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Inequality, household debt, ageing and bubbles: A model of demand-side Secular Stagnation

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Inequality, household debt, ageing and bubbles: A model of demand-side Secular Stagnation

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Abstract

The mainstream concept of Secular Stagnation provides a comprehensive theoretical picture to explain sluggish economic growth and engenders a renewed role for fiscal policy. For these reasons, it should be praised. Given the difficulties entailed by the theoretical framework in which the theory is located, this paper offers a perspective on US stagnation that is grounded in some of the same foundational elements of the mainstream attempt (inequality, sluggish population growth and ageing, household debt, housing bubble) but relies on a model in which growth is driven by the autonomous components of aggregate demand. Stagnation is the result of the failure to move from a household debt-plus-bubble-led model to a model led by public expenditure. In the course of the analysis, a new treatment of ageing is offered.

Keywords: Secular Stagnation, natural rate of interest, fiscal policy, aggregate demand, supermultiplier
JEL Codes: E31, E40, E52, E58

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1. Introduction

Economic stagnation has been characterising advanced capitalism for some years, and the outbreak of the Covid-19 pandemic threatens to reinforce this worrisome never-ending trend. This fact led on the one hand to a renewed interest in the role of the so-called hysteresis effects of recessions on potential output (Fatàs and Summers 2018; Fatàs 2019) and on the other hand, to revive the theory of Secular Stagnation (Summers 2014, 2015, 2016, 2018). The way was paved for a forceful repurposing of fiscal policy as a main stabilisation tool (Blanchard and Summers 2018; Furman and Summers 2019) and for the discussion of negative interest policy (Di Bucchianico 2020c). The demand-side Secular Stagnation literature offers an original explanation for lasting stagnation based on several key trends in US capitalism such as the rise of inequality, population ageing, ballooning household debt and the role of financial bubbles (Summers 2014; Eggertsson *et al*. 2019).[1] Yet, its reliance on a natural rate of interest hinders the entire theoretical apparatus (Bertocco and Kalajzić 2018; Hein 2016; Lavoie and Seccareccia 2016; Palley 2019c), and the supposition for it to be negative is unwarranted (Di Bucchianico 2020a, 2020b).

The paper aims to offer three contributions. First, to reposition Summers's analysis in a demand-led context so as to free his theory from neoclassical constraints. Second, to move forward the study of Secular Stagnation in a supermultiplier framework (Serrano *et al*. 2020), something that adds to the extant non-mainstream literature on the topic (Hein 2019a, 2019b, 2020a; Skott 2016; Petach and Tavani 2020). Third, to expand the analysis of Allain (2019) and introduce the role of population growth in the analysis of stagnation. The analytical strategy we chose to employ, namely the supermultiplier growth model, is increasingly gaining ground among the heterodox growth models (Allain 2015, 2019; Deleidi and Mazzucato 2019, 2021; Dutt 2019; Girardi and Pariboni 2020; Haluska, Braga and Summa 2021; Haluska, Serrano and Summa 2021; Hein 2018; Hein and Woodgate 2021; Lavoie 2016; Palley 2019b), although it of course also attracts criticisms (Palumbo and Trezzini 2003; Nikiforos 2018; Skott 2019). We will therefore try to build a supermultiplier model (Serrano 1995; Freitas and Serrano 2015) in which the salient factors stressed by Summers, namely inequality, private debt, ageing and bubbles, play a role. In doing so, we will rely on issues already established (i.e. the role of emulative consumption and household debt as in Kapeller and Schutz 2015; Pariboni 2016, 2017) but also original strategies that have seldom been explored (i.e. the novel formalization of ageing we set forth, inspired by Allain 2019). This, according to us, allows to preserve the insights to be found in the demand-side Secular Stagnation Theory, getting rid of the unhelpful (negative) natural rate of interest and highlighting even more the role of aggregate demand in determining long-run economic trends. Stansbury and Summers (2019) have recently acknowledged that this might be the road to bring the analysis forward. This

[1] We specify the demand-side nature of this explanation because in the literature on Secular Stagnation there is also a supply-side version (Gordon 2015), whose discussion lies outside the scope of this paper.

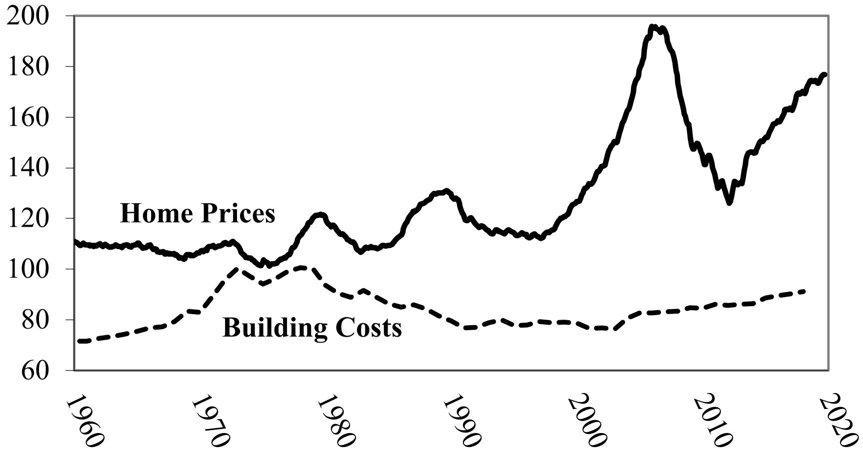
paper is also meant as further stimulus to pursue such a line of research, that can lead to an acknowledgement that "stagnation is no inescapable fate, but that it is, to a large degree, the result of 'stagnation policies'" (Hein 2020a, p. 15; Hein 2016), as also claimed by Stiglitz (2018).

The paper is structured as follows: section 2 reviews the most important patterns introduced by Summers (2014, 2015, 2016, 2018) and Eggertsson *et al*. (2019) in their explanations of Secular Stagnation and how they are treated; section 3 develops an alternative supermultiplier model in which the trends of inequality, household debt, ageing and a housing bubble allow a better explanation of stagnation; section 4 discusses the main insights to be taken from the model; section 5 concludes.

2. Empirical trends and the mainstream demand-side Secular Stagnation Theory

Summers (2014, p. 67) expressed concerns about the possibility for the US to achieve concomitantly satisfactory growth, low unemployment and financial stability: "[o]ne is left to wonder how satisfactory would the recovery have been in terms of growth and in terms of achievement of the economy's potential with a different policy environment, in the absence of a housing bubble, and with the maintenance of strong credit standards." Actually, the US had just some years before witnessed a dramatic boom and bust of a housing bubble (Fig. 1).

Figure 1 - Home price and building costs, US (1960-2019).

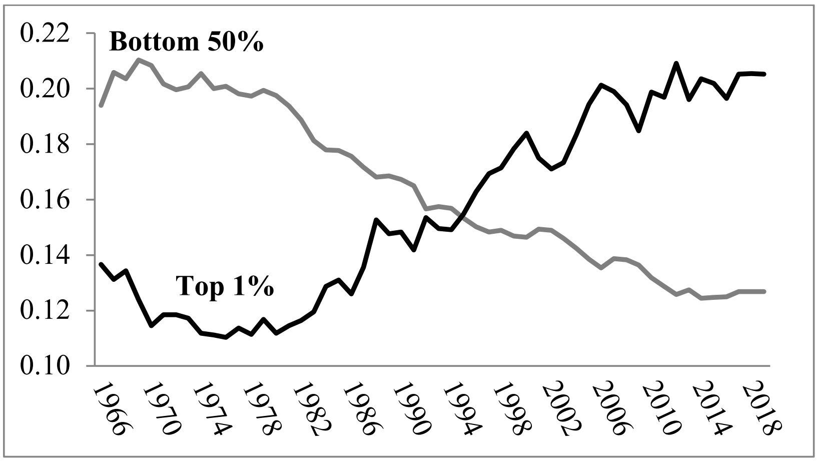


Source: R. J. Shiller online database.

Since the 1980s the US economy has witnessed recurrent financial bubbles, with housing being a sector particularly prone to them (Walther 2019). House price-mortgage spirals became detached from the 'real' dynamics of home construction (Fig. 1). This can be explained with the rise of financialisation, fostering the use of housing as an asset (Kohl 2020), a pattern that tends to reinforce the adverse aftermath of a stock-market bust and to amplify business cycle fluctuations (Mian and Sufi 2018).

If the US were bound to rely on financial bubbles in order to get close to full potential, this was due to a structural imbalance between saving and investment (Rachel and Summers 2019), whose outcome was a continuous downward pattern for the natural rate of interest. Summers (2014, pp. 69-71; 2018, pp. 234-238) listed a series of elements creating an excess of saving over investment even at a zero rate of interest. Among those we find the rise of inequality (Piketty 2014), which fosters the increased supply of saving given that subjects belonging to the richest classes usually features a higher marginal propensity to save with respect to workers (Fig. 2).

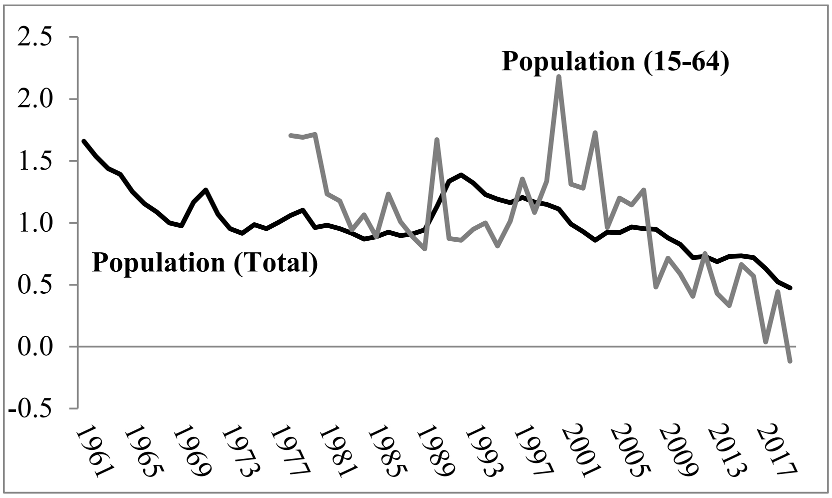
Figure 2 - Top 1% and Bottom 50% income shares, US (1966-2018).



Source: World Inequality Database.

Another element is plummeting population growth (Fig. 3), which goes hand in hand with population ageing. This issue is peculiarly important also in the 'supply-side' explanations *à la* Gordon (2015), given its adverse impact on potential output growth. In the schema of Summers it can both curb the demand for investment meant to furnish equipment to workers and call for higher savings for retirement in response to population ageing.

Figure 3 - Total population and working age population percentage changes, US (1961-2019).



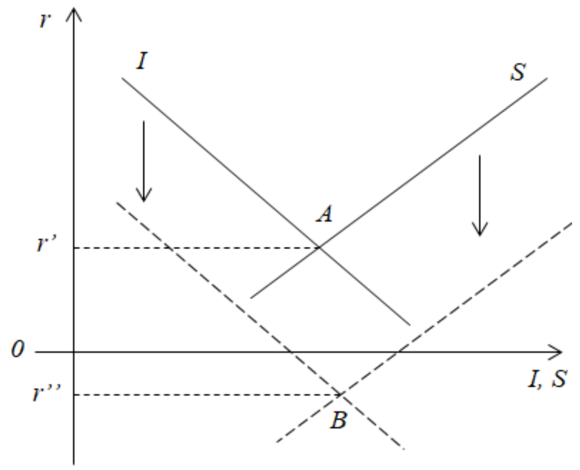
Source: Federal Reserve Economic Data.

An additional element is the fact that major firms such as Facebook, WhatsApp, etc. do not need big amounts of physical capital compared to the past, when Fordist companies created a strong demand for capital.[2] Even though we will leave this element aside, alternative ways of introducing intangible assets beyond physical capital in the explanation of crisis episodes are available (Pagano and Rossi 2009).

In Summers's (2015, 2016, 2018) Wicksellian framework the downward pressure imparted by these elements to a natural rate of interest determined by 'real' forces brings the latter into the negative territory (Bertocco and Kalajzić 2018; Fig. 4). Therefore, "if the IS curve tracing out combinations of output and real interest rates shifted left and down for structural reasons, observers would see that the real interest rate consistent with full employment was lower and that it was at least possible […] that full employment would be unattainable with positive nominal interest rates" (Summers 2018, p. 231).

[2] In connection with this element, also the falling relative price of investment goods in relation to consumption goods contributes to weaken the demand for investment.

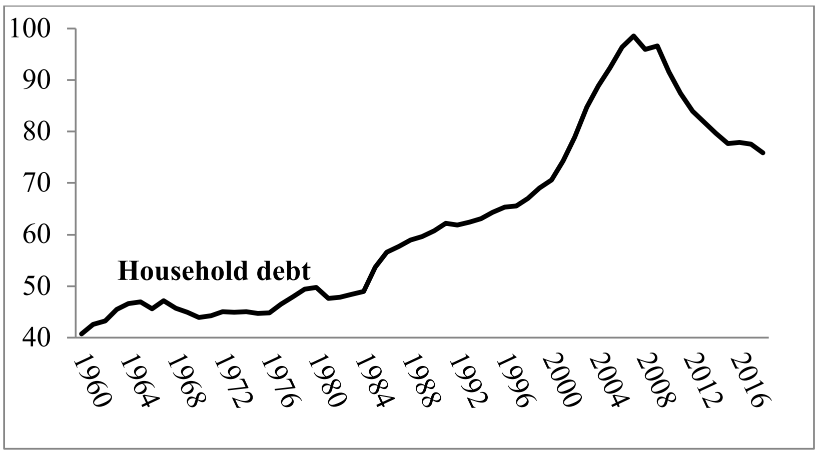
Figure 4 - The natural rate of interest (A) that turns negative (B) given low demand for investment and high supply of saving.



Source: author's elaboration.

When monetary policy is ineffective due to the zero lower bound, the best way to address stagnation is to resort to a deficit-spending policy fostering public investment, and a general rethinking of economic and fiscal policy rules is desirable (Blanchard and Summers 2018; Furman and Summers 2019). In this line of research, the three-generation OLG model by Eggertsson *et al*. (2019) sticks out as the most advanced contribution. To the empirical trends already mentioned, the authors also add deleveraging due to unsustainable household debt (as in Eggertsson and Krugman 2012; Fig. 5).

Figure 5 – Household debt (% of GDP), US (1960-2018).



Source: Global Debt Database, International Monetary Fund.

In their model, the interest rate emerges in an endowment economy in which the young cohort does not receive endowments, so they must borrow from the middle-aged subject to an exogenous debt limit. The middle-aged, in turn, lend to them through the issuance of bonds, and they will spend all their incomes (endowments plus interests) when old. The natural rate of interest r_t, determined in the saving-investment market, depends on the discount factor of the representative agent β, population growth g_t, the amounts of exogenous endowments to the middle-aged Y_t^m and old Y_{t+1}^o, and the debt limit D_t, D_{t-1}:

$$1 + r_t = \frac{1+\beta}{\beta} \frac{(1+g_t)D_t}{Y_t^m - D_{t-1}} + \frac{1}{\beta} \frac{Y_{t+1}^o}{Y_t^m - D_{t-1}} \tag{1}$$

Given a debt limit, its collapse forces a saving demand reduction, thereby contributing to Summers' list of elements depressing the natural rate of interest. However, fiscal policy can boost the demand of saving via deficit spending (also encouraged by the high value of the fiscal multiplier at the zero lower bound) and bring the natural real interest rate back into the positive region. Hence, the best way to cancel off the secular stagnation equilibrium is permanently augmenting the stock of public debt (Eggertsson *et al*. 2019, pp. 28-30).

Overall, the general framework provided by Summers (2014, 2015) and Eggertsson *et al*. (2019) is based on very relevant empirical trends and offers important policy prescriptions in favour of fiscal policy. However, what is questionable is the logic leading from the premises to the conclusions. Among other post-Keynesians, Bertocco and Kalajzić (2018) maintain that in a modern monetary economy a natural rate of interest cannot be defined. This is pointed out also by Hein (2016, 2020) who, in addition, contends that such an analytical choice is bound to incur in the logical problems highlighted during the Cambridge capital controversies. Additional difficulties arise when considering that the natural rate of interest cannot turn persistently negative in an economy with capital (Serrano *et al.* 2020). Di Bucchianico (2020b) shows that this issue affects all the several strategies in which the Secular Stagnation Theory has been set forward (IS-LM, Ramsey, OLG). Other 'internal' criticisms can be found in Bernanke (2015), Pagano and Sbracia (2014), von Weizsäcker (2020).[3]

Second, the mainstream narrative does not accurately determine the environment in which stagnation emerges, nor the role to attribute to the relevant factors it highlights. One example is the crucial assumption in Eggertsson, Mehrotra and Robbins's (2017, p. A.5) model according to which youngsters do not receive endowments (or, later, they cannot access the labour market): "[i]f all generations receive the same endowment […], then it is easy to see that there is no incentive to borrow or lend, and, accordingly, the real interest rate is equal to the inverse of the discount factor $1 + r_t = \beta^{-1}$. It is thus inequality of income across generations that is responsible for our results and triggers

[3] The problems connected with the use of a natural rate of interest are also felt when discussing negative interest rate policy (NIRP) effectiveness (Di Bucchianico 2020a, 2020c; Palley 2019b).

possibly negative real interest rates." Hence, the presence of unemployment is not a result of the analysis but rather a starting point needed to get a negative natural rate of interest. Causation is inverted: in fact, young people need credit to cope with a slack labour market resulting from a financialised socio-economic environment prone to stagnation (Hein 2019a, 2020a). Another instance of this inverted causation can be seen in the misinterpretation of the role of public expenditure. On the one hand, fiscal policy serves primarily to reduce an alleged oversupply of saving and raise the natural rate of interest: "[a]n expansionary fiscal policy can reduce national savings, raise neutral real interest rates, and stimulate growth" (Summers 2016, p. 7; see also Eggertsson *et al*. 2019, p. 3).[4] On the other hand, the role for public expenditure in determining long-run growth is not emphasised. Thus, the longer-run perspective of stagnation policy in which the last years can be put is concealed (Hein 2016; Stiglitz 2018): "If the 'new normal' hypothesis is incorrect, then those very policies [higher inflation target, persistent increases in the debt-to-GDP-ratio, more generous pay-as-you-go Social Security] that are desirable in order to eliminate secular stagnation are likely to be as counterproductive and costly as existing economic theory suggests" (Eggertsson *et al*. 2019, p. 44). Accordingly, in what follows we will get rid of this general theoretical apparatus in order to preserve what should be welcomed (the strong policy take in favour of deficit-spending) and to avoid the logical problems that arise due to the use of a (negative) natural rate of interest.

3. A model of stagnation for the US

The Sraffian supermultiplier modelling strategy is enjoying a remarkable deal of theoretical discussion (Allain 2015, 2019; Deleidi and Mazzucato 2019, 2021; Lavoie 2016; Hein 2018; Fiebiger and Lavoie 2019; Palley 2019a, 2019b) and empirical analysis (Girardi and Pariboni 2016, 2020; Girardi *et al*. 2020; Haluska, Braga and Summa 2021; Haluska, Serrano and Summa 2021; Pérez-Montiel and Erbina 2020). In this section we shall try to transplant into that model (Serrano 1995; Cesaratto *et al*. 2003) Summers's insights on inequality, household borrowing, a housing bubble, slow population growth and ageing. Our closest inspiration is the work of Serrano *et al*. (2020).

Grounding in Freitas and Serrano (2015), Serrano and Freitas (2017), we start from a closed economy with a government sector. For simplicity we abstract from technical progress and suppose constant returns to scale. There is one fixed-coefficients technique and only one product is produced combining homogeneous labour with homogeneous fixed capital. Natural resources and labour are overabundant; income

[4] However, within this framework the possibility to resort to deficit-spending policy is also recalled by the more pragmatic comparison between historical trends of the growth rate against the interest rate (Blanchard 2019).

distribution is fixed exogenously. All variables are expressed in real terms. Accordingly, full capacity output Y_{Kt} depends on the capital-to-capacity-output ratio v and the capital stock K_t as in (2):

$$Y_{Kt} = \frac{1}{v} K_t \tag{2}$$

Capital accumulation g_{Kt}, driving the expansion of capacity output, is defined in (3) as a function of the investment share I_t/Y_t, the rate of capacity utilization u_t, the given v, and the exogenous depreciation rate δ. In (4), the rate of capacity utilization changes subject to the discrepancy between output growth g_t and capital accumulation.

$$g_{Kt} = \left(\frac{I_t/Y_t}{v}\right) u_t - \delta \tag{3}$$

$$\dot{u} = u_t(g_t - g_{Kt}) \tag{4}$$

$$I_t = h_t Y_t \tag{5}$$

$$\dot{h} = h_t \gamma (u_t - u_n) \tag{6}$$

Investment, in (5), is treated as fully endogenous and serves to equip firms, having a marginal propensity to invest h_t, with the amount of capacity needed to produce at a normal level of utilization u^n. The marginal propensity to invest is liable to change, according to a flexible accelerator as in (6) and with a responsiveness given by $\gamma > 0$, when the actual rate of capacity utilisation persistently deviates from its normal level.

We can now turn to building the block constituted by consumption. We start by describing workers' consumption. Following Setterfield and Kim (2016, 2017), workers react to discrepancies between a target level of consumption C_t^* and the actual consumption level C_t^w (with ϑ positive reaction parameter) by raising borrowing B^w:[5]

$$\dot{B}_t^w = \vartheta(C_t^* - C_t^w), \qquad \vartheta > 0 \tag{7}$$

$$C_t^* = \rho^w[\rho C_t^m + (1-\rho) C_t^c], \qquad \rho^w > 0 \tag{8}$$

The target level of consumption is formed by looking at the weighted consumption of capitalists and managers (the latter possessing a higher weight given their social proximity to workers, see Kapeller and Schutz 2015) and responding with a coefficient ρ^w. Workers' consumption is expressed as the product of their number N^w times per

[5] Why workers experienced a marked slowdown of real wage growth, which would obviously be preferred to debt, is analysed among others by Stirati and Paternesi Meloni (2018, 2021).

capita consumption. This formalisation allows us to shed light also on the role of population dynamics (Allain 2019), as we will discuss later (cf. Sec. 4).

$$C_t^w = N^w \cdot \{c_w[w(1 - t_t^w) - (i + \phi) \cdot d_{t-1}^w] + b_t^w\}; \;\; WS = \frac{w \cdot N^w}{Y_t} \tag{9}$$

They consume, with a marginal propensity c_w, the disposable income given by the real wage w (minus taxes with a marginal rate t^w) to which the interest rate i and the debt-repayment rate ϕ applied to the extant amount of debt d^w are subtracted. To this amount of consumption, workers add the additional credit b^w they are granted.[6] Later, we will also introduce the fact that some workers can default on part on their debts. The wage share WS is obviously calculated as the representative real wage w times the number of workers N^w over total income Y_t.

$$C_t^m = c_m[MS(1 - t_t^m)Y_t]; \;\; MS = \frac{w_m \cdot N_m}{Y_t} \tag{10}$$

Managers consume out of their skilled-labour wage w_m net of taxes levied with a marginal rate t^m. They may also wish to borrow to finance additional consumption; this is permitted by revaluation of the stock option portion of managers' remunerations, serving as collateral for further borrowing. Given its secondary role for our scope, we keep things simpler by not considering such a component. Capitalists are supposed to follow a different consumption behaviour according to which they consume profits net of taxes levied at the marginal rate t^c, plus the interest rate i applied to workers' debt D_t^w and the interest rate i_d applied to public debt D_t.

$$C_t^c = c_c[PS(1 - t_t^c)Y_t + i \cdot D_t^w + i_d \cdot D_t]; \qquad PS = \frac{\Pi}{Y_t} \tag{11}$$

To the three-class repartition we also add the consumption of old retired people (to tackle the issue of ageing), and of the unemployed. Allain (2019) introduces the element of autonomous consumption driven by the subsistence expenditure of unemployed workers to highlight the role of household consumption in tight connection to demography. Such a strategy constitutes the main inspiration for our attempt to model the impact of ageing. In addition, following Allain's lead (2019, p. 95), we add to the unemployment insurance scheme he uses in his paper also a pension financing scheme, so as to integrate autonomous consumption of the unemployed with autonomous consumption of the elder.

$$C_t^o = N^o \cdot c_o \cdot tr_t \tag{12}$$

[6] Lower case letters are used to describe per capita terms; upper case letters describe the same terms, but at an aggregate level.

The consumption of old retired people C_t^o is given by N^o the number of members of that age cohort times their marginal propensity to consume c_o times retirement income in the form a public transfer tr_t. Similarly, unemployed consume the transfer they get as subsidy:

$$C_t^{un} = N^{un} \cdot c_{un} \cdot tr_t \tag{13}$$

As we will see later, the relative number of workers N^w and unemployed N^{un} is endogenous to output expansion. At last, government has a budget balance BB (14) in which we find the sum of public spending G_t, taxes T_t, transfers Tr_t, and interests on accumulated public debt $i \cdot D_t$:

$$BB = G_t - T_t + Tr_t + i \cdot D_t \tag{14}$$

It is now possible to put together all the elements hitherto discussed for the sake of deriving the full aggregate demand equation, that turns out to be:

$$Y_t = C_t^w + C_t^m + C_t^c + C_t^o + C_t^{un} + G_t + h_t Y_t \tag{15}$$

And thus, by gathering all the elements of autonomous expenditure together in Z_t, isolating the equilibrium level of income Y_t^*, and considering an adjusted position in which the expected rate of growth of the autonomous components of demand is sufficiently persistent so that $g^e = g^Z$, we obtain:

$$Y_t^* = \frac{Z_t}{s - h_t}$$

$$Z_t = C_t^{aw} + C_t^{ac} + C_t^{ao} + C_t^{aun} + G_t$$

$$s = 1 - c_w \cdot WS(1 - t_t^w) - c_m \cdot MS(1 - t_t^m) - c_c \cdot PS(1 - t_t^c) \tag{16}$$

$$g^e = g^Z = \sum_{t=0}^{m} \beta^t g_t$$

In (16) we have in the first equation the equilibrium level of income given by the supermultiplier, in the second the sum of the autonomous components of demand, in the third the marginal propensity to save of the economy s, in the forth the formation of expectations over the pace of aggregate demand expansion that follows a process such that observations up to *m* periods backwards matter (although with a decreasing weight due to $\beta < 1$). To ensure stability, the denominator of the supermultiplier must be lower than one.

Moving to the dynamically growing version of the model, we get:

$$g_t = g^Z + \frac{h_t \gamma (u_t - u_n)}{s - h_t} \tag{17}$$

In which output grows over time at a pace g_t given by the sum of autonomous demand growth g^Z and the growth of investment needed to bring capacity utilisation towards its normal value. As Serrano and Freitas (2017, p. 75) explain, "when actual and normal degrees of capacity utilization are different, the rate of growth of output and demand is determined by the rate of expansion of autonomous consumption plus the rate of change of the supermultiplier". Given that the economy is supposed to grow at a pace g^Z set by autonomous demand, and that autonomous demand in the second equation of (16) is composed by several elements, we must isolate those who actually set the growth rate. Indeed, Pariboni (2016, pp. 227) points out that "the economy's growth rate slowly converges to the growth rate of the fastest growing autonomous component." This consideration leads Freitas and Christianes (2020, p. 319) to suppose that the autonomous components in their model (public expenditure and capitalist consumption) grow on average at the same rate, so as to avoid the "implausible situation in which the total autonomous demand share of one of the two autonomous expenditures tends towards 100 percent, while its complement tends to zero". We exploit Pariboni's (2016) clue by letting autonomous demand be guided by workers' autonomous consumption so as to mimic what happened in the US prior to the Great Recession (Barba and Pivetti 2009; Shaikh 2016, pp. 729-736). However, we also consider that growing workers' debt feeds on capitalists' consumption via interests (as in Hein and Woodgate 2021):

$$\begin{gathered}
\frac{C_t^{aw}}{Z_t} + \frac{C_t^{ac}}{Z_t} = 1, \qquad \rho + (1 - \rho) = 1 \\
C_t^{aw} = [N^w b_t^w - N^w c_w (i + \phi) \cdot d_{t-1}^w] \\
\frac{b_t^{wMax}}{d_{t-1}^w} = \sigma, \qquad b_t^w = \alpha \cdot b_t^{wMax} \\
C_t^{aw} = N^w \cdot b_t^w \cdot \left[\frac{\alpha\sigma - c_w(i + \phi)}{\alpha\sigma}\right] \rightarrow g^{C^{aw}} = g^{N^w} + g^{b^w}
\end{gathered} \tag{18}$$

The first equation in (18) simply represents autonomous workers' and capitalist consumption as shares $\rho, (1 - \rho)$ of autonomous demand, once in an adjusted position they become the two main components. By isolating the autonomous part of workers' consumption it is possible to get the second equation. In the third row we introduce two exogenous parameters. The first is σ, standing for the maximum ratio between new debt and accumulated debt. It reflects banks' assessment on what is their limit in the concession of new credit, conveying the potential lending supply.[7] The second is α, that simply expresses new debt demanded by workers as a percentage of the maximum attainable, assuming that it will systematically be lower that unity. Therefore, we obtain the new form of workers' autonomous consumption as in the fourth equation. At this point, by taking the logs and deriving with respect to time we have the growth rate of workers' autonomous consumption as the sum of workers' population growth rate g^{N^w} and the growth rate of (per capita) credit-financed consumption g^{b^w}.[8]

We describe aggregate household debt accumulation following the intuition offered by Mason and Jayadev (2015): to use an equation akin to that utilised to describe public debt evolution, adapted to handle private debt accumulation. Private debt evolution through time is governed by equation (19), in which we find on the right-hand side new credit obtained by workers B_t^w, interest payments on accumulated debt $i \cdot D_t^w$, amortisation of accumulated debt $\phi \cdot D_t^w$, and defaults on accumulated debt $\psi \cdot D_t^w$:[9]

$$\dot{D}_t^w = B_t^w + i \cdot D_t^w - \phi \cdot D_t^w - \psi \cdot D_t^w \tag{19}$$

For convenience, we reformulate it dividing through by Y_t so as to work with the household debt-to-GDP ratio d_t^w:

$$\dot{d}_t^w = b_t^w + (i - \phi - \psi - g_t)d_t^w \tag{20}$$

By means of this equation, we analyse two aspects. First, given that household debt accumulation generates also interest payments accruing to capitalists, its growth also drives autonomous consumption of rentiers.

$$\begin{gathered} C_t^{ac} = c_c[i \cdot D_t^w + i_d \cdot D_t] \\ g^Z = g^{C^{aw}} = g^{C^{ac}} \end{gathered} \tag{21}$$

In fact, by applying the same manipulations as in (18), we get that, in the first equation of (21), the growth rate of capitalist autonomous consumption is equal to the growth rate of workers' debt. Provided that workers' new debt B_t^w grows at a rate higher than the rate of interest i, the relation in the second equation in (21) holds: autonomous demand grows at the pace set by workers' autonomous credit financed consumption,

[7] Obviously, given that we fully accept the money endogeneity principle, this supply element is constrained by riskiness and profitability evaluations, not by prior saving; for a deeper analysis, see Deleidi (2020).
[8] The third term disappears as all the element in it are exogenous coefficients who do not feature a properly defined growth rate. The only exception can perhaps be the interest rate; however, its rate of growth would be that of a certain (small) percentage term.
[9] An element present in Mason and Jayadev (2015) that we do not consider is the rate of inflation, which contributes to lower the burden of debt.

and capitalist autonomous consumption adjusts to grow at the same rate.[10] The two elements grow at the same pace in the long run and, and this avoids the need to exogenously impose a condition as in Freitas and Christianes (2020). Second, albeit in a modified form suited to address our specific case, we follow Freitas and Christianes (2020, pp. 321-323) way of analysing stability of this household debt-driven regime by means of system (22).

$$\begin{aligned}
\dot{h} &= h_t\gamma(u_t - u_n) \\
\dot{u} &= u_t\left(g^Z + \frac{h_t\gamma(u_t - u_n)}{s - h_t} - \frac{h_t}{v}u_t + \delta\right) \\
\dot{d}_t^w &= \rho(s - h) + \left(i - \phi - \psi - g^Z - \frac{h_t\gamma(u_t - u_n)}{s - h_t}\right)d_t^w
\end{aligned} \tag{22}$$

The dynamic system (22) is made up of three differential equations in three variables h, u, and d^w. The first equation is (6), the variation of the marginal propensity to invest. The second equation is (4), the variation of the rate of capacity utilisation, in which we substituted (17) in g_t and (3) in g_{Kt}. The third equation is obtained by considering, in (20), b_t^w as a share ρ of autonomous demand multiplied by the inverse of the supermultiplier, and by substituting (17) in g_t. We follow Freitas and Christianes (2020) strategy to solve it: they recall Freitas and Serrano (2015) solution for the first two equations as an autonomous system, and also use them to get the third equation's steady-state fully-adjusted solution and stability condition. From Freitas and Serrano (2015, pp. 263-269), in a steady-state we must have that:

$$u^* = u^n, \qquad h^* = \frac{v}{u^n}(g^Z + \delta), \qquad g^* = g^{K*} = g^Z$$

By introducing them into the last equation of (22) we get (23); then, by setting $\dot{d}_t^w$ equal to zero we can calculate the steady-state value d^{w*}.

$$\dot{d}_t^w = \rho(s - h^*) + (i - \phi - \psi - g^Z)d_t^w \rightarrow d^{w*} = \frac{\rho(s - h^*)}{g^Z + \phi + \psi - i} \tag{23}$$

At last, to check the stability property of the private debt-to-GDP ratio, we impose the derivative of $\dot{d}_t^w$ in (23) with respect to d_t^w to be negative:

[10] If the rate of interest is higher than the growth rate of new workers' debt, then the regime is actually driven by capitalist autonomous consumption, because autonomous demand would grow at the pace set by the growth of that element. Moreover, given that the interest rate on public debt is normally lower than that on private debt, and that public debt accumulation in this debt-led regime is not the prime growth driver, we can momentarily set these elements aside.

$$\frac{\partial \dot{d}_t^w}{\partial d_t^w} = (i - \phi - \psi - g^Z) < 0 \rightarrow \; g^Z + \phi + \psi > i \tag{24}$$

Stability condition (24) thus derived requires the sum of the growth rate of autonomous spending, the amortisation rate, and the default rate to be higher than the rate of interest. The meaning is intuitive: for the household debt-to-GDP ratio not to explode the sum of the elements that either boost output growth or curb debt growth must outweigh the element that determines household debt growth. However, we single out the ambiguous nature of the default rate: contrary to the amortisation rate, it surely contributes to cancel off debt, but at the cost of causing overall macroeconomic instability.

What happens when deregulation (Panico *et al*. 2016) engenders a boost to household debt accumulation, permitting a dramatically fast expansion of subprime debt together with its securitisation? In this case, we suppose that, initially, subprime debt grows faster than prime credit. Although as seen before with 'conventional' household debt this should, in the end, make subprime debt the determinant of long-run growth, we will here only consider the case in which this type of loans take up a sizeable part of total credit. This choice reflects the fact that, as seen also during the unravelling of the US Great Recession, subprime credit rapidly leads to an unsustainable scenario that urgently calls for deleveraging.

$$\begin{aligned} B_t^{wtot} &= \alpha B_t^w + (1-\alpha) B_t^{ws} \\ \phi^{tot} &= \alpha \phi + (1-\alpha)\phi^s \\ \psi^{tot} &= \alpha \psi + (1-\alpha)\psi^s \\ i^{tot} &= \alpha i + (1-\alpha) i^s \end{aligned} \tag{25}$$

In (25) we simply have that all the elements already present in (19) are now the outcome (*tot*) of a weighting in which subprime (*s*) credit comes into play. Accordingly, as new debt accumulates, defaults and interest payments rise while amortisation plunges. Despite the possible boost imparted to the rate of growth of household debt by subprime injections, other forces tend to make the economy unstable. These facts have a neat adverse impact on stability. In (24), on the left-hand side, the collapse of amortisation rates can be algebraically counterbalanced by the rise of defaults, but such a change is detrimental to the economy: debt cancelled by default is a false stabiliser. Moreover, the rising average rate of interest dramatically stifles stability. Therefore, the factors that can steer this growth regime towards an unstable path are: a surge of the average rate of interest on household debt such that $g^Z + \phi^{tot} + \psi^{tot} < i^{tot}$, a state of the economy in which the stability condition is not violated but this is due to a too high default rate ψ^{tot}, or a mixed condition.

A housing sector bubble can be the perfect trigger for such a situation. A period of sustained house price rise can generate wealth effects further reinforcing the possibility for households to start a new cycle of borrowing fostering autonomous demand expansion (Zezza 2008; Caverzasi and Godin 2015; Wildauer and Stockhammer 2018; Cesaratto and Di Bucchianico 2020). Consumers may spend aggressively against skyrocketing house values, leading however to a dramatic spread of personal defaults (Mian and Sufi 2011).[11]

$$\dot{B}_t^{wtot} = \vartheta(C_t^* - C_t^w) + \theta\dot{H}^p$$
$$\dot{H}^p = \varphi\left(H_t^d - H_t^s\right) + \tau\left(\beta\dot{B}_t^{wtot}\right) \tag{26}$$

In the first equation in (26) total household debt now reacts to the emulative effect as in (7) but also to house price H_t^p dynamics with an intensity θ. In the second equation house prices respond with a positive coefficient φ to the difference between housing demand H_t^d and housing supply H_t^s, and with a positive coefficient τ to the portion β of the total new debt related to the housing sector.[12] Once a housing bubble kicks in, the parameter τ can grow in magnitude relative to φ, signalling the surging relevance of housing as an asset rather than a service to enjoy (Kohl 2020). Rapid B^{wtot} growth especially fostered by subprime debt brings about a situation in which it is increasingly likely that banks will start progressively tying up loose ends, asking debtors to secure their positions and hence possibly fostering an even deeper wave of defaults. This opens the phase of forced deleveraging and puts an end to the household debt-driven regime.

Clearly, among the most worrisome consequences of an abrupt halt to autonomous demand expansion there is the adverse impact on the labour market. Palley (2019a, 2019b) formally introduced the latter in the supermultiplier framework, showing that autonomous demand expansion does not lead to an explosive situation: unemployment approaches a well-defined steady-state value.

$$g^u = g^n - g^{em}$$
$$g^u = g^n + \alpha_0 - \alpha_2 u - (1 - \alpha_1)g^K \tag{27}$$
$$u^* = \frac{g^n + \alpha_0 - (1 - \alpha_1)g^Z}{\alpha_2}$$

[11] Another way to frame the issue can be to differentiate between factors conferring a sustained trend to the growth of autonomous demand and factors having a more short-lived effect (Dejuán and Dejuán-Bitriá 2018).

[12] We suppose that only workers use their houses as collateral to get additional credit from banks. Moreover, old and unemployed workers do not buy new houses.

Palley (2019a, 2019b) considers the growth rate of unemployment as the difference between labour force growth g^n and employment growth g^{em} (first equation in (27)). Then, he considers employment growth to be the result of the sum of capital stock accumulation g^K and technological progress in the form of a so-called Kaldor-Hicks function. The latter is formulated as a linear function $g^t = \alpha_0 + \alpha_1 g^K - \alpha_2 u$ that makes the rate of labour-augmenting technical progress g^t a positive function of capital accumulation g^K and a negative function of the unemployment rate u (all α being positive; second equation in (27)). Thus, in the second equation in (27), replacing g^Z into capital accumulation g^K and setting $g^u = 0$ to analyse a steady-state yields the third equation in (27), where steady-state unemployment rate is a positive function of labour force growth and a negative function of autonomous demand growth.

$$u^* = \frac{g^n + \alpha_0 - (1-\alpha_1)(g^{N^w} + g^{b^w})}{\alpha_2} = \frac{\alpha_0 - (1-\alpha_1)g^{b^w}}{\alpha_2} \tag{28}$$

In (28) we note two things. First, given that autonomous growth is driven by growth in the number of workers and per capita workers' debt growth, we have replaced g^Z with the last equation in (18). Second, we set labour force growth equal to zero to account for the halt to which working age population has come in the US. Given that $g^u = g^n - g^{em}$, and that now $g^u = 0,\ g^n = 0$, also employment growth must be zero; hence, the growth rate of per capita workers' debt g^{b^w} becomes in (28) the only driver of unemployment determination.[13] Thus, even though in principle nil labour force growth should tend to favour unemployment reduction, sluggish autonomous demand growth due to forced deleveraging may nonetheless cause its rise. Moreover, unless demand growth kick starts again due to an expansion of other components, unemployment will settle on higher average values.

When household debt accumulation must come to a halt because of financial instability, then its growth cannot be relied upon to steer the economy's expansion. At this point, we can evaluate the other alternatives available among the autonomous components of the second equation in (16). When household debt accumulation abruptly ceases growing, and the government does not promptly boost its expenditure plans, pensions and unemployment benefits can serve as temporary anchors for the economy. The role of both autonomous retirement (12) and autonomous unemployment spending (13) can be evaluated in growth rates:

$$\begin{gathered} g^{C^{ao}} = g^{N^o} + g^p \\ g^{C^{aun}} = g^{N^{un}} + g^{tr} \end{gathered} \tag{29}$$

[13] To keep things simple, we are here omitting the fact that there may be a part of discouraged and inactive population. In this discussion a person does not exit the labour force even when s/he remains unemployed for a long period.

The growth rate of autonomous consumption of retired people is hence given by the growth rate of their cohort g^{N^o} and the growth rate of per capita retirement income g^p. Population ageing can impact growth as an independent factor related to spending via pensions. With regards to unemployment benefits, the collapse of private debt accumulation lets the number of unemployed grow, and this can act as a stabiliser, albeit only temporarily until the steady-state is reached. Although in purely analytical terms these factors may be drivers of growth exactly like the others, a more plausible case is represented by a public expenditure-led growth regime in which the state enters the picture not only via pension and unemployment transfers. Following a conventional motion equation for public debt variation $\dot{D}$, we have to consider the sum of public spending G_t, taxes T_t, transfers Tr_t, and interests minus amortisation on accumulated public debt $i \cdot D_t$:

$$\dot{D} = G_t - T_t + Tr_t + (i - \phi) \cdot D_t \tag{30}$$

The stability conditions for the public sector-led growth are studied by Freitas and Christiansen (2020), Hein and Woodgate (2021): although the second contribution also identifies a ceiling for the growth rate of public spending, they agree in stating a sort of Domar condition according to which the growth rate of public spending must be higher than the interest rate: $g^Z > i$. As seen in the private debt case, once public expenditure grows at the fastest pace, it picks up the role of setting the economy's growth rate, and autonomous capitalist consumption converges to that growth rate as well. However, this time the element that grows hand in hand with deficit-financed expenditure is public debt held by capitalists, which was the other autonomous component in their consumption function (11). In terms of stability, a government that can work in tandem with the central bank can more freely set the growth rate of public expenditure, and can also more easily come to terms with the monetary authority so as to keep the rate of interest low.

4. Discussion

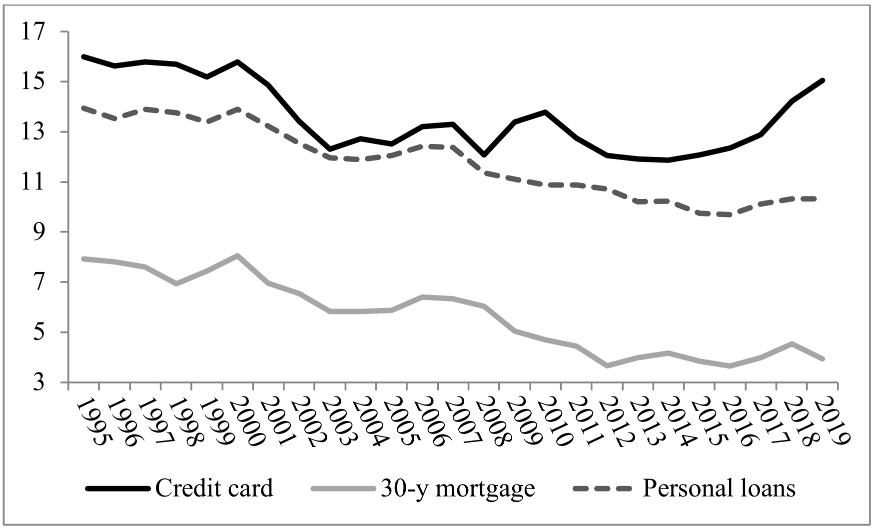
We can now use the elements introduced in the preceding section to compare the insights to be taken from our model with those offered by Summers (2014, 2015, 2016, 2018) and Eggertsson *et al.* (2019). In our attempt, we try to offer a stylised representation of some of the main features of the growth model followed by the US in the decades before the 2009 Great Recession: primarily driven by household debt and sustained by a housing bubble in its last stage, featuring an ageing population and stationary labour force, ending up in need of conspicuous public expenditure to restore growth.

Let us start from inequality and household debt. Our way of modelling different patterns of consumption across social classes according to emulative behaviour *à-la* Veblen-Duesenberry is obviously not a novelty. In the well-known work of Kapeller and Schütz (2015) a rise of the profit share resulting in an unequal effect on the incomes of two categories of workers can generate, albeit only temporarily, a 'consumption-driven profit-led regime', a possibility further confirmed by Setterfield and Kim (2017) and also Pariboni (2017) in a supermultiplier framework.[14] This block constitutes in the model the main engine of long-run growth driven by autonomous credit-financed spending so as to mimic what happened in the US prior to the Great Recession. Clearly, the steadily surging value of both the profit share and the share of wages earned by managers help them to achieve high and rising consumption standards: inequality is a major, albeit indirect, determinant of household debt accumulation via emulation (Barba and Pivetti 2009; Cynamon and Fazzari 2016). In addition to this, the US economy "has become addicted to a pattern of credit cycles, dominated by unsustainable consumption booms during the upswing based on illusionary 'wealth effects' and followed by a painful 'deleveraging' process in the slump" (Walther 2019, p. 381). This became particularly evident during the last, outstanding bubble driven by financialisation of the housing sector (Kohl 2020). Our formalisation of the bubble is inspired by empirical analyses of the high growth rate of mortgages in subprime areas, the same areas that experienced high house price growth.[15] Kim (2020) provides an insightful comparison between post-Keynesian and mainstream works on household debt, (rightfully) praising Mian and Sufi for their empirical contributions on the topic. In fact, as Kim (2020, p. 38) recounts, they have singled out some main facets in the 2001-2007 ballooning household debt rise: the supply of credit explosion due to securitisation benefited subprime borrowers, the fact that rising house prices and falling interest rates were exploited to consume more (thanks to favourable home equity valuations), and that this implied tremendous default rates once the bubble started to burst, constraining the 'credit-driven household demand channel' (Mian and Sufi 2009, 2011, 2018).

[14] See Mandarino, Dos Santos and e Silva (2020) for a fully-fledged stock-flow consistent treatment of the topic that confirms the insights offered by Pariboni (2016, 2017). Panico and Pinto (2018) analyse the adverse impact of private debt growth on the wage share.

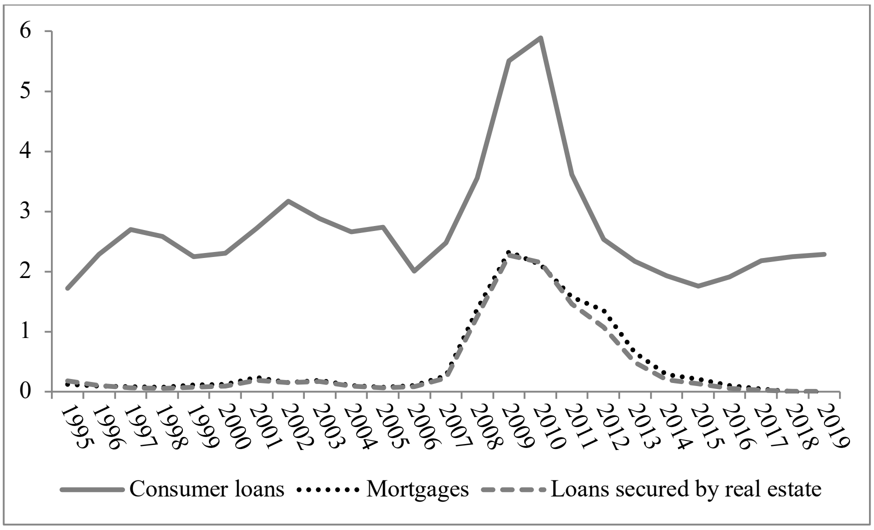
[15] Hence, it allows us to highlight the role of the 'virtual' side of the economy (Sordi and Dávila-Fernández 2020).

Figure 6 - Interest rate (in %) charged on three different types of loans.



Source: Federal Reserve Economic Data.

Figure 7 - Default rates (in %) on different types of loans.



Source: Federal Reserve Economic Data.

In order to check whether our discussion on the stability of this model meets reality, in Fig. 6 and Fig. 7 we can see what a changing composition of private debt can mean in terms of stability condition (24). First, the rising average rate of interest to be paid once subprime credit rapidly expands dramatically stifles stability: on consumer loans and credit card debt the interest rate can be more than double that on a 'traditional' long-term fixed rate mortgage (Fig. 6). Second, debt cancelled by default is a false stabiliser. In the years leading up to the Great Recession, default rates remarkably soared, contributing to the cancellation of debt (Mason and Jayadev 2015), but by this route greatly contributing to spreading financial instability and finally leading to a large-scale deleveraging process that is still ongoing (Lapavitsas and Mendieta-Munoz 2018). In this instance the comparison between our attempt and those available in the mainstream literature is immediate. In the case of Eggertsson and Krugman (2012), Eggertsson *et al*. (2019), sufficiently strong deleveraging can cause (or contribute to cause) the emergence of a negative natural rate of interest, thereby posing issues to monetary policy. In our case, deleveraging subtracts to demand, and stagnation ensues if this gap is not filled by another autonomous component. Summers is right in singling out the relevance of a financial bubble as a factor contributing to postpone stagnation. Nonetheless, the bubble does not momentarily avert stagnation caused by structural imbalances in the saving-investment market. Rather, it boosts autonomous demand growth at the cost of steering the economy away from a sustainable path. Obviously, a regime driven by private debt accumulation is *per se* dangerous, but the boom and bust of a bubble has put the final word on its continuation.

Moving to demographic factors, to tackle sluggish population growth and ageing, we based our analysis on the intuition that, in line with Allain (2019), the more workers there are to feed, shelter and clothe, the more autonomous spending will grow even with a constant amount of per capita autonomous spending.[16] Population enters the model through the growth rate of the labour force and of retired people. Concerning the US case, we have seen at first that total population is rapidly approaching a stationary situation.

$$g^{Pop} = \frac{Births - Deaths}{Population\ size} \tag{31}$$

Therefore, through the simple accounting in (31) we recognise that almost no net effect for growth stems from total population growth. This is the case also when relative cohorts' growth is considered. We refer to a dependency ratio, from which we derive its motion equation:

$$DR = \frac{N^o}{N^w + N^{un}} \rightarrow \dot{DR} = \dot{N}^o - (N^w \dot{+} N^{un}) \tag{32}$$

From (32) we can see that, as obvious, the dependency ratio grows with an ageing society: it follows that the working-age stationary population and ageing combine to give an increasingly important role to retirement income. Indeed, ageing society has been used as a pretext to substitute the pay-as-you-go system with a capital-funded system (Łaski and Walther 2015, p. 153). Pivetti (2004, p. 234-237) pinpoints how the skyrocketing share of elder US citizens who rely on high stock-market quotations to generate a suitable return on their accumulated savings imparts a downward bias on the

[16] Another important example of expenditures linked to population growth is residential housing, that can be a major factor in shaping cyclical and long-term patterns (Fiebiger and Lavoie 2019; Pérez-Montiel and Pariboni 2021).

course of the interest rates, that are policy-controlled (Deleidi and Levrero 2021). This might be inserted into the model by replacing (12):

$$C_t^o = N^{o,payg} \cdot c_o \cdot tr_t + N^{o,cs} \cdot c_o \cdot b_{t-i}^r(i);\ B_{t-i}^r(i) = \frac{E}{i-g};\ \theta = \frac{N^{o,cs}}{N^{o,payg}} \qquad (33)$$

In (33), old people are sorted in two categories: those financed by a transfer tr_t from the government in the form of a pension in a pay-as-you-go system (*payg*), and those financed by previously accumulated savings used to buy (per capita) dividend-yielding equities $b_{t-i}^r(i)$ in a capitalised system (*cs*). For the latter category, given the earnings per share E and the expected nominal earnings growth g, a lower rate of interest i tends to increase the stock price per share $B_{t-i}^r(i)$ (Gordon 1959), thereby assuring a sufficient level of the quotation so as to keep retirement income at least at a subsistence benchmark. The parameter θ conveys the relative number of those who are financed by one system or the other, and its surging magnitude signals the rising weight of financial markets in retirement-financing. This helps to take into account the fact that a higher weight enjoyed by financial markets can engender an environment of progressively lower interest rates to keep it financially sustainable (Borio 2017). Such an environment ought to be studied in its entirety, as the financial sphere rise is a multi-faceted phenomenon (Hein 2019a, 2020a; Wildauer and Stockhammer 2018) and policy decisions on how to finance the pension system are not taken in a vacuum (Palley 1998). In addition to this, stationary labour force means that the relative cohorts of employed and unemployed can change their relative size in terms of shares of total labour force as accumulation goes on, but no positive net contribution to growth stems from this factor. This appears to resurrect Hansen's (1939) concerns about declining population growth that would have caused a fall in investment via accelerator effects (Backhouse and Boianovsky 2016, p. 5). This is an element that our model is well-suited to capture, while avoiding conferring population a role not too far from the traditional Solow-type view (Di Bucchianico 2020a), as often happens in the literature we are dealing with.

At last, a fundamental discussion concerns the weight in total autonomous spending of its different components. Pariboni (2016, pp. 226-228) analyses the destabilising role that autonomous credit-financed borrowing can have in the long run when there are also other autonomous components. If debt-financed consumption grows more rapidly than public spending the ratio of debt/income ratio of borrowers steadily augments, and in our case the further injection of subprime borrowing accelerates the process. These clues can provide a way to rationalise the slowdown of US growth which characterised the aftermath of the Great Recession. First, a sudden drop in household debt followed by a lasting deleveraging process, coupled with the copious public spending needed to counter the enormous hole in aggregate demand, helps steer the economy towards a more sustainable path. This is explained by the share-out-of-total-autonomous-spending element. Second, if the new component of autonomous demand that takes the lead now grows more than the other (subdued) one, it will be responsible for setting the pace of the economy's growth rate. Hence, if this component does not grow enough, despite the beneficial effect due to the increasingly more sustainable path undertaken by the economy, its growth rate will not keep up the pace with its previously established trend. Hein (2020a, p. 8) aptly summarises these trends when stating that after the Great Recession "[h]igh public deficits stabilised the economy and allowed for low but positive growth in the USA and the UK, which moved from a debt-led private demand boom regime towards a domestic demand-led regime stabilised by public sector deficits," provided they respect the stability conditions studied by Freitas and Christiansen (2020), Hein and Woodgate (2021). This reasoning appears to enjoy considerable empirical confirmation. Eichengreen (2015), Blecker (2016), Fair (2018), and Cynamon and Fazzari (2017, p. 21) show that, since 2010, the "government is slowing overall demand growth, and therefore magnifying the post-crisis stagnation of demand."[17] Hence, Summers's take on public spending is well-directed, but it needs to be also extended to the long run. Public expenditure is not needed to absorb excess saving at a zero rate of interest, but to guide long-run growth and impart to it a trend sufficiently strong so as to restore more satisfying growth rates.

5. Conclusions

Economic stagnation has been afflicting advanced economies for more than a decade. The mainstream demand-side Secular Stagnation theory is an important attempt to understand it, but the neoclassical garment in which it is wrapped up makes it difficult to achieve a more radical break-up with conventional wisdom. Therefore, the model herein presented tries to start from the same premises as Summers's proposal, while avoiding the use of saving supply and investment demand schedules to ground the analysis in a (negative) natural rate of interest. Accordingly, the issues of inequality, household debt, ageing and housing bubbles are translated into a model in which the autonomous components of demand drive growth in the long run. When a process of growth based on rising inequality and surging household debt plus a housing bubble come to an abrupt end, as in the US case, the failure to sustain growth through public expenditure generates stagnation issues. Stagnation is thus not the outcome of some 'deep' issues related to structural imbalances in the market for saving, but rather the result of 'stagnation policies' that can be reverted.

[17] This is even more evident in the Eurozone, where full-blown austerity hindered recovery even more severely (Di Bucchianico 2019).

Appendix 1. Social accounting matrices.

Table 1 - Balance sheet matrix

	Workers	Managers	Rentiers	Old	Unem	Firms	Banks	Gov	Sum
Deposits	D_{ep}^{w}	D_{ep}^{m}	D_{ep}^{c}	D_{ep}^{o}	D_{ep}^{un}		$-D_{ep}^{tot}$		0
Loans	$-D^{w}$						D^{w}		0
Equity			E^{c}			$-E^{c}$			0
Capital						K			K
Gov Debt			D					$-D$	0
Houses	$p_h H^w$	$p_h H^m$	$p_h H^c$	$p_h H^o$	$p_h H^{un}$				$p_h H^{tot}$
Net worth	$D_{ep}^{w} - D^{w} + p_h H^w$	$D_{ep}^{m} + p_h H^m$	$D_{ep}^{c} + E^c + D + p_h H^c$	$D_{ep}^{o} + p_h H^o$	$D_{ep}^{un} + p_h H^{un}$	$K - E^c$	$D^w - D_{ep}^{tot}$	$-D$	$K + p_h H^{tot}$

Table 2 - Transaction flow matrix

	Workers	Managers	Renters	Old	Unem	Firms		Banks		Gov	Sum
						Current	Cap	Current	Capital		
Consumption	$-C^w$	$-C^m$	$-C^c$	$-C^o$	$-C^{un}$	$C^{tot}+G$				$-G$	0
Wages	$w(N_f^w+N_b^w)$	$w_m(N_f^m+N_b^m)$				$-(wN_f^w+w_mN_f^m)$		$-(wN_b^w+w_mN_b^m)$			0
Investment						I	$-I$				0
Profits			Π_f+Π_b			$-\Pi_f$		$-\Pi_b$			0
Loan flow	$B^w-(\phi+\psi)D^w$		$-B+\phi D$						$-B^w+(\phi+\psi)D^w$	$B-\phi D$	0
Loan interest	$-iD^w$		i_dD					iD^w		$-i_dD$	0
Deposit flow	$-\Delta D_{ep}^w$	$-\Delta D_{ep}^m$	$-\Delta D_{ep}^c$	$-\Delta D_{ep}^o$	$-\Delta D_{ep}^{un}$				ΔD_{ep}^{tot}		0
Deposit int.	iD_{ep}^w	iD_{ep}^m	iD_{ep}^c	iD_{ep}^o	iD_{ep}^{un}			$-iD_{ep}^{tot}$			0
Taxes	$-T^w$	$-T^m$	$-T^c$							T	0
Transfers				T_r^o	T_r^{un}					$-Tr$	0
Equity issue			$-\Delta E^c$				ΔE^c				0
New houses	$-p_h\Delta H^w$	$-p_h\Delta H^m$	$-p_h\Delta H^c$			$p_h\Delta H^{tot}$					0
Sum	0	0	0	0	0	0	0	0	0	0	

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