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A structural explanation for high interest rates in a rentier-led economy with endogenous money

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ABSTRACT

In neoclassical economic analysis factors receive their rewards based on their relative scarcity; the more abundant a factor is, the lesser its remuneration. This approach can be traced back to Ricardo's theory of rent on land. While this is a sound theory for determining rent on land, it cannot be generally applied to all production factors such as labour and capital, especially since the nature of the latter lends itself to somewhat questionable quantification. In the paper I am able to show, with the help of a stock-flow model, that in a setting where loanable money capital and labour are abundant and virtually inexhaustible; high, even double-digit interest rates, can emerge. Reasons for this are structural, they depend on power relations between different groups and on the underlying institutional arrangement in a given society.

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1. Introduction

Neoclassical economic analysis posits that there exists a monotonic inverse relationship between the quantity of capital and its rate of remuneration. Furthermore, if we take the quantities of other factors as given, we can express a 'demand function' for any single factor (Garegnani, 2003). Within the neoclassical paradigm distribution, prices and quantities of factors employed are all determined by the 'opposing forces of supply and demand' (Kurz, 2003). Scarcity represents a universal characteristic of this system, thereby making the very issue of distribution irrelevant. Interestingly enough, however, classical economists understood free competition as operating on both product and factor markets, with different classes consciously competing for their share of the spoils on the latter (Garegnani, 2003). Ricardo only connected scarcity with land rent and not with wages and profits, which were asociated with productiveness (Quadrio-Curzio, 2003). Following Wicksteed, however, what used to be the theory of rent was turned into a general, universal theory of scarcity and scarce resources (Quadrio-Curzio, 2003). I believe this 'generalisation', which represents the basis of marginalist analysis, to be false and I intend to prove, that even in a setting where all production factors are abundant, the rate of remuneration on money capital can still be relatively high.

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The paper proceeds as follows. The first part is devoted to a short look at the role of rentiers in the history of political economy, followed by alternative theoretical views on capital and the character of the interest rate in chapter three. Building on the foundations of these conclusions, I establish a simple stock-flow model, based on the work of Godley and Lavoie (2012). Chapter five is dedicated to the results and interpretation of the model developed in chapter four. It is in this chapter that I am able to show how, given an institutional matrix, the interest rate state of rest (or the average interest rate) on money capital resolves itself. It is here where I also deal with the implications of these results, which give us hints as to why some economies might find themselves plagued by high interest rates.

2. A short excursus on the political economy of rentiers

The importance of institutional realities in shaping the macroeconomic environment was something that classical political economy understood very well; hence the adjective 'political'. What will be shown in this paper is that the interest rate itself is a reflection of the institutional environment. When it comes to the role of rentiers in society, students of economic history will remember that some very prominent economists in the past have already had their say on this matter and their conclusions are similar to our own. While, admittedly, dealing with very different groups of rentiers, aristocratic landlords on the one hand and financial capitalists or bankers on the other, Ricardo and Keynes seemed to have been in accord that the political influence of rentiers, in their various forms, ought to be limited. Keynes even goes so far as to hope that they would eventually be 'sterilised' (Keynes, 1997, p. 253). This was to be done with a policy of continuously low interest rates and in retrospect it seems not to have done the trick. In fact, in the paper I will try to show, that heavy regulation and *de iure* low interest rates which were part of the post world war consensus, could not have had the desired long run effect as long as the de facto power relationships had remained the same – something prophecized by Kalecki already back in 1943, in his paper on the Political Aspects of Full Employment.

One of the more well known disputes in history of economic thought is that between Malthus and Ricardo concerning Corn Laws, where at the heart of the matter was again the question of income distribution and rents. While it is fashionable to discard much of Ricardo's theory due to its adherence to Say's law, he was nevertheless generally in the right with regard to the issue of rents in his debates with Malthus. The sheer fact that income created is also consumed does not, to my mind, imply that everything is alright in the world, for if an investment banker (or a landlord back in nineteenth century Britain) is frivolous with his money, that still doesn't solve the question of where he got this money in the first place. So rentiers cannot be portrayed as some sort of agents of Say's law, making sure that supply finds its demand. In fact, as Ricardo was able to show, their consumption is financed at the expense of the profit rate (Panico, 1988, p. 15). It was due to these reasons that he went against Malthus' reasoning and wanted to import cheaper corn from abroad, because by doing so this would, *ceteris paribus*, allow the British economy to operate at a higher profit rate, thereby also increasing the rate of capital accumulation.

The problem is that the rentiers' income rests in having the monopoly power over a crucial production factor, land in Ricardo's model and money capital in the model which will be presented in this paper. From the vantage point of the community as a whole (or a nation if we were to borrow from Smith), both land and money capital are merely means to an end.

This however is not true for landlords, financial capitalists and rentiers in general; to them these means also represent the end, because it is control over these means of production that provides them with a generous source of income. However, they need to use a large proportion of that income to maintain their monopoly power, hence the necessity for high rents. This is by no means a purely hypothetical scenario; even as the capitalist relations of production started to assert themselves in the seventeenth and eighteenth century, the weight of high interest rates imposed by 'usurers' was still much felt (Panico, 1988, p. 52). Or as Marx (1972, p. 539) had put it: 'In those times it was the rate of interest which regulated the rate of profit. If the money-lender charged a high rate of interest to the merchant, the merchant must have charged a higher rate of profit on his goods.' However, the emerging dominant social force, merchants and industrial capitalists, were very much in favour of state intervention to bring the rate of interest down (Marx, 1972, p. 456) which led to state-enforced reductions of the interes trate in the two earliest merchant and industrial capitalist powers, the Netherlands and England (Panico, 1988, p. 52). The fact that international finance presently wields such power does not bode well for the global economy. We find ourselves in a rentier-led global economy which leads to lower profit rates of enterprise and *ipso facto* a slower accumulation of capital – since marginal efficiency of capital has to be higher than would otherwise be neccessary. This state of affairs leads to lower growth rates and high global unemployment. With the fast growing population in the third world acting as a reserve 'on tap' army of labour (Patnaik, 2009, p. xvi), the first half of the twenty-first century is looking very gloomy for the majority of people inhabiting our fair blue planet.

3. Alternative views on capital and the character of the interest rate

Issues and diverging opinions concerning the interest rate are not something new in the field of economics and todays most commonly held views – namely that an increase in economic activity leads to an increase in the real capital stock which then brings down the interest rate – can be traced back to the likes of David Hume (Screpanti & Zamagni, 1993, p. 52). Likewise a theoretical portrayal of the interest rate as being essentially a monetary phenomenon, determined outside the sphere of production and independent of any 'real' variables, has a rich tradition as well. The purpose of this paper is not to reignite the Cambridge Capital Controversy even though the two opposing theoretical views on interest formation bring with them two different theories of distribution as well. In a world of heterogenous capital goods one is actually left arguing in circles, since the quantity of capital stock is said to determine the interest rate, yet one needs to know the interest rate in order to determine the value of the capital stock. From very early on, this was noted by Sraffa (2003): 'One can only wonder what is the good of a quantity of capital or a period of production which, since it depends on the rate of interest, cannot be used for its traditional purpose, which is to determine the rate of interest.'

Being able to quantify a production factor therefore becomes crucial in the marginalist framework, where relative quantity determines remuneration of that factor. Should capital aggregation be deemed logically untenable, the same would then be true for the universal version of marginalist analysis, based on the Ricardian theory of rent. Of course as Joan Robinson (Robinson, 1975, p. vi) pointed out, the capital controversy dispute was never so much about the measurement of capital as it was about the meaning of capital. Pondering on this meaning we could perhaps be allowed to borrow from Jevons (Keynes, 1964, p.

75), who says, 'not that a factory, or dock, or railway, or ship is capital, but that it represents so much capital sunk in the enterprise. Accordingly, I would not say that a railway is fixed capital, but that capital is fixed in the railway.' Capital, therefore, was used to employ labour and machinery used to build those docks, ships and railways; capital in that sense is a social relation and not simply a stock.[1] This social relation, however, must somehow manifest itself and it does so in the form of money – a term itself not completely free of confusion as noted by Kaldor (1982, p. 15). The physical stock of goods is merely a result of this social process of production; it is the access to money capital which, once forwarded and employed, is then used, if we may borrow from Sraffa (1963), to produce commodities by means of commodities.

Once we understand this production circuit, it becomes more obvious, that money is itself a production factor and that it enters into production at its very begining (Lavoie, 1992, p. 150). The dynamic flow of commodities in every period is the result of organised production, but those who wish to organise production need access to existing resources (Lavoie, 1984). Therefore, far from being merely a vessel for exchange, money, in form of loans, is the money capital mentioned in the previous paragraph, employed in production of ships, docks and railroads that Jevons is talking about. The granting of loans to producers, creates a new flow of credit money *ex nihilo*, at the stroke of a pen (Lavoie, 1992, p. 153). At this point it should be noted that *ex hypothesi* all the loans granted in the proposed model are used to further advance the capital stock. Veblen (1904), the father of the institutional school, argues for example, that loan extension, whilst it may benefit the individual enterpreneur, is unlikely to have positive effects on the accumulation of capital stock and may in fact just cause asset price inflation. While this is obviously true in practice, asset price inflation is not a phenomenon which will be tackled in this paper, where loans are only granted for physical capital and not titles of ownership. The subject of my inquiry is the money capital interest rate, which represents the price of new investment funds. More precisely what this paper will show is that high, potentially even growth-stiffling interest rates on new investment funds are not a natural consequence of money capital scarcity.

When talking about the attitudes of the Mediaeval Church towards usury, Keynes (1997, p. 184) seems to be implying that exogenous factors – such as norms and legal instruments – play a substantial role in determining the interest rate. Interpreted in this light, mediaeval usury laws hardly seem unreasonable at all, for what they essentially represent is nothing more than a formal lever of power over the interest rate. Reasoning along these lines is obviously in stark contrast with the dominant view, where monetary factors are seen as passing fancies, only determining the short-term fluctuations of the interest rate (Panico, 1988, p. 1), whereas in the long run the monotonic inverse relationship between the quantity of capital and its remuneration (Garegnani, 2003) is believed to remain intact. The alternative to marginalist methodology lies in the Sraffian and post-Keynesian traditions, where the interest rate is treated as exogenous, determined outside the sphere of production (Sraffa, 1963, p. 39). From a strictly methodological standpoint the latter approach is satisfactory and logically sound. However, simply employing the correct methodology is not enough, in and of itself, to find a state of rest; for that we need to look at the structure of a given society, specifically the power relations between different interest groups.

Before we plunge *in medias res* I wish to briefly describe the methodology employed in the next section. I have decided to follow in the footsteps of post-Keynesian tradition, where models are built around 'stylized facts' and where institutions of the real world are taken

into account from the very start of the process, as opposed to being hidden behind veiles of abstract (and arbitrary) functional relationships. More specifically my model is a variation of the ones made by Godley and Lavoie (2012), who have themselves continued the work of Tobin. This approach offers a simple, yet comprehensive stock-flow analysis of the whole economy. While these models are powerful tools that can be used for playing out different scenarios, they are essentially grounded in the short run. Concepts of the short and long run in economics tend to get a bit hazy, so let me try to explain what I mean. In the long term not only are our predictions rendered immune by uncertainty, as was explained by Keynes (1937), but they do not account for social change – or any other discontinuous change that differs greatly from the current state of things, for that matter. When I say that the model is grounded in the short run, what I mean is that it only holds as long as the underlying social conditions don't change (i.e. the class relations stay the same). The latter can change in less than a decade or they can remain stagnant for centuries, which is why using the (well established and commonly used) term 'short run', is more than a fair bit deceptive.

4. The model

The behavioural transaction matrix below this paragraph is there essentially to give the reader an overview of the whole economy. The setting is one of a pure 'laissez-faire' economy, where there is no central bank, no government and all financial needs of producers are met by a private banking sector (Table 1).

Looking at the behavioural matrix above, we see different categories, all of which now need to be defined as dependent variables. This is exactly what I propose to do next, in order to get a complete system of equations that describe our bank-money world economy, made up of two classes and a vertically integrated firm sector. I will explain the notations together with the equations below.

$$C_S = CW_D + CR_D \tag{1}$$

$$I_S = I_D \tag{2}$$

$$\Delta L_S = \Delta L_D \tag{3}$$

$$N_S = N_D \tag{4}$$

Table 1. Behavioural matrix of the economy.

		Firms		Banks	
Workers	Rentiers	Current	Capital	Current	Capital
$-CW_D$	$-CR_D$	$+C_S$ $+I_S$ $[Y]$	$-I_D$		
$+W_S = wN_S$		$-W_D = wN_D$ $-AF_S$ $-r_{L\text{-}1}L_{\text{-}1}$	$+AF_D$	$+r_{L\text{-}1}L_{\text{-}1}$ $-r_{M\text{-}1}M_{\text{-}1}$ $-PB_S$	
	$+r_{M\text{-}1}M_{\text{-}1}$ $+PB_D$				
			$+\Delta L_D$		$-\Delta L_S$ $+\Delta M_S$
	$-\Delta M_R$				

The first four equations basically tell us that scarcity isn't a simptomatic problem in this economy. While neoclassical analysis essentially rests on the assumption of scarcity, post-Keynesians take an altogether different view on the matter, as seen from the first set of equations. Supply of consumer goods, denoted by C_S, investment goods, I_S, and loans, ΔL_S, is able to adapt to whatever the demand for any of those respective categories might be. The same goes for labour, N_S, where an infinite well of unemployed workers is assumed to exist. There exists a silent assumption for the third relation, namely that all the borrowers are deemed credit worthy. The banks therefore are more or less stripped of what is generally supposed to be their main role; telling apart those who are and those who aren't credit worthy (Minsky, 1986, 229). Bear in mind that in a perfect world where all business ventures succeed and all loans are therefore repaid, banks can supply all the loans demanded, because they are created *ex nihilo*, out of thin air, so to speak.

Concerning monetary endogeneity, which is what is described in the paragraph above, it is widely believed that endogenous money is a relatively new phenomenon, a result of modern financial institutions. Without going into further detail, as it would most likely require a whole new paper, let me just say, that for as long as we've had glimpses of modern financial structures, we've had financial innovation, liability management and therefore, monetary endogeneity to some degree. Arestis and Howells (2001) argue that the bill-credit market in the sixteenth century, where we can already speak of a highly developed intra-European circuit of payments with bills of exchange, had already had the characteristics of what is today perceived as 'banking endogeneity', namely the quantity of credit adjusting to the volume of trade. If we can successfully prove that even in a system where money capital (or loans if you will) is abundant, high interest rates can occur, we have a fortiori shown that scarcity can not be the single determinant of high interest rates.

$$PB_D = PB_S \tag{5}$$

$$PB_S = r_{L-1}L_{-1} - r_{M-1}M_{-1} \tag{6}$$

$$AF = \delta K_{-1} \tag{7}$$

$$Y = C_S + I_S \tag{8}$$

Equation (5) states that the bank profits demanded, PB_D, are exactly equal to those supplied, PB_S, because even though we can be sure that bankers (or rentiers in the table above), much like anybody else, have an insatiable appetite for profits and the trappings of wealth, they cannot effectively demand more than there is supplied. Or to put it bluntly, there is no demand for bank profits irrespective of actual realised bank profits. In this sense bankers are not 'masters of their fate'[2], as their fate is inextricably linked to that of firms and their willingness to take new loans for further investments. Bank profits, PB_S, are defined by equation (6) as the difference between the interest received from loans and the interest paid for deposits, with the current profits obviously being the result of past activity. Firms play a very passive role in this model and could be seen as merely vehicles for wages and interest payments on loans. In very simple terms, we could just imagine that the manner in which the dominant class extracts its surplus is through the mechanism of interest rate payments, which then funnel themselves into the income categories of profits and interest payments on deposits.

With commodities being used in production of commodities, it is only understandable, that for each new production cycle, some of those commodities need to be replaced or require maintenance. Relation (7) tries to capture this fact, albeit in a very simplified manner. Amortisation funds, AF, are assumed to be exactly the same (in aggregate) to the amount of equipment that needs to be replaced or requires maintenance; so on average, firms will come up with the necessary funds to cover the wear and tear that is a neccessary byproduct of production. Firms will prove themselves to be more than a worthy foe of thermodynamics.

Finally equation (8) defines national income, Y, as the sum of supplied consumer and investment goods (and services). Note that in this model the sales of the firms are essentially equal to the national income.

$$W_D = Y - r_{L-1}L_{-1} - \delta K_{-1} \tag{9}$$

Wages, as defined in (9), are simply the residual of sales once we deduct from them interest payments and depreciation allowances.

$$YD = W_S + PB_D + r_{M-1}M_{-1} \tag{10}$$

In the equation above we have the definition of disposable income of the whole community, which is made up of wages, bank profits and interest payments on bank deposits from the previous period. A closer look would reveal that deposits found in PB_D and the ones found in equation (10) would cancel each other out and we would be left with only wages and interest on loans. Let us, however, leave the notation the way it is, for now.

$$\Delta M_R = PB_D + r_{M-1}M_{-1} - CR_D \tag{11}$$

$$\Delta L_D = I_D - AF \tag{12}$$

Relation (11), the difference between the disposable income of rentiers – essentially the disposable income of the community minus the wages – and their consumption, constitutes saving; or what comes to the same thing, the change in the stock of money they decide to hold. In reality they could opt for other holdings, but in our model the only way to store wealth is in the form of money.

The change in the stock of loans, as described by (12), essentially depends on net investment undertaken by enterpreneurs. Gross investment is funded from two sources: amortisation funds and new loans. Amortisation funds come out of the firms' own pockets, so to speak, but new net investment has to be financed by loans, therefore making net investment the main driver behind the demand for new loans.

$$\Delta M_S = \Delta L_S \tag{13}$$

$$r_L = \bar{r}_L \tag{14}$$

$$r_M = \bar{r}_l - \varepsilon \tag{15}$$

Equations (13) through (15) give a further description of the banking sector. The first equation basically states that any change in the supply of money depends on the supply of new loans, or to put it in a different way: loans create money and not the other way around. It is worth remembering, however, that loans are not shoved down people's throats; they are demanded. In our model the demand for loans is driven by net investment. Equation (13)

represents a key proposition of monetary endogeneity, namely that credits make deposits (Lavoie, 1992, p. 153).

In absence of any central banking authorities, relations (14) and (15) essentially give bankers the discretionary right to set the interest rate for loans and deposits as they see fit. The deposit rate,r_M, described by equation (15), is in fact implicitly determined by the interest rate on loans, r_L. The greater the difference between these two rates, denoted as ε, the greater the profits of the banks. From a purely technical standpoint this sort of characterisation essentially means that monetary factors guide the rate of interest (Panico, 1988, p. 1), which is itself exogenous and not determined by the rate of profits (i.e. interest on the 'real' stock of capital). Again, while technically the interest rate, $\bar{r}_L$, is fully arbitrary, it does not exist in a vacuum. I believe the characterisation of the problem in this fashion – with exogenous interest rates – is correct, but it does not, by itself, tell us where the state of rest is likely to be.

$$W_S = wN_S \tag{16}$$

$$N_D = Y/pr \tag{17}$$

$$w = W_D/N_D \tag{18}$$

Now we move on to the wage bill which is defined by three equations. The first one is rather obvious and defines the wage bill, W_S, as the product of the wage rate, w, times the level of employment, N_S. Relation (17) tells us the (demanded) level of employment, N_D, and as we can see, it is defined as national income over labour productivity. The latter is defined as being equal to output per unit of labour, or to put it in mainstream terms, the marginal and average products of labour are constant (Godley & Lavoie, 2012). Finally the wage rate, w, is defined by equation (18) in both nominal and real terms, since inflation is not part of our inquiry. This is a rather quaint, yet quite standard, representation of the labour market, which is alright, for our attention primarily lies elsewhere.

$$YD_R = YD - W_S \tag{19}$$

$$CW_D = W_S \tag{20}$$

$$CR_D = \alpha_0 + \alpha_1 YD_R + \alpha_2 M_{R-1} \tag{21}$$

Where $0 < \alpha_1 < 1$ and $0 < \alpha_2 < 1$.

$$C_D = CW_D + CR_D \tag{22}$$

Having previously already defined the disposable income of the community as a whole, we subtract from this sum the wage bill and the disposable income of rentiers, YD_R, is successfully defined by equation (19). Turning our attention to the next relation, we can see that the workers spend (CW_D) what they earn (W_S), a classical proposition that was later on used, among others, by Kalecki (1971) in his models as well. The rentiers consumption function, CR_D, described by equation (21) is rather simple and consists of three parts: autonomous consumption, α_0, consumption out of the current disposable income, $\alpha_1 YD_R$, and consumption out of accumulated wealth, $\alpha_2 M_{R\text{-}1}$. So unlike workers, rentiers need not – and in fact do not – spend all of their income at any given point in time. The sum of

both rentier and worker consumption constitutes the aggregate consumption demand, C_D, captured by relation (22).

$$K = K_{-1} + \left(I_D - DA\right) \tag{23}$$

$$DA = \delta K_{-1} (= AF) \tag{24}$$

Where $0 < \delta < 1$

Capital stock in the current period is defined as capital stock from the previous period plus net investment. Note that, if we were to re-write it a bit, this is exactly the same relation as that of equation (12). New capital expenditures are financed by new loans, but whereas the stock of loans is homogenous, the capital stock is not and therefore not much more can be said about it. Qualitative implications of the capital stock are very important, it represents the development of human society, quantitatively, however, it is a meaningless abstraction. In order for new projects to take place they need to be financed and they are financed by loans, which exist in the form of money. This money represents capital with which capitalists can operate and expand production. For the sake of simplicity equation (24) supposes that depreciation allowances, *DA*, are exactly the same as amortisation funds, *AF*, meaning firms will always set aside enough funds to handle the wear and tear.

$$K^T = \beta Y_{-1} \tag{25}$$

$$I_D = \gamma\left(K^T - K_{-1}\right) + DA \tag{26}$$

$$\Delta M_R = \Delta M_S \tag{27}$$

Investment decisions depend on many different factors, but it is safe to assume, that in the aggregate, results from the previous periods (such as sales, for example) will have some bearing on the future level of investments. With the advancement of loans enterpreneurs are able to acquire the neccessary commodities (i.e. K^T, the target amount of 'capital') needed for producing more commodities. In the aggregate it is understood that all enterpreneurs have various plans to produce commodities and that they're decisions whether or not to invest in new production are somehow related to previous sales, i.e. their future targets depend on past results as capture in equation (25). While this is a very simplistic representation, it captures the connection between past, present and future.

Equation (26) is rather self explanatory. The investment demand function is simply the partial adjustment accelerator model. Net investment adjusts partially to the discrepancy between the targeted stock of capital and the stock from the previous period. Gross investment is the sum of net investment and depreciation allowances (Godley & Lavoie, 2012, p. 227). Not having instantenous adjustment is important, because production takes time.

The final relation, (27), follows from all the others and simply states that the change in the rentiers' money stock is equal to the money supply from the banks. However, as Moore (1997) had pointed out, rentiers – or for that matter anybody else – don't really demand deposits (one needs to work in order to acquire them in the first place!), they are in fact the ones who supply deposits to the banks. The supply of new money originates with new loans and therefore with new investment. Equation (27) is redundant and a truism, because the money for deposits had already been supplied in form of loans.

5. Interest rate state of rest

Solving the system is not too complicated and can be done in a few short steps, some of which will be skipped for clarity of exposition. In equilibrium rentiers spend their disposable income which allows us to rewrite equation (21) in the following manner:

$$YD^* = \alpha_0 + \alpha_1 YD_R^* + \alpha_2 M_R^* + W_S^* \tag{28}$$

Furthermore, were we to make an aggregate balance sheet of the whole economy we would see that the following relation must hold at all times:

$$V_R = M_R = K = L \tag{29}$$

We can immediately make use of this relation, by replacing the money stock with the capital stock in the equation for disposable income above. Additionally, since we are in equilibrium, this implies that actual capital stock has to equal the targeted capital stock. Not only that, but the latter itself is a function of the national income in equilibrium, meaning that $K^* = \beta Y^*$. This gives us the following expression:

$$YD^* = \frac{\alpha_0(1 - \delta\beta)}{\beta(\bar{r}_L - \alpha_1 \bar{r}_L - \alpha_2)} \tag{30}$$

Having the relation for disposable income and once more making use of the relationships between different stocks captured in (29) we get the expression for the equilibrium level of national income:

$$Y^* = \alpha_0 / \beta(\bar{r}_L - \alpha_1 \bar{r}_L - \alpha_2) \tag{31}$$

It becomes immediately obvious that not all parameter values yield reasonable and realistic results. Apart from the obvious fact that beta has to be greater than zero, the following inequality must hold good as well, if our model is said to represent a stable economy:

$$\bar{r}_L > \alpha_2 / (1 - \alpha_1) \tag{32}$$

With everything set up to unravel the structural characteristics of the interest rate and its state of rest, it is worthwile noting, once again, the setting in which this is being done. The resulting interest rate can have nothing to do with uncertainty and volatile expectations, for all goods supplied are also demanded, all loans granted will have eventually been repaid and even the unemployed labourers are quite content, and don't seem to mind waiting for the next job offer to spring up. As economies go, we seem to have come across an institutional wonderland; one with a docile, yet plentiful workforce and a banking sector ran by almost superhuman bankers. If one were to follow conventional wisdom, one would find it very peculiar, indeed almost nigh impossible, I suppose, that this economy could be plagued by high interest rates on money capital. Yet, upon further examination of the inequality above, this is exactly what seems to be the case.

Condition (32) is saying that the interest rate on loans has to be greater than the quotient between the rentiers' propensity to consume out of wealth and their propensity to save. A sufficiently low interest rate would require a similar low propensity to consume out of wealth and a high propensity to save out of current income. A simple numerical example is quite telling. Imagine that the rentiers' consumption out of wealth is rather small, equal

to five percent, and that their propensity to save is equal to thirty percent. Using this, rather conservative example, the interest rate would have to be, $\bar{r}_L > 0,167$, which is to say, upwards of sixteen percent. These rates would not be unheard of before modern capitalism fully took off. In fact Homer and Sylla (2005, p. 29–30) report that annual interest rates in Sumerian city-states were around 20%, similarly interest rates in ancient Assyria in the period around 700 BC were said to have ranged from 25% to 40%. Interest rates ranging above twenty percent per year were not uncommon in Greece, and while the interest rates in the Roman empire eventually declined, they still remained in double digits (Homer & Sylla, 2005, p. 41). Yet in our example, conventional wisdom is seemingly baffled, how can it be that the interest rate on money capital would be so high when its supply is seemingly infinite? How is it that in a world with no exogenous shocks, with all expectations fulfiled, we have double-digit interest rates?

While the interest rate is a monetary phenomenon, and seemingly completely arbitrarily set, this only holds in the pure mechanistic sense; that is to say, as far as theory goes, such a representation is good enough, but it tells us nothing about any specific state of rest in a given economy – for that we need more information. This is not a defficiency of the theory, quite the opposite, it just means that the theory is relatively universal and can be employed in various institutional circumstances. It is exactly these circumstances, that represent the final determinant of the equilibrium state of rest of the money capital interest rate. Our example represents but one in a multitude of institutional posibilities. So whereas, generally speaking, the interest rate is indeed arbitrary and can find the state of rest at any given level – more or less – that is only true before we know the institutional setup; before the structure of society and its power relations have been taken into account. Once we solve the model and get the macroeconomic constraint, we see that in order for the economic system to be stable, there are limits as to where the interest rate can find its state of rest.

Different structure breeds different results irrespective of the fact that people are pretty much the same in any instititutional setup. In a society where rentiers are the dominant social force – a scenario neither unrealistic nor completely unlikely – high interest rates merely mirror the underlying power structure between different classes. Therefore the real reason for high interest rates on loanable money capital is the fact that they represent the income, the bread and butter, of the financial rentier class. The key thing to remember is that interest rates and rentiers' incomes go hand in hand, where the first go, the other follow. One cannot lead a lavish lifestyle without a source of income and should the latter depend (for the whole class, not neccessarily for every single individual) on interest rate payments on loanable money capital, these payments will have to be sufficiently high as shown by condition (32). There is no easy way around this conundrum and interest rates will remain high as long as the underlying macroeconomic structure does not change. We must remember, however, that in reality financial institutions are more complex than the simple bank-money world which is portrayed in this model. In a different, perhaps more modern setting, we can imagine higher dividend payments, share buy-back schemes or mergers and acquisitions of rivals playing a similar role to that of outright high interest rates on loanable money capital. So the story essentially remains the same no matter how complex the system might be – you cannot have rentier consumption without someone paying for it in one way or another.

Almost as an added bonus, for the rentiers at least, the system in question, is quite resilient to change, with high interest rates stifling investment activity and nipping social mobility in the bud. One could, of course, argue that low, or at least lower, interest rates are viable in this economy. The rentiers need only spend (a lot) less, out of both wealth and current income. Technically this is true, but in reality we should not forget that a rentier (imagine, for example, the Medici family) without conspicuous consumption is like a wolf with no teeth. Lavishness for sake of lavishness is only part of the story; refined consumption patterns, while harder to quantify, play just as an important role in keeping the status quo as do the guards and the maids that need to be employed in order for the rentiers' wealth to remain intact. To protect existing wealth, much of the current income needs to be spent. Additionally these expenditures imply a higher interest rate and that itself implies a lower equilibrium level of output, since the level of output is inversely related with the interest rate, as can be seen in relation (31). The social structure is therefore reinforced and kept intact by these large expenditures (military, ceremonial etc.) aimed essentially at nothing else other than keeping the existing social relations intact. It is easy to imagine society falling in a trap of a vicious circle, where ceremonial consumption needs to remain high to keep the interest rates (i.e. rentiers income) high and the interest rates need to be high to keep the ceremonial consumption high with everything aimed at perpetuating the existing institutional matrix. Once the cycle has begun it becomes quite irrelevant which came first, the chicken or the egg.

In this paper we have been able to prove that even in a world with no scarcity where the interest rate is set completely arbitrarily by the banking system, the interest rates in equilibrium might still *have to be* high. Note again that the market system in the model is working perfectly; the markets for goods have all cleared and no economic crises are in sight. While I agree with Keynes (1997, p. 184) notions on interest rate formation being a monetary phenomenon, this only represents the neccessary theoretical pre-condition, but cannot, by itself, yield any clue as to where the interest rate might find its state of rest. Starting at the 'money end' might seem blasphemous from the point of view of neoclassical paradigm, but as Patnaik (2009, p. xi) argues in his book The Value of Money, it is the institution of money which is at the heart of the entire social arrangement in capitalism, so it would make sense to start the analysis with money and not add it as an afterthought, after having dealt with 'real phenomena' first[3]. From the outset the interest rate is, therefore, arbitrary, however, this does not mean, as shown by condition (32), that the end result is also completely arbitrary; macroeconomic realities impose their will and the system, with its power relations in place, dictates the final equilibrium. Using the same methodology around a different set of stylized facts, for example, with additional classes and with workers earning more than just the bare minimum required for reproduction, would yield different results. In other words one would essentially need a different society to get a different result and that is no small feat. It took industrialist and merchant capital a long time to gain the upper hand over landlords and money lenders, both rentiers of some sort. Essentially what this means is, that the parts, in isolation, cannot change the system, by simply moving within the given parameters of the system. So in general only structural shifts would be able to do any good. Those unfortunately take time and since they include re-distribution of power and wealth in society, are seldom very popular amongst the powerful, who are, at least in theory, ideally placed to play either the catalyst of social change or, perhaps more likely, the spoiler.

6. Conclusion

Neoclassical economic analysis posits that there exists a monotonic inverse relationship between the quantity of capital and its rate of remuneration (Garegnani, 2003). The theoretical foundations for this view come from Ricardo's theory of rent on land, with scarcity governing the amount of rents. But whereas Ricardo only connected scarcity with land rents, following Wicksteed, the theory of rent was turned into a general and universal theory of scarcity (Quadrio-Curzio, 2003) where one principle governed the remuneration of all factors. I set out to prove that this universality was ill-founded and that scarcity does not determine remuneration of capital. The idea was to create a setting where production factors, namely labour and capital, were abundant. If in the setting of abundance capital remuneration would still prove to be high, this would constitute an a fortiori argument against the 'monotonic inverse relationship between the quantity of capital and its rate of remuneration'.

Following Godley and Lavoie (2012) I create a stock-flow model of an economy with two classes, rentiers and workers, with a vertically integrated firm sector and a banking sector. Firms' financial needs are wholly met by what can already be considered a modern banking sector, but without a central bank. The quantity of credit in the model adjusts to the volume of commercial activity, so we can speak of banking endogeneity, or the endogenous supply of money. With a complete model in hand all that is left is to solve it, a task left for the appendix. Upon getting a result for the national income in the state of equilibrium, it becomes immediately obvious that not all parameter values yield reasonable and realistic results. What becomes apparent is that interest rates, in spite of an abundance of loanable money capital, need to be high for the economy to function properly. Another striking feature of this result is that it comes from a post-Keynesian setting of monetary endogeneity where the interest rates are exogenous and can be set arbitrarily by the banks. Yet even in this setting the underlying macroeconomic realities cannot be neglected and interest rates have to be comparatively high if the economy is to operate normally. The paper provides a meaningful counter-example, in a realistic institutional setting, to the claim that scarcity alone governs capital remuneration.

Finally the paper gives an alternative explanation for high interest rates; in a society where rentiers are the dominant social force – a scenario neither unrealistic nor completely unlikely – high interest rates merely mirror the underlying power structure between different classes. Therefore the real reason for high interest rates on loanable money capital is the fact that they represent the income, the bread and butter, of the financial rentier class. The key thing to remember is that interest rates and rentiers' incomes go hand in hand, where the first goes, the other follows. One cannot lead a lavish lifestyle without a source of income and should the latter constitute (for the whole class, not neccessarily for every single individual) of interest rate payments on loanable money capital, these payments will have to be sufficiently high. There is no easy way around this conundrum and interest rates will remain high as long as the underlying structure of the society does not change. What is more, a large amount of rent income – be it in form of interest rate payments on money capital or in some other form – is likely to be spent in order to preserve existing social relationships and wealth, which means that expecting rentier expenditures to drop (with both their incomes and the interest rates following *pari passu*) on their own, is not realistic. Again, however, it is worth noting that social structure represents not only a state, but a process as well and that models are only capable of describing the former, but not the latter.

Notes

1. Although what society is left with once capital has successfully been employed, is a stock of goods, so it is not surprising that this real, physical stock is what most people understand under the term capital.
2. This is something that Kalecki (1971, p. 13) has famously stated is true for capitalists, who as a class earn what they spend, which makes them, collectively at least, 'masters of their fate'.
3. Obviously the main problem with this approach is that money doesn't play the role of loanable money capital in which case it is understandable why it is seen as 'neutral'. Once we realise that it influences 'real' production, such methodology becomes logically untenable (although empirically quite defensible).

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