac{\delta\rho}{\delta Y}]dY$ with $\rho_0 = 0$

[5] During the two rounds of adjustment in the seventies and eighties the world rent income was 'recycled' through international banks towards developing countries that accelerated their foreign borrowing leading to defaults in the eighties and nineties. This theme is not part of our present discussion.

accumulation (8') financed the acceleration in wage earners debt (house mortgages and credit card financed consumption) as in the following expression:[6]

(5') $d^2B_w = -(1-\tau_w)d^2B_\lambda = -(1-\tau_w)Y^2\frac{\delta\rho}{\delta Y}\hat{Y}$

On the other side, in reducing the wage share w, the rise in ρ reduced the tax base by $\tau_w dw$ - expression (4). Given the constant government expenditure ratio g, a fraction τ_w of the acceleration in rentiers' financial assets accumulation (8') financed the following acceleration in government debt:[7]

(7') $d^2B_g = -\tau_w d^2B_\lambda = -\tau_w Y^2\frac{\delta\rho}{\delta Y}\hat{Y}$

In brief, with consumption and government expenditure sustained constant by means of borrowing, the investment rate i and the profit share π were also sustained and GDP growth was unaffected in spite of the rise in ρ.

Such sustained GDP growth led to the rise in commodity prices, particularly after 2004. This further accelerated the generation of rentiers' financial assets held at international banks. Towards 2008 the insolvency of some banks became evident: there was a mismatch between the nominal value of their fixed income assets (such as government bonds and mortgage securities) and the net present value of the repayment capacity of a significant proportion of their debtors: mortgage holding wage earners and peripheral governments in Europe. Let us, for simplicity, assume that such debtor's repayment capacity is a function of expected GDP growth as in the following expression.

(10) $B_{\lambda,0} > \int (w - c + \tau - g)Ye^{-rt}$

where variables are dated in time and

r : rate of discount

t : time

Expression (10) says that the face or nominal value of rentiers assets at t=0 $B_{\lambda,0}$ is larger than the net present value of debtors repay capacity. The main difficulty in trying to improve debtors repay capacity is in that variables are interrelated. For example, how much a reduction in g or c would hamper Y is a classical controversy in theoretical and applied economics. Banks intermediate

[6] $d^2B_w = d\{[(1-\tau_w)w-c]Y\} = (1-\tau_w)Yd(1-\pi-\rho)+[(1-\tau_w)w-c]dY = -(1-\tau_w)Yd\rho+[(1-\tau_w)w-c]dY = -(1-\tau_w)Y\frac{\delta\rho}{\delta Y}dY+[(1-\tau_w)w-c]dY = \{-(1-\tau_w)Y\frac{\delta\rho}{\delta Y}+(1-\tau_w)w-c\}dY$ with $(1-\tau_w)w = c$

[7] $d^2B_g = d\{[(\tau_w w+\tau_\pi\pi)-g]\}Y = Yd[(\tau_w w+\tau_\pi\pi)-g]+(\tau-g)dY = Y\tau_w dw+(\tau-g)dY = -Y\tau_w d\rho+(\tau-g)dY = -Y\tau_w\frac{\delta\rho}{\delta Y}dY+(\tau-g)dY = [-Y\tau_w\frac{\delta\rho}{\delta Y}+(\tau-g)]dY$ with $\tau = g$

between rentiers as creditors on the one hand and wage earners and governments as debtors on the other. The high leverage of international banks worsened the solvency problem leading to liquidity crises and the recurrent runs on the international banks since 2008, with a recessive impact on GDP like all banking crises in history have had. Unfortunately there is no available data to quantify the solvency and the liquidity problems, for we do not know the de-aggregate composition of international banks' balance sheets, by debtor, creditor and the corresponding maturities and interest rates. For example, we know about the around three trillion dollars of Italy's and Spain's debt comparable to China's total foreign reserves, but we have only a general idea of who the banks holding such debt are and we certainly do not know the financial conditions and individual beneficiaries of the derivatives structured by the banks on such debt. The Bank of International Settlements estimated outstanding derivatives in 2010 in the order of 700 trillion dollars with most of it "over-the-counter", an euphemism indicating private contracts not subject to government regulation. Surely the data exists for every financial transaction is somewhere recorded, but it is not available for scientific research. To quantify the solvency problem is not easier, for in most countries data on distribution of income between wages, profits and rent through time has not been collected and, as different from financial transactions, there are no past records. There is data on personal distribution of income and the Gini coefficient is available for some countries, but this does no allow us to test our hypothesis that it is the re-distribution of income from wage earners to rentiers that is at the root of the solvency problem. Thus we are left with the general assertion that a permanent and substantial redistribution of income away from high spenders in favour of low spenders should have a recessive impact unless the latter lend their incremental wealth to the former who should eventually run out of money and become insolvent.

Solutions to the recessive banking insolvency

Let us consider the solutions to the recessive banking insolvency that have so far being discussed in the literature.

It does not seem feasible to improve the repay capacity neither of mortgage holding wage earners nor of peripheral European governments through growth, because the rent share ρ is function of GDP growth - equation (9). The technological change that could loosen such functional relationship would simply

take too long. For example, massive innovation in substantial cost reduction of energy sources with a small natural resource ingredient, such as solar, would imply a definite solution to the problem. In fact it would free 'bio-fuels' land for production of much needed food. But such innovation would take longer than the timing of the current solvency crisis.

Arnold, Brys, Heady, Johansson, Schwellnus, and Vartia (2011) test with panel data for 34 years and 21 OECD countries that tax on immovable property was the most favorable form of taxation on GDP growth. In our case it would be a tax on the market value of the natural resource land/deposit/field, a modern version of Ricardo's Land Tax ("virtually a tax on rent"). Such world tax would enable to both improve government revenues and also reduce the tax pressure on wage earners with an overall improvement in repayment capacity. As we have discussed above, however, a significant share of world rent is not taxable.

The possibility of liquidation of debtor's assets does not seem viable. In the case of housing mortgages massive liquidation would further reduce house prices (Campbell and Pathak, 2011) further stressing banks' balance sheets. In the case of government assets their privatization to cancel debt does not seem feasible in a reasonable time span given the heterogeneity of the nation states involved.

An orderly debt reduction in the form, for example, of a long term refinancing of principal and reduced interest payments that would enable debtors to grow and enhance repayment capacity might not represent a problem to the banks on the assumption that the 'toxic' assets have already been marked to their reduced market values and that the lender of last resort provides unlimited liquidity to match the occasional run on the banks. The difficulty arises with the property rights that would be affected leading to the intervention of judiciary courts with heterogeneous codes throughout Europe and the USA. In addition, a debt reduction implies 'moral hazard', meaning the relaxation of the financial discipline that prevents a debt default from spreading.

The conventional solution *à la* IMF of an individual debtor reducing its expenditures does not apply, because indebtedness is massive throughout Europe and the United States. An expenditure reduction would only reinforce the recessive impact of the banking insolvency, further reducing repayment capacity of employees and governments. It is the conventional debt trap caused by the pre-Keynesian idea that internationally all insolvent debtors can cut expenditure at the same time.

The argument has been put forward for an inflationary exit with negative real rates of interest (Hall, 2011) in a sort of Keynes' euthanasia of the rentier. Inflation would reduce the real value of troubled assets avoiding the more traumatic formal debt reduction that violates property rights. But Hall's argument is for a closed economy. Should the large Central Banks (the European Central Bank, the Bank of England, the Bank of Japan and the Federal Reserve) adopt a coordinated inflationary policy it would tend to devalue their respective currencies. Creditors like China (but also Japan and Germany vis-a-vis the dollar) would have no alternative but to accept this - the argument runs - because if they sold their Western assets they would undermine their value and also make their manufacturing exports less competitive. Inflation, however, takes time to erode values and the insolvency seems to be at a critical point. In fact, the sharp increase in the monetary base since 2008 by the Fed, the Bank of England, the Bank of Japan and the ECB has not been re-lend but largely held by banks, which is evident in the fact that the M_2 has not risen above trend. This opens the question about future sterilization whenever the liquidity trap ends - abruptly perhaps. Shall this end be coordinated so as to avoid a run on individual currencies? How much of such sterilization would be done through coordinated fiscal surpluses, and how much through coordinated increments of interest rates through issuing of short term debt by the lender(s) of last resort and/or raising banks reserve requirements?. All of which would have recessive consequences. Lack of coordination in these matters could lead not just to disorderly inflation but also to an escalation of bank-currency crises.

So far the industrialised economies seem to have been adopting a combination of some of the above policy options: some 'voluntary' sovereign debt reduction in exchange for some fiscal austerity in peripheral European economies, some 'toxic' asset purchases by the Fed, some easy lending to the banks by the ECB, some purchases of peripheral sovereign debt by the ECB in the secondary markets in exchange for austerity plans, some bank nationalisations in Belgium and in the UK, and son on. Most of the debt burden, however, remains outstanding. Would this policy mix eventually solve the crisis? Is the size of the debt problem too large for the implementation of an out-right solution. Given that the US and Japanese Treasuries are practically insolvent, are those holding 10 year Treasury Bonds near post-World War II yield lows of around 2% p.a. in the case of the US and around 1% p.a. in the case of Japan, over-reacting? The answers would require access to the relevant data.

Whatever the outcome of the current crisis, it is our argument that long run GDP growth requires that the share of rent income does not increase significantly - something both Leon Walras and David Ricardo agreed upon.

References

Arnold, J., B. Brys, C. Heady, A. Johansson, C. Schwellnus, and L. Vartia (2011): "Tax policy for economic recovery and growth," *Economic Journal*, 121(February).

Ashcraft, A., P. G.-P. P. H., and J. Vickery (2011): "Credit Ratings and Security Prices in the Subprime MBS Market," *American Economic Review*, 101(3).

Atkinson, A. B., and S. Morelli (2010): "Inequality and banking crises: a first look," in *Global Forum*, Turin. International Labour Organization.

Bar-Isaac, H., and J. Shapiro (2011): "Credit Ratings Accuracy and Analyst Incentives," *American Economic Review*, 101(3).

Campbell, J. Y., S. G. S., and P. Pathak (2011): "Forced sales and house prices," *American Economic Review*, 101(August).

DeBacker, J. B. H. V. P., and I. Vidangos (2011): "Rising inequality: Transitory or permanent? New evidence from a US panel of household income 1987-2006," *Finance and Economics Discussion Series, nr. 60, Federal Reserve Board, Washington DC*.

Dewatripont, M., R. J. C., and j. Tirole (2010): *Balancing the Banks: Global Lessons from the Financial Crisis*. Princeton University Press.

Griffin, J. M., and D. Y. Tang (2011): "Did Credit Rating Agencies Make Unbiased Assumptions on CDOs?," *American Economic Review*, 101(3).

Hall, R. E. (2011): "The long slump," *American Economic Review*, 101(April).

He, J., J. Q., and P. E. Strahan (2011): "Credit Ratings and the Evolution of the Mortgage-Backed Securities Market," *American Economic Review*, 101(3).

Kilian, L., and L. T. Lewis (2011): "Does the Fed respond to oil price shocks?," *Economic Journal*.

Mertens, K., and M. O. Ravn (2011): "Leverage and the Financial Accelerator in a Liquidity Trap," *American Economic Review*, 101(3).

Mian, A., and A. Sufi (2011): "House prices, home equity–based borrowing and the US household leverage crisis," *American Economic Review*, 101(august).

Nicolini-LLosa, J. L. (1985): "The degree of monopoly, the macroeconomic balance and the international current account," *Cambridge Journal of Economics*, 9(2).

Stiglitz, J. (2010): *Freefall: America, Free Markets and the Sinking of the World Economy*. W W Norton.