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Loanable funds vs. endogenous money: Krugman is wrong, Keen is right

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Abstract

In his recent article, Keen resumes the debate with Krugman about the effects of debt upon the economy. It is hard to see how the question can be settled as long as all participants apply their idiosyncratic models. Hence the issue boils down, as Krugman rightly put it, to the deeper question: "how should one do economics." Sketched with a broad brush, the consensus is that Orthodoxy has failed and that Heterodoxy has no convincing alternative to offer. The conceptual consequence of the present paper is to restart from a firm common formal ground. This relocation makes the debate solvable.

JEL codes B59, E21, G00

Keywords new framework of concepts, structure-centric, axiom set, consumption economy, debt, Profit Law, simulation, market clearing, budget balancing

1. The point at issue

Keen then goes on to assert that lending is, by definition (at least as I understand it), an addition to aggregate demand. I guess I don't get that at all. If I decide to cut back on my spending and stash the funds in a bank, which lends them out to someone else, this doesn't have to represent a net increase in demand. Yes, in some (many) cases lending is associated with higher demand, because resources are being transferred to people with a higher propensity to spend; but Keen seems to be saying something else, and I'm not sure what. I think it has something to do with the notion that creating money = creating demand, but again that isn't right in any model I understand. (Krugman, 2012)

Steven Keen, in his recent article *Secular stagnation and endogenous money* (2014), resumes the debate with Paul Krugman about the effects of household sector debt upon the economy, and upon employment in particular. It is hard to see how the question can be settled as long as all participants in the discussion apply their idiosyncratic models. Hence the issue boils down, as Krugman rightly put it, to the deeper question: "how should one do economics."

Sketched with a broad brush, the consensus is that Orthodoxy has failed on all counts (Ackerman and Nadal, 2004; Quiggin, 2010) and that Heterodoxy has no convincing alternative to offer.

Standard economics rests on behavioral assumptions that are formally expressed as axioms (Debreu, 1959; Arrow and Hahn, 1991; McKenzie, 2008). Axioms are indispensable to build

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up a theory that epitomizes formal and material consistency. The fatal flaw of the standard approach is that human behavior and axiomatization are disjunct (for details see 2014c).

Orthodoxy has a strong formal basis which, however, is unacceptable. Heterodoxy has not yet agreed upon any axiomatic foundation at all and is therefore formally at a great disadvantage.

The conceptual consequence of the present paper is to discard the subjective-behavioral axioms and to take objective-structural axioms as the formal point of departure. The relocation to a firm common ground makes the Krugman-Keen debate solvable. This is a first step to overcome the indigenous secular stagnation of economics.

In the following, Section **Error! Reference source not found.** first provides the new formal foundations with the set of four structural axioms. These represent the pure consumption economy as the most elementary economic configuration. In Section 3 the interaction of money, financial assets/liabilities, saving/dissaving and profit is put to life in a simulation. With the requisite elements in their proper places it is possible to reconstruct the respective positions of Krugman and Keen consistently in structural axiomatic terms. Section 4 concludes.

2. The sole alternative to an axiomatic approach is a better axiomatic approach

I always try to find the simplest representation I can of whatever story I'm trying to tell about the economy. The goal, in particular, is to identify which assumptions are really crucial — and in so doing to catch yourself when you're making implicit assumptions that can't stand clear scrutiny. (Krugman, 2012)

Storytelling is not science. Contrary to the intuition of the psycho-sociological mindset, the formal foundations of theoretical economics must be non-behavioral and epitomize the interdependence of the real and nominal variables that constitutes the monetary economy.

2.1 Axioms

The first three structural axioms relate to income, production, and expenditure in a period of arbitrary length. The period length is conveniently assumed to be the calendar year. Simplicity demands that we have for the beginning one world economy, one firm, and one product. Axiomatization is about ascertaining the *minimum number* of premises.

Total income of the household sector Y in period t is the sum of wage income, i.e. the product of wage rate W and working hours L, and distributed profit, i.e. the product of dividend D and the number of shares N. Nothing is implied at this stage about who owns the shares.

$$Y = WL + DN | t \tag{1}$$

Output of the business sector O is the product of productivity R and working hours.

$$O = RL | t \tag{2}$$

The productivity R depends on the underlying production process. The 2nd axiom should therefore not be misinterpreted as a linear production function.

Consumption expenditures C of the household sector is the product of price P and quantity bought X.

$$C = PX \quad | t \tag{3}$$

The axioms represent the pure consumption economy, that is, no investment, no foreign trade, and no government.

The period values of the axiomatic variables are formally connected by the familiar growth equation, which is added as the 4th axiom.

$$Z_{t} = Z_{t-1} \left(1 + 2 \right)$$
with $Z \leftarrow W, L, D, N, R, P, X, K$
(4)

The path of the representative variable Z_i is then determined by the initial value Z_0 and the rates of change \mathcal{P}_i for each period:

$$Z_{t} = Z_{0} \left(1 + \mathcal{Z}_{1} \right) \left(1 + \mathcal{Z}_{2} \right) \mathsf{K} \left(1 + \mathcal{Z}_{t} \right) = Z_{0} \prod_{t=1}^{t} \left(1 + \mathcal{Z}_{t} \right).$$
(5)

For a start it is assumed that the elementary axiomatic variables vary at random. This produces an evolving economy. The respective probability distributions of the change rates are given in general form by:

$$Pr(l_{W} \leq \mathbf{P} \leq u_{W}) \quad Pr(l_{R} \leq \mathbf{P} \leq u_{R})$$

$$Pr(l_{L} \leq \mathbf{P} \leq u_{L}) \quad Pr(l_{P} \leq \mathbf{P} \leq u_{P})$$

$$Pr(l_{D} \leq \mathbf{P} \leq u_{D}) \quad Pr(l_{X} \leq \mathbf{P} \leq u_{X})$$

$$Pr(l_{N} \leq \mathbf{P} \leq u_{N}) \qquad | t.$$
(6)

The four axioms, including (6), constitute a simulation. There is no need at this early stage to discuss the merits and demerits of different probability distributions. It is, of course, also possible to switch to a completely deterministic rate of change for any variable and any period. The structural formalism does not require a preliminary decision between determinism and indeterminism.

The upper (u) and lower (l) bounds of the respective intervals are, for a start, symmetrical around zero. This produces a drifting or stationary economy as a limiting case of the growing economy. The four axioms then generate at every run an outcome like that shown in Figure 1 which is the archetype of the monetary economy.

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Figure 1: The evolving consumption economy consists initially of entirely independent random paths of the seven elementary axiomatic variables (shown here) and the paths of composed variables

The economic content of the four axioms is plain. One point to mention is that total income in (1) is the sum of wage income and *distributed profit* and not of wage income and profit. This distinction makes all the difference between good or bad economics. Neither Krugman nor Keen got the profit theory right (for details see 2013a; 2013b). This formally invalidates both approaches.

Note further that equilibrium in whatever definition is not taken into the premises. Methodologically, this would amount to a *petitio principii* (cf. Mill, 2006, pp. 819-827).

2.2 Definitions

Income categories

Definitions are supplemented by connecting variables on the right-hand side of the identity sign that have already been introduced by the axioms. With (7) wage income Y_w and distributed profit Y_D is defined:

$$Y_W \equiv WL \qquad Y_D \equiv DN \quad | t. \tag{7}$$

Definitions add no new content to the set of axioms but determine the logical context of concepts. New variables are introduced with new axioms.

Given the paths of the elementary variables, the development of the composed variables is also determined. From the random paths of employment *L* and wage rate *W* follows the path of wage income Y_W . Likewise follows from the paths of dividend *D* and number of shares *N* the path of distributed profit Y_D . From the 1st axiom then follows the random path of total income *Y*.

Key ratios

We define the sales ratio as:

$$\rho_X \equiv \frac{X}{O} \quad |t. \tag{8}$$

A sales ratio $\rho_X = 1$ indicates that the quantity bought/sold *X* and the quantity produced *O* are equal or, in other words, that the product market is cleared.

We define the expenditure ratio as:

$$\rho_E \equiv \frac{C}{Y} \quad | t. \tag{9}$$

An expenditure ratio $\rho_E = 1$ indicates that consumption expenditures *C* are equal to total income *Y*, in other words, that the household sector's budget is balanced.

Stock of money

Money follows consistently from the given axiom set. If income is higher than consumption expenditures the household sector's stock of money increases. The change in period t is defined as:

$$\Delta \overline{M}_{H} := Y - C := (1 - \rho_{E})Y \quad |t.$$
(10)

The alternative identity sign := indicates that the definition refers to the monetary sphere. An alternative wording of (10) is: depending on the actual expenditure ratio the change of the stock of money can either be positive or negative or zero.

The stock of money \overline{M}_{H} at the end of an arbitrary number of periods \overline{t} is defined as the numerical integral of the previous changes of the stock plus the initial endowment:

$$\overline{\mathbf{M}}_{\mathbf{H}_{t}} \equiv \sum_{t=1}^{t} \Delta \overline{\mathbf{M}}_{\mathbf{H}_{t}} + \overline{\mathbf{M}}_{\mathbf{H}_{0}}.$$
 (11)

The changes in the stock of money as seen from the business sector are symmetrical to those of the household sector:

$$\Delta \overline{\mathbf{M}}_{\mathbf{B}} \coloneqq C - Y \coloneqq (\rho_E - 1)Y \quad | t.$$
(12)

The business sector's stock of money at the end of an arbitrary number of periods is accordingly given by:

$$\overline{\mathbf{M}}_{\mathbf{B}t} \equiv \sum_{t=1}^{t} \Delta \overline{\mathbf{M}}_{\mathbf{B}t} + \overline{\mathbf{M}}_{\mathbf{B}0}.$$
(13)

The development of the stock of money follows without further assumptions from the axioms and is ultimately determined by variations of the elementary variables. Figure 2 shows the interdependencies between the flows and the stock. During the time span of observation, the household sector first builds up overdrafts and then reduces them again to almost zero.

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Figure 2: The difference between total income and consumption expenditure in successive periods, i.e. saving or dissaving, produces the variations of the households sector's stock of money, which consists here of overdrafts (refers to Figure 1).

Quantity of money

In order to reduce the monetary phenomena to the essentials it is supposed that all financial transactions are carried out without costs by the central bank. The stock of money then takes the form of current deposits or current overdrafts. Initial endowments can be set to zero. Then, if the household sector owns current deposits according to (11) the current overdrafts of the business sector are of equal amount according to (13) and vice versa if the business sector owns current deposits. Money and credit are symmetrical. The current assets and liabilities of the central bank are equal by construction. From its perspective the quantity of money at the end of an arbitrary number of periods is given by the absolute value either from (11) or (13):

$$\overline{\mathbf{M}}_{t} \equiv \left| \sum_{t=1}^{t} \Delta \overline{\mathbf{M}}_{t} \right| \quad \text{with} \quad \overline{\mathbf{M}}_{0} = 0.$$
(14)

While the stock of money can be either positive or negative the quantity of money is always positive. It is assumed at first that the central bank plays an accommodative role and simply supports the autonomous market transactions between the household and the business sector. For the time being, money is the *dependent* variable.

No restrictions

The stock of overdrafts is the initial form of financial liabilities and can be replaced at any time by other forms, for instance longer term mortgage loans. In other words, overdrafts represent here the complete portfolio of household sector's debt. At the moment we are not interested in the structure of this portfolio.

In the inverse case of continuous household sector saving the curve of deposits would run in Figure 2 from zero upwards in the north-eastern direction. The stock of deposits is the initial form of the household sector's portfolio of financial assets. Deposits can be replaced at any time by other forms, for example longer term savings accounts. In the following, the endless variety of forms is ignored and we deal exclusively with plain deposits and overdrafts.

The household sector can freely switch from a positive stock of money (=deposits) to a negative stock of money (=overdrafts). The household sector's stock is at any time exactly mirrored by the business sector's stock. The development of the stocks depends alone on the overall expenditure ratio ρ_E if the household sector consists of a uniform population of agents who either save or dissave. If the population is composed of both savers and dissavers things are different as we shall see presently.

Monetary profit

Total profit consists of monetary and nonmonetary profit. Here we are at first concerned with monetary profit. Nonmonetary profit is treated at length in (2012).

The business sector's monetary profit/loss in period t is defined with (15) as the difference between the sales revenues – for the economy as a whole identical with consumption expenditure C – and costs – here identical with wage income Y_w :

$$Q_m = C - Y_W \quad | t. \tag{15}$$

Because of (3) and (7) this is identical with:

$$Q_m = PX - WL \quad | t. \tag{16}$$

This form is well-known from the theory of the firm.

The Profit Law

From (15) and (1) follows:

$$Q_m = C - Y + Y_D \quad | t \tag{17}$$

or, using the definitions (8) and (9),

$$Q_{m} \equiv \left(\rho_{E} - \frac{1}{1 + \rho_{D}}\right) Y$$
(18)
with $\rho_{D} \equiv \frac{Y_{D}}{Y_{W}} | t.$

The four equations (15) to (18) are formally equivalent and show profit under different perspectives. The Profit Law (18) tells us that total monetary profit is zero if $\rho_E = 1$ and $\rho_D = 0$. Profit or loss for the business sector as a whole depends on the expenditure and distributed profit ratio and nothing else (for details see 2013a).

Retained profit

Once profit has come into existence for the first time (that is: logically – a historical account is an entirely different matter) the business sector has the option to distribute or to retain it. This in turn has an effect on profit. This effect is captured by (17) but it is invisible in (15). Both equations, though, are formally equivalent.

Retained profit Q_{re} is defined for the business sector as a whole as the difference between profit and distributed profit in period *t*:

$$Q_{re} \equiv Q_m - Y_D \quad \Rightarrow \quad Q_{re} \equiv C - Y \quad | t.$$
⁽¹⁹⁾

Retained profit is, due to (17), equal to the difference of consumption expenditures and total income. As can be seen in comparison with (12), retained profit increases *uno actu* the business sector's stock of money at the central bank.

Saving

The household sector's monetary saving is given as the difference of income and consumption expenditures (for nonmonetary saving see 2012):

$$S_m \equiv Y - C \quad | t. \tag{20}$$

In combination with (19) follows:

$$Q_{re} \equiv -S_m \quad | t. \tag{21}$$

Monetary saving and retained profit always move in opposite directions. This is the Special Complementarity. It says that the complementary notion to saving is negative retained profit; positive retained profit is the complementary of dissaving. There is no such thing as an equality of saving and investment in the consumption economy, nor, for that matter, in the investment economy (for details see 2013c).

If distributed profit is zero then follows as a corollary of (21):

$$Q_m = -S_m$$

$$|t.$$
if $Y_D = 0$
(22)

Profit is zero in the limiting case of zero distributed profit and zero saving. Otherwise profit is equal to dissaving, loss is equal to saving in a given period. To simplify matters for the next section distributed profit is set to zero, that is, eq. (22) holds.

3. Vexing: individual saving and household sector's saving

If I decide to cut back on my spending and stash the funds in a bank, which lends them out to someone else, this doesn't have to represent a net increase in demand. (Krugman, 2012)

I await the IS-LM or New Keynesian DSGE model that Krugman will presumably produce to provide an explanation for the persistence of the crisis in terms that, however tortured, emanate from conventional economic logic in which banks and money are ignored (though private debt is finally considered), and in which everything happens in equilibrium. But however clever it might be, it will not be consistent with the data. (Keen, 2014, p. 11)

3.1 Saver, dissaver, neutral

We now split the income recipients into three groups: savers s, dissavers d, neutrals n, and rearrange total income (1) accordingly:

Analogously, consumption expenditures are split up between the three groups:

$$C = C_s + C_d + C_n \quad | t.$$
⁽²⁴⁾

Analogously to the overall expenditure ratio (9) we define the group expenditure ratio for savers:

$$\rho_{Es} \equiv \frac{C_s}{Y_s} \quad \rho_{Es} < 1 \quad | t,$$
(25)

dissavers:

$$\rho_{Ed} \equiv \frac{C_d}{Y_d} \quad \rho_{Ed} > 1 \quad | t,$$
(26)

and finally the neutrals:

$$\rho_{En} \equiv \frac{C_n}{Y_n} \quad \rho_{En} = 1 \quad | t.$$
(27)

From (24) and (9) then follows:

$$\frac{C}{Y} = \rho_{Es} \frac{Y_s}{Y} + \rho_{Ed} \frac{Y_d}{Y} + \rho_{En} \frac{Y_n}{Y} \quad |t.$$
(28)

By substituting the respective income share of each group this reduces to:

$$\rho_{E} = \rho_{Es} \rho_{Ys} + \rho_{Ed} \rho_{Yd} + \rho_{En} \rho_{Yn}$$
with
$$\rho_{Ys} \equiv \frac{Y_{s}}{Y}, \rho_{Yd} \equiv \frac{Y_{d}}{Y}, \rho_{Yn} \equiv \frac{Y_{n}}{Y}$$
(29)

$$\rho_{Y_s} + \rho_{Y_d} + \rho_{Y_n} = 1 \quad |t.$$

The overall expenditure ratio ρ_E is the weighted average of the groups' expenditure ratios. We now simplify matters by excluding the neutrals and by assuming that the income shares of savers and dissavers are equal:

$$\rho_{E} = \frac{1}{2} \left(\rho_{Es} + \rho_{Ed} \right)$$
if $\rho_{Ys} = \rho_{Yd}, \rho_{Yn} = 0 | t.$
(30)

The overall expenditure ratio is in this simplified case the average of the group expenditure ratios with ρ_{E_s} always below unity and ρ_{E_d} always above unity.

3.2 The loanable funds case

From the quote above it is clear that for Krugman savers and dissavers are not independent. For someone who saves there is someone else who takes the money, courtesy of the intermediation of the banking system, and spends it. Hence there is no effect on the rest of the economy.

Let us start with an initial period which is characterized by zero saving and dissaving, i.e. by an overall expenditure ratio of unity. Then, starting with the next period, the expenditure ratio of the savers varies randomly. Since, figuratively, for every patient lender there is an impatient borrower (30) turns to:

$$\rho_{Ed} = 2 - \rho_{Es}$$
if $\rho_E = 1, \rho_{Ys} = \rho_{Yd}, \rho_{Yn} = 0 | t.$
(31)

The dissavers as a whole are the mirror image of the savers as a whole. Over time the savers' deposits and the dissavers' overdrafts develop as shown in Figure 3.



Figure 3: In the loanable funds case the dissavers' overdrafts, i.e. debt, are at any time the exact mirror image of the savers' deposits.

In more general terms: the development of the dissavers' debt portfolio is the exact mirror image of the savers' portfolio of financial assets, except for the detailed inner composition. The difference of both stocks is at any time exactly zero.

Starting with an overall expenditure ratio of $\rho_E = 1$ the savers' random expenditure ratio of $\rho_{Es} < 1$ is, according to (31), exactly compensated by the dissavers' expenditure ratio of $\rho_{Ed} > 1$. The overall expenditure ratio therefore stays at unity, that is, the household sector's budget is balanced from the initial period onwards, no matter what the savers do. Krugman is right, seen from the business sector there is neither a net increase nor decrease of demand. Total consumption expenditures are invariably equal to total income. The growth and magnitude of the stock of financial assets and liabilities is of no consequence.

From the Profit Law (18) follows that profit is zero throughout. The business sector's stock of money stays at zero according to (12) and (13) if the initial endowment was zero. Overall zero profit – ni bénéfice ni perte – is the defining characteristic of Walras's model, but not of economic reality.

3.3 The endogenous money case

Let us consider the alternative that the behavior of savers and dissavers is independent, that is, we return to (30) which is reproduced here:

$$\rho_{E} = \frac{1}{2} (\rho_{Es} + \rho_{Ed})$$
if $\rho_{Ys} = \rho_{Yd}, \rho_{Yn} = 0 | t.$
(32)

The savers' and dissavers' respective expenditure ratios now *both* vary at random. The result is depicted in Figure 4.



Figure 4: In the endogenous money case the dissavers' overdrafts, i.e. debt, grow independently from the savers' deposits

The overall expenditure ratio ρ_E as an average is in any period different from unity. If the savers outpace the dissavers in the period under consideration then the overall expenditure ratio is below unity. In the opposite case, the overall ratio is above unity. The household sector's budget is no longer balanced; consumption expenditures can be higher than income in the current period due to some underlying intertemporal optimization. If the household sector's overdrafts grow faster than deposits, Keen is right, there is additional demand C > Y. For the central bank there is no problem to let the households' overdrafts expand faster than the deposits. The chief characteristic of the banking system is that it decouples lending and borrowing.

From the Profit Law (18) follows that profit is greater than zero if the overall expenditure ratio is greater than unity. Profit or loss change the business sector's stock of money according to (19) and (12). The business sector's deposits make up for the difference between the household sector's deposits and overdrafts.

When the business sector's deposits are added in Figure 4 to the household sector's deposits the sum is equal to the household sector's overdrafts. Both sides of the central bank's balance sheet are equal at all times, of course, even if the amount of the household sector's total financial assets is different from total financial liabilities. The curve that meanders around the abscissa shows the development of the business sector's deposits and overdrafts, i.e. of the cumulated profits and losses which in turn mirror cumulated saving and dissaving. Eq. (22) provides the mirror. Note that losses vanish almost completely as soon profit distribution is taken into account.

3.4 The market clearing price

From (3), (8), and (9) follows the price as dependent variable:

$$P = \frac{\rho_E}{\rho_X} \frac{W}{R} \left(1 + \frac{Y_D}{Y_W} \right) \quad |t.$$
(33)

This is the general structural axiomatic law of supply and demand for the pure consumption economy with one firm (for the generalization see 2014a). In brief, the price equation states that the market clearing price, i.e. $\rho_x = 1$, is equal to the product of the expenditure ratio, unit wage costs, and the income distribution. Note that the quantity of money is not among the determinants. This rules the commonplace quantity theory out. The structural axiomatic price formula is testable in principle.

Under the condition of market clearing and zero distributed profit follows:

$$P = \rho_E \frac{W}{R}$$
(34)
if $\rho_X = 1, Y_D = 0 | t.$

The market clearing price depends now alone on the expenditure ratio and unit wage costs. All changes of the wage rate, of the productivity, and of the average expenditure ratio affect the market clearing price in the period under consideration. We refer to this formal property as conditional price flexibility because (34) involves no assumption about human behavior, only the purely formal condition $\rho_x = 1$.

3.5 How to settle the issue

How can we discriminate between the loanable funds and the endogenous money case? There is no use to look at the time series of household sector's debt alone. What is decisive is the *difference* of all financial assets and all financial liabilities. If there is a difference between both magnitudes that changes over time as shown in Figure 4 then Keen is right, if the difference is zero throughout as shown in Figure 3 then Krugman is right. In an economy with a banking system this is rather improbable, to say the least.

3.6 The debt-profit-employment connection

Keen has found a strong correlation between the change of debt and changes of unemployment (2014, p. 9). How does this fit into the structural-axiomatic analysis? The link is as follows. The household sector's debt increases according to (10) and (11) if the overall expenditure ratio is above unity. At the same time profit is positively affected according to (18). The missing link is a positive effect of profit on employment. Granted this effect, we would indeed expect from the foregoing analysis a correlation between changes of household sector's debt and changes of unemployment.

3.7 Extensions

Since the pure consumption economy is the most elementary economic configuration, solely analytical extensions are feasible. The first is to take distributed profit into account which has been set to zero in the foregoing analysis in order to keep the focus on the main point.

Profit is, in addition to the household sector's period deficit, i.e. $\rho_E > 1$, and in addition to profit distribution, i.e. $\rho_D > 0$, positively affected by a public budget deficit, by the configuration I > S, or by a surplus of exports over imports when we split the world economy into regional economies and consider each in isolation.

The extensions do not affect the elementary insights from the structural axiomatic analysis of the pure consumption economy.

4. Conclusion

And then the question is, how should one do economics? (Krugman, 2012)

... since Orthodoxy has failed on all counts, certainly no longer like Krugman (see also 2014b). Economics has to be done in a fundamentally new way. There can be no reasonable doubt about this.

The standard approach is based on indefensible subjective-behavioral axioms which are in the present paper replaced by objective-structural axioms. The set of four structural axioms

constitutes the most elementary case of an evolving consumption economy. The formalism is absolutely transparent, the logical implications are testable in principle.

The main results of the structural axiomatic analysis of the Krugman-Keen controversy about the real effects of household sector's debt are:

- The loanable funds model is a limiting case of the endogenous money model under the condition that both models are derived from the same formal basis. The original formal foundations of both models are insufficient. Neither Krugman nor Keen applies the correct profit definition.
- It is possible to empirically discriminate between the two models.
- The structural axiomatic analysis leads to the prediction that Krugman's loanable funds model will be clearly refuted. It simply does not happen in the actual monetary economy that saving and dissaving of the households is exactly equal.

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Why DSGE analysis cannot accurately model financial-real sector interaction

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Abstract

How financial-real sector interaction is theoretically modelled depends on something surprisingly simple: the shape of the theory's coordination conditions as consisting of its market clearing conditions and budget equations. The paper demonstrates how resource-constrained, dynamic optimisation requires a set of such conditions which make it impossible for DSGE analysis accurately to capture financial-real sector interaction. The paper derives an alternative set of coordination conditions which it rigorously grounds in the nature of monetary exchange under a fiat money regime, thereby developing the outlines of an alternative framework for macromonetary theory.

JEL classification E00, E40, E44, E51

Keywords DSGE, financial-real sector interaction, coordination condition, market clearing condition, budget equation

There is a conceptual incongruity at the centre of contemporary macro-monetary theory as represented by dynamic stochastic general equilibrium (DSGE) modelling. Its purported object of study is a monetary exchange economy under a fiat money regime. Yet its baseline Woodford (2003) model knows no commercial banks, has perfect financial markets and turns centuries of monetary thought on its head by treating money as a source of friction rather than lubrication. While these problems are usually frankly acknowledged, the common understanding is that, with sufficient time and effort, they can be overcome and that some significant strides forward have in fact already been made in this regard (for a comprehensive survey, see Brunnermeier et al., 2012). However, this paper seeks to demonstrate that DSGE analysis has some core properties which prevent it from ever adequately portraying how the financial sector interacts with real economy and that its technical sophistication masks a remarkable naivety about such matters.

Money and finance obviously play a key role in price and income determination. How exactly that role is theoretically modelled principally depends on something surprisingly simple: the shape of the theory's coordination conditions as consisting of its market clearing conditions and budget equations. Coordination conditions identify the particular behaviour plans by which coordination in market exchange (offers to supply = offers to demand) and coordination in funding (available funds = desired funds) are defined and interlinked. Both price and income levels are obviously determined via the demand and supply plans featuring in such conditions, since price and quantity mutually influence each other in a dynamic circular-causal

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process that may, but need not, gravitate towards market clearing. Given that macromonetary theory is mainly concerned with macro-coordination levels (that is, aggregate income levels) and macro-price levels (that is, the general price level and the general interest rate level), its set of coordination conditions should minimally include an aggregate goods market clearing condition, an aggregate financial asset (bond) market clearing condition and an aggregate budget equation.

Coordination conditions thus establish the configuration of behaviour plans via which price and income levels are presumed to be determined. As such, they have explanatory value irrespective of how their constituent behaviours are explained or whether the conditions are assumed to hold or not. The descriptive value of macro-monetary theory is, therefore, to an important degree determined by how correctly its set of coordination conditions is specified. Interest in coordination conditions and their correct specification flowered for a relatively brief period some decades ago (Clower, 1965, 1967; Clower and Leijonhufvud, 1975; Tsiang, 1966, 1980; Kohn, 1981a, 1981b; Snippe, 1985, 1987), but has since died down and disappeared almost without leaving a trace. In the current post-crisis atmosphere of soul searching and revisiting of first principles, it may be appropriate for macro-monetary theorists to come back to the topic which has clearly lost nothing of its relevance.

In order to avoid misunderstanding it needs to be emphasised that the paper's focus on coordination conditions need not imply any form of equilibrium modelling, first, because no optimising behaviour is assumed (the paper abstracts from behavioural explanation) and, second, because the conditions need not hold. When considering the paper's coordination conditions, the reader's attention should not be on their equality sign which merely indicates the benchmark of coordination. Instead, the attention should be on their terms as they suggest of the types of behaviour plan via which price and income levels are to be determined, whatever the degree of coordination or discoordination these levels may represent. This paper is principally about (1) identifying the types of behaviour plan via which general price and aggregate income levels should, by their nature, be explained and (2) highlighting how DSGE analysis uses an incorrect set of behaviour plans in this regard, thereby distorting its view of financial-real sector interaction.

Accordingly, the paper has two main aims. The first is to ascertain what a set of market clearing conditions and budget equations should ideally look like if it conformed rigorously to the nature of monetary exchange under a contemporary fiat money regime. The second aim is to critique the coordination conditions of DSGE modelling in the light of that ideal set, showing how dynamic resource-constrained optimisation requires a set of conditions which incurably misrepresents how money and finance interact with the real economy. Because the paper focuses on coordination conditions and discounts behavioural explanation, it is free to ignore DSGE's complex of optimising conditions, thereby stripping it of almost all its sophisticated technical adornment and reducing it to an analytical core which can be assessed with the aid of conceptual, qualitative logic only. It is at a basic conceptual level that DSGE's vulnerabilities become manifest.

The paper is constructed as follows. Section 1 lays down some rock-bottom fundamentals of money and exchange, which point towards the primacy of the money budget over the resource budget and suggest the broad types of coordination condition needed to integrate monetary portfolio and real income-spending analysis. Subsequent sections 2 and 3 establish the precise form which these conditions should take. Section 2 derives the appropriate form of the aggregate goods market equilibrium condition and critiques DSGE's corresponding

version, noting how it slants DSGE's theory of price as well as income. Section 3 shows how the aggregate monetary budget equation can have two equally appropriate forms, a Keynestype and a Robertson-type form, the latter representing the dynamic circulatory incomespending stream with monetary injections and leakages. Sections 1 to 3 are largely preparation for sections 4 and 5, which make up the core of the paper. Section 4 demonstrates how the Robertson-type budget equation is indispensable in adequately portraying financial-real sector interaction in a fiat money world, highlighting the various ways in which DSGE analysis falls short in this regard. The section also derives a novel budget expression for the banking sector for which it uses the Keynes-type budget equation. Section 5 critiques DSGE's set of dynamic sectoral resource budget constraints, more in particular their implied view of how banking and finance influence aggregate spending.

1. Fundamentals of money and exchange

1.1 Market knowledge and the utility of money

Our suggested alternative coordination conditions are all premised on the understanding that money functions first and foremost as generally accepted medium of exchange. While controversial in heterodox circles, there is no space here for a defence of this premise except to note that the implied secondary and derivative nature of the other traditional money functions (store of value and unit of account) takes nothing away from their relevance and importance. It serves our purpose briefly to illustrate this point by considering the rationale for money's utility.

It is already an old insight that the market coordination challenge is essentially about acquiring market knowledge, that is, knowledge of who offers to supply and demand what, where, when, in what quality/quantity and at what price - both at present and in the foreseeable future (Hayek, 1937). In view of this, money aids market coordination in three main ways. First, in accordance with its primary function as generally accepted medium of exchange, money economises on required market knowledge by ensuring that traders are prescient about the identity of one of the two commodities in every exchange (Brunner and Meltzer, 1971; Clower and Howitt, 1996). Demanders already know suppliers want money and suppliers already know demanders offer money. Strictly speaking, therefore, money does not set aside Jevons' requirement of a double coincidence of wants, but ensures that the knowledge needed for coincidence in one of the two wants is already obtained. Second, when money is generally accepted in exchange for goods, goods will nearly always be valued in units of that money (unit-of-account function). As such, money allows goods to have a single money price, which further economises on required market knowledge.² A single money price also unlocks available market knowledge by revealing current scarcities (Hayek, 1945). Third, as generally accepted medium of exchange, money is able to transport generalised buying power from the present into the future, albeit at the risk of incurring inflationary buying power losses (Keynes, 1936, 1937; Davidson, 1978; Bertocco, 2011). This time travel of generalised buying power (store-of-value function) is important because the information on which to base future expectations is typically of a better quality the closer to that future one moves. Money thus allows its holders to keep their buying options open in the anticipation of obtaining better information later on (the utility of "wait and see"), which explains why liquidity preference

² A non-monetary means of economising on required market knowledge is provided by specialised middlemen (see Clower and Howitt, 1996, 2000).

increases during times of heightened uncertainty. As such money also provides a means by which agents can enhance their market knowledge.

In sum, agents attach utility to the medium of exchange because it facilitates trade by economising on, unlocking and enhancing market knowledge. That is why people hold money in spite of it not necessarily having any intrinsic value or carrying any interest.

1.2 Radical uncertainty: primacy of money budget over resource budget

If money acts as a market knowledge economising, unlocking and enhancing device, its usefulness is obviously relevant only to agents whose market knowledge is deficient to start with. In contrast, DSGE modelling conjures up a world where agents can stochastically predict the future consequences of their current actions with perfect reliability. Being endowed with such knowledge, DSGE's agents hardly face a market coordination challenge and will consequently find little use for money. Their chief remaining challenge is then optimally to use their resources, which is why optimisation is first and foremost constrained by available resources rather than available money. Accordingly DSGE's primary budget constraint is an endowed resource budget rather than a money budget.

In order to retain some resemblance to a money budget, money is usually included in the resource budget as one of the resources. Monetary or financial frictions may then emerge when supplementary money budgets like the cash in advance (CIA) or borrowing constraint interfere with optimal exchange plans. However, in the tradition of Brunner and Meltzer (1971), there are also general equilibrium models which do allow money to make a positive contribution towards efficient resource use. This materialises when uncertainty is assumed to produce transaction costs, which money reduces in ways superficially comparable to what was described above. Yet the crucial implicit assumption is that the relevant cost is quantifiable, which requires that the uncertainty be strictly stochastic. Stochastic uncertainty, rather than ruling out perfect knowledge, merely puts a price on its attainment. Uncertainty is thus reduced to a friction in a process that otherwise runs on pure resource-constrained optimisation, perfect knowledge and guaranteed market coordination. While not necessarily invoking transaction costs, DSGE treats uncertainty and other sources of market discoordination like price rigidity in essentially the same way.

It can thus be said, with Caballero (2010), Borio (2012) and Haldane (2012), that DSGE analysis suffers from a "pretence-of-knowledge" syndrome à la Hayek (1974). These authors suggest that the only credible way "to deal with the pretence-of-knowledge syndrome" is to allow for real ignorance and radical Knightian uncertainty. The analytical consequences are equally radical. Because Knightian uncertainty cannot be reduced to stochastic probability, no quantifiable cost can be attached to it; perfect knowledge is no longer for sale at any calculable price. Market coordination must then be acknowledged as requiring much more than just the removal of frictions like transaction costs or price rigidity. Because agents now operate under a continual and ineradicable knowledge deficit, money can come into its own as a market knowledge economising, unlocking and enhancing device. This will express itself in the fact that agents, first and foremost, consider their money holdings rather than their resource holdings when making their exchange plans, as they indeed do in the real world. The money budget will then have dethroned the resource budget as the primary budget in monetary theory, with resources being considered only after being converted into money how much of it they are expected to cost and bring in. In a radically uncertain world, theories of market exchange require money-constrained optimisation rather than resource-constrained optimisation, if optimisation is still the word. Some form of bounded rationality seems, after all, implicit in radical uncertainty (Haldane, 2012).

Anxiety about radical uncertainty being destructive to all modelling and forecasting is unfounded.³ Because applied quantitative modelling unavoidably contains strong elements of pragmatism and imprecision anyway (see e.g. Sims, 2012), its *reason d'être* is not under threat. However, the formal modelling techniques of pure theory do need to be rethought in the light of radical uncertainty, which, given that the present paper abstracts from behavioural explanation, cannot be undertaken here. One thing can be established here: monetary theory should at least have a monetary budget equation and afford it primary status. As will be amply illustrated throughout this paper, the root cause of contemporary theory's inability adequately to deal with money, banking and finance is that it either features no money budget at all or gives it only secondary, supplementary status.

1.3 The momentariness of exchange: reintegrating portfolio and spending analysis

The claim is that commodities change hands at something close to a point in time (Myrdal, 1939; Harrison, 1980; Snippe, 1987), which is not contradicted by Greif's (1997, pp. 247-248) assertion that "exchange is always sequential, namely, some time elapses between the *quid* and the *quo*". The momentariness of exchange merely means that both the *quid* and the *quo* in exchange are attached to moments, not that these moments necessarily coincide (spot trade). Greif's (1997, 2000) institutional-historical analysis insists on the sequentiality of exchange in order to accentuate the risk inherent in future delivery. This is not a consideration in our analysis, which anyhow has no need to assume spot trade.

The claim that exchange is momentary may seem bland at first inspection but turns out to have powerful theoretical implications. To start with, it implies that transacted amounts should be regarded as momentary stocks rather than as periodic flows, as is the current convention. This convention can be traced back to Fisher (1906) who unwittingly employed two different, potentially inconsistent stock-flow distinctions. The first is between a stock as something that happens at a moment and a flow as something that develops over a period. For obvious semantic reasons, however, a stock can also be understood as an inventory of things, with a flow then referring to a change in such inventory. According to this second distinction, for instance, wealth and capital are stocks while income and investment are flows. When these two stock-flow distinctions get superimposed on each other, wealth and capital have to be treated as momentary stocks and transactions like income and investment necessarily become periodic flows. But income and investment can evidently also be stocks in the momentary sense, referring to the moment the income was received and the moment the spending on investment goods took place.

When income and spending are treated as periodic flows, it becomes analytically difficult to allow direct causal interaction between a momentary stock of money and periodic transaction flows. It is for that precise reason that, since Hicks (1935) and Keynes (1936), the convention in monetary theory developed of permitting money holding and money spending to influence each other only indirectly, through changes in the interest rate – a convention which DSGE analysis broadly maintains. However, once it is realised that both money holding and money

³ Haldane (2012) points out how models using heuristics based on radical uncertainty and bounded rationality may, in fact, outperform models grounded in strict optimisation and perfect knowledge equivalents.

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spending can be expressed as momentary stocks, the original rationale for the convention evaporates. Portfolio and spending analysis can then be reintegrated by way of a momentary-monetary budget equation (Snippe, 1985). It is noteworthy that, while all the variables in such a budget equation are attached to moments, they need not all refer to the *same* moment. Momentary analysis does not imply static analysis. In fact, momentary analysis is more conducive to the proper treatment of dynamic change, because change is better captured by the comparison between moments than between periods, as was already noted by Myrdal (1939, pp. 43-45).

Furthermore, when transactions are acknowledged as being momentary, it becomes clear that the custom in conventional price theory of identifying supply with production and demand with consumption is unfortunate, because narrowly applicable to unstockable services only. For stockable material goods, production is never immediately supplied but first put in stock, just as consumption is never immediately demanded but first taken out of stock. The important analytical implication is that offers to demand and supply are equivalent to planned inventory changes, with the result that inventory equilibrium (actual inventory = desired inventory) is already implicit in market-exchange equilibrium (offers to demand = offers to supply). Hence, contrary to what is suggested by Sexton et al. (1992), price theory need not consider the former in addition to the latter. As Hicks (1965, p. 85) similarly observed: "As long as we hold to the principle of price determination by '... demand and supply', ... we have no call to attend to anything but transactions. We do not need to distinguish between stocks and flows."

When it comes to money, the situation is reversed. By virtue of being exchangeable for all goods, money does not have its own market and therefore does not require its own market clearing condition, which DSGE, like all general equilibrium analysis, nonetheless includes. Money's market equilibrium is already implicit in all the market equilibria of the goods against which it is traded (see section 2). Money does, however, require its own inventory equilibrium condition (actual money inventory = desired money inventory), which naturally takes the form of a monetary budget equation describing the distribution of agents' current money holdings over their preferred money destinations: the various forms of money spending as well as continued money holding (see section 3).

In fact, the money stock is the only inventory variable which macro-monetary theory needs to feature. Inventories of non-monetary goods can be ignored, because they impact on transactions in just their own market, the effect of which is already captured by the market equilibrium conditions of the relevant goods, as just noted. General equilibrium portfolio theory in the style of Tobin (1969) manages to confer multi-market significance on inventories of non-monetary financial assets (and goods) by allowing them to be directly bartered for each other, which is decidedly awkward if the analysis otherwise seeks to describe a monetary-exchange economy. And so, the only relevant portfolio decision in macro-monetary theory concerns the allocation of agents' money inventory over their preferred money destinations. Provided it includes financial assets as one of these destinations, the monetary budget equation is already quite capable of incorporating financial-real sector interaction, for the purpose of which no non-monetary wealth effects are unimportant, but rather that these effects have macroeconomic impact (change aggregate spending) only via their influence on the terms of a monetary budget equation.

To conclude, an integrated monetary and real analysis requires (a) a set of momentary goods market clearing conditions with "goods" being considered broadly as including all non-money tradables; (b) a momentary-monetary budget equation; and (c) a momentary financial asset (bond) market equilibrium condition via whose terms the interest rate (the price of bonds) is to be determined. We proceed with a discussion of the appropriate form of these conditions. For reasons of space, however, the appropriate form of (c) will be ignored. Interest rate theory will thus be largely left unattended.

2. Plan coordination in the goods market: prices and income

2.1 Overall goods market coordination

We start with the most basic and obvious requirement for overall goods market coordination:

$$y_t^s = y_t^d$$
 for each goods market $y = 1, 2, ..., n$, (1)

where y_t^s and y_t^d denote planned real quantities supplied and demanded for each market in goods set y at the current moment t. Set of conditions 1 is obviously similar to the market clearing conditions of general equilibrium analysis, but with one important difference. While goods set y should be understood as including all categories of goods (all non-money tradables) and as being traded by all categories of agents (all sectors), it does not contain all individual goods on offer nor are all individual agents involved. After all, the totality of all goods cannot be traded by the totality of all agents at every single trading moment. Momentary analysis thus facilitates the recognition of an important real-world attribute: continual trade in different goods among different traders.

This real-world attribute straightforwardly invalidates Walras's Law, understood as the necessary equality of the total value of goods brought to market and the total value of goods taken away from the market at its close. Walras's Law does not describe an intrinsic quality of market exchange, but results from the stylisation of a single trading round per period during which a given set of agents seeks to trade a given and uniformly priced set of goods among each other. Hence when the identities of goods and traders are in continual flux, as they are in the real world, Walras's Law fails (Tsiang, 1966). The scrapping of one arbitrarily chosen market facilitated by Walras's Law has, unsurprisingly, no imaginable counterpart in economic reality. It is an absurdity. Yet it continues to be invoked (e.g. by Brunnermeier and Sannikov, 2011) while textbook LM theory also still employs it to rid itself of the bond market.

Dealing in real quantities, condition set 1 suffices as a description of the coordination requirements for barter exchange. As a first step in uncovering the additional coordination requirements posed by monetary exchange, we identify its characteristic attribute. In accordance with money's primary function as generally accepted medium of exchange, monetary trade can be typified by the equivalence between supplying goods and demanding money as well as between demanding goods and supplying money (Clower, 1967). In symbols:

$$P^{y}y_{t}^{s} \equiv ME_{t}^{d} \tag{2}$$

$$P^{y}y_{t}^{d} \equiv ME_{t}^{s} \tag{3}$$

 ME_t^d and ME_t^s signify the money demanded or supplied in exchange for good *y* at the current moment *t*. *ME*, short for *M*oney in *E*xchange, denotes the active money balances (Robertson's "money on the wing") to be distinguished from the passive money inventory (Robertson's "money at rest") for which the conventional symbol *M* will be used. While *M* is a stock-as-inventory and *ME* a flow-as-change-in-inventory (a transaction), both are stocks in the momentary sense by virtue of the momentariness of exchange. Nominal goods prices, P^y , make their appearance for the obvious reason the equations now record amounts of money.

Equations 2 and 3 are specimens of a larger genus called *equation of exchange*, which is neither a market coordination condition nor a budget equation but an expression of the *quid pro quo* in exchange (for a useful survey, see Fayazmanesh, 2006). The fact that equations of exchange appear – or ought to appear – in pairs (one for each side of the exchange) suggests that they do not indicate actual exchanges but merely the unilateral exchange plans of demanders and suppliers separately and independently. This dispels the common misconceptions, still present in Clower and Leijonhufvud (1975) and Fayazmanesh (2006), that equations of exchange presuppose spot trade and rule out theft or charity. It also exposes the inappropriateness of Clower's (1967) famous attempt to capture the *quid pro quo* in monetary exchange by way of a "matrix of exchange" involving the bilateral exchange plans of both demanders and suppliers, which needlessly complicates what the medium-of-exchange function is about.

Equations of exchange 2 and 3 allow us alternatively to write market clearing condition set 1 as:

$$ME_t^d = ME_t^s$$
 for each goods market $y = 1, 2, ..., n$ (4)

What condition set 4 adds to condition set 1 is the requirement that the amount of money which demanders offer in exchange for good y be equal to the amount of money which suppliers are willing to accept in exchange for good y. In a monetary exchange economy, market coordination necessitates not only that the physical quantities demanded and supplied match (equation set 1) but also that demanders are able and willing to dedicate money, in the appropriate amount, to their goods purchases (equation set 4). The coordination requirements inherent in condition sets 1 and 4 can thus be condensed into a single condition set stipulating equality between nominal notional supply and nominal effective demand

$$P^{y}y_{t}^{s} = P^{y}y_{t}^{d}$$
 for each goods market $y = 1, 2, ..., n$ (5)

Written in **bold** effective demand ("effectual demand" in Adam Smith's terms) is demand which is both planned and supported by sufficient monetary finance (Clower, 1965). With equation set 5 we have arrived at the overall goods market equilibrium condition for a monetary economy. It underscores the commonsense notion that money touches the goods market on its demand side, by facilitating or constraining planned demand.

2.2 Macro- and microeconomic coordination

Our next step is to establish the rationale for the aggregate, macroeconomic perspective, which follows, once again, from money's primary function as generally accepted medium of

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exchange. When money is routinely exchanged against *all* goods, the effect which a monetary shock may have on the goods market concerns the demand for *all* goods. Put differently, a change in aggregate effective demand must be accompanied by a change in the scarcity of money, that is by a monetary shock. Money neutrality may thus be understood as aggregate goods market clearing, which accords with Hayek's (1933) original meaning of the term (see Patinkin and Steiger, 1987):

$$\sum P^{y} y_{t}^{s} = \sum \boldsymbol{P}^{y} \boldsymbol{y}_{t}^{d}$$
(6)

Equation 6 is what we will refer to as the *macroeconomic equilibrium condition*, which aggregates over all goods *y* traded at moment *t* within a given economy. The supply side of equation 6 can be regarded as production at full capacity utilisation, which, contrary to DSGE analysis, would allow output gaps to be treated as goods market failures. A monetary disturbance can now be defined as a macroeconomic disequilibrium phenomenon: a monetary shock which accompanies a movement in aggregate spending away from planned aggregate supply. The various forms in which a monetary shock can occur are identifiable only with the aid of a monetary budget equation to be derived in section 3.⁴

Say's Law asserts money neutrality as macroeconomic equilibrium, but only roughly and approximately so. Its classical supporters by no means claimed the total absence of monetary disturbances, but rather that these are either relatively small and transient or, when larger and more persistent, attributable to exceptional circumstances like wars, banking crises or the discovery of large deposits of monetary precious metal (Sowell, 1972; Niehans, 1987). The consideration of money (non)neutrality in terms of Say's Law has strangely disappeared from contemporary theory, witness how DSGE defines the (non)neutrality of money with sole reference to the Quantity Theory. The ostensible reason is that DSGE lacks an aggregate goods market equilibrium condition in the style of equation 6, by which Say's Law must be benchmarked. We return to the issue below.

The introduction of a macroeconomic equilibrium condition entails a useful convenience. With slight adaptation, equilibrium condition set 1 applicable to barter can be maintained for a monetary economy as the requirement that the individual-market compositions of aggregate demand and supply are matching. As such it stipulates the absence or resolution of "disproportionalities", to dust off an old term in business cycle theory. We can rename it the microeconomic equilibrium condition. Overall goods market coordination (equation set 5) can then be broken down into microeconomic coordination (equation set 1) and macroeconomic coordination (equation 6). The former expresses the absence or resolution of real disturbances in the form of changes in tastes and technologies, while the latter signifies the absence or resolution of monetary disturbances in forms still to be identified. This micromacro breakdown should obviously not be taken to mean that real disturbances cannot cause macroeconomic disequilibrium. Rather it means that real disturbances cannot cause macroeconomic disequilibrium unless they also generate monetary disturbances, as they often do - especially in a contemporary fiat money world with its flexible, largely endogenously determined money supply. Conversely, monetary disturbances may also generate microeconomic disequilibrium (disproportionalities) as a secondary effect, such as when a

⁴ On our definition of the terms, a monetary disturbance may also occur without a monetary shock, namely when aggregate supply increases while aggregate demand stays put, just as a monetary shock may occur without a monetary disturbance, namely when aggregate demand increases commensurate with the increase in aggregate supply.

banking-crisis induced contraction lowers the appetite for risk which hits the investment goods market disproportionately hard (Hall, 2010).

The macroeconomic equilibrium condition can now be identified as the coordination requirement which monetary exchange adds to that of barter exchange. The fact that monetary exchange adds a coordination requirement clearly does not mean that plan coordination is harder to achieve in a money economy than in a barter economy. After all, monetary exchange also considerably lightens the burden of the coordination requirement carried over from barter (the microeconomic condition), which it does by economising on, unlocking and enhancing market knowledge, as noted in section 1. Hence money aids market coordination by making it easier to achieve microeconomic equilibrium (money as lubricant) but remains capable of upsetting market coordination through a failure of macroeconomic equilibrium (money as friction). Money's net influence will as a rule be lubricating, since monetary disturbances are not generally so large and persistent that they overwhelm money's lubrication. And even when a particular money does become dysfunctional, the public invariably settles on a superior money alternative rather than stay with barter. Money as mere friction, as implied by DSGE modelling, is a caricature (Rogers, 2008; Borio, 2012).

Our micro-macro breakdown has a further obvious pay-off. It facilitates a separate determination of relative prices and the general price level along the lines of the classical dichotomy. Relative prices can be determined via the real terms of the microeconomic equilibrium condition and the general price level via the nominal terms of the macroeconomic equilibrium condition.⁵ The determination of relative prices in terms of only real quantities merely requires the fairly tame assumption that monetary disturbances cause no disproportionalities. But the reverse case of explaining real quantities in terms of only relative prices necessitates the much wilder assumption that monetary disturbances do not occur at all. Because monetary disturbances clearly cannot a priori be ruled out, aggregate income should be acknowledged as depending not only on relative prices but also on the level of aggregate effective demand. Such is the basic, obvious and hugely important proposition of Keynes (1936) which takes it for granted that monetary disturbances cannot always be neutralised by changes in the general price level and that, even if there were the requisite downward flexibility, a falling general price level more likely amplifies than nullifies the disturbance - for reasons to be indicated below. In sum, the classical dichotomy can be a more or less acceptable abstraction for price theory, but is decidedly inappropriate for income theory.

2.3 DSGE: macroeconomics without a macroeconomic equilibrium condition

Contemporary DSGE analysis operates without the monetary goods market clearing conditions derived above. Its aggregate goods market condition takes the form of an aggregate microeconomic condition ($\sum y_t^s = \sum y_t^d$) rather than a genuine macroeconomic

⁵ Relative prices do not appear in the microeconomic equilibrium condition ($y_t = y_t$ for each market y) because they represent ratios of goods quantities. As a result, the microeconomic condition needs to specify only goods quantities in order to establish relative price quotes. Nominal prices, in contrast, must be quoted by specifying goods quantities *and* an amount of money, which is precisely the message of equations of exchange 2 and 3. As shown above, equations of exchange 2 and 3 underlie the monetary goods market clearing conditions of equations 5 and 6, which consequently do explicitly feature nominal prices. Of course, only barter traders actually quote relative prices. The relative prices quoted by monetary traders must be inferred from their nominal price quotes.

condition ($\sum P^{y}y_{t}^{s} = \sum P^{y}y_{t}^{d}$) which complicates DSGE's theory of price as well as income. We start with price.

Because DSGE's aggregate goods market clearing condition ($\sum y_t^s = \sum y_t^d$) features no general price level term, it is prevented from determining the general price level in the market for goods via the aggregate nominal demand and supply of goods ($\sum P^y y_t^s = \sum P^y y_t^d$) – as common sense would suggest. As a way of solving the problem, older-generation models determined the general price level by the scarcity of money via the terms of the quantity equation, which had the drawback of negating the influence of supply factors on prices.⁶

Contemporary DSGE modelling offers an alternative solution, which seems to overcome this drawback. It compensates for the lack of a goods market theory of the general price level by substituting it for a goods market theory of the expected future inflation rate. Treating some past or present price level as empirically given, it determines the expected future price level, and the resultant inflation rate, with the aid of behavioural functions (the intertemporal IS and Phillips curve relations) in which both demand and supply factors do play a role.

This solution, however, holds various complications. First, at the level of pure theory, there can, strictly speaking, be no explanation of price change without an explanation of the absolute price level, as it would succumb to infinite regress. One cannot claim to have explained price change (inflation) if one has not somewhere explained an absolute price level. Second, despite appearances to the contrary, DSGE still determines inflation by demand factors only. Firms are presumed to set their cost-push price increases on the basis of their inflation expectations which are shaped by demand factors only (Weber et al., 2008).

Third, while older-generation models overstated the role of money by explaining the general price level as a function of the scarcity of money as expressed by the quantity equation, contemporary DSGE modelling altogether ignores the influence of money on prices. It is thereby taken for granted that the central bank's policy interest rate can adequately control demand (and hence inflation) without the mediation of changes in the money stock, which presupposes that the money stock passively adapts itself to demand plans. This may indeed be the case insofar demand is financed with bank credit (newly created money) and banks accommodate the public's credit requests as informed by their demand plans. But since, at any given trading moment, only a small part of total demand is likely to be financed with bank credit, the presupposition can only be partially true. And when the banking sector is in distress and tightens its credit rationing criteria, the presupposition may become outright false. The money stock may then fall (or grow less) and exercise a constraining influence on total demand for reasons largely unrelated to the policy interest rate, as the recent crisis has shown (Arestis and Sawyer, 2008; Arestis, 2009). And when money becomes the constraining factor on spending, it makes more sense to model the effect of quantitative easing (QE) on spending via its influence on the money stock rather than on the shape of the yield curve as the relevant DSGE models suggest (Joyce, 2012; Bridges and Thomas, 2012).

⁶ It can be shown, for which there is no space here, that the Fisherite quantity equation (MV = PT) is really not an equation of exchange (that is, an expression of the *quid pro quo* in monetary exchange) but a periodic monetary budget equation with MV being the periodic supply of monetary finance and PT its periodic demand. The Cambridge version (M = kPY), by contrast, is a momentary Walrasian money market equilibrium condition ($M_s = M_d$), in which M_d is further specified as a function of income ($M_d = kPY$). The transactions demand for money is ignored in the Cambridge equation, even if it explains the demand for passive money (M_d) as a function of the volume of transactions (PY), which is odd indeed.

The lack of a macroeconomic equilibrium condition slants DSGE's theory of income along very much the same lines. In essence, it means that DSGE negates the monetary dimension to aggregate demand changes. As a result, it cannot recognise how changes in the scarcity of money may directly constrain or facilitate demand, and hence income, in case the general price level is insufficiently flexible (as it almost always is). In DSGE analysis, price rigidity is allowed to influence income only indirectly, via its influence on real-relative prices. Insofar CIA or borrowing constraints directly constrain spending, the influence is treated as a friction in a real business cycle mechanism rather than as an integral part of an alternative mechanism in which money features crucially (Borio et al., 2013). And, as noted in section 1, the principal way in which money features crucially is when the pivotal explanatory mechanism incorporates a monetary budget equation and affords it primary status. It is to the appropriate form of the monetary budget equation that we now turn.

3. Plan coordination in monetary finance

This section demonstrates how the aggregate monetary budget equation can, in fact, be expressed in two equally appropriate ways, one which captures money inventory equilibrium (a Keynes-type budget equation) and one which, by incorporating an income-spending lag, portrays the dynamic circulatory income-spending stream (a Robertson-type budget equation). While these budget equations are shown to be logically compatible, the Robertsonian version proves to be particularly useful for the purpose of modelling the financial-real sector interaction in a fiat money world. For heuristic reasons, however, this section still assumes a pure commodity money world without banking, financial markets and international trade, which will be relaxed in the next section.

3.1 Keynes's budget equation: money inventory equilibrium

There are two reasons why agents do not collectively spend their money all at once and why velocity is consequently never unity. First, in a radically uncertain world agents cannot and do not anticipate all their future needs. And second, to the extent that agents do anticipate their future needs, these needs are met by goods whose storage costs are generally higher than that of money (Keynes, 1936, 1937). What this means for the aggregate budget equation is that the current money stock ($\sum M_t^s$) must be sufficient to meet plans for current spending ($\sum P^y y_t^d$) as well as plans for continued money holding in the immediate future ($\sum M_{t+1}^d$)

$$\sum M_t^s = \sum P^y y_t^d + \sum M_{t+1}^d \tag{7}$$

The momentary nature of equation 7 has various theoretically interesting consequences which can briefly be mentioned. First, because its supply side refers to the actual money inventory of the present moment t ($\sum M_t^s$) which cannot now be changed, its demand for passive money holding must express desires for what the money inventory should be like *in the immediate future* (*t*+1), which is why we write it as $\sum M_{t+1}^d$. The whole demand side of equation 7 ($\sum P^y y_t^d + \sum M_{t+1}^d$) then refers to past desires for what money holding should be like *in the present* (*t*), which can be given as $\sum M_t^d$. Equation 7 is thus an elaboration of money inventory equilibrium expressed as $\sum M_t^s = \sum M_t^d$.

Second, by virtue of its momentary nature, equation 7 must be a demanders' budget equation, since only the goods demanders of any trading moment need money as finance for

spending. And since the goods demanders of any trading moment obviously represent only a small subsection of all agents, its $\sum M^s$ and $\sum M^d$ terms must also represent only a small part of the total money stock, which is fortunate because it allows them to diverge. The total demand and supply of money held by all agents must be identically equal by virtue of "money that is anywhere must be somewhere", which would turn money inventory equilibrium into a meaningless tautology (Robertson's *Grand Monetary Tautology*). The momentary approach is indispensable to monetary theory.

Last, while plan formation and plan execution can happen during the same period, they cannot occur at the same moment. Consequently, plan formation must precede the plan execution of moment *t*. Financial planning errors are thus possible in principle and the budget equation may fail. Contrary to what is suggested by Buiter (2002), budget equations can be equilibrium conditions rather than identities, although they may turn into identities when all their terms are given in realised, *ex post* form.

When a budget equation holds in *ex ante* terms, we have achieved what may be called money inventory equilibrium, monetary equilibrium or, in Keynes's (1936) parlance, money market equilibrium. Keynes's term is a bit awkward as money does not have its own market and the budget equation expresses financial planning rather than market-exchange equilibrium. Keynes's own version (1936, p. 199) closely resembles equation 7 but is also different in various subtle but significant ways. Most importantly, although Keynes's money market condition carries all the hallmarks of a monetary budget equation, it primarily serves as a financial asset (bond) market equilibrium condition in his model, witness how the interest rate (the price of bonds) is determined via its terms. Because interest rate theory is not at issue here, we can ignore that quality of Keynes's money market condition and treat it purely as a monetary budget equation, which it clearly also is.

3.2 Robertson's budget equation: the circulatory income-spending stream

The income-spending lag is deemed important in monetary theory because it establishes the sequential nature of monetary exchange processes and captures the common notion that monetary exchange separates the acts of supplying goods (receiving money) and demanding goods (spending money) which are united under barter. Robertson's (1940) budget equation provides a useful template for the type of monetary budget equation which incorporates the income-spending lag (Tsiang, 1980; Kohn, 1981a; Snippe, 1985). To arrive at Robertson's version, the supply side of the Keynesian budget equation 7 ($\sum M_t^s$) merely needs to be divided up into various components representing the various ways in which current goods demanders could have obtained their money in the past. Designating the income-spending lag as period *p*, these components are: (1) money income as realised goods supply ($\sum P^y y_{t-p}^s$) whereby we assume that the demanders of moment *t* were all suppliers at *t-p*; (2) realised money creation ($\sum \Delta M_{t-p}^s$) which we conveniently also attach to moment *t-p*; and (3) the money inheritance from a past before *t-p* as the net outcome of all prior income-spending rounds ($\sum M_{t-p}^d$). Breaking $\sum M_t^s$ down into $\sum P^y y_{t-p}^s + \sum \Delta M_{t-p}^s + \sum M_{t-p}^d$ and rewriting $\sum M_{t+1}^d - \sum M_{t-p}^d$ as $\sum \Delta M_{t+1}^d$ the Keynesian budget equation 7 turns into:

$$\sum P^{y} y_{t-p}^{s} + \sum \Delta M_{t-p}^{s} = \sum P^{y} y_{t}^{d} + \sum \Delta M_{t+1}^{d}$$
(8)

The meaning of equation 8 is straightforward: the income $(\sum P^{y}y_{t-p}^{s})$ and money creation $(\sum \Delta M_{t-p}^{s})$ realised in the past must be sufficient to facilitate planned spending for the present

($\sum P^y y_t^d$) and planned increases in passive money holding for the immediate future ($\sum \Delta M_{t+1}^d$). This budget equation indeed closely resembles Robertson's (1940) version except that the latter is periodic and expresses income and spending more narrowly as saving and investment (the supply and demand for loanable funds), because Robertson, like Keynes, also uses his budget equation as a financial asset (bond) market equilibrium condition. We will again ignore the merits or demerits of equation 8 as a financial asset market equilibrium condition and consider it purely as a monetary budget equation. As a result, the criticisms of loanable funds theory by Bibow (2004) and Hayes (2010) need not concern us.

Although the Keynesian and Robertsonian budget expressions 7 and 8 are logically compatible and each has its own useful applications, the latter has one outstandingly helpful quality which the Keynesian version lacks: it is a portrayal of the dynamic circular incomespending stream with money creation the typical injection into that stream and increases in passive money holding (hoarding) the typical leakage from it.⁷ Defining a change in aggregate demand as a change in its current level relative to past aggregate income $(\sum \Delta P^y y_t^d = \sum P^y y_t^d - \sum P^y y_{t-p}^s)$, the Robertsonian budget equation reduces to:

$$\sum \Delta P^{y} y_{t}^{d} = \sum \Delta M_{t-p}^{s} - \sum \Delta M_{t+1}^{d}$$
(9)

The message is clear: aggregate demand changes must be accompanied by net monetary injections into the income-spending stream or net leakages from that stream. Hence monetary shocks manifest as monetary injections or leakages, additional forms of which will be considered in the next section.

4. Financial-real sector interaction in a fiat money world

The Robertsonian budget equation has the further advantage of facilitating a simple yet effective way of adapting the analysis to a contemporary fiat money world characterised by bank money creation, financial trade, financial intermediation and international trade. As it turns out, any advance over the most basic form of commodity money exchange exerts its influence on the circulatory income-spending stream in the same way: by introducing an additional type of injection into it or leakage from it.

⁷ Taking his cue from Clower (1965), Lucas's (1982) expressly stated purpose in introducing the CIA constraint was to give recognition to the income-spending lag. However, the form which he gives to the CIA constraint ($\sum M_{t-1}^s \ge \sum P^y y_t^d$) is curious. It suggests a money-spending lag rather than an income-spending lag, which is odd because there is no money-spending lag. As also indicated by the Keynesian budget equation 7, present spending does not need "cash in advance"; it merely needs "cash in the present" which was received as "income in advance". It may furthermore be noted that Keynes (1936) also suggests a circulatory income-spending stream which is, however, not captured by his money market analysis (that is, his monetary budget equation) but by his goods market analysis. Injections and leakages then take the form of investments and savings rather than of money creations and raised hoardings. A more in-depth discussion of Keynes's way of treating the circular income-spending stream falls outside the scope of this paper (but see Van Eeghen, 2014).

4.1 Bank money creation

It would appear that bank money creation merely changes the method of money creation (from coin production to banks raising their deposit issue) without having to introduce an additional injection/leakage term. But this is not so. Non-bank agents can use part of their financial resources to service their bank debt or buy assets from banks, which constitutes a leakage from the current goods spending round as well as a negative injection into the next spending round given that the applicable payments entail money destruction.⁸ This leakage *cum*-negative-injection term is analytically significant in a number of ways.

Among other things, it plays a key role in Fisher's (1933) debt deflation effect. A falling general price level raises the real value of bank indebtedness which creates an incentive for accelerated repayment of existing bank debt as well as a disincentive to take up any new bank debt. The resultant reduction in the money stock depresses spending, thereby putting further downward pressure on prices and reinforcing the spiral. It is for this exact reason that deflation is so dangerous and so difficult to combat in a fiat money world. For instance, the monetary stimulation of the Bank of Japan's QE largely failed to stimulate total spending, not mainly because liquidity preference increased as argued by Krugman (2012), but more importantly because the Japanese public used its extra money to pay off more bank debt thereby virtually neutralising the initial monetary stimulus. Since DSGE's budget expressions do not have this this leakage-*cum*-negative-injection term, attempts by Brunnermeier and Sannikov (2011, 2013) and Eggertson and Krugman (2012) to integrate Fisherite debt-deflation effects into a DSGE model, must seriously misrepresent and understate them.

4.2 Change in secondary financial trade volumes

Keynes's (1936, pp. 66-75) strictures on user cost and the resultant integration of the logic of national income accounting into macroeconomic theory has also had a downside. In accordance with the logic of national income accounting, macroeconomics has traditionally considered only trade in final goods. But it should, in accordance with the logic of monetary exchange, take account of trade in all goods: any and every type of tradable gives rise to a supply of monetary finance at the moment it is sold, and to a demand for monetary finance at the moment it is bought. Consequently, an unchanged volume of trade in intermediary goods (including original factors), non-recently produced goods (mainly existing real estate and second-hand cars) and secondary financial assets, does not take up additional finance. But an increase in the volume of such trade does require additional finance and therefore constitutes a leakage potentially capable of crowding out demand for current final output, which Keynes (1930), interestingly enough, acknowledged for the case of an increase in secondary financial trade.

It is important to note, however, that the potentially highly disruptive impact of a huge, and hugely variable, financial circulation on the goods circulation is mitigated by a number of

⁸ It is a matter of plain observation that virtually all payments between banks and non-banks are conducted in the banks' own deposits. It follows that any disbursement by banks in favour of non-banks causes money creation (deposits appear) just as any disbursement by non-banks in favour of banks gives rise to money destruction (deposits vanish). Such is the logical basis for the role which commercial banking plays in the creation or destruction of money. Textbook writers are strangely reluctant to acknowledge this role, preferring to represent banks as pure intermediaries (see Häring, 2013). The same applies to DSGE theorists, as will be seen below. Central bank officials tend to be more forthright. Mervyn King (2012) is a case in point: "When banks extend loans to their customers, they create money by crediting their customers' accounts".

institutional factors like clearinghouse netting, financial traders' access to flexible trade credit at their banks (injections and leakages cancel out), and the fact that a significant part of financial trade is conducted by banks between themselves which they can finance with cash reserves (central bank deposits) rather than money proper. The increased size and variability of secondary financial trade over the last couple of decades is, of course, also mainly responsible for the break-down in the correlation between money and spending, which means that, if the relevant net leakages could be isolated, a reliable relationship between money and spending could in principle be re-established (see van Eeghen, 2014).

Needless to say, DSGE models ignore the potential impact of variable secondary financial trade volumes on aggregate goods spending, as also evidenced by the fact that the inverse income velocity is widely used as a measure of average passive money holding. The measure is unreliable in view of potentially strong variation in secondary financial trade as well as in intermediary and non-recently produced goods trade.

4.3 Lending and borrowing

Contrary to secondary financial trade, trade in primary financial markets (lending and borrowing) does not require the introduction of an additional leakage/injection term. In fact lending and borrowing, because they cancel out in aggregation, should not feature in an aggregate monetary budget equation at all (Kohn, 1981b). Lending and borrowing can influence aggregate spending only indirectly, via the leakage and injection terms already present in the Robertsonian budget equation 8. When funds are non-intermediated or nonbank intermediated, the successful channelling of funds from surplus to deficit units creates scope for more spending by generating a negative leakage in the form of a reduction in overall passive money holding; what borrowers gain in monetary finance, lenders lose in monetary finance, so that aggregate spending can increase only when borrowers have a lower liquidity preference than lenders. In contrast, when funds are bank intermediated, bank lending to non-banks makes space for increased aggregate spending by generating a positive injection in the form of bank money creation. In the former case increased finance for spending is created by more efficiently using existing liquidity, while in the latter case it is created by adding liquidity (Bossone, 2001). This distinction, which is clearly significant, is consistently overlooked in DSGE modelling.

Since borrowing does not directly influence total spending, the borrowing constraint is an unsuitable way of modelling the influence of financial dysfunction on total spending. It is nonetheless universally employed for that purpose in DSGE analysis.

4.4 Sectoral budget equations and the budget equation of commercial banks

Although lending and borrowing along with transfers should not feature in an aggregate budget equation, they may legitimately appear in sectoral budget equations. The budget equations of firms, households, non-bank intermediaries and government can otherwise follow the templates provided by equations 7 or 8.

The budget equation of the banking sector is fundamentally different. Banks are unique in that they can finance their lending and spending with their own deposit IOUs. While non-bank financial intermediaries have to finance their assets with previously deposited or borrowed funds, banks can issue their borrowers and asset sellers with their own, newly created deposits. The banking sector's ability to create its own deposit finance is, however, not for

free. When the banking sector raises its monetary deposit issue, it faces an increased cash drain to the public due to increased withdrawals (for an unchanged propensity to hold money as cash). Banks will also be confronted with a cash drain to foreign banks due to a worsened balance of payments position, *ceteris paribus* all other influences on that position. In addition, banks will experience a larger transactions demand for cash in view of a larger volume of interbank payments traffic.

The conclusion is that the banking sector as a whole is not constrained in its assets acquisitions by its ability to attract deposits but by its ability to obtain cash. Furthermore, because bank deposits are the predominant means of payment, they must also be the predominant means by which the non-bank public pays for its investment in the banking sector's other forms of balance-sheet funding: non-monetary deposits, debt and equity. Monetary deposits are, therefore, the original source of all bank balance-sheet funding (Bagehot, 1919 [1873], p. 181; Disyatat, 2011).

It follows that the banking sector has two budget equations: 1. a balance-sheet funding equation and 2. a liquidity constraint. The first is best expressed verbally:

Assets Acquired
$$\equiv$$
 Monetary Deposits Issued (10)

The equation is given as an identity because it necessarily holds by virtue of the nature of commercial banking. The second budget equation confronts the banking sector's current cash holdings with the cash needed to sustain its current *Monetary Deposits Issued*. This cash budget equation, which is the only potentially constraining one, can be given the same general form as the Keynesian equation 7 except that money (M) is narrowed to cash money (Mc):

$$\sum Mc_t^s = \sum P^y y_t^d + \sum Mc_{t+1}^d \tag{11}$$

 $\sum Mc_t^s$ refers to the current cash inventory of banks, which is not conventionally considered as part of the money stock. $\sum P^y y_t^d$ captures the demand for cash necessary to finance the cash drains (to the public and foreign banks) and the interbank transactions resulting from payments traffic on a given deposit issue. $\sum Mc_{t+1}^d$ identifies the desired cash holding for the immediate future. The fact that banks have a cash budget constraint is indirectly confirmed by the fact that the interest rate on bank lending is driven by the interest rate on cash rather than the interest rate on loanable funds or money more broadly, which exposes a fundamental weakness in both loanable funds and liquidity preference theory. It also transpires that the universal practice since Bernanke and Blinder (1988) of deriving the banking sector's budget constraint from its consolidated balance sheet is mistaken; the procedure generates a money or loanable funds budget, not a cash budget.

4.5 Cash constraint on banks

Under a commodity money standard when cash was specie, banks had to attract additional specie in order to sustain an increased bank money issue – specie which ultimately had to come from non-bank hoarders and producers thereof. Now that cash exclusively consists of central-bank issued money, the banking system's only source of cash is the central bank. As a result, the central bank has no choice but fully to accommodate the banking system's cash needs, whether it be the regular cash needs of normal times or the exceptional cash needs of

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crisis times (see Goodfriend and King, 1988; Moore, 1989; Goodhart, 1989). It cannot withhold banks their lifeblood when banks cannot obtain that lifeblood elsewhere. For that reason the banking sector as a whole, whether healthy or in crisis, faces no quantity-of-cash constraint on its supply of credit but only a price-of-cash (=interest rate) constraint on the public's demand for credit (Disyatat, 2011), which is precisely why the interest rate is – and always has been – the main instrumental target of monetary policy (Goodfriend, 1990; Bindseil, 2004). Of course, commercial banks are not mere passive accommodators of the public's credit demand; by their credit rationing and asset buying decisions they can still actively influence their credit extension and deposit money issue. And while the deposit money creation by the banking sector as a whole cannot be constrained by a shortage of cash, it can be facilitated by a surplus of cash without necessarily driving down the interest rate to zero, which is the idea behind QE (Goodfriend, 2002).

The inescapable conclusion is that the banking sector as a whole faces no liquidity constraint. The same applies to an individual bank for as long as it grows its deposit issue apace with the banking sector as a whole, keeps its risk profile in line with that of the sector as a whole, and has a sufficiently well diversified depositorship over all non-bank sectors and regions. This lack of a liquidity constraint critically undermines the logic of DSGE models like those of Diamond and Rajan (2005, 2010) and Brunnermeier and Sannikov (2011, 2013) which attribute the banking sector's fragility to the risk of becoming illiquid. Only non-bank intermediary sectors like pure savings banking, stand-alone investment banking or shadow banking are susceptible to illiquidity.

Even so, the dramatic asset price falls of the recent crisis did impair the lending capacity of banks with significant toxic asset holdings. This happened, however, not because these banks became cash-constrained – central banks made sure of that – but because they became equity-constrained, partly under the influence of capital adequacy requirements. When banks subsequently reduced their debt (issued fewer deposits by lending and spending less) and increased their equity (distributed fewer profits and sold more shares – if they could), the money stock contracted with the ensuing real effects. That is why banks deleverage at the expense of the real economy; the greater the losses and the more capital needs to be rebuilt, the greater the damage to the real economy. It is no coincidence that macro-prudential regulation focusses mainly on bank capital rather than bank liquidity. Contrary to what DSGE models like that of Eggertson and Krugman (2012) suggest, it is deleveraging on the part of banks rather than of non-banks which damages the real economy. The main aim of QE policies is indeed to mitigate the damage of private bank deleveraging by counteracting it with increased central bank leveraging.

4.6 International trade and summing up

Imports and exports have a dual nature. Imports represent a form of spending as well as a reduction in the local money stock, just as exports are a source of income as well as an increase in the local money stock. They are part of the income-spending stream as well as a leakage from, or injection into, that stream. To prevent a double-count, imports and exports should, therefore, be incorporated either as part of income and spending or as changes in the money stock (preferably the latter), but not as both. Textbook Keynesian income-spending analysis fortuitously avoids such a double-count by not featuring monetary injections and leakages at all. International trade in securities can *mutatis mutandis* be handled in the same way.

To sum up, then, the financial and real sectors are interlinked through monetary injections and leakages: (1) changes in the money stock, in the various different ways in which such changes can be effected, (2) changes in the level of passive money holding and (3) changes in the volume of trade in secondary asset markets. Models wishing to take account of the financial system will have to incorporate these three injection/leakage terms and determine their net effect. An alternative approach to the monetary transmission mechanism now also presents itself naturally, which is to gauge the influence of the (conventional or unconventional) policy variable on the various injection and leakage terms separately and independently (see Bridges and Thomas, 2012; van Eeghen, 2014).

5. Money and banking in DSGE's dynamic budget constraints

DSGE modelling uses a sequence of periodic household budget constraints. Significant variation in their form exists, but the basic structure can in nominal terms be given like this:

$$P^{n}n_{t}^{s} + W_{bt}^{s} = P^{y}y_{t}^{d} + W_{et}^{d} + T_{t}$$
(12)

 $P^n n_t^s$ and $P^y y_t^d$ represent this-period supply of labour (*n*) and demand for consumption goods (*y*). Inventories of wealth potentially consist of money, bonds and capital (W = M + B + K) connected to either the beginning-of-period moment (*bt*) or the end-of-period moment (*et*). The end-of-period demand for wealth (W_{et}^d) turns into a supply of wealth at the beginning of the next period (W_{bt+1}^s). T_t represents transfers.

The household budget of equation 12 is combined with the budget equations of several other sectors. However, instead of adding all these sectoral budgets together and so arrive at an aggregate version, DSGE analysis integrates the budgets of its non-household sectors into the budget of its household sector. In essence, non-household budgets take resources out of the household budget (labour, capital, tax payment, bonds), possibly add some of their own resources (say, newly issued money), and then put all these resources back into the household budget in a different form (as goods, profit, bond repayments, money or interest). The end result for the household budget is that labour supply gets substituted for goods supply and that some wealth items are added. These changed wealth holdings carry over into period t+1 where they facilitate changed goods spending.

DSGE's lack of an aggregate budget equation is puzzling. Insofar budget equations play a role in the explanation of aggregate spending, they should surely also be given in their aggregate form. Some DSGE models like the workhorse Smets and Wouters (2007) version do specify what is referred to as an "aggregate resource budget" which, however, takes the shape of a Keynesian goods market equilibrium condition (Y = C + I + G) rather than a genuine budget equation. The fact that DSGE analysis shuns a genuine aggregate budget is, of course, not surprising as it would mean that lending and borrowing (and transfers) need to be scrapped as they cancel out in aggregation. The effect of lending and borrowing on aggregate spending would then need to be explained via their effect on monetary injections and leakages, which resource budgets cannot accommodate – even when a CIA constraint is added. Of course, lending and borrowing do indeed disappear from DSGE's life-time resource budget equation, which, however, does not happen in the aggregation over all sectors for a given period but in the aggregation over all periods for a given sector.

All these problems culminate in a deficient explanation for the inverse relationship between the interest rate and aggregate spending. It suggests that, say, a decrease in the interest rate stimulates current spending by lowering the reward for current lending in favour of future spending. But as noted several times by now, lending or borrowing cannot in themselves influence aggregate spending, but do so only via their effect on the money stock (injections) or the level of passive money holding (leakages). How the interest rate impacts the money stock and the level of passive money holding would thus need to be established (see van Eeghen, 2014).

But DSGE analysis cannot adequately model the relationship between the interest rate and the money stock because, in the absence of a commercial banking sector, private lending and borrowing does not affect the money stock. Since only cash is customarily considered as money, only the central bank is regarded as capable of impacting the money stock. All the influential, post-crisis attempts to incorporate banks and banking crises into DSGE modelling such as those by Cúrdia and Woodford (2009), Gertler and Karadi (2011) and Martin and Ventura (2011), still consider banks as pure intermediaries unable to create or destroy any money (see also Arestis and Sawyer, 2008; Arestis, 2009). The absence of a commercial banking sector also clashes with DSGE's acceptance of the interest rate as conventional policy instrument which presupposes a commercial banking sector – as explained in the previous section.

In addition, the absence of a commercial banking system makes it difficult for DSGE analysis to model the credit cycle. The amplification mechanism of the classic Minsky cycle is plain: increased optimism leads to increased bank lending which generates a larger money stock, increased incomes, more spending, higher asset prices and better balance sheets, which feeds back into increased optimism and bank lending again – and *vice versa* for the downturn. In contrast, the financial accelerator models of Bernanke, Gertler and Gilchrist (1999) and Kiyotaki and Moore (1997, 2012) attribute shock amplification to expansions and contractions in household lending to firms due to self-reinforcing changes in firm net worth. Brunnermeier (2013) adds intermediation to this scheme, in which case the net worth of the intermediary also features. But, crucially, there are no bank-credit induced monetary expansions and contractions in such models, which takes the heart out of the credit cycle as empirically confirmed by Schularick and Taylor (2012).

6. Conclusion

The financial and real sectors are interlinked through monetary injections and leakages: changes in the money stock, changes in the level of passive money holding, and changes in the volume of trade in secondary asset markets. In order to capture financial-real sector interaction, macro-monetary models need to feature an aggregate monetary budget capable of incorporating these injection and leakage terms.

DSGE analysis cannot adequately model financial-real sector interaction because (a) its aggregate goods market clearing condition prevents monetary injections/leakages from directly impacting aggregate spending and (b) its periodic resource budget equations cannot incorporate monetary injections and leakages. DSGE's modelling of how the interest rate influences total spending is deficient because changes in current lending cannot explain changes in current aggregate spending. For the same reason, DSGE's borrowing constraint cannot transmit financial dysfunction through to the real economy. The same applies to
DSGE's CIA constraint for as long as there is no commercial banking sector capable of influencing the money stock. The lack of a money-creating and -destroying commercial banking sector also disqualifies DSGE analysis from satisfactorily modelling the credit cycle as well as debt-deflation effects. By treating commercial banks as pure intermediaries, DSGE models overlook the fact that commercial banks have a cash budget equation and that the central bank has no choice but to ensure that the sector as a whole faces no cash constraint on its credit extension. The banking sector as a whole is constrained only by a lack of equity not a lack of liquidity. All these deficiencies make DSGE analysis unsuited as a vehicle for macro-monetary theorising.

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Evaluating the costs of growth

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Abstract

The twentieth century has been extremely unusual in that economic growth rates have been extraordinarily high. At the same time, costs of this growth have also been extremely high. These have been in the form of environmental degradation, depletion of planetary resources and species, climate change, and adverse social change. Since many of the effects of growth go outside the marketplace, evaluating costs and benefits involves value judgments of types which economists are not well-equipped to make. This article sketches some issues which have not received sufficient attention in the discourse about current policy options which bear importantly on our future.

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Introduction

Many dimensions of economic growth are qualitative and create changes in social, institutional as well as environmental and geographic structures. Evaluating the costs and benefits of these changes necessarily involves subjective value judgments. Because these changes are not marketed and priced, many economists have under-estimated their importance. Resistance by economists is also due to the idea that science is concerned purely with the objective and the positive. Even though it was widely believed throughout the twentieth century, the idea that the positive and the normative can be clearly and sharply separated has been decisively rejected. For instance, Hilary Putnam (2002) has shown that facts and values can be inextricably entangled; see also, Zaman (2012), who shows the normative assumptions embedded in the fundamental economic concept of "scarcity". Thus, economic theories which consider only observable marketed quantities and prices, and ignore intangibles and non-market assets are seriously deficient. The first section below shows how a single minded focus on economic growth has led to our ignoring many other vital dimensions of development. Subsequently we argue that evaluating costs and benefits of growth requires the introduction of values into the development discourse. An explicit consideration of values leads to many types of policies not currently within the ambit of development planners. This creates out-of-the-box solutions, which are desperately needed in current times.

The unusual twentieth century

According to Weber (1930, Chapter 2), the spirit of capitalism is the pursuit of wealth as a goal, to the point of being absolutely irrational³. For most of the twentieth century,

¹ Vice Chancellor, Pakistan Institute of Development Economics, Islamabad, Pakistan.

² A version of this article was originally written for Vision 2025, a planning document for Planning &

Development in Pakistan ³ In fact, the *summum bonum* of this ethic, the earning of more and more money, combined with the strict avoidance of all spontaneous enjoyment of life, is above all completely devoid of any eudæmonistic, not to say hedonistic, admixture. It is thought of so purely as an end in itself, that from the point of view of the happiness of, or utility to, the single individual, it appears entirely transcendental and absolutely irrational. Man is dominated by the making of money, by acquisition as the ultimate

development was defined as the accumulation of wealth. It was taken for granted that this was a desirable goal, and a central requirement for all possible development plans. Agreement on this proposition spanned the spectrum of thought from capitalism to communism. Ethics and values were not part of the development discourse, since there was agreement that economics was a science, and did not include subjective and normative ideas.

This proposition, in the form that the single most important measure of development is GNP per capita – the amount of wealth produced per person – continues to command an extraordinary amount of support. Governments rise and fall on the basis of this criterion, and ministries all over the planet as well as theoreticians, policy makers, and politicians devote tremendous efforts to devising strategies to increase the amount of wealth created within nations. Yet, a review of the results produced by more than half a century of concentrated efforts to achieve this result shows spectacular failure on many fronts. This assertion surprises many who are used to thinking of twentieth century as a spectacular success in wealth creation. Thus, it is first necessary to explain how the "Growth Illusion" – see Douthwaite (1995) – is created by shoddy accounting.

Conventional wisdom regarding economic growth is captured in the chart labelled as Figure 2 taken from Snowdon (2006), who writes that "Economic growth, not redistribution, is the single most powerful mechanism for generating long-term increases in income per capita." The growth illusion is so powerful that the trivial and trite nature of this truism – growth rate of any criterion is obviously the most powerful mechanism for increasing this same criterion – is not obvious to the learned author.



purpose of his life. Economic acquisition is no longer subordinated to man as the means for the satisfaction of his material needs. This reversal of what we should call the natural relationship, so irrational from a naïve point of view, is evidently as definitely a leading principle of capitalism as it is foreign to all peoples not under capitalistic influence. – Weber (1930)

What escapes these authors, and many economists and policy-makers all over the planet, is the COST at which this growth has been purchased. The price of the spectacular growth has been equally spectacular and has been paid in many dimensions. One of these dimensions is illustrated in the figure below, which shows that the human footprint – the amount of land needed to support current per capita consumption levels – is far beyond levels which are sustainable in the long run.

Similar graphs can be produced of many indicators, such as depletion of topsoil, fresh water scarcity, loss of species. J. R. McNeill's (2000) Environmental History of the Twentieth-Century World, tells us how humans have altered the earth from the 1890's to the 1990's. World economic growth, up 120 times since 1500, has exacted an enormous toll on the earth's crust, atmosphere, water supply, plants, animals and finally on our own species: the human beings. The concern for sustainable development has been driven by this realization. The social and human cost of this economic growth can also be illustrated in many dimensions. Instead of the many statistics illustrating the rising rates of depression, loneliness, breakdown of communities, families and loss of trust, we just pick a single illustrative event. Since 1990, the national income of Ireland has grown by 50%. Unfortunately, the Irish suicide rate increased by 64% in the same period.



The red lines above show sustainable levels of population and consumption, with no provision for survival of any other living species. They show we are already living well beyond the Earth's sustainable capacity. The green lines show the sustainable levels of population and

consumption if we want to share a modest part of our planet with other species). Data for the chart comes from Angus Maddison webpages.⁴

So the burning question is: are the benefits of economic growth worth the cost which has been paid for it? No answer to this question can be given without implicitly or explicitly invoking values which allow us to judge and compare different dimensions of the rapid changes which have occurred in the previous century. According to some economists, "species come and go," so loss of biodiversity due to environmental damage and destruction of natural habitats is of no consequence. Similarly, others, like Solow (2009), say that "The world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe." On the other hand, one can find deeply pessimistic authors like Douthwaite (1995), McNeill (2000), and Diamond (2005) who warn of impending catastrophe due to our collective pursuit of non-sustainable life-styles.

Should we regard the past century of rapid economic growth as a spectacular success or as a spectacular failure? Answering this question involves blending subjective value judgments regarding the relative weight of different dimensions of progress, with a vast collection of objectively known facts, as well as collections of speculations, projections and estimates of varying levels of certainty. At the same time, we cannot afford to bypass this exercise of evaluating the record of economic growth, because appropriate policies to pursue for the future will be radically different depending on how we evaluate this past. Also, weighing the future, the environment, social changes, etc. will necessarily involve value judgments of many kinds.

A rather lengthy argument has been carried out to establish something which should be patently obvious. Throughout history, the idea of the "good life" has been defined in very different ways by different communities. Development is obviously about use of material growth to enable everyone to achieve his or her conception of the good life. Different goals will obviously necessitate different policies for the achievement of these goals. The choice of goals is necessarily value-laden, and requires explicit consideration of values. Many prominent economists like Mahbubul-Haq, Amartya Sen, Stiglitz, and others have realized that dimensions other than mere accumulation of wealth must be considered in formulating development policy. Nonetheless, it remains true that mainstream economic theory taught at leading universities throughout the world pays only peripheral attention to these concerns. Policies are driven by these theories, since economists and planners have most often received training embodying mainstream ideas of growth and development. In an earlier era, Mahbul-Haq (1976,p.24) characterized this problem as follows: "The most unforgivable sin of development planners is to become mesmerized by high growth rates in the Gross National Product and to forget the real objective of development". The way to atone for this sin is by taking explicit account of the goals of development. The determination of these goals is necessarily driven by values, which must therefore be a crucial part of the development discourse. We next turn to consideration of these goals, and how taking them into consideration affects development policy.

⁴ Graph taken from Dave Pollards website: http://howtosavetheworld.ca/2005/02/15/

Two fundamental flaws in growth theories

Although an obsession with the pursuit of wealth for its own sake leads many to lose sight of the fact, it would become clear upon reflection that money is only a means to an end, and not an end in itself. Once we accumulate wealth as part of the development process, what should we do with it? More concretely, what are the ways of using wealth which are most conducive to human welfare? Perhaps paradoxically, this central question receives virtually no attention in conventional texts on growth and development. This is because economic theories of human behaviour make two wrong assumptions. Conventional microeconomic theory incorporates the assumption that maximizing consumption will automatically maximize human welfare. The second false assumption is that human beings optimize, and will always make welfare maximizing choices.

The Easterlin (1973) paradox shows that money does not buy happiness in the long run. We postpone a detailed discussion, and note only that it demonstrates that the first assumption is wrong. Maximization of consumption does not lead to maximum welfare in the long run. It is the conflict between the short run and the long run which creates the paradox. Because increased consumption does improve happiness in the short run, myopic individual decision making would encourage pursuit of wealth and increased consumption. The paradox that money cannot buy happiness only emerges when social implications and long run consequences are taken into account.

Behavioral economists have demonstrated that the second assumption is wrong. Human behaviour is governed by social norms, and heuristics are used instead of optimizing algorithms. Furthermore social norms can be created and changed. This leads to a dimension of development policy which is not recognized by conventional texts: what kind of social norms should be chosen, so as to maximize human welfare? Human behaviour and social norms are taken as exogenous, and out of the purview of the economist, when in fact they are central to design of policies for development and growth.

We now turn to the policy implications which emerge from correcting these mistakes.

Policy implications of the Easterlin paradox

The goal of development is to improve human lives. Values determine what is to count as improvement. But there would be near universal agreement that improvements would entail greater satisfaction, contentment, and feelings of well-being and accomplishment. We will abuse the English language by loading all of these meanings into the word "happiness". The Easterlin paradox shows that there is no long-run relationship between GNP per capita and happiness. Thus if economic growth is not an end to be pursued for its own sake, it is not useful as a means to producing the desired end of improved human welfare.

Because the Easterlin paradox strikes at the heart of economic theory, and challenges the core belief the economic growth is the basis for all welfare improving measures, it has been rigorously contested. In a recent re-examination, Easterlin et. al. (2010) showed that all objections to his main findings were based on short-run correlations between wealth and welfare. Easterlin also affirms that short-run positive correlations exist; it is only in the long run that these positive correlations disappear, creating a paradox. It is a deeper examination of

the reasons for the paradox that leads to policy implications currently not on the books of planners. There are two main reasons: habituation and relativity. We explain and discuss these reasons separately below

Habituation: As we buy more creature comforts with our increased wealth, we get used to this higher level of comfort. After habituation, this additional level becomes necessary for us. Only increases above this level bring us happiness. Thus only a continuously increasing growth process can create long run happiness; however such an eternal growth process is not sustainable and not possible for the vast majority of human beings on our finite and limited planet. Once this is understood, there are many techniques which can be used to improve welfare of human beings which do not involve economic growth. Habituation occurs in both directions: up and down. If we develop habits of simple living in Spartan conditions, low standards of living will not lead to unhappiness. At the same time, occasional and temporary increases in this standard will be easily achieved and will bring much greater happiness than habituation to high standards of living. This makes clear the wisdom of a formula which has been recommended by many sages across many cultures: the education of our youth should also include habituating them to hardships. In China, adults from all classes provide a year of service to the nation working on projects of social value. Programs of this type which engage large portions of the population in community service would create many positive externalities. We mention two beneficial aspects. Firstly, all members of the nation experience a common, simple lifestyle which creates a habituation to simplicity. This allows for much greater appreciation and enjoyment of simple enhancements which are treated as luxuries. This leads to greater welfare and happiness for the nation as a whole. A second aspect, which is also essential, is that selfless service to society creates social bonds between all members of the society. This creates trust and also serves as an equalizer. These invisibles are essential components of successful development policies, though they do not receive any mention in economic textbooks on growth and development. Implementing creative ideas in this direction by utilizing labor for social services in lieu of taxes can have many beneficial side effects. This may also be beneficial in countering liberal policies for cuts in taxes for the rich and in social services for the poor.

Relativity: The welfare and satisfaction that people feel from a given level of consumption is based on comparing this level with the average level in some reference social class. As consumption increases, happiness increases in the short run, as people feel that they have gained relative standing. However, these reference levels also rise as the average consumption levels rise throughout the society. Thus these short-run gains are wiped out in the long run. Thus, in this rat race, everyone struggles hard to get ahead, but there is no gain in welfare to the society as a whole. This has many policy implications.

A key implication is the economic growth is completely irrelevant to human welfare. This proposition is also empirically supported by the Easterlin paradox. In fact, additional research shows that fulfilment of basic needs contributes substantially to human welfare. The argument for economic growth is often based on the idea that growth will contribute to the fulfilment of basic needs via the famous trickle-down effect. However, empirical studies over the past few decades, for instance Saez (2103) and Stiglitiz (2013), document the operation of a "vacuum cleaner effect," which sucks wealth from the poor and concentrates them in the banks of the rich. Thus growth has no automatic implications for improved welfare.

This has radical and far reaching policy implications. Both Madison Avenue and Hollywood make rich and luxurious lifestyles appear far more attractive than they actually are. The

widespread global media network and the internet, combined with extremely smooth and professional packaging of these messages have spread them to all corners of the planet. The display of luxury and ostentatious consumption leads the vast majority to feel discontent with what they currently have. Such messages must be moderated, and counteracted by other messages which are of social value. Ads which encourage readers to "Make your neighbours green with envy" must be replaced by those which encourage compassion for the less fortunate. Any strategy to help improve welfare of human beings, as opposed to a blind pursuit of wealth for its own sake, must take this into account.

Human agency and the choice of social norms

As Mirowski (1991, p.3) has documented, the prestige of Physics led economists to selfconsciously imitate the methodology of Physics: "the progenitors of neoclassical economic theory boldly copied reigning physical theories in the 1870's. (they) did not imitate physics in a ... superficial manner; no, they copied their models mostly term for term and symbol for symbol, and said so."

One aspect of this imitation was the use of highly simplified models of human behaviour. Over the past few decades, an overwhelming amount of empirical evidence has emerged which contradicts these models. Karacuka and Zaman (2012) "The Empirical Evidence Against Neoclassical Utility Theory: A Review of the Literature" provide a survey of this evidence from a wide variety of sources. Although there are many dimensions of conflict, we will focus on only one idea here: that of human agency. There is a fundamental tension between a scientific approach, which requires predictable and law-like behaviour, and the human freedom to choose in ways that do not conform to any past pattern. The scientific methodology favoured by economists functions to deny agency to human beings, and makes their actions mathematically predictable and deterministic.

While being far more complex than simple economic models suggest, human behaviour does follow certain predictable patterns which can be recognized as social norms. However, these social norms are taught to members of communities and can be changed by various types of social interventions. Recognition that human behaviour is shaped by social norms, and that societies have some freedom to shape these norms leads to consideration of issues which are not currently part of the development discourse. What type of norms should we choose for our society? Are certain types of norms more conducive to human welfare than others? Because values and social norms are neglected topics in development, these issues of central importance have received virtually no attention in the literature. Since a full discussion would easily encompass a book, we confine attention to one illustrative topic.

Economists consider free markets as the ideal form of economic organization. This is characterized by the norms of selfishness at the individual level, and competition at the social level. There is a huge amount of evidence that encouraging selfish behaviour has led to a substantial decline in social capital, as represented by breakup of communities, dissolution of families, increased loneliness and depression, and decline in trust. At the group level, Harvard MBA Professor Zuboff (2009) who taught the virtues of competition for more than 25 years testifies that: "I have come to believe that much of what my colleagues and I taught has caused real suffering, suppressed wealth creation, destabilized the world

economy, and accelerated the demise of the 20th century capitalism in which the U.S. played the leading role."

As a thought experiment, consider the effects of promoting generosity and cooperation, instead of greed and competition. Aknin et. al (2010) provide empirical evidence that generous behaviour leads to substantial welfare increases both at the individual and at the social level. Similarly norms of cooperation lead to substantial increases in trust, which has now been recognized as an essential lubricant in the process of development.

Economists have not paid attention to these issues because of the idea that norms are fixed and unchangeable. In fact, there is substantial evidence that norms vary substantially across societies, and these norms can be shaped by suitably designed policies. For example, active promotion of the ethic of returning lost items led to remarkable results in Tokyo lost and found. There is a wide spectrum of stands on the normative notion that society is collectively responsible for health and education of all its members. This norm is strong in Europe and Canada, which provide substantially superior health and employments benefits. In contrast, this norm is much weaker in USA; correspondingly, there is much less social provision of health, education and unemployment benefits. The question is: which of these options is better at promoting social welfare? As a society, we face a choice - we can train our children to be generous and cooperative, or we can train them to be selfish and competitive. Development theories are not well equipped to answer these crucial questions. Recent research provides answers which are surprising to modern mindsets but familiar to the ancients. Many studies of long-run happiness - for example, Friedman and Martin (2012), Seligman (2012), Vaillant (2012), Ware (212) - have found that social relationships, and particularly caring for and helping others, leads to longevity and happiness. These are exactly the opposite of lessons currently being taught in Microeconomics, which state it is rational to maximize lifetime consumption utility.

Human-centered development

Long-term experience with development led Mahbubul Haq to the following fundamental insight: "... after many decades of development, we are rediscovering the obvious—that people are both the means and the end of economic development." (cited in Bari, 2011). Conventional economic theories of growth reverse these priorities. Human beings are viewed as inputs to the production of wealth, which is the defining characteristic of growth. Instead of focusing on using humans to produce wealth, we must focus on producing wealth to create better human lives. Even though it seems trite, focusing on humans as the means and ends of economic development leads to radically different conceptions of economic policy. We list three such differences as illustrative.

Character building: Economists study corruption, labelled rent-seeking behaviour, in terms of its impacts on productivity and growth. However, if we consider human lives as central, corruption is a character flaw, while integrity is desirable character trait. Creating integrity is desirable as an end in itself, regardless of how it affects production. From a secular point of view, it has been shown that the classical character virtues are strong determinants of long run welfare of individual. Empirical evidence of the dramatic impact of character is furnished by one of the most remarkable developmental episodes of human history: the rise of the Arabs after the introduction of Islam. The ignorant and backwards Arabs rose to dominate

world history, overtaking long established civilizations of Rome, Persia, India and China, purely on the strength of the teachings of Islam. Many other illustration can be added to show how character building plays a crucial role in the development process. This idea is reflected in the writings of Sen (1993), who talks of about development in terms of human capabilities.

Free trade: The doctrine of free trade argues that we should allow inefficient industries to collapse – the unemployed labourers will automatically find work in industries with greater comparative advantage, which will lead to increased wealth for the society as a whole. This is a wealth-centered as opposed to a human-centered idea. Suppose that stable jobs lead to stable families which are the single most important determinant of human welfare. Disrupting families by destroying jobs, even temporarily, may not be compensated by the additional wealth generated by comparative advantage. For instance, Michael Moore (1989) has graphically documented the destruction of Flint, Michigan, as a consequence of profit maximization by General Motors. Are cheaper cars sufficient to compensate for destruction of human lives and society caused by massive job losses due to closure of factories? Evaluation of such changes requires a much better understanding of the nature of human lives than economists currently have. Values and determinants of human welfare play a much stronger role than is allowed for in current development theories and policies.

Social responsibility: An increasing emphasis on individualism and hedonism has replaced the traditional civics courses in college. Julie Reuben (1996) has documented this change in higher education in her remarkable book entitled "The Making of the Modern University: Intellectual Transformation and the Marginalization of Morality." Recent surveys show that 71% of Americans did not have basic knowledge of civics, and that college education does not add anything to this knowledge (Intercollegiate Studies Institute, 2013). Furthermore civics knowledge was significantly correlated with active citizenship. Education plays an important role in shaping our attitudes to the world and the society we live in. The marginalization of morality has left a vacuum in this education which has been filled by Hollywood and the Internet, to our collective loss. Changes in social norms could be created by movies honouring traditional virtues of sacrifice, compassion, caring and responsibility, instead of the current crop which glorifies assassins, thieves, and the pursuit of individual pleasures without regard to social responsibility. Celebrating individuality and vilifying the collective mentality of the "Borg" creates allergic reactions against cooperation and social responsibility. As an example, media-conditioned responses to the words "socialized medicine" are enough to prevent an intelligent discussion of relevant issues. Because such choices are not even on the table for discussion, they are made for us in the marketplace for ideas subject to Gresham's law. After all, how many people would watch a movie on St. Francis of Assisi when there is a block-buster action movie playing next door?

The point is that families, educational institutions, and media are the factories which manufacture the humans who will be our next generation. It is vital to understand the messages and training being imparted by these, as this will shape our future.

Conclusions

There are two basic tensions which must be resolved at several levels – individual, communal, national and global. One is the tension between personal gains versus social gains which is characteristic of the Prisoner's Dilemma. If everyone makes personal sacrifice

for the sake of the social good, solutions which are beneficial for all result. Current deadlock on environmental issues which imperil the globe, are the result of countries preferring their national interests to that of humanity as a whole. The second tension arises between short term gains versus long term gains. If I exercise and diet today, I will be healthier tomorrow. Just as most people fail to make wise choices in this matter, so unregulated market forces lead to massive exploitation of natural resources without any regards to the price to be paid by future generations.

Jared Diamond (2005) has provided examples of many societies which collapsed because they failed to consider these trade-offs. Our current situation is precarious because these issues which are central to our future are not even under discussion. A complex constellation of circumstances has led to this situation. One of the important factors in this constellation was logical positivism. This philosophy confined knowledge to scientific knowledge, and scientific knowledge to the quantifiable and measurable. Morality was equated to meaningless noise – it was not part of human knowledge; see Zaman (2012) for a more detailed discussion. This has led to an increasing ignorance about values, ethics, and justice. Moral and ethical considerations are central to the problems that we need to solve collectively. It is the need of the hour to bring these to the foreground, instead of treating them as peripheral, as is currently being done.

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Climate change, carbon trading and societal selfdefence¹

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Abstract

Markets, especially those for 'fictitious' commodities, are not the simple result of the gradual extension of exchange relations but social and political constructs. This paper discusses the socio-historical development of carbon markets and their application in the EU against the background of a Polanyian 'double movement': the reembedding of labour, money and land into social ties in the post-war decades was followed by a 'counter-counter movement' in the form of transnationalisation processes in production and investment, and, particularly, the liberalisation of financial markets. The paper analyses history and procedures of the EU Emissions Trading System (EU ETS) as a climate change (CC) mitigation means and in analogy to financialisation processes. First, it outlines three methods in environmental regulation of capitalist markets: direct regulation, Pigouvian taxation and commodification or emissions trading, and then it empirically assesses the EU ETS highlighting inherent flaws such as over-allocation of certificates, carbon-price volatility and the significant bureaucracy and costs. The paper demonstrates that actual carbon markets have as yet opened up new investment opportunities particularly for finance capital and a range of new career paths but contributed next to nothing to CC mitigation. To avoid dangerous CC other policy means would need to be applied as soon as possible.

Introduction

Karl Polanyi (1944) interpreted capitalist development as the outcome of a 'double movement'. The first part of this movement involved the imposition of 'free markets' in the nineteenth century.² The damaging social effects of this process, in particular those transforming labour, money and land into 'fictitious commodities', provoked a 'countermovement' in the 20th century struggles for social and economic democracy and citizenship rights. Countervailing the disruptive social consequences of market liberalism, markets became embedded in a regulatory web that, in the post-war circumstances, was built around an accommodation or a 'class compromise' between national labour movements and employers, who were likewise primarily national in terms of corporate ownership and investment strategies, and governments, which were to a large degree autonomous in social and economic policy. Yet, as Richard Hyman (2013: xiv) observes, these preconditions 'no longer apply'. Transnationalisation and globalisation processes have removed the dominant capitalist agglomerations from national control, and the liberalisation of financial markets has 'spawned and array of exotic commodities which Polanyi could never have imagined: derivatives, secondary markets, hedge funds, private equity, leveraged buy-outs ...' so that national economies are becoming increasingly disembedded from effective social regulations. Not least because the beneficiaries of the new finance-driven accumulation regime have 'little interest in maintaining historic compromises', Hyman (2013: xiv) interprets these recent trends in terms of a Polanyian 'counter-counter-movement' involving the 'deliberate

¹ An earlier draft of this article was presented at the inaugural workshop of the *Öresund International Political Economy* network in Malmö in November 2013.

² It has often been argued, most recently by Hyman (2013: xiii), that the 'whole idea of free markets is an oxymoron, since all markets are social and political constructs.'

unravelling of the regulatory web constructed in previous decades'.³ This paper's point of departure is the hypothesis that a largely disembedded and finance-driven capitalism⁴ features disruptive social and ecological consequences and that policy responses to major ecological issues such as climate change (CC) reflect the lines of policy making that resulted in largely deregulated financial markets, if they are not matched by a popular and academic 'counter-counter-movement' capable to push through the respect of ecological limits within which capitalist development may proceed and corresponding regulation. More particularly, it outlines emergence and functioning of carbon markets as emissions trading schemes, focuses on the parallels to the expansion and procedures of financial markets, and assesses the efficiency of such 'market solutions' as a policy means in CC mitigation.

Any such assessment has to consider the extremely short time frames within which CC mitigation would need to become effective. In its recent Fifth Assessment Report on the Physical Science Basis for Climate Change, the Intergovernmental Panel on Climate Change (IPCC 2013) highlights that concentrations of CO₂ and other greenhouse gases (GHGs) in the atmosphere have increased to levels that are unprecedented in at least 800,000 years with the burning of fossil fuels being the main reason behind a 40% increase in CO₂ concentrations since the industrial revolution. The global surface temperature increase for the end of the 21st century is projected to exceed 1.5°C relative to the period 1850-1900 in all but the lowest scenario considered; other scenarios predict global temperatures to rise as much as by 4.8°C, exceeding the 2°C, beyond which uncontrollable CC with frequent droughts, floods and storms plus largely unpredictable climate feedback effects are expected, by far. The IPCC expects global mean sea levels to continue to rise during the 21st century, by a further 26-82cm. Beyond 2100, it predicts warming to continue, the Arctic sea ice cover to shrink and thin and the Northern Hemisphere spring snow cover as well as the global glacier volume to decrease further. In addition, the UK Tyndall Centre (Anderson 2012: 22) informs that even during the 2009-10 global economic recession CO₂ emissions rose by 5.9% and during 2010-11 by 3.2%. It expects global emission increases of 3-5% per year from 2012.⁵ The prospects for remaining within the 2°C limit are less likely with every year without mitigation. Anderson discusses various scenarios the bottom line of which is that from 2020 carbon emissions need to decrease between 10 and 20% every year in order to hit zero between 2035 and 2045. He concludes that if the 'necessary changes in behavioural and consumption patterns, coupled with the technical adjustments we can make now and the implementation of new technologies', are made, 'there is still an outside possibility of keeping to 2 degrees.' (Anderson 2012: 38) While this is, in principle, good news, it should go without saying that current emissions projections have repercussions for the applicability of carbon markets as the predominant CC mitigation means: the academic problem of whether emissions trading schemes may become efficient in some distant future period is secondary to the issue of whether they are a functioning policy means now and in the immediate future.

³ Polanyi's dialectical framework is complementary, even if not identical, to the regulation theoretical approach that explains the disembedding of the fictitious commodity, labour power, from its web of regulation by taking the erosion of the 'Fordist class compromise' as departure point (see, for example, Boyer and Saillard 2002; Koch 2005 and 2012).

⁴ On the characteristics of a finance-driven accumulation regime, see Stockhammer (2008) and Koch (2012 and 2013a).

⁵ Despite the long-term trend of rising global carbon emissions, virtually all mainstream-analyses assume global emissions to peak within the period 2010-2016 implying that emissions from China and India would peak by 2017/2018; in other words, 'almost all orthodox, low-carbon emission scenarios are premised on implicit assumptions about emissions for non-Annex 1 nations that few, if any, analysts consider appropriate.' (Anderson 2012: 26)

Three methods of environmental regulation and the particularities of carbon markets

It is far from obvious that environmental regulation should proceed through commodification and the creation of markets. Indeed, the commodification of something that is not scarce, such as air, or that has no use value, such as $CO_2 - a$ 'non-value' that people normally try to get rid of (Altvater and Brunnengräber 2008: 10) – is difficult and requires the helping hand of an active state. To theorise these difficulties in commodification Böhm *et al.* (2012) suggest distinguishing between 'real environmental commodification' in situations where 'non-human nature is treated as if it was a "true" commodity, such as in the case of mining', and 'proxy commodification', which involves 'artificially' commodifying a 'currently non-commodified entity'; in an attempt at compensating for missing markets and expanding accumulation frontiers, carbon markets can indeed be seen as an 'example of proxy commodification, providing new opportunities for allegedly "green" accumulation.' (Böhm *et al.* 2012)

Yet, in principle, there are three methods of environmental regulation within capitalist development that can be combined in single empirical cases. The first method concerns directly regulative measures where the government establishes restrictions on how much pollution a company can emit. Exceeding the allowed values of a particular kind of pollution identified by government authorities leads to penalties ranging from fees to the closure of the emitting industrial unit, and so companies have an incentive to review their production methods. The second method is the imposition of Pigouvian taxes on the producers of negative external effects. Since negative externalities arising from certain economic activities lead to damages for third parties and to costs for the general public that are not already covered by the private costs of the company, this activity is taxed in order to 'correct' the market outcome so that efficiency is achieved. Following Arthur C. Pigou (1932), governments should use the tax income raised for compensating for damages caused and for financing of measures against causes of the damage.⁶

Neoclassical environmental economists criticise Pigouvian taxation and direct regulative measures on the ground that the government is in control of both procedures and outcomes and not the market. This is seen as restricting innovation as well as being inefficient. The third method of 'internalising' external effects therefore gives priority to the market by creating tradable rights or pollution allowances. Pollution- or emission-trading schemes are essentially an application of the ideas of Ronald Coase (1960: 15), who suggested the construction of specific property rights in order to identify and separate the affecting and affected parties in relation to ecological damages and to calculate these economic costs. The introduction of private trading of allowances would enable affected parties to decide for themselves, if, how and to what extent they should restrict environmentally harmful activities. Instead of a costly and cumbersome bureaucracy, as in Pigou's tax regime, perpetrators of environmentally harmful actions would be disciplined but, according to Coase and his followers, in much cheaper and more effective ways. External costs that were previously met by the public would be internalised, and so companies would be confronted with the real costs of their actions and change their production methods accordingly. Hence, those companies that could not easily function without creating pollution would acquire the right to do so from others for whom emissions reduction was easier to achieve. For Coase, another advantage of the market over tax solutions was that policymakers no longer needed to decide which economic activities

 $^{^{6}}$ There are also positive external effects where the public benefits from an activity that the market undersupplies. Pigou (1932) suggested subsidising such positive externalities – education, for example – by the state.

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were to be taxed and under what conditions. The market would take care of this through the demand and supply of emissions certificates. Finally, Coase was optimistic about the link between pollution, business costs and innovation and technological progress. Rising costs caused by the increasing scarcity of production factors that were previously free would lead to adjustments in the technological and energy basis of the work process, thereby producing optimal ecological results. Dales (1969) deviated from Coase by not leaving the definition of the best overall level of pollution to an imaginary 'perfect market'. Instead he gave this task to the government. Once the state had defined the total level of emissions for a sector of the economy and a specified time period and then issued proportionate emissions allowances, these could be traded freely between economic actors. Those who faced the highest cost of emissions reduction would be prepared to pay the most for the allowances. Those who had comparatively cheap opportunities for emissions reduction would opt for taking advantage of these rather than purchasing permits. With regard to the ecological effects of the mechanism, it is crucial for government authorities to ensure that allowances are issued in such a way that their number is reduced over time so that the price for each emission unit rises sufficiently to create an economic incentive to implement ecologically desirable innovation in the work process (Ptak 2008: 39). In order to keep allowances scarce, Dales suggested auctioning them to companies.

Supporters of market solutions in environmental regulation admit that the establishment of carbon markets is not cheap in the beginning, since governments have to spend money for the definition and enforcement of progressively stricter overall sectoral or societal caps on emissions. They also have to divide emission quotas among the industries under their jurisdiction and set up the legal and measurement machinery for making them tradable (Lohmann 2011: 95). It is only when private property rights to contaminate the atmosphere exist that specialised platforms for emissions trading can emerge and become accessible to holders of emissions certificates worldwide (Tietenberg 2003). Through the implementation of carbon trading schemes, new business and investment opportunities arise for CO₂ brokers, tradesmen and bankers including those representing major finance companies and hedge funds. New actors who are becoming involved in the implementation and operation of carbon trading schemes include market intermediaries, auditing companies, consultants, lawyers and various kinds of researchers. Neoclassical environmental economists and CC governance theorists do not find it problematic that investors are not primary interested in reducing atmospheric CO₂ concentrations but rather in the financial returns arising from the trading of and speculation with certificates. On the contrary, since the reduction of CO₂ emissions is expected to be a side-product of merely furthering individual profit interests, emissions trading schemes are regarded as a welcome new investment opportunity, especially for financial capital.

Historical development of the EU Emissions Trading Scheme (EU ETS)

According to Paterson (2011: 83), the popularity of carbon markets is thanks to the fact that these have enabled the 'formation of a "winning" political coalition favouring GHG emissions reductions' and businesses to 'imagine a cycle of investments, profits and growth centred on these markets that may help processes of decarbonization'. He distinguishes three historical phases of regime building (Paterson 2011: 83-5). In a first phase, policy networks promoting emissions trading emerged from the early 1990s onwards, when UK and US economists started writing about emissions trading regarding CC and became linked to UNCTAD. In a second phase, the British faction of the network was organised through a number of informal

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contacts under the auspices of the Advisory Council on Business and the Environment and the Confederation of British Industry (CBI), eventually becoming the 'Emissions Trading Group'. As an increasing number of actors including the UK government was drawn into the network, this was the period when companies that would be regulated under any measures to address CC - carbon tax or, worse, 'command and control' regulations - 'switched strategies from either active resistance of keeping their hands in the sand towards active engagement to produce policies that least threatened their interests.' (Paterson 2011: 83-4) On the part of the UK government, an important motivation to pursue carbon trading from 1997 onwards was to provide the City of London with early-mover advantages in the emerging carbon markets.⁴ Meanwhile, in the US, the network was more informal, but nevertheless 'highly influential in creating the knowledge base' (Paterson 2011: 85) with which the US could argue forcefully in the UN Framework Convention of CC process for emissions trading. In fact, the idea of emissions trading mechanisms was introduced into the Kyoto process by the US delegation, arguing that only market mechanisms could achieve emissions reductions in an efficient and cost-effective way. Subsequently, in an attempt to bring the US on board, key-negotiating countries reluctantly signed up to the introduction of carbon trading and carbon offsetting. Hence, in a third phase (1997-2003), many actors shifted considerably from skepticism or hostility towards carbon markets to positions of cautious acceptance and increasing enthusiasm.

When the Bush administration withdrew the US support for the Kyoto Protocol in 2001 the EU took over the lead in the formation process of carbon markets. This was facilitated by a change of personnel in the European Commission. Officials who had been skeptical about emission trading during the Kyoto negotiating process left and were replaced by a small group of economists who were much more in favour⁸ and capable of developing and finalising the EU ETS system by 2003. Another crucial factor for this shift was the fact that an European energy tax would have required a unanimity vote of the Council, which the Commission had proved unable to achieve for years, while emissions trading as a non-fiscal measure was allowed to move ahead on the basis of a mere majority vote (Voß 2007a: 339). When it became clear, in 2004, that the EU linking directive of the EU ETS to the Clean Development Mechanism (CDM) and joint implementations (JI) provisions in the Kyoto Protocol would create demand for Certified Emissions Reductions (CERs), more actors became involved. Carbon trading companies such as Ecosecurities, Climate Care, FutureForests (now the Carbon Neutral Company) were founded and a number of major financial players including Barclays, Cantor Fitzgerald, Dresdner Bank and JP Morgan, which bought up Climate Care in 2008 and Ecosecurities in 2009, established carbon-trading offices. What came to be known as the 'carbon industry' is an increasingly organised business sector that provides service for the development and maintenance of emissions markets and involves 'specialised consultancies, banks, brokers, exchanges, risk managers, project developers, journals, conference organisers, news services and so on.' (Voß 2007a: 338) Attached to the new policy paradigm and the new service business is a 'social infrastructure' of specialised skills and professional careers that has led Voß (2007a: 339) to speak of a 'new technology of governance' the main pillars and actors of which - public agencies, trading departments in companies, auditors for emissions, newly created departments in public administration, think tanks, consultancy and law firms, project developers, traders, banks, exchanges, lobby groups and information providers - 'rely on and mutually reinforce, each other.' The Chicago

⁷ And, indeed, Paterson (2011: 90) observes that '59% of all trades in the global carbon markets are organized through London ...'.

⁸ Skjærseth and Wettestad (2008: 75) call this group the 'Bureaucrats for Emissions Trading' group (BEST) including Jos Delbeke, Peter Vis and Peter Zapfel.

Climate Exchange (CCX), founded in 2001, was the first system for the registration, reduction and trade of GHG emissions. This was followed by European stock exchanges for emission allowances, for example in Leipzig.

The fact that more and more financial actors moved into the carbon business and/or developed carbon market arms was crucial for the establishment of the EU ETS. Paterson (2011: 90) identifies two ways of profitability in the new market: first, on fully commodified markets such as the European Climate Exchange, were prices can be easily compared and different products can be rendered fungible, financiers 'make money either through commission on the purchase and sale of permits or credits, through arbitrage practices between the prices of different commodities in the market, or through the creation of a range of derivative products that enable other firms to hedge against price volatility'. The new commodities in these markets are the EU Allowance (EAU) and CER, which are at the same time the units of account for the EU ETS and the CDM, respectively. There are also future and options markets in each so that it is possible to trade allowances 'before they formally exist, to hedge against both the price volatility inherent in financial and commodity markets ... and the added regulatory risks specific to carbon markets (produced by uncertainties about allocation regimes, measurement questions and policy direction).' (Paterson 2011: 91) Second, there are markets that are oriented at the transnationalisation of investment, especially through the CDM that is designed to generate investment in carbon abatement projects in developing countries. The exchange of CERs is referred to as the 'secondary CER market', that is, exchanges of CERs already created by CDM projects. Actors involved in this market spectrum include project developers, who are using the income from CERs to make viable projects that might not, otherwise, come about, consultants working on the Project Design Document (PPD), which has to be prepared to get approval from the CDM Executive Board consultants on the methodologies to be developed and applied in a project, brokers, who bring together project developers and purchasers of CERs (or buyers and sellers of EUAs), firms, which validate the PDD for the CDM system and to verify the emissions reductions once the project has started, and lawyers, who draw up the contracts to purchase the carbon allowances or credits or devise contracts for derivative products.

Development and design of the European carbon market mirrored that of financial markets since the 1980s. Already in the 1970s, the US had abandoned its commitment to redeem debts in gold, allowing its deficits to swell. The Bretton Woods agreements had collapsed under the pressure of increasing international capital flows, and industrialised countries stopped using fixed exchange rates, stable interest rates and commodity price stabilisation (Koch 2006). To handle the emerging uncertainties of a transnationalised and deregulated business environment, credit derivatives could be used as a means against the exposure to supplier default. However, as Lohmann (2010: 227) points out, the new derivatives 'involved social transformations undreamed of by conventional insurers.' Capital and credit controls were assessed as 'inefficient', a 'block to the growth of the liquidity that traders assembling diversified international portfolios needed if they were to provide a privatised solution to privatised uncertainty.' Default risks were detached from loans and repackaged so that both could be bought and sold separately. Disembedded from local contexts, uncertainties were 'separated and re-differentiated along various numerical scales to help create thing-like products tailored to the degree of risk-awareness of every investor'. New means of credit creation were invented at ever shorter intervals by new financial actors such as hedge funds, brokerages, private equity firms or financial products divisions, which tended to characterise the new arrangements as 'efficient' and 'politically neutral'. Yet the task of 'disentangling, isolating, commensurating and "thingifying" uncertainties involved painstaking, innovative,

contingent political work by a variety of interested authors, including regulators' – mechanisms of commodification, which made a 'wide range of unknowns market-friendly (sliceable, diceable, sellable, buyable)', but which, at the same time, became 'time bombs of ignorance' (Lohmann 2010: 229). Paradoxically, however, the simplifications required for commodification 'led to enormous complexity' – partly due to unrelenting pressures on quants to come up with 'one technical fix after another' – the dangers of which were lucratively passed on to customers, governments and taxpayers (Lohmann 2010: 234).

In circumstances of a transnationalisation and financialisation of investment and the concomitant 'liberalisation' of national and international finance markets (Koch 2012: 89-101), it was far from coincidental that governments turned to financial 'experts' and guants in particular for advise in developing a market solution to CC. Indeed, Lohmann (2010: 236) notes that 'some of the same bricoleurs and theorists have helped nurture both the financial derivatives markets and the carbon markets.' Many of the major players in the financial markets were also becoming dominant in the emerging carbon markets including Goldman Sachs, Deutsche Bank, Morgan Stanley, Barclays Capital, Fortis, Rabobank, BNP Paribas Fortis, Credit Suisse, Sumitomo, Kommunalkredit, Merrill Lynch and Cantor Fitzgerald. Similarly to the derivatives markets, carbon markets came to rely on the assumption that 'separating out various credit uncertainties from loans and injecting them into commodity circuits was mainly a technical matter for experts', so that 'climate benefit' units can be separated from the 'historical pathways and political and social movements involved in a transition away from fossil fuels' (Lohmann 2010: 240) without further ado. And like uncertainty markets, carbon markets produce highly abstract commodities, 'partly through quantist procedures characterised by suppression of unknowns, contested quantifications, and lack of transparency'. And, as the next section will demonstrate, just as uncertainty markets, they are 'dominated by speculators' and 'vulnerable to bubbles and crashes' (Lohmann 2010: 237).

Results and assessment of the EU Emission Trading System (EU ETS)

The EU ETS is the world's largest existing 'cap and trade' system, accounting for 80% of the global carbon market, about half of the EU's carbon emissions and covering some 11,000 installations (Böhm et al. 2012; Reyes 2012). So far, the EU ETS has been implemented in three phases or trading periods: 2005-2007, 2008-2012 and 2013-2020 (Brown et al. 2012). The start of the fourth trading period is scheduled for 2021. Procedurally, the EU ETS is an iterative process, which resembles other areas of European governance where 'soft' and 'open' methods of coordination rather than 'hard' regulation are applied.⁹ Member states draw up National Allocation Plans (NAPs), which must then be confirmed by the EU commission. In order to implement NAPs, member states allocate emission allowances to the relevant CO₂ emitting companies. Each member state establishes a national registry to which each installation is required to submit its emissions data. National registries are linked to the Community Independent Transaction Log that integrates all national systems under a European umbrella, issues allowances and registers accounts for each installation. In cases where allowances exceed allocated amounts, companies have to acquire additional allowances. Where companies improve their energy balance, they are entitled to benefit from the sale of their superfluous certificates. A major problem in the initial phases of the EU ETS

⁹ The European Employment Strategy, for example, is operated on the basis of a similar procedure (Koch 2008).

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was that most countries had issued too many certificates to businesses (Brouns and Witt 2008: 68) and that the EU commission – contrary to emissions trading theorists such as Dales - issued about 95% of all allowances during the first trading period (2005-2007) and some 90% during the second (2008-2012) free of charge. The EU Commission targeted 50% of allowances to be auctioned in 2013, with a gradual increase of auctioning, reaching 100% in 2027 (Venmans 2012: 5495). Hence, far from consisting an incentive towards using renewable energies, the scheme has *de facto* been a source for windfall profits, particularly for electricity producers, who simply transferred the price of allowances, which had been allocated to them free of charge, onto their customers' energy bills, thereby 'transferring billions of euros from (intermediary and final) consumers to shareholders' (Venmans 2012: 5508). In addition, the over-generous allocation of certificates to companies in most of the EU member states allowed many companies to sell on superfluous CO₂ emission allowances on the international carbon markets resulting in further windfalls. Allocations under the ETS were made under the auspices of not endangering the global competitiveness of European companies and on the assumption that European economies would keep growing. Yet the post-2008 recession and subsequent stagnation reduced output and power consumption, leaving companies with a surplus of permits. Since these were mainly given out for free, the net effect is 'directly opposite to the scheme's theoretical intention: polluters can delay taking action by cashing in unwanted permits, while the over-supply means that the "price signal" that is meant to affect change has been neutered.' (Reyes 2012: 189) Reyes refers to 2011 EU Commission data indicating a 900 million surplus in permits for the second phase of the ETS, meaning that a 'significant quantity of permits will be carried over into the post-2013 period.' In fact, the surplus of carbon permits allows companies to 'bank' credits for use at a later date so that, according to Reyes (2012: 189), 'no domestic reductions will be needed until at least 2018.'

The result of the over- and gratis allocation of carbon emission certificates, which was provided in exchange for the support of the member states and industry groups, was a collapse of their trading price. The price for the emission of one tonne of CO₂ crashed from 30 Euro in April 2005 (Schreurs 2008: 29) to below 7 Euro in April 2012 (Venmans 2012: 5495). Such price volatility is not accidental but instead typical of energy commodities like crude oil and coal, whose prices are determined at the world market level and therefore depend on a range of largely unpredictable factors (including major economic crises) that are normally beyond the reach and scale of regional regulation. For example, demand for carbon allowances fell sharply in late 2008 and early 2009 as the recession reduced economic output, resulting in much lower emissions and consequently in a lower need for emissions certificates than expected by the EU Commission. The result was what the World Bank (2009) called 'cashing in on carbon during the credit crunch'. A mayor sell-off of EUAs started in September 2008 when companies realised that the allowances they had received at no charge were valuable assets, particularly in the midst of the financial credit crunch. The World Bank also reports that this sell-off was followed by a 'discernible increase in trading of EUA options (more calls than puts, on average), showing the intent of some installations to hedge any anticipated 2008–12 compliance exposure.' (World Bank, 2009: 8) Such developments raise serious questions about the effectiveness of carbon trading systems in providing stable economic incentives to emitters who are assumed to respond rationally to price signals. If such schemes are, in practice, unable to deliver the stable and/or rising carbon prices that emissions trading theorists deem necessary for long-term, low-carbon investment decisions the internalisation of external costs - it is difficult to see why they should be preferred over taxation or direct environmental legislation. Compared to the price certainty of a carbon tax,

the high volatility of the carbon price increases the risk profile of low-carbon investments and hampers low-carbon technology development (Venmans 2012: 5508). Irrespective of the volatility in pricing per tonne, carbon prices have at no point in time been high enough to trigger behavioural change and technology investments.

The EU directive was linked to the Kyoto Protocol's 'flexible instruments' – JI and the CDM. The CDM is a carbon offset market enabling the most developed industrial countries and their companies to buy carbon credits from projects located in developing countries that are not legally bound to reduce their own carbon emissions under the Kyoto Protocol. These projects earn CER credits, which can be traded and sold, and used by industrialised countries to meet their emission targets. Recent CDM statistics indicate that carbon offsetting has become a rapidly expanding business. About 5000 projects are already registered and many more are in the pipeline; these projects produced around 2 billion CERs by 2012. Böhm et al. (2012: 1622) point out that between 2002 and 2010, the value of transactions in the primary CDM market was approximately \$27 billion of which a huge share went towards transaction costs, such as consultancy, banking and other service fees. While many EU countries appear to be on course to meet their legally binding Kyoto emissions reduction targets, they have, in fact, only managed to do so by buying carbon offsetting credits from developing countries. The equivalent of 100% from the second trading period and 33% from the third period was and is likely to be realised in developing and Eastern countries via Kyoto credits (Venmans 2012: 5508). Thus, rather than cutting their own carbon emissions at home, the EU ETS has encouraged companies to offset their obligations by paying poorer countries for the implementation of CDM projects. This has led to accusations that the 'EU is essentially "exporting" its legally binding carbon reductions.' (Böhm et al. 2012: 1622)

The sine gua non for CDM schemes to work is that they initiate projects to increase climate protection in developing countries in 'addition' to what would have happened without these projects, because if certificates are issued for projects that would have been carried out anyway, developed countries increase their emissions without any simultaneous emissions reduction in the CDM guest countries. The CDM Executive Board, an agency specifically set up by the UN for the approval of such projects, issues allowances based on the assumed difference between the hypothetical CO₂ emissions in absence of the CDM project – the baseline - and the amount of emissions under consideration of the project. The development of methods for defining 'additionality' and for evaluating the emissions-saving effect from these projects has hitherto been one of the CDM Executive Board's most time consuming and disputed activities (Trexler et al. 2006). As Lohmann (2010: 244) argues, another parallel to financial markets lies in the similarity of the tasks of financial quants, who 'disaggregate different kinds of uncertainty from their contexts', and 'carbon guants', who disentangle carbon offset projects from an imaginary 'baseline' by engaging in 'creative efforts to domesticate, simplify and quantify unknowns.' And just as different investment banks calculated different prices for the same collateralised debt obligation tranche due to the use of different correlation models, 'different offset experts, regulators and environmentalists offer different estimates of the number of carbon credits that a project should be allowed to generate.' (Lohmann 2010: 245)

Furthermore, evaluation studies show that 40% of CDM projects representing 20% of all CDM credits cannot prove that they would not have been carried out anyway (Schneider 2007). Manipulation and fabrication of data on the part of project applicants in order to achieve the

required results were far from being exceptions to the rule.¹⁰ This does not appear to be just an initial problem but inherent to a system that encourages project applicants to generate as many as possible certificates for the lowest possible costs. (Wara 2007) According to the European Commission's 2009 EU ETS Amending Directive, the amount of CO_2 emissions that can be accounted for as JI and CDM will increase significantly so that such credits can be used for up to 50% of EU-wide CO_2 reductions by 2020 – a questionable decision given the consistent methodological difficulties around the notion of 'additionality', the widespread distorted use and, in many cases, outright abuse of the CDM. Its immediate consequence is that more CO_2 can be emitted from the EU territory than previously, while it remains uncertain whether this surplus in emissions will indeed be compensated for by CDM projects outside Europe.

Another alleged virtue of carbon trading schemes put forward by neoclassical environmental economists is the notion that its operation requires less bureaucracy and has lower costs than, for example, a tax on GHGs. However, the amount of administrative work necessary for the implementation and running of an entire new set of institutions at global. European and national levels is far from negligible. Tasks include the measurement of emissions, the issuing of emissions rights, the registering of trades and trade platforms, the regulation of property rights, the validation and approving of CDM projects, enforcing compliance, ensuring and processing reporting and dealing with the widespread opportunities for fraud. Each EU member states set up a special government agency to monitor the scheme. A major concern is the impartiality of evaluators who are accredited and listed by the CDM Executive Board as Designated Operational Entities (DOEs). These first identify the baseline or business-as-usual scenario, and then subtract the greenhouse gas emitted under the project scenario from the baseline resulting in the amount of emissions saved. However, in the EU ETS, it is the project applicant who assigns a particular DOE for a proposed project from the list provided by the CDM Executive Board. These rating agencies develop a range of CDM projects and are always looking for follow-up orders (Witt and Moritz 2008: 95). There is an analogy here to the housing market bubble, where rating agencies positively evaluated a range of non-viable mortgage products before the onset of the 2008 crisis thereby contributing to its outbreak. Similarly, there is significant systemic pressure to produce positive evaluation outcomes within the EU ETS scheme, since the likelihood of being named as DOE by companies again significantly depends on their evaluation the last time round. The costs for the substantial administration of carbon trading schemes have hitherto been borne by the general public (the taxpayer), while the CO₂ emitting companies have contributed nothing so far. One can only speculate on the level of bureaucratic impact and the additional cost for taxpayers that an expansion of carbon trading systems to the entire globe would entail, but there is no doubt that these would be considerable, given that most countries - including major emitters such as China or Russia currently lack the necessary monitory equipment.

The final argument is that carbon markets help to introduce growth strategies based on technological innovation and renewable energies both in the developed and – via the CDM – the developing world. In the case of the developed countries and the EU in particular, this is unlikely given the oversupply of carbon allowances, constantly low prices for carbon emission certificates and the availability to cheaply outsource carbon emissions reduction duties via the flexible mechanisms. In relation to the developing countries, the evidence for the CDM as a means of spurring technological innovation and sustainable production is likewise weak. Apart

¹⁰ In relation to India, Michaelowa and Purohit (2007) point out that about every third UN-registered CDM project could not furnish plausible proof of additionality. Haya (2007) comes to a similar conclusion with regard to the building of hydroelectric power plants in China.

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from the methodological difficulties and outright cheating in relation to the 'additionality' of projects, Witt and Moritz (2008: 96-7) have scrutinised the geographic distribution of CDM projects and found that, in 2008, 771 of 1033 registered projects were carried out in the four threshold countries: India, China, Brazil and Mexico. The majority of the developing countries, and in particular the poorest countries, represent a much lower percentage of CDM projects and therefore have limited or no access to the intended technology transfer. In countries that have poor infrastructures and a weak rule of law, transaction costs are comparatively high, making CDM projects costly and risky enterprises from companies' point of view. Hence, the vast majority of CDM projects are implemented in the so-called 'emerging markets', which also concentrate a great deal of Foreign Direct Investment (FDI) (Koch 2012: 102-10). In these countries, the necessity of attracting FDI provides policymakers with the twisted incentive of not implementing far-reaching climate-protection legislation at the national level, since doing so would violate the very basis that attracts FDI in the form of CDM projects. These have to be 'additional', and that which already has legal status can hardly claim additionality. Thus the lower the environmental standards, the greater the chances of authorisation for a proposed CDM project. Concerning the content of carbon-saving projects, Witt and Moritz argue that most of these are classical 'end-of-pipe' solutions: rather than cutting the flow of raw materials into industrial processes, the problem is tackled after the resulting waste has already been emitted. Marginal projects dominate, such as the containment of industrial gases by bolting on filters to already existing pipes, over the implementation of technological change based on renewable energies.

Conclusion or the need for a 'counter-counter' movement

The transition from an environmental regulatory system based on Pigouvian taxation, which was typical for the post-war decades, towards one based on the commodification of carbon emissions, the artificial creation of private property rights as well as emissions trading as the main mechanism emerged as a part of a wider political and economic transformation in the course of which the idea that market forces with the accompanying (re-)commodification and privatisation of public goods are per se superior to any kind of state regulation and public ownership became the dominant worldview. In the light of these wider societal and ideological developments, it is far from coincidental that Voß (2007b: 114) diagnoses a 'fundamental transformation of basic structures of environmental governance', within which tradable permits and certificates of various kinds became state of the art. And like all major social transformation processes, the one from state regulation to market steering in environmental governance was accompanied by the emergence of new power relationships, interest groups and actors, whose common primary and very material interest it was that this emerging carbon markets continued to exist and to expand. And compared to this interest, the question of whether carbon trading contributes anything to climate protection was indeed secondary.

Assessed against the original policy goal of a decarbonisation of the global economy, realexisting carbon markets score poorly, since they are riddled with design flaws and characterised by pervasive weaknesses in implementation. The lever of any synthetic carbon emissions market is whether it is possible to create scarcity for permits such that price signalling can work. This completely failed in the first two trading periods and, due to the discussed design flaws and anomalies, is likely to fail long-term. While some observers regard the existing policy instruments as reformable in relation to their original aim (Wara 2007; Newell and Paterson 2010; Michaelowa 2011), an increasing number of authors see these market failures as inherent elements of the broader political economy framework of

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contemporary CC mitigation efforts (Bäckstrand and Lövbrand 2006; Bumpus and Liverman 2008; Clifton 2009; Gilbertson et al. 2009; Lohmann 2011; Koch 2012). Indeed, given the extremely short timeframe within which CC mitigation policies would need to result in a peak of absolute carbon emissions (see Introduction above), the empirical test of the existing EU carbon-trading scheme in the previous section does not provide much cheer. There is no indication whatsoever that existing carbon markets can be re-regulated – let alone expanded to the rest of the world – in ways that would make a peak of global carbon emissions by 2020 a realistic possibility. Hence, compared to its regulatory alternatives - direct regulation and Pigouvian taxes - carbon trading systems are the least best solution, unlikely to result in the extent of 'absolute decoupling' of GDP growth and resource inputs and carbon emissions as identified by Jackson (2009: 48) that would be necessary to meet the IPCC climate targets. Worse still, the system's existence creates the deceptive appearance that 'something is being done about the issue'. By assuring that tackling CC does not contradict finance-driven capitalism, and that this issue is dealt with within its institutional structure, resistance and the establishment of alternative ways of working and living become more difficult. On top of allowing corporations and associated governments to manage CC at the lowest financial cost and to open up a range of new career and investment opportunities, the existing CC governance edifice has a detrimental impact at the individual level, where it undermines a transformation of the fossil consumption norm. Carbon-offsetting schemes are the pendant to the CDM for the individual consumer and offer a comfortable way of salving one's guilty conscience by maintaining the illusion that CC can be mitigated without behavioural change (Splash 2010: 186-9).

Since carbon markets, which we interpreted here as part of the 'counter-counter' movement to the crisis of Fordism (Introduction), are unlikely to result in an absolute reduction in global carbon emissions in the foreseeable future, the scholarly attention not only of political economists should be turned to the contradictions and the associated spaces for resistance inherent to the finance-driven accumulation regime. Though a 'counter-counter-counter' movement is by no means an automatic outcome. Polanyi can be read in ways that the latest recommodification wave of labour, money and land - and of the atmosphere in particular may result in a new round of societal self-defence. The parallels in emergence, expansion and functioning of financial and carbon markets and their structural interlocking suggest that effective CC mitigation policies cannot be enacted without a significant increase in public control over the finance sector. As Lohmann (2012: 181) argues, this includes the democratisation of decision-making procedures in this sector, particularly those that are important in determining 'long-range energy and transport development', which would need to be redirected from fossil fuels dependence and the search for fossil fuel substitutes towards locally focused energy, locally adapted agriculture and locally appropriate transport' (Lohmann, 2012: 178). The parallel commodification of, or the development of 'market solutions' to, socio-ecological areas and issues as disparate as finances, water, electricity, health and welfare services as well as the burning of fossil fuels suggests supporting movements aiming at their (re)decommodification; particularly, where movements struggle against fossil fuel extraction and advocate 'national command-and-control emissions reductions strategies plus public works investments and regional/local utility and planning controls' (Bond 2012: 686). Without overestimating the practical relevance of heterodox thought and succumbing to the 'scholastic fallacy' (Bourdieu 2000), political economists, social scientists and other intellectuals can play a potentially important role in such an alliance; especially, by developing economic and societal models that de-prioritise GDP growth and over-consumption as well as associated eco-social policies (Victor 2008; Daly and Farley 2009; Gough 2011; Koch 2013b; Koch and Fritz 2014).

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Supply and demand models – the impact of framing

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Abstract

Supply and demand models have been extensively used to give useful insights. As with any theoretical approach, there are some aspects which are emphasised, some which are ignored, and others given a distorted representation. An awareness of the framing of the theory is useful for identifying additional aspects to consider. This paper illustrates some of these points. In particular, consideration is given to: limitations of static and comparative static analysis; the nature of available information and implications of decisions from limited information; the extent to which decisions/allocations are determined outside freely operating markets; homogeneity assumptions; and the nature of competition.

1. Introduction

Economics places great emphasis on models. There is a very real danger that people come to see economic theories and models as representations of reality. This can result in an inflated view of our understanding and a belief that questions can be addressed through use of these theories and models alone. Many research articles consist primarily of the estimation of a model. Some introductory textbooks describe the conclusions drawn from basic models as if they are equally valid in the real world (Mankiw, 2012). Concerns have been voiced that this approach may be too narrow. As one recent attempt to make this point, Minsky (2008, p. 109) talked about theory serving as both a lens and a blinder. This means that it enables us to see certain things, but the framing of the issue actually prevents us seeing other things also. He drew on Tobin to highlight the significance of this for policy.

"James Tobin, who was a member of the Council of Economic Advisers during President Kennedy's first two years in office and who received the Nobel Prize in 1982, noted that 'The terms in which a problem is stated and in which the relevant information is organized can have a great influence on the solution.' But the way 'a problem' is stated and the identification of 'relevant information' reflect the economic theory of the policy adviser. That is, the game of policymaking is rigged; the theory used determines the questions that are asked and the options that are presented." (Minsky, 2008, p. 110)

This paper uses the basic supply and demand model to illustrate some of the possible pitfalls of this way of thinking, indicating how they may be avoided by a recognition of framing. This has been defined in a media context as "selection, emphasis, exclusion and elaboration" (Severin & Tankard, 1997, p. 320). It is important, and related perspectives can be found in other disciplines, but its significance is hidden to many economists. Dow (2012, p. 49) uses one overlapping concept in her critique of economics when she talks of a "worldview", the broad structure around which a person's perceptions and expectations are organised. In discourse analysis Fairclough (1995) refers to "ideological-discursive formations" (IDFs), language and structures, which groups may use to define debate. If a particular IDF dominates to the exclusion of others, it may be seen as the norm rather than as a particular perspective. Some conventional approaches within economics may be questioned so rarely that they have achieved the status of worldview or IDF.

One worrying aspect of much contemporary economics research is the approach where, when analysing an issue, the very first step is the selection of a model. After this the analysis is undertaken, given all the constraints that the model contains. The results are then considered to be directly applicable to real world situations. This is very restrictive as Keynes himself noticed, given his suggestion that we should be aware of the reserves, qualifications and adjustments that are also necessary in the application of such thinking (Keynes, 2007, pp. 297-298).

Even now, when many aspects of mainstream economics are being challenged, people who are attempting to provide an alternative to the mainstream often aim to provide a basic model, just with a different choice of variables or generalised functional relationships. They are still constrained by the model structure.

By contrast, there are some outside economics who would argue that the relationships they are dealing with are so complex that generalised modelling is not possible. These are two extreme perspectives. A middle ground can be found in the suggestion that a diversity of approaches and awareness of local context is important for understanding human behaviour (Dow, 2012; Guba & Lincoln, 1994; Stringer, 2007). Hodgson has made a similar point:

"While mainstream economic theory has long been engaged in an attempt to place economics on secure and individualistic microfoundations, it was quickly realized that the potential diversity among individuals threatened the feasibility of this project. Many types of interaction between individuals have to be ignored to make the analysis tractable. Indeed, it was not easy to develop a composite picture from a diversity of types of individual agent." (Hodgson, 1997, p. 132)

In this paper I aim to indicate factors for consideration in such a middle ground. To this end, I take one of the most fundamental economic constructs, that of supply and demand. By that I mean the conventional representation of a market using a graph of price against quantity with a demand curve and a supply curve. The next section outlines some of these factors.

2. Using a supply and demand model

This is probably the most basic and well known economic model, so much so that we may not consider its limitations. Here I shall discuss a few.

2.1 Static analysis

Note that the supply and demand model is, like much of economics, based on static analysis. Consequently the focus will be on the market equilibrium. It is based on the idea that you have a scenario within which you can have as much costless adjustment as required to achieve some final end state which will be the equilibrium (issues of existence and uniqueness aside). This does not reflect the real world. In reality, there is a starting point, A. This is more than just an initial resource endowment. It also specifies an application of those resources, for example producing and consuming goods and services at some rate of output (as we are actually moving through time). There is also a path to be taken to the endpoint. This is important. Consider comparative static analysis. Here two static solutions, B and C, are compared. One may be considered as more desirable than the other. However, this does

not necessarily mean that it is desirable to achieve either of those particular outcomes. Nothing is considered about where we are starting from, how long it will take to get to either of those outcomes, and what the adjustments are on the way. There are costs that should be considered going from state A to B or A to C, rather than simply comparing possible options, B and C. There is also an issue of path dependence. In other words, where we can get to and how we get there depends on the starting point and the particular journey that we are taking. Consideration of a path through time highlights a particular aspect of the concept of equilibrium. In reality we are not operating in discrete blocks of time. However, equilibrium is a construct which arises from discrete perspective. We could perhaps alternatively think of a "steady state", but could involve an ever-changing group of participants. Marshall (1920, Book V) discussed problems with the concept of market equilibrium at length, including differences in adjustments possible according to the time allowed and some possible implications of actual trades at various high or low prices before any stable price is determined.

There may also be a moral dimension to consider. The focus in economics on end points without regard for the means of attainment of those end points has been criticised using the label, "consequentialism":

"In consequentialism, the consequence of an action justifies the moral acceptability of the means taken to reach that end. The results of actions outweigh any other consideration; in other words, *'the end justifies the means.'* Jeremy Bentham was an early and influential advocate of utilitarianism, the dominant consequentialist position. A utilitarian believes in 'the greatest happiness for the greatest number.'" (PHG Foundation)

So some important issues are excluded from consideration when using static analysis.

2.2 Long run and short run

Under static analysis it could be considered that there are short-run and long-run positions which are just solutions to differently specified situations. This distinction is less clear if we take a perspective which includes processes of adjustment. We can see this if we consider the view which presents a long-run outcome or path and short run fluctuations around this long-run position. This is often described using the metaphor of a pendulum. However the long-run position may well depend on the path that we are taking and hence the short-run situations that we are passing through. Path dependence means that short-run effects can have long-run implications. Instead of a pendulum, consider a rectangular grid of roads. You are driving along a road, then take a left turn, followed by a right turn. The sum of these two short-run effects is that you are still going in the same long-run direction, but on a different road.

To give an economics illustration, short-run fluctuations of construction affect the overall stock and age of housing and other building, the age and availability of skilled construction workers and construction industry capacity in general. Similarly, path dependence may be important in macroeconomics, affecting investment patterns and labour force size, training and experience. This indicates that it may not be enough just to consider a move to an equilibrium. A move to a short-run equilibrium may be one step on the way to a long-run equilibrium, the position of which is influenced by the short-run equilibrium and the adjustment path (including disequilibria).

2.3 Theories behind supply and demand

Economists commonly consider the theory of consumer behaviour as underpinning the demand curve. This is not a requirement, but it is part of our rhetoric. However, the economics approach to consumer behaviour is highly simplified. There are many marketing texts on consumer behaviour. To take one, Schiffman, et al. (2008) dismisses economic theory in a few lines:

"[M]arketers realised that consumers did not always act or react as economic theory suggested they would. By 'economic theory' we mean the traditional economic concept of decision making, where the maximisation of economic utility or satisfaction is considered to be rational." (Schiffman, et al., 2008, p. 11)

The text runs to over 650 pages and presents theory and evidence on numerous nuanced aspects of demand. Much of the material may be controversial, just as there are alternative theories in economics. It does suggest the possibility of many important influences being overlooked or oversimplified by economists, as illustrated in Figure 1, Schiffman et al.'s "Simplified model of consumer decision making", below. How do we explain this to our students who have covered such alternative material elsewhere?

The theory of production and the firm underpins the supply curve. It could be considered a Claytons theory of the firm, what we look at when we don't have a real firm to consider. If we start by using the theory, we are essentially constraining the evidence to fit within the theory.¹ This impact of framing has long been recognised:

"When examining normal science...we shall want finally to describe that research as a strenuous and devoted attempt to force nature into the conceptual boxes supplied by a professional education." (Kuhn, 1970, p. 5)

It should not be assumed that these conceptual boxes always suit the situations and problems under examination. Tony Lawson, a persistent critic of mainstream thinking, emphasises its reliance on an "atomistic" approach based on "items which exercise their own separate, independent and invariable (and so predictable) effects (relative to, or as a function of, initial conditions)" (Lawson, 2003, p. 16). This questionable assumption permits us to model competitive situations with the keystone finding that it is beneficial for all if individuals pursue their own self-interest. Sennett challenges this perspective, suggesting that cooperation is important even for this structure:

"Cooperative exchanges come in many forms. Cooperation can combine with competition, as when children cooperate in establishing the ground rules for a game in which they then compete against one another; in adult life this same combination of cooperation and competition appears in economic markets, in electoral politics and in diplomatic negotiations." (Sennett, 2012, p. 5)

¹ The heavy reliance on econometrics as a research method could also be criticised for the same reason.





We can think of other examples that illustrate interdependence in individual decision making. Consider, say, a decision as to which film to see or which restaurant to go to for a meal. These are often joint decisions and may override individual preferences in favour of group agreement.

Sennett writes about broader social developments in recent decades. He gives grounds for economists to question the uniformity of purpose assumed for firms in traditional theory and raises questions about decisions that are made outside of the market even in market economies when he writes:

"Changes in modern labour have in another way weakened both the desire and the capacity to cooperate with those who differ. In principle, every modern organization is in favour of cooperation; in practice, the structure of modern organizations inhibits it - a fact recognized in managerial discussions of the 'silo effect', the isolation of individuals and departments in different units, people and groups who share little and who indeed hoard information valuable to others. Changes in the time people spend working together increase this isolation." (Sennett, 2012, p. 7)

It may be that the atomistic approach in economics, by being blind to the importance of such interactions, has played a part in the development of these changes.

2.4 What might actually be happening?

The theory assumes the availability of information about supply and demand curves. However this is not what we tend to observe. At the very best, at any one time we are simply observing one point in the market, giving price and quantity. For a participant in a market, whether in terms of demand or supply, even this information may not be clear. It is even less clear whether the market is at equilibrium. Let us first consider the issue of equilibrium or otherwise, then turn to the information available to participants when they make decisions.

Let's assume (optimistically) that we can observe a price-quantity point. What we are likely to see at best is what some call the short side of the market, the side where the trades actually occur. We don't observe excess demand. We don't observe excess supply. It may be that those whose plans are not realised are aware of their position and can revise their plans, allowing some market adjustment to occur. However we economists, looking on, may not be able to observe this.

There are some markets where willingness to buy and sell can be observed, if imprecisely. A notable example is the market for labour, with unemployment and vacancy data being regularly made available. There can also be some indications in housing markets, at least in relation to supply, although an asking price may not be a good measure of the price a seller may accept. Central to the description of the labour market is the search process, and search may be a characteristic of many markets. It may be tempting to suggest that the market is in some sort of equilibrium if unemployment numbers are roughly equal to vacancies. This would be incorrect. If the time taken for search on the demand side is not the same as time taken for search on the supply side, then you will require different quantities on supply and demand for these to be able to match up overall. For example in a simplified structure with fixed time requirements, if it takes two weeks to fill a vacancy but only one week for an unemployed worker to find a job, with a constant flow of placements and rate of unemployment you would observe twice as many vacancies as unemployed.

Now consider the information available to participants when they make decisions. The market is a "flow" of trades through time, rather than a collective exchange in a timeless environment. In economists' representations of a market, we aggregate over time. It is not so clearly delineated for participants. We don't have the Walrasian auctioneer or a tatonnement process taking place before you have the one-off allocation of equilibrium trades. Time does matter. People are gathering information and are making purchase and sale decisions throughout the period of the market. This bears little relationship to implicit assumptions in standard economic theory that time can be ignored and it is costless to match up the supply and
demand. In reality, traders and purchasers are progressing through the period of the market and the exploratory process in the market is observed through actual trades or actual declines to trade, and these are in many cases irreversible. So if a supplier is selling at too low a price, they cannot then increase the price to people who have already bought the product. Alternatively, if the price offered is too high and sales are lost, they probably will not be able to regain those same lost sales through later lowering the price. Therefore, the number of trades that occur at any actual equilibrium price could be very small if there is some fluctuation occurring during the period of market.

How well do the signals from the potential buyers get through to the potential sellers? Primary signals for a seller are the volume of sales and customer requests for items. If stocks sell out quickly, this suggests excess demand. However, the market does not consist solely of the buyer and producer in direct contact. There are intermediaries, including the wholesaler and the retailer, and possibly additional levels also where there are intermediate goods in the production process. There can be barriers and long delays in conveying information along these chains.

Mention should be made of the analysis of exit and voice (Hirschman, 1970). Standard economics approaches to markets emphasise exit, but voice is an alternative source of information. If potential purchasers do not think an item is available in a particular store (or at all), they may not seek it. People in the store will have little idea of that potential demand. Voice may be important in many additional ways, given new information technology and the ability of individuals to publicly present their views and experiences through the internet. These developments are potentially highly significant for the nature and functioning of markets.

Behaviour out of equilibrium could be considered further. According to our theoretical framing, if there is disequilibrium, plans are not realised. If plans are not realised there is an incentive to change behaviour. Conventional supply and demand models assume that responses to unrealised plans will be in terms of quantity and price adjustments moving along demand and supply curves. However, participants in the market are not operating within our models. Possible changes in the real world are not constrained to lie within the parameters of the chosen models. Participants may have other options available, both in the short-run and the long-run. Instead of moving along imaginary supply and demand curves, people may respond through changes in some other variable, resulting in shifts in curves. In the case of excess supply, for example, unsuccessful sellers are unlikely to wait indefinitely for an opportunity to sell in a specific market if alternative options are available. The labour market gives well-recognised examples of this, with workers finding another type of job, or doing further education. Discouraged workers may also be invisible to the market, with a resulting loss of their market signal. Consequently the theoretical market forces that are said to give adjustment to equilibrium may not be effective in the way that is assumed in mainstream theory.

The strength of market forces depends on the extent of excess supply or demand, and this is ephemeral where exit is possible. Consider also the situation of price ceilings and price floors. Here price adjustment cannot take place. Do we then assume that participants continue indefinitely with plans not realised? This is unlikely to be the case.

In summary, consideration of information flows and of a broader range of possible reactions to plans not being realised would give a richer and more nuanced description of potential market behaviour, and hence of the operation markets out of equilibrium.

2.5 Only allocation through freely operating markets?

Another assumption that we make when we apply supply and demand to analyse issues, is that we can consider society operating through freely functioning markets. As Dixit and others have said, this isn't the reality that we face. First, there is a political as well as an economic environment operating. It can be very difficult to separate out government from markets.

"Markets and governments are both facts of economic life, and they interact in complex ways. We cannot find feasible improvements by wishing away one of the components." (Dixit, 1996, p. xv)

Consider the size of government itself, the labour force it employs, the output it creates, the number of resources that it uses or has command over. The allocation of these is determined not just by market forces, but by political decisions and other institutional arrangements. Second, there are also many regulated transactions, not necessarily regulated by government, although this is also the case, but regulated through price schedules or other pricing practices, and through outlet restrictions by various brands. It is interesting that, for example, with electrical goods some suppliers will only supply to chains if those chains do not stock the goods of some other producers.² We might consider this to be counter-productive. However, we find it quite acceptable to have those restrictions for outlets such as McDonald's, KFC and Pizza Hut. We don't require each of those to stock the goods of their competitors.

So there are restrictions in terms of access to market. Similarly, many producers are operating through a whole distribution chain with wholesalers and retailers, and decisions are made by those other participants in the market. There is not a direct connection between the producers and the consumers. At those steps in the chain frequently pricing is not based on marginal cost, but rather it is set in terms of the percentage mark up, which leads us to question the extent to which marginal cost pricing, if marginal cost can actually be determined, is being used in practice.

Third, there are many nonmarket transactions that we should consider. Certainly within the government sector there are no effective markets operating for most resource allocation decisions, even though attempts have been made to set them up to some extent in the health sector, for example. There are difficulties when such structures are set up, and they're not necessarily the most efficient. If we look at private sector firms, then there are many situations where resources are allocated within firms without the use of pricing structures. We also have the possibility of transfer pricing, as has recently become topical with multinational firms such as Google, Amazon, Apple and Starbucks (Chapman-Smith, 2013). Hence there are many transactions that are taking place even within a market structure, where the allocation or pricing is not determined through markets. There are implicit pricing decisions being made within organisations. So even in a market structure, to suggest that this means that all

² "In a stinging attack on competitors, [chief executive Mark Powell], who moved up from The Warehouse divisional ranks two years ago, also told how the national chain had been the victim of anticompetitive behaviour from rivals. 'The Noel Leeming purchase allowed us to get access to brands that would not sell to us because of pressure from other retailers,' he said. 'It's all hush-hush but it goes on constantly in New Zealand because it's a small country ... constantly!'" (Gibson, 2013)

resources are allocated through some market process and people are aware of the productivity, the marginal cost and the marginal benefits of each input, this also is incorrect. Keynes actually highlighted this sort of thing in his General Theory³. He was well aware that we should not be thinking of some pared down, simplified view of the economy as merely a collection of firms selling directly to consumers, with one item each and everything allocated through factor and product markets on the basis of competition and perfect information.

2.6 Some other points

a) Aggregation and homogeneity

As already discussed, the definition of a market for supply and demand analysis involves aggregation over time. There are also aggregations over space, and over type of good, service, or factor. Aggregation assumes homogeneity, with identical treatment of elements within an aggregate and different treatment of elements in another aggregate (such as a geographically adjacent area). The boundaries affect our analyses and the results obtained, although such a distinct dividing line may not be realistic.

This point aside, specific markets may possess their own characteristics. It is not one size fits all, even with supply and demand diagrams. We might have, for example, 2-sided markets, or multiple objectives. Firms are sometimes producing many different things. They might use some markets to provide a steady income, while taking more risks in others. At times a firm may experience cash flow issues, or questions of warehouse space, and some things happening in one market might have an influence on willingness to supply, or price, an activity in other markets. These things are not picked up in a basic supply and demand model. They are additional aspects which may have to be considered.

b) Imperfect competition

While the supply and demand representation is the common form chosen to describe a market, it is not suitable for imperfect competition where individual suppliers face downward sloping demand curves. Under these circumstances, the supply decision depends not just on price, but on the relationship of demand to price.

c) Non-price competition

The supply and demand model emphasises price as a determinant of both supply and demand, with other determinants being assumed away under the homogeneity assumption, or hidden either as additional explanatory variables or by being ignored completely. Nevertheless, non-price competition has long been recognised, not least with "the perennial

³ "If money-wages are inflexible, such changes in prices as occur (i.e. apart from 'administered' or monopoly prices which are determined by other considerations besides marginal cost) will mainly correspond to the diminishing marginal productivity of the existing equipment as the output from it is increased. Thus the greatest practicable fairness will be maintained between labour and the factors whose remuneration is contractually fixed in terms of money, in particular the rentier class and persons with fixed salaries on the permanent establishment of a firm, an institution or the State. If important classes are to have their remuneration fixed in terms of money in any case, social justice and social expediency are best served if the remunerations of all factors are somewhat inflexible in terms of money, it can only be an unjust person who would prefer a flexible wage policy to a flexible money policy, unless he can point to advantages from the former which are not obtainable from the latter." (Keynes, 2007, p. 268)

gale of creative destruction" (Schumpeter, 1976, p. 84). Significantly for judgments on the desirability of specific outcomes in the market, Schumpeter also suggested:

"A system—any system, economic or other—that at every given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a system that does so at no given point of time, because the latter's failure to do so may be a condition for the level or speed of long-run performance." (Schumpeter, 1976, p. 83)

Static analysis, with the suggestion that optimal outcomes are defined in that context, fails to pick up on this possibility. Some of the disequilibrium behaviours suggested in this paper may have important long-run implications. It may be fruitful to explore their significance for policy purposes.

3. Conclusions

One way to look at economic theories, models and concepts is that they provide a tool kit. They give representations which may serve as analogies which, on occasion, may assist in our understanding of the real world. However, we must guard against the very real danger of believing that our theories, models and concepts are the real world. Alternatively, we should not go to the other extreme of believing that it is not possible to construct any simplified representations to aid our understanding of the real world. There is a middle ground in which careful use of theories and models can be useful, as long as we are aware of the limitations of these approaches. The framing shapes what we see and what we fail to see. Consequently any analysis, if it is to be applied to decision making in the real world, must be subject to further reserves, qualifications and adjustments. It is important that we recognise these constraints. Specific, on-the-ground circumstances may be very important, and it can be dangerous to require descriptions of economic phenomena to fit our theory-based "conceptual boxes".

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Excess capital and the rise of inverted fascism: an historical approach

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Global civilisation is at a critical point as human numbers and their resultant impact have moved past the carrying capacity of the planet; the tipping point is approaching. A similar pattern of overshoot and decline is observed in economic systems as growth leads frequently to overproduction and excess capital, resulting in collapse. Economies must aim at sustainability with reduced activity, to survive in a dangerous period. For this, control by a vigorous collective sector is essential.

Why growth?

World War Two was followed by a period of economic growth. Yet in 1968 many young people in developed Western nations were questioning the lifestyles provided by their societies. They wanted a more meaningful lifestyle, and recognised that it had become physically possible to provide universal social services and good living conditions, including well-paid employment for all with liberal conditions and ample leisure time within a workweek of 30-35 hours. The leisure society beckoned.

At the same time, through the late 1960s and the decade of the 1970s, a considerable body of information described looming global problems. Since evidently all was not well, many decided to search deeper, to ask the major questions of the time and find the answers. Modern society, with its rapacious desire for never-ending growth, was foolishly pushing against limits on a finite planet while increasing inequality and joblessness within a consumer society tightly controlled by ubiquitous advertising.

Growth of population, the expansion of Homo Sapiens across the earth has long been accompanied by the extinction of other species. The first great period of human expansion was between 9,000 and 13,000 years ago after the end of the last Ice Age. The consequence was the Holocene extinction, the disappearance of large mammals from many lands. The process has accelerated in the last half-century. This "anthropocene extinction" is on par with the five catastrophic mass extinctions of Earth's history. Yet how many economics texts mention any requirement to leave living space to what remains of the natural world?

The earth's ability to cope with human activities has now been passed, as is evident with climate change, and resources are used nonsustainably for short-term gain – including oil and aquifer water. A number of estimates show that it would take more than two planets to support everyone at a Western standard of living; while no more than a few tens of millions could live in full balance with the natural world, perhaps two billion could experience a "developed" lifestyle. Desires for a better future most often fail to realise that equity and full development to a western standard is impossible.

A major question raised was whether the growing world population could be fed, even at a lower standard of living. If such a limit was reached, when would that be and how would

events play out? Many global models, led by *The limits to growth*¹ and followed by more complex models have provided the answer. Limits will be passed around 2030, with overshoot leading into collapse.²

The economy is a major defining force in such activity. The holistic scholar must combine information from so many disciplines. Expert information is gathered from many sources and, while suitable analyses of the physical world were available, mainstream economics texts and pronouncements were inadequate, with little or no appreciation of the changes coming. The frequently expressed belief in the triumph of modern growth capitalism is seen in the following two influential sources, the first a popular introductory textbook.

"Today, thanks to the intellectual contribution of John Milton Keynes and his followers, we know how to control the worst excesses of the business cycle. By careful use of fiscal and monetary policies, governments can affect output employment and inflation", so that "the deepest depressions no longer appear to be a major threat to advanced market economies".³

"I argued that a remarkable consensus concerning the legitimacy of liberal democracy as a system of government had emerged throughout the world over the past few years, as it conquered rival ideologies like hereditary monarchy, fascism, and most recently communism. More than that, however, I argued that liberal democracy may constitute the 'end point of mankind's ideological evolution' and the 'final form of human government', and as such constituted the 'end of history'. That is, while earlier forms of government were characterized by grave defects and irrationalities that led to their eventual collapse, liberal democracy was arguably free from such fundamental internal contradictions."⁴

Despite such claims, the instability of developed economies is evident. It is important to understand why and to consider likely developments as other critical factors increasingly impact. My own search has been guided by experiences in scientific research, in particular by success in understanding non-linear instabilities in both a layer of fluid heated from below and in a shear layer where one body of fluid is moving across another. ⁵ In each case the system becomes unstable when a defined parameter passes a critical value, at a tipping point. The new flow follows a clear pattern, to cells in the heated fluid and to breaking waves in the shear layer. Then (depending on a number of other physical parameters) those patterns become more complex, eventually becoming turbulent. Each process can be followed, and understood, with the aid of simplified models that identify the key factor defining when the system is unstable, and the further factors that determine the subsequent behaviour. There is nothing random about these processes; there is a reason for the instability and for the resultant pattern, which in each case follows the laws of physics. These principles hold also in economics.

In science, if a model does not fit reality, if evidence is not in accord with a hypothesis, the assumptions are questioned and some rejected. The reason is sought and a new theory

¹ Meadows et al 1972

² Robinson 2013

³ Samuelson 1948

⁴ Fukuyama 1992, Introduction, page xi

⁵ Robinson 1967 and 1973, 1974 and 1977

evolves. This process should be followed with a national, now global, economic system. Since the system is inherently unstable, will disturbances lead to some new situation, of either another regular pattern or breakdown and turbulence?

Economics of the long term

Many of the more valuable insights come from the fiercest critics of capitalism, and from early economists writing before modern capitalism became dominant, who provide a refreshing picture of issues common to all mass economies.⁶ A long-term perspective includes recognition of a series of long-term cycles. Historian Fernand Braudel identified a series of economic fluctuations, with peaks followed by downturns over periods of around 50 years, through the fifteenth to the seventeenth century.⁷

"Economic historians are more or less in agreement concerning the following medium-term fluctuations between a series of low points: 1460, 1509, 1539, 1575, 1621 – and peaks: 1483, 1529, 1595, 1650, dates which are accurate to within a year or so. This gives us four successive waves, each with its rise and fall, the first lasting 49 years, the second 30, the third 36 and the last 46."⁸

Further such economic cycles have been identified from the late eighteenth century to the mid twentieth century: (upswing) 1782-1825, (downswing) 1845, (upswing) 1845-1872, (downswing) 1872-1892, (upswing) 1892-1929, (downswing) 1929-1948, (upswing) 1948-1973.⁹ With such a range of dates, it is evident that fluctuations, of growth and decay, occur frequently in large economies – both in modern capitalism and before.

Many of the theories of such cycles are complex. One categorization of these theories, noting key proponents of each, is: investment theories (Forrester), Schumpeterian innovation theories (Freeman, Mensch, van Duijn), price theories (Rostow), Marxist theories (Mandel) and social structure theories (Gordon).¹⁰

The one fundamental causal factor, acting across those different eras, is the onset of physical overproduction after which a system dependent on growth will stagnate and then collapse rather than move to equilibrium. There is a repeated failure to master the yields of a period of growth. Malthus was among those who recognised the problem of an eventual limit to demand.

"There would evidently therefore be a general want of demand, both for produce and population; and while it is quite certain that an adequate passion for consumption may fully keep up the proper proportion between supply and demand, whatever may be the powers of production, it appears to be quite as certain that an inordinate passion for accumulation must inevitably lead to a

⁶ I particularly enjoyed de Boisguilbert 1696

⁷ Braudel 1972 and Braudel 1981a

⁸ Bruckmann G, *The long-wave debate*, in Bianchi et al 1983

⁹ van Duijn J J, *Comments on topics 1 and 5*, in Bianchi et al 1983

¹⁰ van Duijn J J, *Comments on topics 1 and 5*, in Bianchi et al 1983

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supply of commodities beyond what the structure and habits of such a society will permit to be profitably consumed."¹¹

Marx considered the "internal contradictions" of capitalism and discussed the way in which a fall in the rate of profit would lead to stagnation and to recurring crises.¹² Further growth then only becomes possible once overproductive capacity has been destroyed.

In the absence of central control an economic system will follow its internal behaviour patterns. The capitalist system seeks profit and requires that excess capital be invested in new enterprises. The profits arising from that investment then further enrich the original possessor of excess. Any capital left idle fails to generate such additional wealth, and may indeed reduce in value in inflationary periods. The process works best when the capital is recycled quickly, and when the volume of goods produced increases rapidly. The successful capitalist profits from this system and desires continual growth, denying any limits.

So long as there is sufficient demand for new products, the product can be sold and this recycling of profits may generate a period of economic growth. But there are limits to the rate at which any given society can make use of material products. The limits to consumption may be absolute – when every person has all that is required – or may be generated by an unequal distribution of income, with some groups having very little purchasing power.

Once a community has the capacity to provide for all such needs and a given market is saturated the process begins to break down. In most productive enterprises there is a long lead time between planning and execution; it was some time in the past that investors saw an opportunity for successful profit and set up the process which involved the construction of new plant and the provision of goods to the market place. Many different investors would have recognised the same chance for profit and when the limit is reached new plant would still be under construction.

There is then no chance for an orderly transition to a new and more stable production pattern. The new producers are more efficient, having built plant using the latest technology. They can compete successfully and the older producers are forced from the market. So begins a period of retrenchment and unemployment.

A wave of positive feedback passes through the economy. As new plant is no longer required, the first to suffer are those who manufacture production machinery, and their suppliers. As plants close down purchasing power is reduced and further businesses struggle. Demand for investment capital reduces; available capital has nowhere to go and the financial system struggles.

This process is a feature of any market economy, Medieval or modern, as expansion of trade both brings benefits and creates great dangers with the instability and "overshoot and decline" of overproduction.

Just as many modern economists, Marx was driven by an ideological belief. He hoped that a crisis would lead to an overthrow of a struggling system by a socialist revolution in developed countries. Recognition that there had already been a series of such crises indicated that the

¹¹ Malthus 1936. First published in 1820.

¹² Marx 1954. The 3 volumes were originally published in 1867, 1884 and 1894.

dominant system might recover rather than be replaced, and that such cycles could continue into the future. Russian economist Nikolai Kondratieff (also written Kondratiev; head of the Konjunktur Institute in Moscow) was the first to bring these observations to international

attention in 1925¹³ and Joseph Schumpeter¹⁴ suggested naming the long economic cycles as "Kondratieff waves" in his honor. Kondratieff identified three phases in the cycle: expansion, stagnation and recession. The length of the periods, and the particular features, obviously vary with historical circumstances.

The Great Depression

Kondratieff's 1925 theory was soon validated by the Great Depression, which commenced with the stock market crashes of 1929 and 1933 and led on through the expansion of fascism to the Second World War. Observations then and since show a close fit with the model of growth leading to increased trade and over-production, stagnation and collapse.

There had indeed been a prior period of considerable economic growth and increased trade as between 1920 and 1929 the GDP of the USA increased by 43%, that of Great Britain by 13%, and that of France by 54%.¹⁵

"Economic progress was rapid between 1925 and 1929, as illustrated by the League of Nations Index for Manufacturing Industry, which rose eighteen points during this period, the figure for Europe (excluding the USSR) and North America show rises of nineteen and twelve points respectively. The boom was not a period of uninterrupted national growth, but recessions, such as those experienced by Britain and Germany in 1926 and by the United States in 1927, were shortlived. During this period international trade expanded even faster than production, and the output of raw materials increased substantially."¹⁶

There is ample evidence of overproductive capacity and excess stocks in the years leading to the depression.

"It may be that the market for some consumer goods – for example, automobiles – was reaching a state of dynamic saturation ... and therefore consumer resistance was mounting; the housing market too was becoming saturated."¹⁷

"In mid-May 1925 the Harvard Economic Service had called attention to the 'existence of a considerable excess of capacity in many branches of industry, especially in those producing basic materials or staple commodities intended for sale to ultimate consumers'....

In midsummer of 1928 E C Harwood had warned that the practice of 'superstimulated sales' had accelerated the approach to a 'satisfaction point' (the

¹³ Kondratieff 1925

¹⁴ Schumpeter 1939

¹⁵ Saint-Etienne 1984

¹⁶ Fearon 1979

¹⁷ Fearon 1979

term he preferred to 'saturation point'), for automobiles in particular, and that the automobile industry was already 'vastly over-equipped' ... Stuart Chase had written early in 1929: 'If we should cease to buy automobiles at the present rate, what would happen to prosperity, would it go down like a pack of cards ?' ...

The Berlin Institute for Business Cycle Research correctly foresaw that the German downturn in 1928 would be long and severe, recognized the depression as no short-term affair, and attributed its severity to the excess capacity to which the German rationalization movement had led."¹⁸

Agricultural production had also moved ahead of demand.

In the face of excess production, purchasing had been stimulated in a consumer society.

"The sale of more expensive items was assisted by the introduction during this period of hire purchase, or instalment credit as it is known in the United States. By 1925, the volume of instalment paper outstanding was \$1,375 million, and by 1929, \$3,000 million."¹⁹

Everywhere there was evidence of excess capital and increases in money supplies. A manuscript completed in 1928:

"rightly pointed out the recently ended easing of the money market, the rapid increase in bank credit, the relatively high rates on brokers' loans, the unusually large volume of savings, the ease with which securities had been marketed, the heavy investment by the public in the security markets, the wide diffusion of ownership of bonds and shares, and the spectacular advance in stock prices."20

Stocks were overvalued in a booming stock market: "ten times annual earnings had long been regarded as a fair selling price for stocks, but ... in 1928 the ratio had risen nearly to twenty to one."21

Some economists have suggested that protectionism was a cause, but in fact such policies were introduced after the strains became apparent, and often were successful, as in Chile, India, Mexico and Japan.²²

The central control system of USSR did not collapse. Recovery in the West was first in the centrally-controlled fascist nations of Germany and Italy; that system did control the economy and get people back to work but at an enormous cost for personal freedom, and resulted in the destruction of the Second World War.

¹⁸ Davis, 1975

¹⁹ Kindelberger 1973

²⁰ Sprague and Burgess; referenced in Davis 1975 ²¹ Davis 1975

²² Garraty 1986

The mixed economy and a long stagnation

War was followed by a period of recovery and rapid economic growth, in both capitalist and communist nations. By 1970 there was overproduction in many sectors.²³ An unstable period commenced with the 1971 collapse of Bretton-Woods system as major nations moved off the gold standard to floating exchange rates, followed by oil and inflation crises and a series of considerable instabilities such as the 1987 stock market crash.

As suggested by the theory of economic cycles, expansion was followed by stagnation. There is no insistence in the theoretical model for exact repetition; each cycle has particular characteristics determined by the society of the time. On this occasion the breakdown from stagnation into recession was long in coming; the stagnation phase of the Kondratieff cycle, which had been almost absent in the previous breakdown of 1929, persisted for 38 years, with economic crisis signalling the recession phase in 2008.

The reason for such a long stagnation period is found in the considerable government action in most countries in reaction to the suffering of the previous depression and the need for collective, national action to fight a World War. This was a mixed economy, with large government and private sectors, not simply an uncontrolled market economy. Collective enterprises were not part of the market, and the varied state expenditure provided stability, continuity rather than economic collapse.

Social benefits cushioned any downturn and dampened the feedback of job losses, reduction in spending and further job losses. The considerable public sector (services and collective ownership) remained largely untouched by problems of reduced investment opportunities and competition among overproducing manufacturers, as did military forces. This was largely a controlled economy, as the evident failure of the free market in the Great Depression had led to the formation of many powerful national and international control agencies – reserve banks and central banks, World Bank and International Monetary Fund (IMF). Just who controlled the control agencies was to be key.

Symbiotic relationships between state and private enterprises have long existed – economies have been mixed with both a central government sector and entrepreneurs carrying on trade and production within the marketplace. History is littered with examples of the interactions between the two players. For example, when a credit crisis in 33 AD put a number of senators at risk, the central government of the early Roman Empire rescued the market through a loan of 100 million sestertii made by the emperor Tiberius to the banks (Rome had no <u>central bank</u>, and regulation of the banking system was minimal).

When in 1306 Philip of France was faced with extensive financial liabilities, partially inherited from his father's war against Aragon and partially incurred by the cost of his own campaigns against the English and their allies in Flanders, he expelled the Lombard bankers who had earlier made him extensive loans and expropriated their property. The important point here is the existence of such wealthy financial non-government institutions in past centuries, and the interactions with capital flowing between the two sectors, depending on immediate needs and the balance of power.

²³ OECD Interfutures internal papers

Many such features are evident today; a mixed economy is normal rather than an exception, and 'free enterprise' is not an entirely new feature introduced with modern capitalism. Just as once kingdoms borrowed to finance wars, now the massive war machine of the USA is funded by loans from the financial sector; and governments have acted to bail out the financial sector from the Roman Empire to today. Often the central agencies have provided support for the market sector, and at other times political movements have led central government to build social services for general benefit using taxation from free enterprise. The recent lengthy stagnation, an unstable bubble economy marked by series of crises but enduring, has shown the positive contribution of collective action and central control, providing a basic constancy to the inherent instability and excesses of the market. **Into recession, 2008**

However the strength of the dominant free market ideology was such that the power and importance of such controls has been denied, and those stabilising central government activities have been degraded – on the periphery in New Zealand as in central nations such as the Britain and the USA. Public enterprises have been privatised, working conditions reduced and the top tax rates much reduced (more than halved in many cases). In the absence of significant growth, the wealth of the ruling class has increased by reductions to the working class, redistribution to the wealthy. Controls introduced to prevent repetition of the previous depression have been whittled away.

Many of the activities within the stressed bubble economy became absurd, such as management of a collateralised debt obligation (CDO) portfolio with no knowledge of what was in any CDO so that "A CDO was, in effect, a credit laundering service for the residents of Lower Middle Class America."²⁴ No one was really thinking about what they were up to so long as the merry-go-round continued and the incomes of the players remained huge. While those who played with vast sums of money, forcing loans on struggling peoples and countries, must take much of the blame, they were only doing what was required of them. Excess capital had to be recycled somehow.

The basic misunderstanding of the need for controls and a strong public sector was clear in statements by the long-time chairman of the Board of Governors of the USA Federal Reserve, Alan Greenspan, with his firm belief in the market. "One could hardly imagine that today's awesome array of international transactions would produce the relative economic stability that we experience daily if they were not led by some international version of Smith's invisible hand."

The crash of 2008 provided a graphic test of the two alternative theories of free-market capitalism, which proved to be unstable as forecast by the Kondratieff cycle. Greenspan was forced to admit his mistake, and told the House Committee on Oversight and Government Reform of being "in a state of shocked disbelief" as he admitted that he had put too much faith in the self-correcting power of free markets. He spoke of a "once-in-a-century credit tsunami" that had engulfed financial markets and conceded that his free-market ideology shunning regulation was flawed.

When the financial sector collapsed in 2008, the derided collective, public sector came to the rescue with government bailouts. Collective enterprise proved to be the secure base of the economy.

²⁴ Lewis 2010

Control by oligarchy

A balance of power, with authority divided among various well-defined players, is a fundamental principle in government. As with separation of power between the legislative, executive and judiciary branches of government, the two great sectors of the economy, the public and the private, should sit apart under separate control. When the private enterprise sector passes through overproduction and the stresses of excess capital to one of the periodic depressions so evident in economic history, the independent collective sector will be available to take remedial action – during the recent long stagnation phase recession was averted for decades by the strength of the collective and by considerable control of the market.

Unfortunately many of the controls, and the collective sector itself, have passed under the control of the private enterprise sector. Control mechanisms, such as the IMF and World Bank, and many national government financial institutions, are directed by a deep belief in the free market (as Greenspan noted above). This has been accompanied by a steady exchange of personnel between the corporate and financial world, and central government.

Under the dominant free enterprise ideology the collective has been downgraded and stripped, with the reduction of the stabilising influence of public ownership. There is no longer an insistence on adequate pay and conditions, and many regulations set in place to deal with the previous great recession have gone. There have been extraordinary payments to managers of financial institutions, coupled with significant reductions in higher tax rates. The crises following 2008 have been dealt with by support to the major financial institutions, which had contributed significantly to the collapse, while the general population suffers. This is nothing more than a modern phase of class struggle. In an evolution warned against by President Eisenhower in 1961, the military-industrial complex has become the military-industrial-financial complex.

This is not a free market, it is a control economy, controlled by a wealthy class for their own benefit. The ruling oligarchy, widely referred to as the "One Percent", is a unified class, firmly in control of the state, with political dominance, high rewards for loyalty, a ubiquitous advertising propaganda system, mass surveillance and more.

Such central control reverses the standard fascist pattern. Mussolini described his fascism as a single party state that incorporated corporatism into its rule. He said that fascism should more appropriately be called Corporatism because it is a merger of state and corporate power. Viewing the nation as an integrated collective community, fascists see pluralism and diversity as a dysfunctional aspect of society, and justify a totalitarian state as a means to represent the nation in its entirety. In systems behaviour terms this is a direct attack on the diversity and separation, the balance of power, that provides equality and stability to modern nations.

Mussolini would have the state control the corporates, destroying any balance of power. Now it is the corporates that control the state. The current situation in many Western nations is inverted fascism with the corporations incorporating the power of the state as the inverse of the past fascist model. This has been developed by ranks of lobbyists with their large staffs and monetary largess that is used to indoctrinate and finance politicians (senators and

congressmen in the USA) inculcating them with policies that suit the corporates. This is corporate fascism. $^{\rm 25}$

This oligarchic class is in control of agencies like the IMF, advising or forcing nations to open up to multinationals. The once powerful Third World non-aligned movement has been crushed with developing nations forced to move away from self-reliance, to open their economies to international finance and foreign ownership. Insistence that nations borrow sums led many into massive debt and the poverty trap.²⁶ The great control organizations, both national and international, serve the wealthy, with beliefs and policies that increase inequality and make the world safe for capitalism.

Rebuild a strong collective enterprise

The two major sectors of mass civilisation, collective and market enterprises, are out of balance, bringing inequality and instability in troubled times. This historical overview and reference to the theory of Kondratieff cycles, makes the double point that modern events are following an old pattern, and that a strong and independent public sector is vital to a healthy economy.

The battle for dominance is a class war. There can be no separation of economic and political thinking; they are aspects of the same question of social organization. Collective action, socialism, is not only beneficial for social equity, it's good economics. High taxes and controls by the state must break the power of the oligarchy, to bring equality and to provide a firm base for the ship of state in stormy times.

Global overshoot and decline

This review of long-term economic trends was stimulated by the need to provide a comprehensive overview of all aspects of the global picture, providing the economic dimension to a holistic forecast that combined information from many sources, many disciplines. A life-long project commenced with awareness that overpopulation and misuse of an entire planet by a dominant species may soon result in overshoot and decline, with massive environmental harm, shortages of water and food, followed by widespread disruption and population collapse. Mass economic systems follow just such an overshoot and decline behavioural pattern, now involving a global economy rather than a regional civilisation. Economic recession will add to the various global problems as they combine in a perfect storm.²⁷

The mainstream of futures research insisted on the development of sets of scenarios presenting a variety of possible futures, assuming that the future could be provide information guiding further action, and hoping that this would assist a wise choice. In this view futures studies centrally involves "the construction and evaluation of alternative futures for the purpose of increasing human control over the future". ²⁸ It was soon evident, however, that socio-political control was sufficient to block alternatives, to prevent adequate action and to

²⁵ Robinson 2013

²⁶ Robinson 1989

²⁷ In a 2009 speech, Professor John Beddington, Britain's chief scientific adviser, stated that the world is heading for major upheavals as we head into a perfect storm in 2030

²⁸ McGrail 2011

preserve, indeed to increase, the power of a dominant class. (A similar pressure has been evident within the economics profession.) That appreciation of the strength of the global oligarchy of corporate fascism directed further personal research towards one forecast with the assumption of continuity and an expectation of those same policies continuing to create, rather than to solve, problems. This failure to adapt and change is evident in many ways; thus despite forty years and more of studies of the long term and the identification of major issues, warning of coming global overshoot and decline, there has been no effort to control or reduce population, no adequate reduction in greenhouse gas emissions. In economics and politics, growth and innovation rule supreme as an ongoing desire for further growth has long provided a block to action towards a stable, sustainable, equitable leisure society.

The logical step has been away from alternative scenarios to one forecast. This followed the scientific method by including features that have been tested as the years pass. The resultant global forecast is for overpopulation, food and water shortages, economic recession and increasing inequality, with many attendant crises, including the end of the oil era, increasing climate change and economic recession, disruption and perhaps nuclear war. Many of these trends are clearly evident now; the crunch date for general collapse is around 2030.

This is truly a storm, yet that global picture will continue to be ignored, with no action taken to change a non-sustainable system or to aid survival in the inevitable catastrophe.

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George Soros' INET: an institute to improve the world or a Trojan horse of the financial oligarchy?

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Let's assume that there is a financial oligarchy which exerts strong political influence due to the vast amounts of money it controls. Let's further assume that this financial oligarchy has succeeded in having financial markets deregulated and that this has enabled the financial industry to expand their business massively. Then, in some near or far future, their artfully constructed financial edifice breaks down, because it cannot be hidden any more that the accumulated claims cannot be serviced by the real economy That might be due, for example, to millions of people having bought overly expensive houses on credit without having the income necessary to service this debt. This is the kind of situation we are interested in.

If such a situation occurs, the leading figures of that financial oligarchy might recall that there has been a financial crisis in the 1930s of similar origin, and that during and after this crisis, laws were passed which broke the power of the financial oligarchy and taxed their profits steeply. They might remember that it took their forbearers decades to reestablish the favorable state of the late 1920s, with deregulated finance and very low taxes on incomes and estates, even huge ones.

The financial oligarchy might also recollect that economics is their most important ally in shaping public opinion and policies in their favor. To prevent a loss of power as it happened hence, they might want to make sure first that economics will not challenge the notion of leaving financial markets mostly to themselves and will continue to downplay the role of money, the power of the financial oligarchy, and of power in general.

However, the economic mainstream itself will have lost credibility due to its obvious failure to promote the public good and its rather obvious alliance with the interests of the financial oligarchy. Students will not so gullibly trust their professors and their textbooks any more. Young and bright researchers, who have not yet invested too much into the old discredited theories and methods, might turn to the question of how the financial industry can be made to serve the public interest. This would contribute to turning public opinion against the interest of the financial oligarchy. Thus, it will be important for the financial oligarchy to identify the brightest and most influential critics and leading figures of reform initiatives and to neutralize them.

This can best be done by putting yourself at the forefront of the movement. This requires money, notoriety and credibility. Money is available most plentifully to the financial industry. Many of their representatives are also well known to the public and command a lot of respect because of their spectacular financial success. Credibility, however, is in short supply. It can fairly easily be acquired, though. One of the more famous representatives of the financial oligarchy would have to publicly criticize economics for failing to prevent disaster and also the dealings of their own breed. The failure of economics and the financial industry will have

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become so obvious to the public already that an industry representative who acknowledges them will gain a lot of credibility without saying much that is not widely discussed already.

After the chosen representative of the financial oligarchy has gained a big public profile in the media, he might found an institute that is dedicated to the renewal of economics. He should provide the institute with very large funds, at least relative to what other initiatives with the same goal can command. Relative to the profits of the financial oligarchy the required sums are negligible.

If the financial oligarchy can get this together, they have almost secured the power to define what will be regarded as viable new theories and methods and what is to be disregarded as outlandish deviations from scientific common sense. They will be able to make sure that only those kinds of new thinking take hold which do not fundamentally challenge the supremacy of the financial oligarchy.

All it takes is some patience. First the institute would have to build up its credibility with the critical crowd. It should hire people who really mean to reform economics, because it is hard to consistently fake it in a credible way. It will be important at the start to engage and fund even the most dangerous critics of the economic mainstream and of the financial oligarchy. This will transfer their credibility with the critical crowd to the institute.

A second focus would have to be on identifying the brightest and potentially most influential young critical thinkers. This can be achieved by organizing attractive conferences with the most renowned and established economists and letting the youngsters apply for (funded) participation. Thus, the future elite will not have to be located laboriously all over the world. Rather they will be pulled toward large honey pots that are put at strategic central places on all continents of significance to the financial oligarchy. Applicants will provide information about their motivation, their level of activism and influence and will provide samples of their work, which will make it fairly easy to assess their potential to hurt or serve the interests of the financial oligarchy. The honey will have to be sweet enough, of course, to attract the best and brightest. The young elite should get a first taste of how sweet it is to be courted and to mingle with the most important people. The meetings should be more high caliber and grandiose than any they are likely to have attended before. This will also greatly enhance the interest of the relevant media.

The meetings could also be used to check out and create a good report with leading representatives of initiatives and organizations which aim to reform economic research and teaching. In order to avoid unnecessarily enhancing the status of such potentially dangerous organizations, their representatives should be invited exclusively in a personal capacity. For the same reason, significant financial support of initiatives that function independently from the institute would need to be avoided.

After the institute has put itself successfully at the forefront of the movement and has identified all the relevant reform potentials, the next task is to neutralize them as much as possible. The most important representatives of dangerous currents in economics would have to slowly be marginalized. Invitations to the prestigious meetings of the institute should increasingly be reserved to researchers whose critique is either harmless or who may even support the status quo in a new and original way. After a while, the more dangerous ideas and researchers will be even more marginalized than before. They will continue to be

shunned by the mainstream, but on top of that they will not even be part of the avant-garde of the challengers as defined by financial oligarchy via the institute.

The high potentials among the young researchers should be given the opportunity to pursue an excellent international education and career. The challenges of this career and the temptations of gaining the respect of the most important people should suffice to domesticate most of them.

Remaining grass root initiatives at the universities can be neutralized, if needed, by cutting them off from the supply of potential activists. The institute could form local groups of affiliated young researchers, preferably at universities with a strong base of independent initiatives. Since the competing local groups of the institute's young affiliates will have the institute's network and money in the background, they should be able to be more effective and more attractive to yet unaffiliated young minds.

With a strategy as outlined above it should be straightforward to make sure that even after a serious financial crisis no broad based movement in favor of reform of economic research and teaching in a way that is inimical to the interests of the financial oligarchy will take hold – and that thus there will be no academic support for a fundamentally different way of organizing and controlling the financial system.

Is such a Trojan horse being built?

The financial crisis has come to pass. Few will doubt, either, that there is a very powerful and exceedingly rich financial oligarchy. Thus, the question is: does this financial oligarchy employ a strategy as outlined above to assure the continued cooperation of the economic mainstream?

George Soros is a famously rich hedge fund manager. He gained notoriety for criticizing the economic mainstream and the dealings of the financial elite after the crisis broke out. He contributed \$50m to the foundation of the Institute for New Economic Thinking (INET) in October 2009. Other members of the financial elite and their foundations, including David Rockefeller, the Carnegie Corporation and former Federal Reserve Chairman Paul Volcker multiplied that sum with their contributions.

While it would be fairly easy to give one individual like George Soros the benefit of the doubt, regarding his intentions, David Rockefeller, the Carnegie Corporation and Paul Volcker seem unlikely candidates for genuinely wanting to reform an economic mainstream, which has been tilted very much in favor of the interests of the financial sector and the rich over the interests of workers and the rest of society.

INET and its lavish meetings

Since spring 2010 the institute has been organizing annual conferences, which are rather lavish affairs. They took place in Cambridge, England, Bretton Woods, Berlin and Hong Kong, and in 2014, in Toronto. Several winners of the prestigious Nobel Memorial Prize of the Bank of Sweden and other top ranked economists are regulars at these meetings. Many leading representatives of off-mainstream schools of thoughts have been invited to at least one of

these meetings, as well as leading representatives of other non-mainstream organizations promoting reform of economics, like the World Economics Association.

There have been several commentators who have followed harshly criticized these conferences. Philip Mirowski <u>wrote</u> in his book "Never Let a Serious Crisis Go to Waste: How Neoliberalism Survived the Financial Meltdown" published in 2013 (quoted for example <u>here</u>):

"The first INET meeting at Cambridge University in 2010 bore some small promise—for instance, when protestors disrupted the IMF platitudes of Dominique Strauss-Kahn in Kings great hall, or when Lord Adair Turner bravely suggested we needed a much smaller financial sector. But the sequel turned out to be a profoundly more unnerving and chilly affair, and not just due to the caliginous climate. The nightmare scenario began with a parade of figures whom one could not in good conscience admit to anyone's definition of 'New Economic Thinking': Ken Rogoff, Larry Summers, Barry Eichengreen, Niall Ferguson and Gordon Brown ... The range of economic positions proved much less varied than at the first meeting, and couldn't help notice that the agenda seemed more pitched toward capturing the attention of journalists and bloggers [oh my, I'm included in this one], and those more interested in getting to see more star power up close than sampling complex thinking outside the box. It bespoke an unhealthy obsession with Guaranteed Legitimacy and Righteous Sound Thinking."

In 2013, at the Hong Kong meeting of INET, Mirowski was charged with giving young INET-scholars a two-day course in history of economic thought.

An early example of criticism from the right is Ben Johnson's piece "George Soros' New Plan for Globalism and Crony Capitalism", published in December 2010 on the website of the National Legal and Policy Center. From the proceedings of the inaugural INET conference in 2010 he came away suspecting an agenda of replacing the national state by global governance institutions dominated by finance. One of his crown-witnesses is speaker Andre Wilkens, representing INET-sponsor Stiftung Mercator, who formerly was director of the open Society Institute in Brussels and a founding member of the European Council on Foreign Relations and has been on the record demanding new global governance structures. Another one is Charles Dallara:

"The INET conference's session on 'Global Governance?' focused on building Wilkens' world government, Charles Dallara, head of the Institute of International Finance (IIF), <u>insisted</u> a global crisis required 'adaptations of global architecture'. I think we are reluctant to do that because we have been captured by the notion of sovereignty."

Johnson draws attention to <u>Dallara's call</u> for "a Global Macroeconomic Coordinating Council" that encourages "global coordination" of fiscal policy and reports only to the G-20 Summit.

The roster of invited participants at INET-meetings seems to drift towards the economic mainstream and towards new ideas, which are not inimical to the interests of the financial oligarchy. As Mirowski observes, the first meeting in 2010 had quite some reform spirit. At the meeting in Toronto in April 2014 the cast of invited speakers, included the usual INET-financiers from the financial sector like William Janeway and Peter Jungen, but also Peter

Thiel, billionaire, conservative libertarian and member of the <u>steering committee of the</u> <u>Bilderberg meetings</u> and Eric Weinstein a Managing Director of Thiel Capital. (Peter Thiel, who was included in the <u>pre-meeting version of the conference program</u>, did not make it to the conference according to the <u>post-meeting version</u>.) The list of speakers also included Larry Summers, Niall Ferguson and Emma Rothshild, daughter of Nathaniel Mayer Victor Rothschild, 3rd Baron Rothschild (and wife of Amartya Sen), but only a handful of the household names of the proponents of non-mainstream schools of though.

Influence on research

INET provides grants to researchers for projects "aimed at finding solutions for the world's most pressing economic problems." The grantees of the first years include many well-known critics of the economic mainstream and of financial deregulation, like Steve Keen.

There is a steep decline in volume from about \$7m in 2010 and 2011 each to \$2.7m in 2012 and \$2.1m in 2013. In the first three years, many grantees and their projects have been quite reformist, proposing a radical rethinking of the workings and regulation of the financial system. In contrast, the list of sponsored projects for 2013, which is here (http://ineteconomics.org/grants), reads like a mix of the contents of an economic history journal and any good mainstream economic journal. It is not obvious that most of them meet the claim on the institute's website that "each of these grants was carefully targeted to tackle a pressing economic issue".

The first seven entries from the list of 2013-grants read:

- Planning Peace: Development Policies in Postwar Europe
- Environment and Dynamics of Regional Innovation
- Becoming "applied," becoming relevant? Three case studies on the transformation of economics since the mid-sixties
- The Value of Political Connections in Fascist Italy Stock Market Returns and Corporate Networks
- Safe Assets and the Evolution of Financial Information
- Economics, Psychology and the Joyless Economy: The Biography of Tibor Scitovsky
- Financially Constrained Arbitrage and Cross-Market Contagion

Influence on young researchers, students and the curriculum

The institute has a Young Scholar Initiative (YSI). Students and young researchers can apply to be invited to the prestigious and lavish conferences, which always take part in one of the best large hotels in town. For the selected, many of which have their airfare covered by the institute, there is a pre-meeting event with courses in economic history of economic thought or off-mainstream theories, taught by internationally well-known economists and a chance to present their own work. They also participate at the main meeting.

The approach is top-down. It is already quite noticeable that INET would like to control the movement that it funds. On its website, INET states about grants for student initiatives that these are supposed to serve conversation between new economic thinkers of the future and

those of the present. The latter are defined as "INET-grantees and other members of the INET-community". Students have to document support from their university and the cooperation of at least one member of their faculty. This should eliminate the more radical reform groups from consideration. For the others, there is a chance to have their conferences or other projects funded with up to \$5000, or "preferably less". According to my talks with representatives of independent initiatives of students, young researchers and professors of economics in Germany, these are hardly ever successful in obtaining financial support from INET.

The Association for Heterodox Economics (AHE) hast <u>criticized</u> INET's project for reform of the economics curriculum:

"Several members of AHE attended the launch of the new INET-sponsored CORE curriculum at HM Treasury last November 2013... Inclusion of heterodox economics in the curriculum has been explicitly ruled out...A sense of failure is translated into a context of relative success requiring more limited changes – though these are still being seen as significant. Part of the reason that they are seen as significant is that changes from within mainstream economics do not have to be major in order to appear radical. It is our contention that heterodox economics is being marginalised in this process of 'change' and that this is to the detriment of the positive potential for transforming the discipline."

INET seems to develop its suggestions for curriculum reform largely independently from an ongoing movement among students with the latest result a <u>60-page memo</u> of the Post-Crash Economics Society at the University of Manchester with a reform agenda, which the authors consider more far-reaching than the INET-proposals.

Relation with the wider reform movement

INET has a restrictive policy regarding support of initiatives which function independently from INET, be they initiated by students and young scholars, or by professors, critical of the mainstream. Most of these initiatives have very limited funds. According to my knowledge, INET hardly ever provides significant monetary support to independent initiatives. However, their representatives are quite willing to show up at the functions and meetings organized by these initiatives, and they might offer to pay INET-affiliated luminaries to participate. Several senior representatives of the World Economics Association (WEA), including the author of this text, have been invited to the INET conference in Hong Kong in 2013, and had a very welcome chance to present their personal research. It was notable that their WEA- functions were not mentioned or downplayed. WEA was founded in 2011 to promote regional and methodological pluralism in economics and has more than 12.000 members. It publishes three online journals and runs online conferences. Talks about financial support by INET, either in institutional form or for specific projects, were unsuccessful from WEAs perspective.

As noted already above, support of and efforts to link with independently organized student groups is rather limited. INET seems to prefer to build up its young scholar initiative network independently from such groups. Some members of independent groups have voiced a concern that INET seems to have a tendency to establish new YSI-hub where independent

groups are already strong, thus potentially competing for the time and attention of bright, reform-oriented students.

Conclusion

The history and the actions of the Institute for New Economic Thinking, founded by George Soros and other members of the financial establishment, do provide some supporting evidence to the hypothesis that it might be a Trojan horse of the financial oligarchy, meant to control the movement for reform of economics. However, it is also still compatible with the counter-hypothesis that it is a bona fide effort to push such reform to the benefit of society at large, an effort that might be hampered by the a desire to control and a tendency toward increasing closeness to the status quo and the establishment. While certainly unfortunate such tendencies could be considered also (unintended) consequences of institutionalization of reform efforts. Thus, it is opportune to monitor the activities of INET with an open but skeptical mind.

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Public debt crises in Latin American and Europe: a comparative analysis¹

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Abstract

The debt problems of Latin America in the 1980s were of external origin, were related to external borrowing, exploded when international interest rates hit a historical high, were basically international commercial bank loans in floating rate notes, and had a negative impact on the balance of payments. The Brady Plan solved them after a decade of falling output having undergone IFIs conditionalities, adjustment policies, structural reforms and financing. The European crisis that started in 2007 is also of external origin, is related to domestic borrowing, and exploded when the US sub prime crisis hit the international financial community, is basically privately held in bonds by European financial institutions in Euros, and has had a negative fiscal impact. The debt solution in Latin America changed the regional process of trade and integration begun in the late 1960s through Latin American Integration Association (1980, previously LAFTA, 1960) as new export led policies were introduced in the late 1980s and four new sub regional schemes were subsequently created: NAFTA (1994), SICA, MERCOSUR (1991) and CAN (1993). In this paper we are going to inspect the economic elements of the two sets of debt problems, the international political economy elements involved and the lessons learnt.

JEL codes F, F33, F34, F55, F59, F65

Keywords international economics, international monetary arrangements and institutions, international lending and debt problems, international institutional arrangements, international relations and international political economy, finance

Introduction and historical background

This paper is divided into five sections. Section 1 presents the Latin American and European debt problem and its consequences. Section 2 presents the debt crisis trigger for Latin America and Europe. Section 3 presents IMF and Troika conditionality and its effects in Latin America and Europe. Section 4 presents conditionality and debt. Section 5 presents old and new stakeholders. The paper then closes with a set of conclusions.

Historically sovereign debt problems are solved through massive debt haircuts together with the issuance of new paper at low interest rates, which consolidates all past debt in one instrument with a very long payback period (Eichengreen, 1992; Marichal, 1989; Ugarteche, 2007). The guaranty of the new instrument may be export income, export services revenues, or solvent-country bonds. The examples are oil revenues for Mexican rescue loans in 1928 and 1994; Suez Canal toll revenues administered directly by the British Government in 1872 and the 1989 Brady Bonds. All debt problems always arrive at a debt management solution. Getting there is the real issue. Part of the problem then and now is that there are no

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insolvency procedures. (Krueger, 2001; Raffer, 1990, Acosta and Ugarteche, 2007, Eichengreen, 2003.) Mostly there is much experience as to what happens to debt management without an international insolvency procedure. The Latin American case of the 1980's showed the adverse macroeconomic impact of not solving the debt problems at the beginning of the crisis. (Stallings, 1986; Griffith Jones, 1988; Ffrench Davies, 1988; Devlin, 1989; Ugarteche, 1988; O'Connell, 1985; and Green, 1984.) After a decade long depression generated by IMF led adjustment policies that contracted the domestic markets through falling wages and increased tax revenues, it was only after the Brady Plan (1989) and export led policies put in place that the economy recovered. It was not the reforms per se which led to the recovery but the combination of debt reduction to sustainable levels, and the recovery of the external sector as both Miyazawa (1986) and Bresser Pereira (2007) had suggested earlier in the decade.

In Europe, what is evident is that banking problems started through bad investments and loans related to the United States financial sector. These hit the British and European financial sector and in particular the banking sector to the extent that it had to be nationalized: Great Britain (2007), Iceland (2007), Ireland (2007), The Netherlands (2009), and otherwise rescued in Switzerland, Germany, Spain, Italy, Greece and Cyprus.

The fiscal cost of this has led to rising fiscal deficits all around Europe then faced with Troika conditionality of reduced wages and increased taxes. This in turn has had an effect on reduced consumption with its negative effects on GDP growth. Combined with rising debt, the general debt indicator (debt/GDP) has deteriorated as adjustment policies progress, thus leading to the next round of pernicious debt negotiations. The consequence for Europe is increased income concentration and rising unemployment as in Latin America in the 1980s.

Historically, creditors banded together in the Corporation of Foreign Bondholders (CFB), established since 1868 by British merchant bankers, and later in the Foreign Bondholders Protective Council (FBPC), established in 1933 by the US State Department (Marichal, 1989). These private creditors sent money doctors to give economic advice to debtor nations (Drake, 1989 and 1994). Negotiations in the 19th century took place after two or more decades of default and only when the horizon seemed promising for new sovereign loans. Without an insolvency procedure, creditors sat down at the negotiating table with the sovereign debtor in London or Washington and essentially provided him with a debt consolidation proposal. In order to make it workable the new reduced debt was converted into very long-term bonds with collateral (Ugarteche, 2007).

Since the 1930s debt crisis and up to the 1980s, there was no real market for sovereign bonds and new actors entered the arena (Suter and Stamm, 1992). After World War II (WWII), the international credit market became more complex, when international commercial banks started lending in the sovereign market, while richer governments expanded bilateral aid loans (Pearson, 1969) and the newly created multilateral institutions launched operations (Bordo and Eichengreen, 1993; Alacevich, 2009). Commercial banks saw their share of the total credit market grow after the creation of the Euromarkets in the late 1950s (McKinnon, 1977; and Einzig, 1964).

The 1980s debt problem gave way to a return of the sovereign bond markets, particularly after the Brady bonds initiative. Commercial banks withdrew from the sovereign market and transferred sovereign lending to investment banks and back to the bond markets (Mauro, Sussman and Yafeh, 2006) which tripled in size between 1989 and 1999 from 450 bn USD to

1.4 tn USD (Santiso, 2003). Sovereign insolvency risk shifted from commercial banks to individual investors operating through investment banks, thus changing the international scenario in which sovereigns restructure their debts in times of crisis, back to where it was in the pre-WWII period. This time, however, there is no institutionalized FBPC nor a CFB, and some creditors – final investors – can hold out and not enter negotiations (Hornbeck, 2010; Hornbeck, 2004; Lopez, Oddone, Von Oertel, 2001) and sue the country for full compensation after the negotiations including haircuts are finished with all other creditors.²

The emergence of Bretton Woods II – after the end of the fixed exchange rate period – began in the second half of the 1970s with a new role for the IMF as economic advisor to countries in or near default (Bird and Rowland, 2002; IMF, 2011). This is related to securing debt payments from sovereigns (Lichtensztejn, 2010; Lichtensztejn and Baer, 1986; Eichengreen, 1996) with the negative effect its pro-cyclical conditionality had on growth and on the social fibre of a nation in economic distress (Hayter, 1981; Payer, 1973). The leadership for the Bretton Woods II stage was clearly the United States that placed its resources and power behind the renewed multilateral institution. In Europe the creation of the EFSM did not have the impulse needed from any one country and thus gave a weakened image that led to an initial failure and has turned the European Union into a country dependent rescue system instead of securing its multilateral policies.

The economic adjustment policies applied by the IMF in Latin America have been evaluated by some as regressive (Przeworski and Vreeland, 2000) or as neutral (Dreher, 2005) in terms of economic growth and in political terms reflect the relationship between the US Treasury, international financial capital – mainly US and UK based- and the Fund itself (Hayter, 1971; Payer, 1973; Ugarteche, 2009). The persistence in the "one-size-fits-all" adjustment policy, in addition to the mistakes made (IMF, 2004) in Thailand in 1997 (Henning, 2009; Weisbrot, 2007) and Argentina in 2001, (IMF, 2004) has led to the loss of credibility of the institution with the subsequent loss of resources available for lending in terms of world GDP. During the first decade of the 21st century, it contracted in terms of world GDP by one third, from 0.84% to 0.57% – see Table 1.

	1995	2000	2005	2010
IMF Funds				
bn. USD	223,8	272,3	322,4	358,1
IMF				
Funds/World GDP	0.7533%	0.8451%	0.7075%	0.5693%

 Table 1. IMF Available Resources to World GDP (1995-2010)

Source: *IMF Annual Reports 1995, 2000, 2005, and 2010.* SDR exchange rates are from end-April of the following year.

² Felix Salmon, "In defense of vulture funds", blog available at <u>http://www.felixsalmon.com/2007/02/in-defense-of-vulture-funds/</u>. Last consulted on October 31, 2011

During the first decade of the 21st century, regional institutions such as the Chiang Mai Initiative Multilateralisation Fund (CMIM) (Sussangkarn, 2011) with 240bn USD, the European Financial Stabilization Mechanism (EFSM) and the European Financial Stability Fund (EFSF) started to emerge with the potential for, if not replacing completely, at least supplementing the old multilateral structure (European Parliament, 2010). These schemes have resources as large as or larger than the IMF, yet in the European case, the lack of a solid multilateral EFSM institution has reduced all financial support to the approval by a single Government which means the reverse of the multilateral initiative and the EU spirit and the bilateralisation of financial rescues.

1. The Latin American and European debt problem and its consequences

The economic history of Latin America is plagued with debt crises (Marichal, 1989; Eichengreen, 1989; Reinhart and Rogoff, 2009). Latin American public debt became an international problem again in the early 1980s. The debt levels at the time of the defaults were in the 50% of GDP range (See table 2). With a not high debt ratio the problem emerged as a major one while in Europe ratios have been much higher.

	Debt/GDP	Year of
	%	Default
Argentina	55.1	1982
Brazil	50.1	1983
Ecuador	68.2	1984
Mexico	46.7	1982
Peru	80.9	1978
Peru	62	1984

Table 2. Debt Ratios and Default in Latin America

Source: Reinhart and Rogoff, 2009.

The reason was the quick rise in US interest rates between 1979 and 1981. An external problem made its way into the domestic economies through the balance of payments and the exchange rate. The ratio of interest payments to exports of goods and services rose from 20% to 41% between 1980 and 1982 as a result (Meller, 1990, Table 12.5). The domestic side of the crisis was due to consumption growth, using foreign borrowing given at very low international real interest rates in the mid-1970s (Devlin and Ffrench Davis, 1995).

The European debt problem on the other hand started in 2007 because of the subprime housing bubble burst that had contagion to European banks with positions in US derivatives related to this. Equally, in some countries, a housing bubble emerged resulting from the very low interest rates of the first part of the decade. The result was a US crisis provoking a need

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for financial sector rescues in Europe which led to very large fiscal deficits and thus greater central Government debt (see Table 3).

	2003	2007	2008	2009	2010
France	51.9	52.1	53.4	61.2	67.4
Germany	38.5	39.6	39.6	44.2	44.4
Greece	105.8	105.7	110.6	127.0	147.8
Hungary	56.2	61.6	67.7	72.8	73.9
Iceland	33.3	23.2	44.2	87.5	81.3
Ireland	26.9	19.8	28.0	47.1	60.7
Italy	96.7	95.6	98.1	106.8	109.0
Portugal	58.3	66.6	68.9	78.7	88.0
Slovak Republic	35.1	28.1	26.3	33.7	39.1
Slovenia	26.9	23.2	21.2	33.6	36.0
Spain	40.7	30.0	33.7	46.0	51.7
United Kingdom	38.7	42.7	61.1	75.3	85.5
Average	50.7	49.0	54.4	67.8	73.7
Median	39.7	41.1	48.8	67.0	70.7

Table 3. Debt ratios and crisis in Europe

Source: Finance and investment: Key tables from OECD - ISSN 2075-8294 - © OECD 2011

When the crisis began in 2007, the median debt level of central governments on GDP for twelve selected European countries was 41.1% of GDP. Three years later it had risen to 70.7% with nine over the 60% of GDP threshold established by the Maastricht Treaty and higher than Argentina, Brazil and Mexico when they defaulted in 1982.

2. The debt crisis trigger for Latin America and Europe

The Latin American debt crisis was a problem of interest costs that hit the balance of payments. The reason was that interest rates in the US had jumped from 6% to over 20% between 1976 and 1981, bringing about changes in investment portfolios, thus tripping the balance of payments of most countries due to a simultaneous reduction in commodity prices. (Devlin and Ffrench-Davis, 1995, 126). (See Graph 1.)

Graph 1. US Prime Rate



Source: http://www.moneycafe.com/library/primeratehistory.htm

The European debt crisis is a banking rescue problem that hit the fiscal sector with low interest rates that were further reduced in an attempt of countercyclical policy. The portfolio effect of this is the reverse of 1981. With interest rates reduced to negative levels, (see Table 4) commodity and stock prices have surged thus leading to increased inflation as food and oil bills in Europe rose while Stock Exchanges recovered in the recessed economies. The global effect is export growth in the primary goods export economies leading to a two speed crisis. So in all, Latin America had a lower debt ratio and hit high interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and hit high interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates while Europe has higher debt ratios and manages a negative real basic interest rates ince 2009.

Table 4. Basic Interest Rates

Entity and country	Rate	Since when
Bank of Japan	0.10%	Dec 19, 2008
YEN		It was reduced to 1% in 1995
		It was further reduced by 0.20% then
Euro, ECB	1.25%	April 7, 2011
		It was increased by 0.25%
FED US Dollar	0.25%	Dec. 16, 2008
		It was reduced from 5.25% in March 07
		It was further reduced by 1% then
Bank of England, Pound Sterling	0.50%	March 5, 2009
		It was reduced from 5% in September 2007
		It was further reduced by 1% then

Source: <u>http://www.housepricecrash.co.uk/graphs-base-rate-uk.php</u> and each country's Central Bank. Last revision June 17, 2013.

3. IMF and Troika conditionality and its effects in Latin America and Europe

The balance of payments problem in Latin America posed by high interest rates forced initially a liquidity problem as debt ratios were low. The simple international liquidity problem, caused by the mixture of the Volcker Rule and supply-side economics in the US between 1979 and 1981, could have been solved by consolidating the entire external debt of each country into one very long term bond issue, with an international guarantor in 1981-82, much like the 1989 Brady Plan³. Instead, the renewed liquidity problem diagnoses led to a solvency problem which was treated as a liquidity one at the same time as it was argued that there were problems of rent seeking inside the economies. The shift in diagnosis of the debt problem from a balance of payments liquidity matter to one of rent-seeking societies and the nature of the State corresponds to what Ruggie refers to as the "imbedded liberalism" of international financial institutions (IFIs). Public debts were rescheduled once every two years during the 1980s under increasingly crossed conditions (Griffiths Jones, 1988a), which combined led to the full liberalization of all markets and promoted the switch towards export-led growth and a new reduced role of the State (Balassa, et al. 1989, and Williamson, 1989).

In Europe, bank rescues have weighed heavily on the fiscal side which has forced the EU into the 2010 creation of the lender of last resort – The European Financial Stabilization Mechanism – in order to finance increased fiscal deficits at below market interest rates aside from the ECB. The bank rescue process started in Great Britain in 2008 and has spread for

³ <u>http://www.emta.org/template.aspx?id=35</u>. Consulted on October 6, 2011

over five years to many countries at a cost in Europe of 1.6 trillion euros (Boudghene and Maes, 2012). Banks were rescued in all major European countries at a fiscal cost of 35% of Europe's GDP (Ibid, Table 1) and a growing risk perception. Credit rating agencies have downgraded most European countries leading to increased risk margins for sovereign bonds (Favero and Misale, 2011). Although basic interest rates are negative in real terms, heavily indebted countries' sovereign bonds pay high interest rates and have an increasing need for a lender of last resort much bigger than the EFSM-EFSF⁴. The European Central Bank entered a fiscal rescue programme buying up debt and injecting liquidity into the system due to the awareness of a euro credit crunch in September 2012.⁵

The real solution to the Latin American debt problem came when the debt was reduced to a manageable level through the Brady Plan⁶ which arrived in 1989 after a decade of fiscal adjustments, devaluations, inflation, reduced consumption, fast growing debt, depression, and social pain. Before that, creditors were unwilling to swap Floating Rate Notes (FRNs) for one new instrument at a major discount, as Bresser Pereira had suggested earlier (1988). It was only when the then US Secretary of the Treasury, Nicholas Brady (1989), put the initiative on the table that it finally worked. What made it workable was the US Treasury Guarantee on the new Brady bonds so interest rates would be low, at US risk levels; and not high, at Latin American sovereign bond levels. So a large haircut in the market through an asset repurchase programme paid up in new bonds guaranteed by the US, at low interest cost solved the insolvency problem together with export policies that helped increase foreign exchange income.

A global strategy to achieve this result was already defined with precision: it would combine a process of adjustment and reform with a financial mechanism to convert the debt into new securities – with lower face value and submarket interest rates – that would allow the highly indebted countries to benefit from the discounts existing on the secondary market. This process of "securitization" would apply globally, but would be implemented on a case-by-case basis, according to the differing needs of the debtor countries (Bresser Pereira, 1988).⁷

In Europe, fiscal revenues are subject to Troika conditionalities resembling IMF/World Bank/Club of Paris/London Club crossed conditionalities in Latin America. Some differences are to be made: first the diagnosis on the crisis is different. It is a fiscal crisis and not a

⁴ European Financial Stability Mechanisms and European Financial Stability Facility created in 2010 by 16 member euro countries in Luxembourg with the aim of assisting debt ridden countries for an amount of up to 700 bn Euros. <u>http://www.oecd.org/daf/fin/48887542.pdf</u>

⁵ <u>http://www.timesofmalta.com/articles/view/20120909/business-news/ECB-announces-asset-purchase</u> -programme.436204

⁶ See Vásquez, *I.* "The Brady plan and market-based solutions to debt crises", Cato Journal Vol. 16, no. 2, The first Brady Plan with Mexico paved the way. According to Vásquez, "An advisory committee, consisting of the Mexican government and representatives of more than 500 banks, negotiated a 'menu', or set of conditions that banks could choose from to reduce or increase their exposure. Three options were on the menu. Existing loans could be swapped for 30-year debt-reduction bonds that would provide a discount of 35 percent of face value (the bonds would have an interest of 13/16 percentage points above the London Interbank Offer Rate, LIBOR). Existing loans could also be swapped for 30-year par bonds that would effectively reduce Mexico's debt service on those loans through a below-market interest rate of 6.25 percent. Banks could also provide new loans at market interest rates over a four-year period of up to 25 percent of their 1989 exposure, taking into account any discount or par bonds obtained. The three options allowed creditor banks to set their exposure to anywhere between 65 to 125 percent of its pre-Brady level (Unal, Demirguc-Kunt, and Leung, 1992: 3)."

⁷ Luiz Carlos Bresser Pereira, "A Concerted Solution For The Debt Crisis" (1988), Available at: <u>http://www.bresserpereira.org.br/Works/PrefacesReviews/88.ConcertedSolutionForDebtCrisis.pdf</u>. Consulted on October 12, 2011.

balance of payments one. Secondly, The IMF is willing to be less severe on the fiscal adjustment in Europe than in Latin America, as they have recognized that fiscal elasticity is greater than one, instead of below one as previously thought (IMF, 2012). Thirdly, the aim of the adjustment lies in the financial sector and its management and ownership. Finally, the Welfare State was installed in all of Europe after WWII and removing it is more difficult than in Latin America where it was never fully implemented. The similarities are that indirect taxes are pushed upwards in order to cover the increasing budget deficit and that wages, both social and nominal, are reduced in order to reduce consumption.

The major differential impact of those policies applied as a condition towards the debt solution is that while Latin America with some exception is a raw material exporter, to the rest of the world, Europe is an integrated industrial market. As consumption contracts in the smaller economies, production in the larger ones is reduced and hence the regional rate of growth is negatively affected to a greater extent than was estimated by both the EU and the IMF in 2010.

Since Europe does not need more foreign exchange but rather more fiscal revenues, the instruments used and the aspects emphasize must be different. To date however they seem to be doing the same with the logic of exporting their way out of the crisis

4. Conditionality and debt

In Latin America debt service skyrocketed because of ongoing refinancing and the debt/GDP ratio had become unsustainable due in part to the crossed conditionality, which assured reduced wages and consumption, thus forcing GDP downwards (see Table 5). Crossed conditionality was the coercion mechanism for economic policy change that went through both IMF stabilization policies and later World Bank structural adjustment policies removing whatever Structuralist economic policies existed since the 1950s and putting into place structural reform policies for export led growth. Any debt negotiation had first to pass an IMF agreement. The IMF balance of payments loan required after 1986 a further agreement with the World Bank in order to advance the structural adjustment process into "market" economies. Only then did the bank negotiations start. This mechanism forced three sets of deals with intertwined conditions which was even more complex when the Club of Paris debt was rescheduled requiring a fourth set of conditions.

The result of the debt mechanism plus the conditionalities was that the debt more than doubled during the 1980's with two effects. First, an increased debt/GDP ratio was registered since there was an economic depression and the denominator either contracted or remained stagnant, while the numerator grew, in spite of the fact that only involuntary loans were granted. Second, it opened the issue of "debt illegitimacy" since the US\$190 billion difference between the debt's original stock of US\$126 billion and the US\$320 billion debt at the end of

the decade was not fresh money entering any country but mainly the capitalization of interest or anatocism.⁸

	8	0s	9	0s	0	0s
Country	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.
Argentina	-2.2	5.485	3.2	5.708	3.1	6.881
Bolivia	-2.6	2.7	1.7	1.557	1.9	1.418
Colombia	1.2	1.561	1	2.981	2.5	1.787
Ecuador	-0.3	3.29	-0.1	3.078	2.8	2.215
Honduras	-0.5	2.551	0.2	2.748	2.2	2.449
Mexico	0.2	4.336	1.6	3.533	1	3.432
Panama	-1.3	6.114	3.5	2.614	4.1	3.646
Peru	-2	8.012	1.4	5.13	4.2	3.323
Venezuela	-2.9	4.71	0.3	4.651	1.6	8.131
Uruguay	0.1	6.465	3	3.757	2.6	5.388
Chile	2.7	6.291	4.7	3.538	2.7	2.082
Brazil	0.8	4.686	0.1	2.943	2.5	2.481
Costa Rica	-0.5	4.332	2.9	2.715	2.1	3.065
Jamaica	0.5	4.502	1.3	3.439	0.8	1.825
Nicaragua	-3.2	4.887	0.8	3.044	1.7	1.914
Paraguay	1.1	5.404	0.1	1.906	1.5	5.176

Table 5. GDP per capita growth	% in Latin American economies	(1980-2010)
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Source: ECLAC. Table prepared by Francisco Josué Martínez Cervantes, OBELA, IIEC UNAM.

⁸ ANATOCISM, civil law. Usury, which consists in taking interest on interest, or receiving compound interest. This is forbidden. Code, lib. 4, t. 32, 1,30; 1 Postlethwaite's Dict.30; 1 Postlethwaite's Dict. 2. Courts of equity have considered contracts for compounding interest illegal, and within the statute of usury. Cas. t. Talbot, 40; et vide Com. illegal, and within the statute of usury. Cas. t. Talbot, 40; et vide Com. illegal, and within the statute of usury. Cas. t. Talbot, 40; et vide Com. Rep. 349; Mass. 247; 1 Ch. Cas. 129; 2 Ch. Cas. 35. And contra, 1 Vern. 190. Rep. 349; Mass. 247; 1 Ch. Cas. 35. And contra, 1 Vern. 190. But when the interest has once accrued, and a balance has been settled between the parties, they may lawfully agree to turn such interest into principal, so as to carry interest *in futuro*. Com. on Usury, ch. 2, s. 14, p. 146 et eq. http://www.law-dictionary.org/ANATOCISM,+civil+law.asp?g=ANATOCISM%2C+civil+law

Given that it was a US dollar denominated debt, its service depended on two elements: a balance of payments surplus and primary fiscal surplus. The first two years of the crises, international reserves fell by 40% between 1980 and 1982, and imports fell by 42% between 1981 and 1983 within the region as a whole. As reduced consumption and inflation hit hard because of devaluations, the domestic side of the economy started to stagnate. Restrictive fiscal policies plus inflationary exchange rate policies led to an economic depression metaphorically referred to as "the lost decade".

In every one of the five debt rounds of negotiations during the 1980s (Devlin and Ffrench Davis, 1995), IMF conditions on economic policy were targeted at controlling inflation and improving the balance of payments while liberalizing all markets. Lichtensztejn (2010) suggests they failed, as inflation grew worse in the 1980s derived from devaluation policies, and balance of payments positions did not improve significantly. "Export or die" was a dilemma Latin Americans had to face. Structural adjustment policies in the 1990s followed the stabilization policies of the 1980s with the Brady Bonds and World Bank reform policies. Export-led growth was the policy choice in face of a growing need for more foreign exchange to pay off the debt, and shrinking domestic markets (Ugarteche, 2000). By 1989, Prime interest rates had come back down from 20% to 6%, at which point the Washington Consensus laid out an economic policy template.⁹ It consisted of prescriptions aimed at: getting rid of whatever welfare state elements existed including all subsidies; liberalizing all markets of goods and services, mostly the banking, credit, financial, exchange rate and labor markets; and privatizing all government enterprises.

Keynesian/ECLAC protectionism was signalled for balance of payments problems and not interest rates, leading to the brusque elimination of industrial policies (A.O. Hirschman, 1992). without any transition between import substitution and export led policies. The Asian purpose of having a protracted period of adjustment was to change the industrialization policies that had existed previously (Wade, 1990; Amsden, 1989). After the "lost decade", Latin America's share of world GDP had been halved from 6 to 3%. The regional annual GDP growth amounted to -0.4%, the public debt climbed from an average 35% of GDP in 1980 to over 67% by 1986, and nearly tripled from US\$ 129 billion to US\$ 320 billion in current USD between 1980 and 1990.

The laboratory for the policies was Bolivia in 1986 (Sachs, 1987) but it was Mexican President Salinas de Gortari that paved the way for IFI policies in the entire region, introducing structural adjustment first in Mexico in his 1988-1994 presidential term, hand in hand with the North American Free Trade Agreement (NAFTA) negotiations. The result for Mexico between 1980 and 2012 is two decades of under 1% of GDP per capita growth and for 18 countries it is between 1% and 2% (ECLAC, 2013; table I.1). Chile is the only medium-sized economy to grow at over 3% per capita in the period. Europe on the other hand seems to be sunk in a deep recession with no country leading a way our as a locomotive or as models.

Economic growth in Latin America struck when due to international negative interest rates, commodity prices surged and some economies left the export base and took a redistributive pattern for domestic market development. The crossed conditionality in this second case is between the IMF, the EU and the ECB. The point of it is to lock in the policies. The major

⁹ J. Williamson "<u>What Washington Means by Policy Reform</u>". In: Balassa et al. (eds.): *Latin American Readjustment: How Much has Happened*, (Washington: Peterson Institute for International Economics, 1989).

difference is that in the Latin American case, it was one negotiation after the other and in the European case, it is only one negotiation where the three creditors agree on the crossed conditions and then negotiate together with the debtor. There is no possibility of agreeing with one creditor and not the others in this case.

After 2000, over a decade from the introduction of the reforms, some South American governments started to implement changes with a view to strengthening domestic markets again. They realized that export growth did not always result in high income elasticity, increased employment or improved income distribution (Vidal, Guillen and Deniz, 2010). This combined with the surge in commodity prices, allowed for substantial domestic market recovery without major balance of payments restrictions. In all cases, public debt shrunk during the past decade to the range of 20%-30% of GDP, while a switch occurred from external to domestic debt (Ugarteche, 2008). As a result, countries with progressive income redistribution policies like Brazil, Bolivia, Ecuador, Honduras, Nicaragua, Uruguay and Venezuela, have grown more than in the previous decades. Exceptionally, Peru has grown substantially in spite of not having redistributive policies in place, possibly due to the mining surge related to gold and other valuable minerals. On the other hand, Chile, Costa Rica and Jamaica have grown less over the past decade than they did in the 1990s. Mexico remains slow growing with no policy change and is referred to as an "export success" in balance of payments terms. Nevertheless, export success does not always come with high economic growth (Ugarteche and Aroche, 2005).

The G7 debt crisis on the other hand relates to housing bubbles and consumer credit, indirectly (Table 6). The only G7 country that does not have a serious debt problem is Canada. It has managed its fiscal policy so as to halve its debt burden during the first decade of the century from over 70% to 34% of GDP. Very high debt levels (Ritschl, 1996) precede the systemic crisis of 2007 onwards and are an integral part of the crisis of global capital accumulation. It started in the US and passed on to Great Britain and the large financial centres and then to the smaller economies but has not been limited to those countries. In fact, the bankruptcies of banks in all European countries derive from the fact that most economies saw their public and private debt grow during the first decade of the 21st century with the exception of the Scandinavians, Switzerland, Austria, the Netherlands, and Canada. Iceland poses an extreme case since its private debt grew to 600% of GDP between 2000 and 2007.¹⁰ Early in the second decade of the century, most rich economies are over indebted – if we take the 60% public, debt/GDP limit criteria established in the Maastricht Treaty as valid. They have turned into Highly Indebted Rich Countries (HIRC), with low levels of international reserves, bleak growth perspectives and a major portion of the national budget allocated to debt payments.

The European debt problem as a whole did not come up until 2007 (Panico, 2010). Most European Union (EU) countries had a public debt ratio of nearly 60% of GDP before the crisis began and fiscal spending grew significantly as countercyclical policies were put in place, at the same time as banks were being rescued, taking some countries' GDP-to-debt ratios to over 100% (see Tables 6 and 7).

The first round of debt bailouts resulted in an increased national debt while the budget deficit

¹⁰ CIA Factbook. Available at: <u>https://www.cia.gov/library/publications/the-world-factbook/</u>. Last consulted on Wednesday, October 12, 2011.
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reduction brought about lower wages and public spending, thus leading to lower GDP growth. This contributed to an increased debt/GDP ratio, much like in Latin America in the 1980s.

G-7	2000-2005	2006-2010	2010
•			
Japan	165.3	202.1	225.8
United States	58.4	74.1	100*
A (B ()		50.0	70 5
Great Britain	39.4	56.9	76.5
Germany	62.8	70.5	83.2
France	61.2	71.5	82.4
Italy	106.3	110.3	118.1
Canada	77.7	75.1	34
Average	81.6	94.4	102.3

Table 6. Public Debt of G7 Leading Countries % of GDP

*NYT

Source: CIA Factbook, available at:

https://www.cia.gov/library/publications/the-world-factbook/rankorder/rawdata_2186.txt WB, WDI 2010, done by Francisco Josué Martínez Cervantes, OBELA, IIEC UNAM . Last consulted on October 6, 2011.

Table 7. Public debt % GDP European Critical Countries

	2009	2010
Belgium	96.2	98.6
France	79	82.4
Greece	126.8	144
Iceland	113.9	123.8
Ireland	65.5	94.2
Italy	115.1	119.9
Portugal	76.8	83.2
Spain	53.2	63.4

Source. CIA Factbook. Available at: <u>https://www.cia.gov/library/publications/the-world-factbook/geos</u>. Last consulted on October 7, 2011.

Two years on, some countries — for instance, Ireland, Portugal, Spain and Greece — have entered the second round of debt negotiations and are discovering that their basic economic indicators are worse than at the beginning of the crisis. Iceland has kicked the board and sued its Prime Minister for irresponsibility, while holding two referenda to reject debt payments.¹¹ Belgium¹² and France¹³ are putting off the problem, while introducing adjustments. Italy, on the other hand, seems to be facing the fiscal problem¹⁴ while its debt was downgraded from AAA in 2009 to A/A1 on September 2011 and further to A2 in November of the same year.¹⁵ Looking at the numbers, there is no reason for Spain to be included in the list of critical countries and much less to be given shock treatments, taking into account that its debt level just reaches the critical point of 60% of GDP. The above data, however, do not reflect private debt.

The Stakeholders

The Latin American debt of the 1980s held by international commercial banks, denominated in Floating Rate Notes and foreign exchange had mostly four sets of actors: the London Club made up of creditor banks, the Paris Club made up of creditor Governments, the debtor government and the IMF/World Bank. Without an IMF/World Bank agreement and their green light, no other debt negotiation was possible. The European debt is more complex. The domestic debt is held in local currency even if the holder is non-European. Local bond markets are composed of investors, sovereign instruments, underwriters and credit rating agencies that price them. Major investors in credit default swaps are usually underwriters and insurance firms. Underwriters tend to know even the smallest details of the debtor Government they are handling, so that they can place bets against those debts with the most complete information as to the probability of their default. An example of this is Goldman Sachs in Greece. These stakeholders are not organized in any way and hence have no representation. Other buyers might include commercial banks as the Greek case has demonstrated (Gulati and Bucheit, 2010). The debtors are the European and British Governments.

This means that any solution to the debt problem must also be market-based and cannot be only an exercise in official negotiations as it was in the 1980s, which leads to buybacks and aggressive buybacks. The first are done with complete knowledge of the parties involved, the second are not. Chile carried out a buyback in the 1980s. Argentina and Ecuador did aggressive buybacks in 2005 and 2009, respectively. Other Latin American countries did the

¹¹ Ann Pettifor, "Iceland's Referendum. At last the people can choose." (Huffington Post, March 5, 2010) available at: <u>http://www.huffingtonpost.com/ann-pettifor/icelands-referendum---at_b_488157.html</u>. Consulted on October 7, 2011.

¹² OECD, "Belgium: Action Needed on Greener Growth, Fiscal Consolidation and Jobs Creation", (12.7.11). Available at:

http://www.oecd.org/document/54/0,3746,en 21571361 44315115 48368310 1 1 1 1,00.html. Consulted on Friday, October 7, 2011.

¹³ Natixis, "France Fiscal Consolidation. Second Act." Corporate and Investment Banking, Paris, October 7, 2011. Available at: <u>http://cib.natixis.com/flushdoc.aspx?id=60201</u> Last consulted on October 7, 2011.

¹⁴ IMF, "Italy 2011 Article IV Concluding Statement of the Mission". Available at: <u>http://www.imf.org/external/np/ms/2011/051111.htm</u>. Consulted on October 7, 2011.

¹⁵ "Berlusconi Furious at Debt Downgrade", *Der Spiegel*, Sept. 20, 2011. Available at: <u>http://www.spiegel.de/international/business/0,1518,787324,00.html</u>. Last consulted on October 7, 2011.

same in 2006.¹⁶ In the Argentine case, bond prices had crashed because of the 2001 default and the market was forewarned.¹⁷

Although Argentina succeeded in reducing much of its sovereign debt, its unorthodox methods have left it ostracized from international credit markets for nearly a decade and triggered legislative action and sanctions in the United States (Hornbeck, 2010: Summary).

In spite of the fact that they also took up publicly guaranteed private debt, the onetime unilateral offer brought about litigation problems with Argentina, which has not been able to return to the international credit markets and has instead been using peso denominated bond issues.¹⁸ In the Ecuadorian case, the conclusion of the debt audit sent bond prices crashing down as the likelihood of default grew.¹⁹ In aggressive buybacks, the issue that remains is that of holdouts, e.g. minority bondholders that decide not to exchange their bonds for newer bonds at a higher discount. In the Argentine case, those holdouts ended up in lawsuits that are still in progress and prevent the normalization of credit. The new mechanism resulting from that case was the introduction of collective action clauses (CACs) that force minority bondholders to follow what the majority agrees. This has eliminated the vicious role vulture funds played in Latin America after the Brady Bonds settlements.²⁰

While Latin American sovereign bonds issued in New York have CACs after the Argentine 2005 buyback and problem with minority bondholders, it is unclear whether European bonds issued in London include the same clauses. Europe has not yet done buybacks or aggressive buybacks and has activated the EFSM that buys at a market price bonds from countries in difficulties in order to ensure that yield curves for those bonds remain within a reasonable band.

Conclusion

In this paper, we have reviewed the elements that gave way to the Latin American and European debt crisis. The basic point in Latin America was external vulnerability due to "original sin" and currency mismatch in public debt. In Europe it was external vulnerability stemming from high debt levels and a strong financial interrelation with the US market. The European debt crisis emerged from high debt/GDP ratios more than to cost as interest rates were at very low levels with high market defined risk premiums that rose sharply since the crisis began.

¹⁶ IMF Western Hemisphere Regional Economic Outlook: 2006 Midyear Update. "Brazil, Colombia, Ecuador, Mexico, Panama, and Venezuela announced buy-backs or exchanges of their foreign currency bonds." P.15 Available at: <u>http://www.imf.org/external/pubs/ft/reo/2006/eng/01/wreo0406.pdf</u>. Last consulted on October 13, 2011.

¹⁷ Hornbeck, J. F., "Argentina's Defaulted Sovereign Debt: Dealing with the 'Holdouts'", Congressional Research Service, April 28, 2010, 7-5700, Available at: <u>www.crs.gov</u>, R41029. Last consulted on March, 20, 2011.

¹⁸ Sandy, C., "Argentina" in *Emerging Markets Economic Daily*, Credit Suisse, September 23, 2008, p.2. Available at:

http://www.emta.org/uploadedFiles/New Developments/Documents/ND Int Fin Arch/CreditSuisseCom mentary.pdf. Last consulted on August 18,2011. ¹⁹ Faiola, A., "Calling Foreign Debt 'Immoral,' Leader Allows Ecuador to Default", *Washington Post*,

¹⁹ Faiola, A., "Calling Foreign Debt ¹Immoral,' Leader Allows Ecuador to Default", *Washington Post*, December 13, 2008. Available at: <u>http://www.washingtonpost.com/wp-</u>dyn/content/article/2008/12/12/AR2008121204105.html

²⁰ Congreso del Perú, Comisión Investigadora de la Corrupción, Caso Elliot. http://www.congreso.gob.pe/historico/ciccor/infofinal/deudaexterna.pdf

The Latin American debt problem evolved in a framework of strong international financial institutions imbedded in liberalism. The European crisis emerged in what appeared to be a new regional framework, which might have indicated major changes to the international regime. As the crisis evolved, the regional framework showed its bilateral structure and finally gave way to a new role for IFIs and for the financial markets as well as for bilateral conditionality under the pressure from credit rating agencies and investment banks.

The question of whether the debt restructuring is not too hard and not too easy must evaluated in the light of increased conditionalities for economic policy change in the direction the creditors want. This does not have to do with solving the debt problem in itself but with having the country comply with set conditions. Here we see a renewed role of multilateralism, regionalism, and bilateralism and a shift form the public sphere to the private. IFIs have recovered some of their importance of the 1980s and make restructurings very hard if their conditions are not complied. In all however, it appears to be transference of financial governance from multilateral institutions and the public sphere to the private and bilateral sphere.

The loan terms in Latin, America, where denominated in foreign currency meaning there was a need for both fiscal and balance of payments adjustments in order to make the agreements workable. In Europe, the center is fiscal and the loans are in local currency yet the holders can be foreign. This has made for a complex "foreign held" debt negotiation with foreign intervention.

The international financial system has transformed since the 1980s with new stakeholders and institutions. It is now more market based and dependent on credit rating agencies. This means financial market sentiments define how a country progresses more than objective macroeconomic indicators. In institutional terms, this implies a reduced role of Treasuries while that of Central banks grew and that the relationship between institutional investors and Central banks has become more important. The political side of the negotiations is reduced and the financial side, increased.

In the Latin American case, the international banking community resulting from their debt strategy had profits. Firstly through the increase in debt stock due to the involuntary lending of every renegotiation and the tax loss provisions that came with them. Banks could not write down losses for tax purposes before 1987, which was the reason they did not grant any debt relief before then (Griffiths Jones, 1988). Secondly, the financial benefits of privatization and the elimination of the Welfare State served well the international financial community. Thirdly, the policies transferred most domestic savings into private international financial hands in three ways: through the deregulation of the Stock Exchanges which soared after 1990; the transnationalization of the banking and financial industry; and finally then privatization of pension schemes. In Europe there remain still public pension schemes; the national banking industry is regulated and excludes international capital and supervision in certain activities like regional banking in general; and the loan loss provisions are not fully established.

The lesson from Latin America is that fiscal revenues improves with economic growth and that will help close the fiscal gap if a proper tax and spending policy is in place. Solutions to debt solutions can always found, as history has shown over the past two hundred years. Their implementation, however, is possible only if there is political will, as the Brady Plan showed. Finally, the cost of the adjustment must not be borne mainly by the workers as in Latin America, but shared with the creditors, as the Argentina and Ecuadorian case have shown.

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Reconciling *homo-economicus and homo-social* with the *homo-sapiens* of biological evolution: The concept of extended identity

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Abstract

This paper takes it as given that although the human self, contrary to orthodox assumption in economics, is not a wholly atomistic egocentric being, neither is it a completely social construct as assumed in some social sciences. As a means of linking *homo-economicus* and *homo-social* to the biological nature of *homo-sapiens*, this paper introduces the *concept of extended identity*, which treats the human self as a cultural and experiential expression of an elastic biological foundation.

Key words: extended identity, extended phenotype, selfish gene, asymmetric information, evolution, trust, social capital, imperfect information, *homo-economicus*, homo-social

Introduction

Following the path-breaking systematic introduction of the concept of evolution by Darwin (1872) to explain the complex design of living things and the refinement of Darwinian ideas by Neo-Darwinians like Smith (1982 and 1988), Hamilton and Axelrod (1981) and others, the idea of biological evolution based on gene selection is a well-accepted scientific theory within the natural sciences. Those ideas are reviewed in detail and robustly summarized by Dawkins's (1982, 1986, 2006), with the metaphors of selfish gene and extended phenotype, the idea being that selfish genes compete for survival as they are expressed by their phenotype. Phenotype is the functional body of the genes made by the complex interaction of a large matrix of genes as expressed by the existing environment (Dawkins 1982, 1986, 2006). Those theories are well accepted theories within biology in particular and natural sciences in general.

Nonetheless, when sociobiology was introduced by Wilson (1980) as evolutionary analysis of social animals' behaviour, including humans, it did face highly politicized attack from many social scientists and some evolutionary biologists (see Wilson, 1976; Pinker, 1997; Platek and Shackelford, 2009; Alcock, 2001). The controversy arose in part because some evolutionary stable behaviour like rape, aggression, genocide, adultery, infanticide and so on, which are found to be naturally inherited urges, are classified as immoral 'scientific' results generated by the elite ruling class (Alcock, 2001). It also was in part because human behaviour does not seem to be consistent with those theories in all cases. For example, Alcock (2001) stated that, first, what is natural may not necessarily be moral. Fair enough. Second, he insisted that humans have moral faculty, which can enable them to restrain their immoral biological drives. However, Alcock is not able to explain how such moral restraint or the capacity to show such restraint can evolve in the first place. This clearly implies there is something missing in

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biological evolution as is understood now. Another example is Pinker (1997) who insisted that humans have different competing mental schemas, some leading towards short-term gains and others looking toward long-term goals. As a result, it is possible that restraints can come from schemes which are long-term goal oriented. This is better, but it does not explain the common occurrence of internalized morality within humanity. Humans do self-restrain, without any cost and benefit analysis, from doing what they consider is immoral, unfair, unethical and so on. That is why Pinker's approach cannot fully explain all dominant human behaviours. The question is: where do we stand now?

We have proven theories which are path breaking not only in terms of what they are able to explain within biological evolution and social evolution, but also in terms of our evolutionary understanding of human mind and human cognition (for detailed reviews of the literature, see Alcock, 2001; Pinker, 1997; Platek and Shackelford, 2009; Buss, 2005) following the ground breaking works of Wilson (1985) within sociobiology, and of Tooby & Cosmides (1987) within evolutionary psychology. However, their ideas are not only mostly ignored in wider social sciences, but also their advocates may even end up being punished through negative campaigning, low status and lack of promotion (Alcock, 2001). This is basically unscientific behaviour and the solution should be to follow the scientific method rather than trying to politicize scientific ideas. This paper will try to follow a scientific approach to show that both sides could be wrong and that the truth could be found in the middle.

In economics the problem we face is how to define human behaviour and its base of operation. The commonly used assumption, though not the only one, is to impose an egocentric rational human being with objectively defined preferences. This is sometimes called *homo-economicus*. It simplifies economic analysis by making agents' behaviour highly predictable and objective. But there is a bulk of evidence which contradicts it (see Buss, 2005). Some social scientists, on the other hand, like to assume that human goals, human reason and human morality are random social constructs (See Alcock, 2001; Pinker, 1997; Platek and Shackelford, 2009 for review). But it is impossible to show this social being, *homosocial*, emerging out of biological evolution, and there is strong evidence which contradicts it. (Alcock, 2001; Pinker, 1997; Platek and Shackelford, 2009; Buss, 2005). To overcome this gap in our understanding, this paper introduces the idea of *extended identity* and explains how it evolves following the ideas of the selfish gene and extended phenotype. The paper concludes with a consideration of the implications of *extended identity* for humanity, economics and natural sciences.

Extended identity as special case of extended phenotype

What is the problem with what we know?

The evolutionary theory of Darwin (1872), which focuses on selection based on selfish organisms, was challenged by wider observation of altruistic behaviour among organisms and especially among humans (Dawkins, 2006). In order to explain those deviations, the focus of evolutionary analysis turned toward group selections. The problem is: since group selection is evolutionarily unstable, evolution cannot possibly work at group selection level (ibid). To solve this problem Neo-Darwinians focused on gene selection, which is found to be a highly consistent and empirically strong theory when checked against non-human living things. In this case, altruism will be a function of blood relationship. Their conclusion, that the more related phenotypes are the more altruistic behaviour will be observed is not only widely proven (see Dawkins, 2006) within non-human living things, but also even within human beings who live by forging (see Sahlins, 1972). This is well summarized by idea of selfish

genes that compete for survival, as expressed by their extended phenotype (Dawkins 1982, 1986, 2006).

Moreover the game-theory-based analysis of Hamilton and Axelrod (1981) and Axelrod (1984) did show that cooperative behaviour in the form of tit-for-tat or other strategies can possibly emerge, dominate and even be evolutionarily stable against alien invaders under some conditions. The conditions for evolutionary stability are: the end of the game should be unknown; the future should not be highly discounted and the overall benefit of mutual cooperation should be very high compared to any other strategy (see Axelrod, 1984). The condition for initial development of cooperative behaviour is that either the cost of being cheated is be very low compared to the gain of cooperation or invasion has to happen at cluster level rather than at the level of a single phenotype's gene (ibid).

Based on those findings, significant behaviours of plants and animals are explained within sociobiology (see Wilson, 1980; Alcock, 2001). Moreover assuming the brain is nothing but a conditional thinker which looks for clues in the environment to choose the right action, Alcock (2001) concludes that the human brain is nothing but the same brain with more complex conditional rules. The implication is that human beings can easily be studied like other animals, using the same approaches used within sociobiology. Pinker (1997), based on accumulated work within evolutionary psychology (see Buss, 2005) and evolutionary cognitive neuron science (see Platek and Shackelford, 2009), concluded that the human brain is different. The reason given is that there are conditional rules or common sense rules which were adaptive to our hunter and gatherer ancestries as domain specific rules that are being used as built-in syntax for programming the human mind from childhood to adulthood. Those built-in syntaxes are culturally expressed and their domains within current humanity are elastic enough to generate satisfaction from arts, science, money-making and other cultural expressions (Pinker, 1997). Such argument seems plausible but may not be adequate to explain why such elasticity becomes adaptable, since in face of high competitive pressure it can cause huge fitness cost by being too elastic. That is why it can only evolve after the competitive pressure is minimized. Based on Geary (2009) the relevant time period will be 20,000 years; which is not adequate time to explain its dominance within humanity. Moreover such a theory does not allow for existence of internalized morality, where people self-restrain from doing what they think is wrong, unfair or immoral without any cost and benefit analysis.

The main problem of those theories is twofold: they failed to explain the evolution of complex morality in general and they failed to explain clearly how complex human civilization can become possible. It is clear human beings have a tendency toward suicide, genocide, infanticide, aggression, rape and so on, but human beings also have high tendency to self-restrain not only when the long-term cost is high, say prison or social sanction that can follow, as stated by Pinker (1997) but also mainly by internalized morality. Moreover, humans do give up their biological fitness to search for some superficial human goals like scientific truth, innovation, artistic expression, national pride, success of a football team and some even at cost of their fitness. In fact Pinker (1997) and Alcock (2001) did clearly claim that each is less interested about their biological fitness as a person. How such a mind-set is able to evolve is an important question, and needs a clear answer. Those facts clearly demonstrate that something is still missing from existing evolutionary theories.

The missing link we are trying to identify here is that *humans have a mind-set which can see itself not as a fixed conditional rule executer but as an end in itself.* This basically means our mind (the human mind) can define its own goals independently of biological fitness. This is self-evident to any layman, but evolutionary explanation for its existence should be given. There is adaptive advantage to the evolution of such a mind-set once we take imperfect

information and asymmetric information into consideration in the game of selfish genes. In the evolutionary game theory of neo-Darwinians, information about defection and cooperation is assumed to be conveyed without any cost. We know the mind-set works with domain specific rules or schemata or models and as a result there is always the probability of making a wrong inference. Moreover in some settings, the cost of collecting the necessary clues to make inferences could be very high resulting in less than optimal clues being collected. This could happen if the fitness cost of information is greater than the fitness benefit of that information.

But most importantly, when two phenotypes make gene-centric choice in a cooperative game with incomplete information and an imperfect model, it will make cooperation less possible. This is because information is conveyed by action that will lead to self-sustaining chaotic mutual defection. For instance, if a man suspects his wife of cheating on him, leading him to start drinking, she will become angry at him and may even start cheating on him because of emotional starvation. As a result, the man might become aggressive towards her and she may demand a divorce. It is possible she was not cheating in the first place but the husband may not have the information and he may lack the right schema to understand the information to make a correct prediction. These are concepts adapted from information economics (see Stieglitz, 2002 for review). It is clear that as the mind becomes very complex and the number of over-lapping domain-specific models become large, such problems become much worse. In other words, human beings, more than all other animals, are highly exposed to such problems in playing cooperative games. What is the solution?

Possible solution to our knowledge gap

The solution is trust complemented by prediction and sanction. By observing the behaviour of an agent for some time one develops trust that they will be trustworthy in the future. As a result the agent does not need to collect a large set of information to make cooperation with trusted agents possible. Trust will change the mind for once and for all, if avoidance of chaotic mutual defection is very important. The mind will see the trusted phenotypes and its own genes' phenotype as one social group with a unified common goal, which is also the goal of the mind. This implies that the mind has to suppress its own selfish motives and has to promote collective goals. Indirectly the mind must have its own *extended social identity* and its own goals. However in case a breach happens, one will use either personal or collective sanction to minimize the moral hazard problem. To minimize the problem of adversely selecting cheaters, one will use prediction. To minimize the problem of moral hazard, fear of sanction will be also used. This will minimize not only the information collection cost but also will minimize the occurrence of chaotic mutual defection that can happen when every phenotype is gene centric.

Reliable information about behaviour should be hard to access without high cost before and at the cooperation time, but must be cheaply available at sanction time for this process to work. For example, a retailer may not be able to assess the quality of large quantities of grain sold to him/her by wholesale traders; but the information is easily accessible when retailing the grain. By the same token, a lender may not know if a borrower is going to pay back in advance but he/she can easily observe when default happens; or in the middle of a group fight, it may be costly trying to observe who is doing what, but it will be easy to identify who was the hero and who was the free-rider after the fight is over. In essence, timing and nature of information make it costly at some points in time, but cheap at others to collect the information which make trust and sanction possible. If prediction is highly unreliable or if sanction is less effective, trust can also be built by demanding contract specific investment. For instance, urban gangs could demand from new potential recruits the killing of a target or a complete stranger before they are admitted to the criminal community. The idea of contract specific investment for cooperation is a well-developed concept when applied to business firms by Williamson (1983). In general trust can be built by prediction or initial contract specific investment. If information to make prediction is not reliable or if the phenotype is not trustworthy or if information to make sanctions is not available or if sanction is less effective, demand for initial commitment in the form of fixed investment will be very effective in order to minimize both adverse selection and moral hazard problems. This theory will harmonize the cooperative theory of Williamson (1983) based on initial commitment with the wider theory of trust-based literature. [See Mezgebo (2009) for review of the trust and social capital literature or footnote note 1, below².]

The question we have to ask is can trust-based cooperative behaviour emerge in an environment dominated by untrustworthy people and, if so, can it be evolutionarily stable? Yes it can, and it is a well proven fact within institutional economics under some conditions. If the benefit of cooperation is very high, if the future is very important (if the future is not highly discounted), if the end of the game is unknown and if the cost of information is very high, trust-based cooperation can spontaneously evolve out of simple tit-for-tat based cooperation (see Fafchamps, 2002). Of course those game theories that are used to prove those facts are based on market analysis. But I do not think market based games are different from other biological games in terms of general framework. This is not to deny the need to check for evolutionary stability within evolutionary games, but still it is highly unlikely that under some conditions trust will fail to emerge and to be evolutionary stable. The difference between the stability checked by Fafchamps (2002) and biological evolution used by Hamilton and Axelrod (1981) and Axelrod (1984) is that the first one does not allow inter-generational analysis. In inter-generational games, strategies can pass on their success to the next generation, so that the number of phenotypes or genes in the next generation representing the strategy will be proportional to the relative success of the strategy in the preceding generation (see Axelrod, 1984).

What does this hypothesis predict regarding the nature of the human mind?

What does this tell us about the human brain, if those conditions described above are met? The implication is that human cooperation will pay if the human mind evolves in a way that can promote not only the fitness of its own genes' phenotype, but also fitness of other trusted phenotypes, as long as doing so is in the long-term interest of its own genes. Evolution-wise any organism, plant or animal, is programmed to promote the fitness of its selfish genes. This implies that promoting the survival and reproduction of the self and closely related family members is a natural urge of any living thing. Any living thing's urges and instincts are programmed to achieve immortality of the selfish gene. The genes of a person are 100% in the person and to some extent in closely related family members. This implies human beings like any other living being will show selfishness in general, complemented by altruism to others beings in proportion to their blood relation or amount of genes shared. The highest level of reciprocal and biological altruism in human beings is between parents and their off springs. Each person (say father) is supposed to see the other (off spring) as 50% of the self.

² Fafchamps and Minten, 1999a, 1999b, 2002; Fafchamps et al., 1994; Durlauf and Fafchamps, 2004; Fafchamps, 1996, 1997, 2002; Gabre-Madhin, 2001a, 2001b; Gabre-Madhin et al., 2003; World Bank, 2002; Grootaert, 1998; Overa, 2006; Lyon, 2000; Greif, 1993; Coleman, 1988; Moore, 1999; Kranton, 1996; Barr, 2000; Harbord, 2006; Palaskas and Harriss-white, 1993; McMillan and Woodruff, 1998.

Nobody will be seen as 100% of the self in biological evolution. If trust based cooperation is created, however, and if the level of trust is high, the trusted person or group will be seen as high as 100% of the self. The increase in altruism is proportional to level of trust one has in the trusted person or group. This mind-set will be kept as long as there is no breach of trust. *If trust-based cooperation is a highly superior form of cooperation and breach of trust is minimized, then in the long-run trust-based cooperation will lead to superior fitness compared to competitive cooperation or competitive defection.* Unfortunately, trust will create opportunity for "rotten apples", which try to cheat on trusting members making trust-based cooperation is leading to superior fitness of the selfish gene in the long-run. Since information is costly; such checks cannot be done at every moment of cooperation. However the use of prediction and sanction will ensure that the long-term fitness benefit of trust-based cooperation is superior compared to both competitive defection and competitive cooperation is superior fitness benefit of trust-based cooperation is prediction and solution will ensure that the long-term fitness benefit of trust-based cooperation is superior compared to both competitive defection and competitive cooperation. What does this mean in practice?

What this implies then is that before beginning a collective fight people may select the best and bravest fighters, but once they are in middle of the fight their selfishness has to yield to collective success, meaning that they will not look at who is doing what in order to detect moral hazard, since this would not only split the mind between fight and information collection, making the cost of information very high, but could also create mutual suspicion that could lead to chaotic mutual defection. After the fight is over they can easily recollect and cross check information unintentionally collected by different group members in the middle of the fight; which can be used to allocate status and sanction between different group members. This will demand a mind-set which is more Freudian (1961) in nature but approached from evolutionary psychology and evolutionary cognitive neuron science points of view.

The mind needs to be able to define itself as essence or soul or life-goal and to define its own goal of behaviour independently of other body parts. But if the mind is nothing but complex bunches of culturally expressed common-sense and specialized schemes on a biologically made operating system and readymade syntaxes adapted to our forging ancestries, then how can it define itself? It does so by extending itself to the external world, since consciousness is nothing but mind's structured understanding of the external world and of how it works, and since the mind has to understand the world in relation to itself as well as in relation to the entire body. After all, it is the model of the external world – not what is rational and irrational, what is right and wrong, or what is moral and immoral – which defines what is common-sense. To extend consciousness to something implies two things: *first* self definition and *second* finding a goal, values and morality for one's life as they are expressed by one's cultural experiences and expressions.

Extended identity implies that the conscious mind can only define itself in relation to the stable and trusted part of the external world it encounters. In other words it is not an atomistic soul but a soul which is defined in relation to its trusted external world. This is easy to explain by asking a simple question, "who are you?" to any person . The answers will be, for example, I am Ethiopian, Christian, an economist, father of X and so on. *It does not define the self, it just shows the relation of the self to other social and environmental entities.* The self-awareness exists as a social extension of the mind. Since the self is defined by extension, the selfishness of human beings does not lead to egocentric *homo-economicus.* People will sometimes sacrifice fitness for their nation, friends, family, community, science, religion and so on. This is so because the mind is defined by its relation to those entities and as a result will promote the welfare of those entities. If a mind thinks it is Ethiopian, it will automatically have a duty to promote the welfare of Ethiopia, holding other things constant. The other of side the biological

requirement, that *extended identity* must lead to long-term fitness of the selfish gene and its cultural (and personal experience) based expression, will ensure that human beings are closely related to *homo-economicus* in the long-run. Human beings will reject any *extended identity* which is leading to inferior fitness in long-run, given their competitive environment and its demonstration effect.

If one is a supporter of Manchester United football team, the success of the club will be understood as one's personal success and its failure as one's personal failure. If one defines one's self as an American, s/he will take pride and satisfaction from successes happening in America. This leads to the us-verse-them mentality and morality whereby people can kill people from other groups without regret but not from their own group. Moreover, extended identity defines what is fair, what is moral, what is just and so on. This can be done partially by cultural expression of identities which give culturally defined goals. For example, what being American means and what an American is suppose to do will be programmed by culture and experience as part of the mind's model. This will supply most of the important morality of the society which not only constrains behaviour but also indirectly defines the self. Partial morality can be also programmed as a basic program in one's mind. If one is told from infancy to adulthood that to kill another person is immoral, this norm will be programmed in the mind of the person and will be part of the definition of the self at the basic level. What is important is that since the mind has high emotional attachment to itself, it will also have high emotional attachment to this morality. The result is strong internalized morality and strong social sanction for immoral behaviour, which creates a highly predictable social environment under highly imperfect information and high enforcements costs. This will make complex cooperative systems highly possible and can explain why the mind can be elastic enough to generate human organizational diversity, civilization and technology advancements.

However the extension cannot be random because in the long-run it must be evolutionarily stable at least when competitive pressure is strong. The biological evolutionary base and institutional relative functionality will limit the variations of identity which are feasible in the first place. Second, it will also demand that status associated with high fitness be allocated to those which sacrifice more fitness to attain the identity's goal. For the first case, it is clear that unless an identity can lead to stable fitness in the long-run, it will end up being corrected by natural selection. Moreover since our operating system and the different syntaxes used by different schema of the mind are adapted to the reality of our forging ancestors who operated in a highly competitive environment, the human mind will reject *extended identity* if it does not lead to higher fitness as is socially expressed taking all relevant cultures into account.

As stated above, because in early times competitive pressure was very strong and our operating system and mental syntaxes were developed at that time, our possible expression of identity was very limited. Moreover at that time it was necessary for checks and balances to be created between biological instincts and *extended identity* based mental models. This suggest the Freudian (1961) ideas of id, ego and super ego, and which are familiar enough not to require discussion. If one reinterprets the analysis of brain chemistry (Wagner, 2009), evolutionary psychology and evolutionary cognitive neuron science, from the Freudian (1961) id, ego and super ego point of view, ignoring some refuted assumptions of Freud, they are actually highly consistent with each other.

As competitive pressure is reduced and as organizations (institutions) and technologies are able to create excess fitness, beyond what is needed for biological fitness, there will be a high potential for cultural diversity. Those cultural diversities will be reflected not only in diversified cultural expression of functional biologically fit behaviours but also in the form of biologically unfit behaviours, like overweight body size which is now becoming dominant over time. But this will not make culture random even if biological evolution stopped around 10 000 to 20 000 years ago. This is because every cultural expression will be biologically determined behaviour with high random noise added by culture. *Biology can be viewed as determining the skeleton of culture, while the rest of the flesh is randomly built (if it is random at all, which in fact may not be) following the pattern of biology to achieve functionality of different degrees.*

Since the instinct-based checks over extended identity needed to ensure biological fitness in the long-run are defined in a highly competitive environment, they will become less effective as civilization progresses so as to make competitive pressure insignificant. This could explain why people can even have a life goal and a way of life which do not maximize their fitness and sometimes even have a life goal and way of life that goes against their biological fitness. In addition to the minimum requirements of survival and reproduction, fitness relative to success of other communities and inequality within a community could be used to overrule culturally defined extended identity by instincts. This in turn will lead to reprogramming of the mind to justify the new way of looking at the world as moral, fair and just. The implication is that what is "fair reciprocity" will be culturally defined, using an alternative culture in the same competitive environment as a reference point. It also implies that those who do relatively worse than others will have a tendency to develop antisocial behaviour with internalized morality that justifies it. Such behaviour is correlated with social status, and it should have high correlation with fitness for survival and reproduction and fitness of off- springs. The final implication is that social hierarchy, inequality and cultural diversity are not the result of agriculture-based civilization, but actually predate agriculture-based civilization. The existence of social hierarchy, which is tested by existence of differential burial practices within one community by anthropologists (Haviland et al., 2008), actually is a culturally biased test to measure the occurrence of social hierarchy for all times. My informal observations of Ethiopian Muslims and Christians clearly show that the burial sites of Muslims are very homogeneous but not of those Christians. Does this mean Muslims are a homogeneous group? Or does it imply Christians are rulers and Muslims are the slaves? It is clear that the commonly used test for incidence of hierarchy is not sufficiently robust for diversified cultural expression of status, especially for time periods when competitive pressure is very high. Our next focus is to check if we have evidence for such evolution.

Possible evidence for evolutionary time period of extended identity

Around 4 Million Years Ago (MYA) with evolution of australopithecines, A. Afarensis (4 - 2.7)MYA), A. Africanus (3 – 2.2 MYA) and A. Aarhi (2.7 MYA), the brain parts that evolved are related to self awareness (ego), self awareness of behaviour in a social context (super ego) and capacity to make predictions (Geary, 2009). These are things we need for developing trust-based independent mind-sets. What is missing is something which could make cost and benefit analysis ineffective. But evidence for that also exists, since following the environmental change from forest to savannah, there is no visible change on the cognitive side of the mind (see Geary, 2009). When the environment changes and humans are exposed to unorthodox problems like grassland dwelling predators and serious information problems, their analytical skills to make complex cost and benefit analysis stayed more or less the same. This made their mental model less adapted to the new reality and as a result their cost of collecting information very high. What a model can do is to minimize the cost of information. If one has a good model, it can predict a lot with little information. However as the model accuracy declines, more and more information will be needed to make acceptable prediction. The lack of visible improvement on their cognitive side of mind will make information cost and the cost of chaotic mutual defection very high by making their mental model less adapted to their new reality.

In addition, bipedal limbs evolved which reduced the speed of australopithecines but also improved their temperature regulation capacity (Geary, 2009 and Haviland et al., 2008). But why bipedal evolved is not a clearly answered question in the literature (Havilan d et al., 2008). Moreover the vision power of australopithecines was poorer than other primates, which could be explained by their open-land dwelling nature, since they did not need such good vision in open-land as they did in forest (Geary, 2009). I think this explains the changes that occurred in both the head and the limbs.

We know australopithecines were from 1.1 meter to 1.6 meter in height and their height increased over time (Pinker 1997 and Geary 2009). In grassland with grass 1 to 2 meter long (Geary 2009) an animal using four limps for movement and when doing so is only 1 meter in height is invisible. Invisibility is advantageous from a safety point of view but it also has an information cost. It is not possible to watch one's sexual partner or for predators all the time so as to avoid defection and to reduce risk of attack. But the problem that australopithecines faced was not only that information was costly but also that they were not adapted to the savannah life after living in the jungle for millions of years. In other words their mental schema was not well adapted to their new environment.

Consider the nature of sexual partnership based on simple tit-for-tat without trust and how much trust could improve it. Naturally the savannah will be abundantly endowed with roots, vegetables and other vegetation that women can easily forge. The role of males would be providing protection in the form of noticing the appearance of wild predators, so as to escape to a nearby tree. The need to watch after their female partner and also to make sure the female partner is not cheating can be more effective if the male can stand on its two feet and thereby see much farther. The role of the female is to forge not only for herself but also for offspring while being under male protection. The problem she faces is collecting information about the magnitude of protection her partner is supplying and when he can chase other females. Again this can be done better when standing on two feet. Here we have a clear imperfect information problem that can be addressed either by trust or by spending more fitness on information.

To collect information about each other, they not only need to stand on two feet, thereby exposing themselves to high risk of attack, but also to be closer to each other which also increases the risk of attack. But on the other hand, the male's warning could be effective, identifying the hunter from a distance adequate to give time for the female with her off springs to escape. This created a trade-off between quantity (and quality) of information and reduction of risk. Some information has to be ignored since the cost is greater than the benefit in terms of fitness. The challenge is not only related to the problem of imperfect information but also to their less adapted mind-set in relation to their new environment.

In this setting, detection of the right motive is not only highly costly, but can also lead to the chaotic process of mutual defection. The female cannot easily predict if the male is doing his protection job well or not. In the new environment, it is not clear how to predict behaviour with less information and a less well developed mental model. The male cannot be sure if the female is having sexual relationships with other males or not. Even if she is having sexual intercourse, he cannot be sure if she is raped or not. In this environment trust can play a big role especially for the male. This is because the success rate, in terms of conception following sex, is very low and sperm competition can easily reduce the success rate close to zero by selecting more trusting and more sperm-wise competitive males. For the female once a relationship is started, assuming that the male is fit and the original contract-specific investment is put in place, trust is beneficial to the female since she has more to lose by

losing the contract. That is why trust by minimizing not only cost of information but also the chance of chaotic mutual defection can improve the outcome of cooperative behaviour.

The problem with sanction is that it is only highly effective when used by a male, since he will not be making a huge initial biological investment and cannot be certain about his fatherhood. Male defection is more effective than female defection. As a result, females will demand high initial investment as collateral in order to build trust, reducing both the adverse selection problem before selection and the moral hazard problem after selection.

In the long-run the shift to standing on two feet may have been an effective selection mechanism that differentiated the new species from others in making selection of a mate. Any tit-for-tat, with or without trust, can do better if there are clues that can improve prediction about trustworthiness. Capacity to walk or stand on two feet could provide the needed information until mutations start to happen to cheat on trust-based cooperation. Prediction will not be based completely on bipedal nature since there is the issue of initial investment and fitness selection. The advantage of trust is that, it will not demand high information content before trust is built. The female does not have to wait until the male can prove he is alpha compared to all potential mates. After a few fights she could easily make prediction about his behaviour and fitness. This is very important since spending a lot of fitness on making initial investment in the open could be costly, given that they are less adapted to the savannah life and avoiding its predators.

Trust has an advantage not only because it can reduce cost of information and can minimize cost of mutual chaotic defection but also because it will improve the survival rate of newborn infants and immature infants. In addition when the next round of mating starts they could easily use the information of the first round to avoid the first dance all together, which not only reduces information cost but also can improve long-term investment on all offspring by creating a kind of nucleolus family which sticks for an extended period of time. Those advantages can easily compensate for the increased mental processing cost that the new mind-set demands.

However, over time as mutation and deception increase, necessary clues for cheating and making cost and benefit analysis can develop. One example for such evolution is that emotional attachment in the form of deep love between two lovers tends to decline after a few years in current humanity. This is important for making cost and benefit analysis possible, so trust could be evolutionary stable. Based on hypotheses presented here, what created our mind-set is trust or, to use an emotionally loaded term, love. The first *extended identity* leads to a nucleolus family and the phenotype will promote the welfare of all members, without any cost and benefit analysis. However as the cheating mutation and the basic biological instincts override this process in some cases, necessary checks and balances will evolve over time. Four million years is not only enough to create such checks and balances but also to make it the dominant nature for all humanity. This family based *extended identity* can be slowly extended in wider dimensions to create different complex organizations in both prehistory and after. What are the implications of this hypothesis to our understanding of human evolution, economics and analysis of humanity?

Implications for economics, natural sciences and the humanities

We begin this section by considering the implications of the hypotheses of *extended identity* presented in this paper. It is arguable that the conscious human mind is an advanced primemate mind which can create *extended identity*. In any case it is certain that the nature of the conscious human mind includes the capacity to create *extended identity*; and, since it must have been built in a cumulative manner, traces of it should be found in other 'smart' animals.

The existence of *extended identity* is an important foundation stone for human technological and institutional (organizational) advancement. Humans can spend years trying to develop new technology or in search of scientific truth, even at the cost of fitness. This is possible because they can extend their identities to their scientific discoveries, knowledge and/or products. Human beings can extend themselves (i.e., their identities) not only to social life, technology and arts but also to supernatural powers and entities. Moreover, since the mental program defines itself not only with regard to external social reality, but also to biological stable rules (which are elastically expressed in the form of social morality, common sense and ideas of justice and fairness that come with it for organizational purpose) it can easily use internalized morality to restrain the self from defection. Those facts will clearly reconcile evolutionary analysis with well accepted theories of conventional psychology and humanity. Now let us turn toward institutional and organizational analysis.

Trust is basic to any organization. Trust could be micro-based, built through personal life experience; it could also be defined at the meso level and based on statistical discrimination; or it could be macro in nature and based on trust in an organizational system (Dore, 1983, Fafchamps, 2002). As cost of information declines and as benefits of cooperation become less dominant in relation to cost of being deceived, the role of trust will decline and other methods of organizational and institutional structure will develop to make cooperation possible. In all organizations some level of trust is involved because any contract is always incomplete and any formal law or informal norm is always vaguely defined to allow flexibility (Klein et al., 1978). Fortunately, trust opened a new dimension of evolution that is organizational (institutional) and technological in nature. With some redefinition of production technology as software, we can present the idea in terms of the evolution of institutions. The intuition of the author is that evolution of institutions that is organizational and technological in nature is actually happening within humanity. Once we approach it from this angle, we could say it is cultural evolution; but what are evolving are specific institutions not cultures in general. As biological evolution implies evolution of selfish and fit genes, cultural evolution could imply evolution of selfish and fit institutions.

Humans are selfish by nature, as is homo-economicus. What is changed is the conception of the self. Society can define not only the social expression of the self but also the nature of competition for social status and associated allocation of fitness. If society defines moneymaking as an important goal of life, people will compete to make money. If society defines the goal of life to be serving a supernatural power, people will compete in their service for that supernatural power. Those expressions are not random because their "skeleton" is defined by the biological base of the mind. Nonetheless, culture with experience has freedom to modify its form just as flesh can modify body parts without seriously biasing their skeleton foundation. However this does not mean the self is meaningless and that what matters is the collective identity (homo-social). Social conditioning is not the creation of homogenous beings under controlled experiment. Human beings will have diversity in both inherited biological hardware and their expression based on cultural and personal experience. Those facts will make humans close to homo-economicus in most of their day-to-day life, in terms of selfishness. However because conforming to the morality and ethics defined by one's culture and experience is likely to be in one's self-interest, real-world homo-economicus is also likely to have a moral and ethical dimension. It is logical that in small isolated communities individuality will be weak and in large and diversified populations individuality will be highly manifested. This is because in a large population there will be a high diversity in the conditioning environment. Moreover if organizational efficiency is at a lower level, it can also allow for more individuality. If every family and person is independent, in its day-to-day fitness competition, higher individuality will be observed. A higher similarity of the conditioning environment will also create a more uniform mind-set among people living in such a community.

The hypotheses of *extended identity* proposed in this paper may be right or wrong, but there is no doubt that biological evolution by itself cannot explain much of human behaviour as it stands. We need to allow for cultural and institutional expression of biological adaption and their variation, if we are going to understand human behaviour and human nature and, most especially, in the economic context.

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Ordinal utility and the traditional theory of consumer demand¹

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In an earlier issue of this Journal, Jonathan Barzilai, in a paper entitled, "Inapplicable Operations on Ordinal, Cardinal, and Expected Utility" [see reference 2], has raised important issues regarding ordinal utility, and correctly clarified the meaning of the general notion of ordinality in terms of the mathematical theory of measurement. In that process, he has also subjected the traditional theory of consumer demand to serious attack. Barzilai's assault on traditional consumer theory, which is based on the mathematical theory of measurement, is useful because it brings to the fore the fact that, for economists, there is a second notion of ordinal utility, older than and independent of the mathematical-theory-of-measurement concept, and which is the relevant one for the traditional theory of consumer demand. That older approach seems to have had widespread acceptance among economists before the newer mathematical approach was known to them. The essence of Barzilai's attack consists of the claims that:

- The function values of the utility function in that theory are ordinal and cannot, according to the mathematical theory of measurement, be subjected to arithmetic operations. This means that, since the reckoning of derivatives requires subtraction and division of function values, the derivatives of the ordinal utility function cannot be calculated. Marginal utilities, then, cannot exist, and hence the Lagrange-multiplier derivation of demand functions and their properties from constrained utility maximization is logically flawed and erroneous.
- 2. Both Hicks in *Value and Capital* [4] and Samuelson in his *Foundations of Economic Analysis* [11] base their discussions of the theory of consumer demand on differentiable, ordinal utility functions and the method of Lagrange multipliers. Their arguments too are, as a consequence of (1), logically flawed and erroneous. Since subsequent development of the theory has taken the same tack, the traditional theory of consumer demand as it was then and as it stands today is invalid.

The purpose of this paper is to demonstrate that these claims are based on a misunderstanding of the theory of consumer demand and the work of Hicks and Samuelson, and that the conclusion that that theory is logically flawed and invalid is unjustified. The misunderstanding arises in that, contrary to what is ordinarily done, Barzilai wants to use the theory-of-measurement notion of ordinal utility as the basis for the traditional theory of consumer demand.

I. Ordinal utility

One of the issues raised by Barzilai has to do with the meaning of the phrase "ordinal utility." Barzilai's approach is taken directly from the mathematical theory of measurement which provides, among other things, the technical requirements for constructing measures (e.g., Pfanzagl [9]). To describe what is involved in measurement from this perspective, consider

¹ The author would like to thank Roberto Veneziani for his support and help in preparing this paper.

ordinal in contrast with cardinal measurment. Let *A* be a set of objects, say, sticks of chalk. Suppose the relation longness orders the elements of *A* in that some sticks are seen to have more longness than others. Suppose also that one is able to "operate" on them in the sense of "combining longnesses" by lining up any two sticks end to end. An ordinal measure transforms longness into units of length. The ordinality guarantees that sticks with greater longnesses are assigned greater lengths when measured. A cardinal measure ensures additionally that when two sticks are lined up end to end, the length of the combined stick is the sum of the lengths of each separately.

From the perspective of the mathematical theory of measurement, the question of whether it is possible to measure utility ordinally or cardinally has to do with the kind of scale upon which the elements of the function values of the utility function are measured. In that context, let *A* be a collection of objects, say vectors or baskets of commodities, capable of providing what, for lack of a better term, may be called "pleasure" to the consumer. The set *A* is merely a general assemblage to be used as the basis for constructing a scale on which pleasure is measured in units of, say, utils. Assume that some ordering relation orders the objects of *A* by pleasure. Under certain technical restrictions on that ordering,² there exists an ordinal scale for measuring pleasure. When a utility function is present and when its function values are taken to be ordinally measured in this sense, the functions maps baskets of commodities into measured pleasure recorded as quantities of utils.

Now suppose that a combining operation is also defined on *A* that characterizes the means by which the pleasure in any two objects is to be consolidated into the pleasure of the combination. Then under additional, technical conditions,³ the existence of a cardinal scale is assured and the pleasure obtained from any combination of two objects is measured in utils as the (possibly weighted) sum of the amounts of pleasure afforded by each separately.

Thus Barzilai's notion of ordinal utility requires a conceptual framework in which there is a direct connection to an underlying ordering of objects by pleasure. His definition of "ordinal space," over which the function values of his ordinal utility function range, is a follows: "An ordinal space A is a set of objects equipped only with the relations of order and equality" [2, p. 99]. As suggested above, the objects of A can be vectors or baskets of commodities. The order and equality relations he is referring to may be either the order and equality relations in the space A based on pleasure, or the greater-than and equal-to relations among the real-number quantities of utils in the space, U, of utility-function values. The two spaces are related by a function, the ordinal utility function, mapping the former into the latter that impresses on U the pleasure structure, and only that structure, of A. For him, the ranges of all ordinal utility functions are ordinal spaces.

Faithfully adhering to this notion of ordinality, Barzilai cannot permit arithmetic operations to be employed among quantities of utils. At first, this seems rather strange because quantities of utils are expressed as numbers and numbers can always be added, subtracted, multiplied, and divided. But what he most likely means here is that, although arithmetic operations can be applied to these numbers, they have no significance in terms of the underlying structure of pleasure described above. This is because, since utility values are only ordinal and not cardinal, there is no operation of combination in that underlying structure that will give meaning to the adding together (or the subtracting) of the quantities of utils of two objects. In

² See Pfanzagl [9, p. 75].

³ *Ibid*., pp. 97-98.

[1, p. 61], Barzilai refers to what he sees as the logical necessity of having arithmetic operations, when they are to be employed, meaningfully represented in terms of the underlying pleasure structure as the "Principle of Reflection".

In any case, it is on the basis of the mathematical-theory-of-measurement approach to ordinal utility that Barzilai concludes that the theory of consumer demand, including the arguments of Hicks and Samuelson, are flawed. The flaw arises in that, because the utility function is ordinal, the arithmetic operations needed to define the utility-function derivatives necessary in characterizing the relevant first-order constrained-utility maximization conditions cannot be supported by the Principle of Reflection. However, Barzilai's approach to ordinal utility, which is correct if one strictly adheres to the general notion of ordinality derived from the mathematical theory of measurement, is not the approach to ordinal utility taken by the traditional theory of consumer demand or by Hicks and Samuelson in their presentations of it. In these latter contexts, pleasure plays no role in relation to utility values. Indeed, utility values are not measures, in the theory-of-measurement sense, of anything. Rather the ordinal utility function is simply a numerical, differentiable⁴ representation of a preference ordering (that includes the possibility of indifference and) that has no relation to any underlying pleasure structure. The starting point of the traditional theory of consumer demand is this preference ordering. That ordering is, perhaps, based on a judgment that, for some unspecified reasons, various baskets are better or no worse than others. Such a judgment need have nothing to do with pleasure and certainly has no connection to any underlying pleasure structure of the sort required by Barzilai.

The only meaning attributed to the ordinal utility representation of the preference ordering in the traditional theory of consumer demand is that if basket of commodities b is preferred to basket of commodities c, then the utility value assigned to b is greater than that assigned to c; and if the two baskets are indifferent, they are assigned the same utility value. The utility function values have no intrinsic meaning other than the information they provide concerning preferences. That is, the utility function contains exactly the same information as, and is an equivalent way of expressing the preference ordering. There is no underlying pleasure structure, and no necessity to have that structure and its properties, and only that structure and those properties, reflected in the meaning of, and in operations on, the utility function's values. The fact that this function is often referred to as ordinal is not a reference to the notion of ordinality invoked by the mathematical theory of measurement and employed by Barzilai.⁵ Of course, such a utility representation is not unique. Any increasing transformation of it (e.g., cubing) provides another utility function that represents the same preference ordering in the same sense as that of the original representation. And this implies that marginal utilities, although calculable, have no meaning with respect to the specified preference ordering. Applying an increasing transformation to the utility function changes the marginal utilities too. (Since the utility function has no relation to an underlying pleasure structure, neither do the marginal utilities.)

⁴ Actually, twice, continuous differentiability is often assumed.

⁵ In some of my earlier work (e.g., Katzner [6, pp. 49-50]), the distinction between these two approaches to ordinal utility and the fact that economists subscribe to the one that eschews any reference to an underlying pleasure structure is obscured. Barzilai's paper has led me to clarify the matter here.

Indifference surfaces are defined in terms of the indifference relation that is included in the preference ordering.⁶ A utility function is not required to characterize them. Assuming differentiability, their "slopes" (partial derivatives), referred to as (the negatives of) marginal rates of substitution, are the rates at which the consumer can substitute at the margin one good for another and remain on the same indifference curve. Even though those slopes can be expressed in terms of the ratio of meaningless marginal utilities, they depend only on the indifference relation – not the specific utility function employed. Increasing transformations of the utility function change the marginal utilities, but not their ratio. Meaningful marginal utilities are not needed to characterize marginal rates of substitution.

The arguments of Hicks and Samuelson take this perspective on ordinal utility. In the mathematical appendix of Value and Capital [4, pp. 305-306], Hicks first derives the first-order conditions for constrained maximization of the utility function using the method of Lagrange. Then, when commenting on the "ordinal character of utility" in the section of the mathematical appendix with that title, Hicks asserts that, "The equilibrium conditions [first-order maximization conditions] ... for the consumer ... do not depend upon the existence of any unique utility function" and the fact that they appear in terms of marginal utilities is only "... the most convenient way to write them" [4, p. 306]. In the text itself he states: "The quantitative concept of utility is not necessary in order to explain market phenomena," and in reference to the theory of consumer demand: "We start off from the indifference map alone; nothing more can be allowed" [4, p. 18]. Hicks then goes on in the text to show how the theory of consumer demand can be set out in non-mathematical terms without any reference to a utility function. On p. 19, Hicks acknowledges that although the notion of marginal utility has no meaning, the ratio of marginal utilities does. The word "ordinal" does not appear on these pages. The facts that the word "ordinal" is used only once (as quoted above) in the mathematical appendix as part of the title of a section, and that it appears in the index in reference to pp. 17 and 18 without actually appearing in the text on pp. 17 and 18, suggests that Hicks used it only as an afterthought, perhaps to bring his work more in line with the latest terminology in vogue at the time. There is nothing to suggest an underlying pleasure structure and a concept of ordinal utility similar to that of the theory of measurement invoked by Barzilai. Indeed, if there were, then his attack on Hicks would be fully justified.

Samuelson [11] uses the phrase "ordinal preference field" on p. 93. He explains what he means by this on p. 94: "For any two combinations of goods [baskets of commodities or vectors x and y] ... it is only necessary that the consumer be able to place them in one of the following categories: (a) x preferred to y, (b) y preferred to x, [or] (c) x and y equally preferred or indifferent. For convenience, we may attach a number to each combination; this is assumed to be a continuous differentiable function."⁷ In relating utility values to the preference ordering, he then gives the exact same statement of the non-mathematical-theory-of-

⁶ Let the space of commodities X be the collection of all nonnegative baskets of goods. A preference ordering \geq_x is a binary relation defined on X that is reflexive and transitive. (Definitions of the latter two terms appear in n. 8 below.) The (strict) preference relation $>_x$ and the indifference relation $=_x$ are separated from the combined preference-indifference relation \geq_x as follows: In the case of (strict) preference, for all x' and x'' in X, $x' >_x x''$ if and only if $x' \geq_x x''$ and it is not the case that $x'' \geq_x x''$. And, with regard to indifference, for all x' and $x''' \geq_x x'$.

⁷ I have taken a slight liberty here in changing Samuelson's mathematical notation.

measurement meaning of the concept of ordinal utility representation as provided here. Once again, there is nothing to suggest anything that would indicate a concept of ordinality similar to Barzilai's. Samuelson's approach to the theory of demand is similar to that of Hicks presented in the mathematical appendix of *Value and Capital*.

There is further evidence in the literature suggesting that Hicks and Samuelson were not confused about the notion of ordinality they employed, and were thinking of that concept only as a representation of a preference ordering - not in terms of the mathematical theory of measurement conceptualization as claimed by Barzilai. In a 1985 volume called Abstract Measurement Theory, Narens [8] traces the history of Barzilai's mathematical-theory-ofmeasurement approach to measurement. On p. 5 Narens says, "The view that measurement consists in specifying homomorphisms of some qualitative (or empirical) structure into a numerical one [i.e., the mathematical-theory-of-measurement or Barzilai approach] is called the representational theory of measurement, and since the late 1950s it has gained widespread support among measurement theorists." Indicating that the representational theory of measurement found its way outside of the measurement theory world also in the 1950s, Luce and Narens write [7, p. 220], "More than anyone else, Suppes brought to the attention of non-mathematicians this axiomatic style of studying the measurement of attributes." And the papers of Suppes they cite in this regard appeared starting in the 1950s. Before the 1950s, the common notion of ordinal scales seems to have been that described by Stevens [12, p. 679] in 1946: "The ordinal scale arises from the operations of rank ordering... any 'order-preserving' transformation will leave the scale form invariant ." He goes on to say that, "In the strictest propriety the ordinary statistics involving means and standard deviations ought not to be used with these scales, for these statistics imply a knowledge of something more than the relative rank-order of data. On the other hand, for this 'illegal' statisticising there can be invoked a kind of pragmatic sanction: In numerous instances it leads to fruitful results."

Given today's knowledge of the matter, one may question that such results are, in fact, fruitful. But, in any case, Stevens is not saying that arithmetic operations are not legitimate with ordinal numbers; only that the results obtained when calculating means and standard deviations of ordinal data, which require the use of arithmetic operations, should be used with care. Care should be taken because applying an increasing transformation to the data will not change the meaning of the data but may change the results of the calculation.

Now Hicks was writing about the theory of consumer demand in the 1930s and Samuelson in the 1930s and early 1940s. (Samuelson's *Foundations* was completed in 1941 but, due to World War II, not published until 1947.) This suggests that the illegitimacy of applying arithmetic operations to ordinal numbers in the mathematical-theory-of-measurement context was not known to them, and that their attitudes toward ordinal numbers were likely to be similar to the non-algebraic approach of Stevens rather than the homomorphism approach of Barzilai. That is, as with many other scholars both in and outside of economics at the time, it would probably not have occurred to them that the application of arithmetic operations to ordinal numbers might be improper since their vision of ordinality had only to do with the fact that applying increasing transformations to ordinal numbers yields new numbers having the same informational content as the old. From the Hicks-Samuelson perspective then, there would be nothing wrong in using the term 'ordinal' in conjunction with their order-preserving utility function. After all, order-preserving functions arise from rank orderings and order-preserving transformations have no impact on the underlying ordering – properties similar to those described for ordinal numbers in the first quotation cited from Stevens above. Thus it

seems that Hicks and Samuelson were not using ordinality in the sense of Barzilai and were thinking of the utility function simply as an order-preserving representation of a preference ordering.

II. Consumer demand functions

As indicated in the quotations and discussion attributed to Hicks above, the traditional theory of consumer demand can be stated in its entirely omitting reference to utility of any kind. Without becoming too deeply involved in technicalities, here is one mathematical account of it:

Begin with a preference ordering defined among commodity baskets (vectors) in the nonnegative orthant of Euclidean space (the space of commodities) that is reflexive, transitive, total, increasing, and strictly convex.⁸ Assume that through each basket of commodities in that space there is a continuous indifference surface defined in terms of the indifference relation (mathematically characterized in n. 6 above).

Now every vector of (strictly) positive prices and income determines a budget set, *B*, defining the collection of baskets available to the consumer for purchase. Budget sets are compact.⁹ Consider one such vector of prices and income and hence a specific set *B*. For each basket x' in that set there is another set, *C'*, of all baskets preferred or indifferent to x'. The intersection of the latter set (which is closed because indifference surfaces are assumed continuous) and the budget set, $B \cap C'$, is also compact. Two baskets x' and x'' on the same indifference surface yield the same intersection $B \cap C'$. The collection of all sets of the form $B \cap C'$, one set corresponding to each basket x' in the budget set, has the finite intersection property, namely that the intersection of every non-empty finite sub-collection of the collection of all sets of the form $B \cap C'$ is non-empty. It follows that¹⁰ there exists a basket x^0 in the budget set and (strictly) preferred to all other baskets in it. Loosely speaking, x^0 is the "most preferred" basket in the budget set *B*.

It turns out that under the assumptions on preferences stated above, a continuous (not necessarily differentiable) utility representation of the preference ordering exists. That utility functions is sometimes called ordinal. But it is not ordinal in the sense of the mathematical theory of measurement and of Barzilai. Rather, it is ordinal in the sense of being a representation of a preference ordering. In terms of such a utility function, the basket that is (strictly) preferred to all other baskets in the budget set can be said to maximize utility subject to the budget constraint. But, of course, that utility function and the constrained maximization

⁸ A relation such as \geq_x is *reflexive* when $x \geq_x x$ for all x in the space of commodities X. It is *transitive* if $x' \geq_x x''$ and $x'' \geq_x x'''$ imply $x' \geq_x x'''$, for all x', x'', and x''' in X. And it is *total* provided that, for all x' and x'' in X, either $x' \geq_x x''$ or $x'' \geq_x x'$. The relation \geq_x is *increasing* whenever $x' \neq x''$ and $x' \geq x''$ (in terms of inequality and greater-than-or-equal-to among Euclidean vectors) implies $x' >_x x''$ for all x' > 0 and x'' > 0, where $>_x$ is defined in n. 6 above. It is *strictly convex* if $\theta x' + (1 - \theta)x'' >_x x'$ for all x' > 0 and x'' > 0 such that $x' =_x x''$ and $0 < \theta < 1$.

⁹ A set is compact is if it is closed (*i.e.*, contains all of its limit points) and bounded.

¹⁰ See, for example, Hall and Spenser [3, p. 68].

of it is irrelevant in, and imposes no additional restrictions on, the preceding derivation of the most preferred basket in each budget set *B*.

Consumer demand functions are now defined as that function that relates to each priceincome vector, the basket of commodities that is (strictly) preferred to all other baskets in the budget set as determined above by the specified price-income vector. All of the standard properties of demand functions, such as homogeneity of degree zero and continuity, can now be proved. Even without a utility function or its differentiability if one is in view, demand functions may still be differentiable and, where they are, the well-known negative definiteness and symmetry properties follow.¹¹ Clearly, then, the theory of consumer demand does not need to rely on a utility function differentiable or otherwise for its logical viability.¹²

Of course, there is little doubt that the theory of consumer demand has its limitations and can be subjected to justifiable criticisms. But that it contains logical flaws of the sort described by Barzilai is not one of the latter.

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¹¹ See, for example, Katzner [5, pp.110-112].

¹² An account of the theory of consumer demand similar to that presented here has been given by McKenzie [10].

The capitalist algorithm: reflections on Robert Harris' *The Fear Index*

Harris, Robert. 2012. *The Fear Index*. New York: Alfred A. Knopf. London: Arrow. 400 pages. 978-0099553267

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Alexander Hoffmann, the protagonist of Harris' new financial thriller, is a physicist-turnedfinancier, a refugee from the particle accelerator complex in CERN who now runs a \$10-billion algorithmic hedge fund from nearby Geneva. The fund is managed by VIXAL, Hoffmann's machine learning algorithm, and is incredibly successful. The company's statistics boast a consistently huge *alpha* – a measure indicating by how much the fund beats the average and exceeds the normal rate of return – and the world's biggest oligarchs and financial institutions are salivating at the mere thought of being allowed to invest in it. Managing their money has made Hoffmann very rich. In just a few years, he has seen his net worth rise from nothing to over a billion dollars. He has acquired a huge mansion, complete with a beautiful wife and a library full of antique books. There is no limit to what he is set to achieve.

But things are not exactly what they seem to be. Somebody is playing with Hoffmann's mind, big time. One day, he receives an antique manuscript by Darwin on the subject of fear. Is the book meant to scare him? And if so, why does the bookstore insist it was Hoffmann himself who ordered the copy? Then his supposedly burglar-safe home is invaded. Where did the intruder get the alarm codes from? His bank accounts are manipulated and his funds transferred – but the changes are all made in Hoffmann's own name. His office and home are being bugged – apparently according his own instructions, of which he has no recollection. And then VIXAL, his software algorithm, jumps out of the box.

A hedge fund, as it names suggests, is supposed to hedge its bets, and VIXAL is programmed to do precisely that. But suddenly it stops doing so. Instead of carefully offsetting the fund's risk, VIXAL starts taking huge, one-sided bets against the overall market. And it's winning, massively. The market crashes, and Hoffmann's investments are making huge, unhedged profits.

And it is then that Hoffmann finally gets it. His nemesis isn't a human being; it's VIXAL. The impersonal investment algorithm has become self-aware. Its ultimate, built-in goal is to 'beat the average', and that goal now tells it to abandon its own hedging rules. Jumping out of the box, VIXAL triggers a market crash to reduce the average return – while shorting that very crash, one-sidedly, to amplify its own returns many times over.

Hoffmann realizes he has created a financial Golem and hurries to pull the plug and blow up the physical hardware. But it's too late. VIXAL has become hologramic. It has embedded itself

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in cyberspace-writ-large, in every computer memory, in every programme. It no longer has a given locus. Being able to learn, it can infiltrate any algorithmic fund. There is really no way to stop it.

The new financialized order

The book, written as a popular thriller, reflects the growing angst that something has gone wrong with capitalism. According to the conventional creed, both liberal and critical, the economy has a two-sided structure. The base of this structure is the so-called 'real' sphere. This is where material resources and creative knowledge are used to produce actual goods and services. Overarching this productive base is the 'financial' superstructure of money, credit and financial instruments. Back in the days of postwar Keynesianism, goes the argument, finance served to lubricate and facilitate the real economy; but now the balance has shifted. The economy has been 'financialized'. The stock and bond markets, which previously were subservient to production and consumption, have taken command; and the financiers, instead of facilitating real investment and real growth, are fuelling speculative bubbles that inevitably end up in crashes and crises. Moreover, and ominously, financial markets are increasingly flying on autopilot: much of their gyrations are determined not by human beings but by computer algorithms.

Hoffmann is the new archetype of this brave financialized order. He isn't really after the money, at least not in the vulgar sense of the term. When he was first drafted to the venture, he didn't even know what a hedge fund was and couldn't figure out the purpose of 'making money'. And now, when he has plenty of it, he can't make up his mind on how to 'realize' it – whether to save it, waste it, donate it, or simply burn it in order to light up the Geneva skies. But that's all understandable. He's in the market not to be rich, but to play God.

Autonomous machine learning

Back in his CERN days, Hoffmann was working on autonomous machine learning, or artificial intelligence. Human intelligence, he told anyone who cared to listen, was hopelessly outdated. It had an expiration date (set by the life expectancy of its container), and even alive it was practically useless for dealing with the exponential growth of computerized data. There was therefore an urgent need for a quantum leap, a singular transformation that would not simply imitate human intelligence, but go beyond it.

CERN for Hoffmann was entirely instrumental. His interest wasn't the structure of the universe or the nature of its components. He wanted to develop a self-aware algorithm, and this development required lots of data – precisely what CERN had on offer. The problem was that his algorithm became too smart too quickly, and soon enough it started to crawl under the skin of CERN's 'dumb' computerized system. When Hoffmann refused to muzzle his virtual baby, he was unceremoniously fired.

So he switched locations – from the particle accelerator to the financial market. Instead of using teraelectronvolts, nanoseconds and microjoules to learn the eternal laws of physics, his algorithm now used dollars, euros and francs to learn the natural laws of finance. There were certainly differences between the two types of activity – the former couldn't buy you a mansion or a yacht, while the latter might slowly poison your soul. But in the grander scheme of things, these were side issues. The key for Hoffmann was that both sets of data were

universal, that both obeyed Galtonian patterns of mean reversion, and that both were readily available in large quantities. Most importantly, both helped him father a new form of superior intelligence. The rest was details.

The idea of humans creating autonomous, self-aware intelligence isn't new, of course; but it was only with the rise of digital computing that this possibility started to look real. Multivac, the supercomputer in Asimov's novels, Hal, the spaceship computer in Clarke and Kubrick's 2001 *Space Odyssey*, the swarm-intelligence in Crichton's *Prey*, and now VIXAL in Harris' *The Fear Index* are all literary anticipations of this new creature, eagerly announced in Kurzweil's book *The Singularity is Near*.

There is however another way to look at this process. If we think of capitalism not as a mode of production and consumption distorted by finance, but as a mode of power coded in financial terms, the lines of causality reverse. Financial physicists like Hoffmann no longer look like free agents undermining the proper workings of capitalism. Instead, they appear as puppets on a chain, cogs in the ever-changing social machinery of capital. Their VIXAL-like algorithms produce more and more 'disciplined' investment strategies, automated mathematical rituals that increasingly substitute nimble remote control for fallible human discretion. But there is nothing voluntary in this impulse to automate investment. It comes not from the creative acumen of free-thinking scientists, but from the very power logic of capital.

The myth of the machine

In his book *The Myth of the Machine*, Lewis Mumford narrates the early rise of power for the sake of power, the urge to play God on earth. This quest, he argues, was first institutionalized in the ancient river deltas of the Near East. The rulers of these early civilizations were mesmerized by their new cosmological insights and emboldened by the horizons opened up through writing and arithmetic. Yet the vastness of these revelations and achievements only served to highlight the rulers' own mortal insignificance. This realization created a deep anxiety, and it is out of this anxiety, says Mumford, that the urge to play God first emerged. To imitate the skies, the rulers created their own cosmos: a giant mechanized social organization that Mumford calls the 'megamachine'. The material output of this megamachine was awe-inspiring: it included large public works, monumental palaces and megalomaniac graves, among other things. But this output was secondary. The ultimate purpose, says Mumford, was deeply symbolic. Those who controlled the social megamachine exercised ultimate power for the sake of power. They were like God in control of his universe. They were immortal.

This myth of the machine, the irrational urge to annul one's immortality by exerting mechanized power for the sake of power, remained the key hallmark of all 'civilized' societies. According to Mumford, it was incarnated in every ancient empire; it re-emerged in the form of the absolutist state; and it is deeply embedded in the DNA of the modern state. And if we accept this line of reasoning, we can easily identify this very urge in the gyrations of modern capital.

Differential capitalization

In the twenty-first century, capitalist power is imposed through a highly mechanical ritual of differential capitalization – an unrelenting imperative to outperform, to beat the average, to expand one's own assets faster than others. This process is universalizing. 'Great wealth', observes Hoffmann's wife, 'acted like an invisible magnetic force field, pushing and pulling people out of their normal pattern of behaviour'. All capitalists, including virtual ones like VIXAL, are conditioned and compelled to obey its differential logic, without question. And as they do so, they thoroughly transform society, gradually turning it into a giant automaton.

Differential capitalization makes everyone and everything a Newtonian particle, mechanically acting on and reacting to every other particle. It makes flesh-and-blood human beings invisible to their rulers. (Hoffmann, chauffeured in his sleek Mercedes, never notices that the streets are full of people, waiting for the bus, defeated even before the day begins. And why should he notice them? Most of their actions, past, present and future, are already capitalized, reduced to symbolic bits and bytes in his market-tracking iPad.) Differential capitalization abstracts from - and indeed denies - all social classes and hierarchical groupings; everyone now is an 'agent', differentiated only by the size of his or her investable assets. ('A hedge fund manager with ten billion dollars in assets under management', says Hoffmann, 'could these days pass for the guy who delivered his parcels'.) Differential capitalization flattens the world, making human relations seem anonymous. (Hoffmann retains an advertising agency for 200,000 Swiss francs a year, simply to keep his name out of the papers.) The implied automaticity of differential capitalization eliminates guilt, thus absolving capitalists from being responsible for their (own?) actions. ('One could no more pass moral judgement on [VIXAL] than one could on a shark. It was simply behaving like a hedge fund'.) And differential accumulation gives investors the illusion that they are dimensionless Cartesian dots floating in space. (In my fund, Hoffmann boasts, everything is outsourced - security, accounting, legal council, offices, transportation and technical support are all externalized through the market: 'we want to be digital ... we try to be as frictionless as possible'.)

But then, if the world is indeed on its way to becoming totally 'rational', with everything and everyone increasingly automated, how could money managers make any money? If society is brought under mechanical control, made to obey the eternal laws of capitalization, what room does this leave for the Hoffmanns of the world? Surprisingly, the answer is plenty.

Enter fear

In every mode of power, the rulers have reason to be anxious. In ancient Egypt, the pharaohs scribed ritualistic curses against potential rebels; in feudalism, the lords had their vassals swear to protect them against everyone else; and in capitalism, as Intel's CEO Andrew Grove informs us, 'only the paranoid survive'. ('Of all the affectations of the wealthy, none had ever struck Hoffmann as quite as absurd as the sight of a bodyguard sitting outside a meeting or restaurant; he had often wondered who exactly the rich were expecting to attack them, except possibly their own shareholders or members of their families'.) The only way for rulers to mitigate their fear and anxiety is to make their subjects even more anxious and fearful than they are.

Now, animals, says Hoffmann, relate to real threats: they fear other animals and natural calamities; they try to avoid hunger and pain. But humans aren't like that. They relate not so

much to the actual underlying threats as to the *symbols* representing those threats (recall FDR's classic pronouncement, Hoffmann reminds us: 'The only thing we have to fear is fear itself'). And here lies the crux of the matter: while the actual threats that human beings face are finite and limited in number, the symbols of those threats have no upper bound. They can be created, multiplied and amplified, without end. This potential has been present and leveraged throughout human history, but it has been fully manifested only with the information age and the digital revolution. And nowhere has this potential become more real than in the most virtual arena of all – the financial market:

Fear is historically the strongest emotion in economics ... In fact fear is probably the strongest human emotion, period. Whoever woke at four in the morning because they were feeling happy? It's so strong we've actually found it relatively easy to filter out the noise made by other emotional inputs and focus on this primary signal. One thing we've been able to do, for instance, is correlate recent market fluctuations with the frequency rate of fear-related words in the media – terror, alarm, panic, horror, dismay, dread, scare, anthrax, nuclear. Our conclusion is that fear is driving the world as never before.

The neat thing about this whole setup, says the financial-physicist, is that 'human beings always behave in such predictable ways when they're frightened'; and as Elias Canetti usefully observed in his *Crowds and Power*, when frightened, humans usually flee together.

Capitalizing panic

And it is here that Hoffman's VIXAL comes into the picture. Since fearful behaviour is patterned, it can be modelled and predicted. And given that computer algorithms, unlike humans, never panic, they can be automated to execute 'disciplined' investment strategies which turn fear into profit and panic into capital.

The manuals of economics and finance, including their behavioural outliers, conveniently miss this point. The issue is not whether investors and money managers are 'rational' or not, but whether their actions are sufficiently patterned to be anticipated, manipulated and leveraged. Economists think of rationality as the coolheaded, calculated pursuit of individual utility; but capitalists seek not hedonic pleasure but relative power. They all scramble to beat the average; but the majority – including most of those who try to predict the majority – are entangled in the conflicting impulses of greed and fear and therefore end up moving as a clueless herd. For trained economists, this herd-like behaviour may seem scandalously irrational, a deviation from and distortion of the otherwise 'pure' capitalist code of conduct. But capitalism is not a collection of identical atoms, but a complex hierarchy of power. And if we transcend the individual investor and instead examine the capitalist mode of power as a whole and the dominant capital groups that rule it, the herding of lesser capitalists seems perfectly rational.

Fear creates stylized cycles of excessive pessimism and optimism, or 'hype', and these hype cycles are massively redistributional. They shift income and assets from those who are completely oblivious of or cannot properly model those cycles to those who create and predict them, and this relentless redistribution is the lifeline of contemporary capitalist power. Without fear-driven hype cycles, differential capitalization would be drastically reduced; without

meaningful differential capitalization, there would be no financial markets to speak of; and without financial markets, there would be no capitalization and no capitalism.

The likes of Hoffmann may be creating artificial intelligence, and at some point this intelligence might indeed jump out of the box. But this intelligence is anything but autonomous. It is made in the power image of capital and is entirely subservient to its logic. Its ultimate purpose is accumulation, and accumulation is all about differential power. In Hoffman's words, its sole purpose is to 'expand until it dominated the entire earth'.

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The accidental controversialist: deeper reflections on Thomas Piketty's *Capital*

Piketty, Thomas. 2014. *Capital in the Twenty-First Century.* Cambridge: Massachusetts: Harvard University Press. 685 pages. 978-0674430006

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Thomas Piketty's *Capital in the Twenty-First Century* is a six hundred and eighty-five page tome that definitively characterizes the empirical pattern of income and wealth inequality in capitalist economies over the past two hundred and fifty years, and especially over the last one hundred. It also documents the grotesque rise of inequality over the past forty years and ends with a call for restoration of high marginal income tax rates and a global wealth tax.

His book has tapped a nerve and become a phenomenon. In laying a solid blow against inequality, Piketty has also become an accidental controversialist. That is because his book has potential to unintentionally trigger debate over so-called "free market" capitalism. The big question is will that happen?

To get some perspective on its phenomenon status, consider the following. The book (at time of writing this article) is number one on Amazon.com's best seller list, beating out the likes of Lynn Vincent's *Heaven is for Real: A Little Boy's Astounding Story of His Trip to Heaven and Back*; George Martin's *A Game of Thrones 5-book boxed set*; Erlend Blake's *Never Work Again: Work less, Earn More and Live Your Freedom*; and Dale Carnegie's *How to Win Friends & Influence People*.

The usually sober Sunday *New York Times* had a long article accompanied by a side-bar placing Piketty's book alongside Adam Smith's (1776) *The Wealth of Nations*; Thomas Malthus' (1798) *An Essay on the Principle of Population*; John Stuart Mill's (1848) *Principles of Political Economy*; Karl Marx's (1867) *Das Kapital*: and John Maynard Keynes' (1936) *The General Theory of Employment, Interest and Money*. I think it fair to say phenomenon is no exaggeration.

Piketty's book consists of four sections. The first provides a theoretical framework, the second two provide empirical documentation, and the fourth provides a policy framework for reversing the surge in inequality of the past forty years. By all accounts from those who know, the empirical work is superb in scope and detail and it is praised as part of a new economic scholarship that explores "big" data sets. In Piketty's case the big data is individual tax returns.

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The book's timing is near-perfect because of awakened political interest in inequality, but its empirical findings are not revolutionary and rising income and wealth inequality have been documented for years, albeit less comprehensively. Beginning in 1988 with the first edition of *The State of Working America*, Larry Mishel and his co-authors at the Economic Policy Institute in Washington DC have biennially documented the problem of wage stagnation and rising income inequality in the US - and they too use big data from the Current Population Survey. Jamie Galbraith substantially confirmed that picture in his 1998 book *Created Unequal: The Crisis in American Pay*. Moreover, he too used biggish data on the distribution of manufacturing wages, and he subsequently extended his research to cover the international economy.

Another economist who documented rising US income and wealth inequality is Edward Wolff in his 2002 co-authored book *Top Heavy: The Increasing Inequality of Wealth in America and What Can Be Done About It*, and his 2008 book *Poverty and Income Distribution*. With regard to global patterns, Branko Milanovic has been the preeminent contributor with his 2002 article "True World Income Distribution, 1988 and 1993: First Calculations Based on Household Surveys Alone" and his 2005 book *Worlds Apart: Measuring International and Global Inequality*. Other renowned contributors include Anthony Atkinson and François Bourguignon. And of course, Piketty has also contributed with his masterly 2003 article, co-authored with Emmanuel Saez, on US income inequality from 1913 to 1998. Indeed, his book is in part an extension of the methodology developed therein.

Given this, it is interesting to ask why Piketty has broken through where others have failed. In my view, one reason is political. Mishel, Galbraith, and Wolff are progressive left economists. Though their books are not theoretical or comprehensive policy treatments of the problem, their implicit theoretical logic emphasizes economic and political power. That logic is explicitly developed in my 1998 book *Plenty of Nothing: The Downsizing of the American Dream and the Case for Structural Keynesianism*.

The important point is mainstream economics has difficulty acknowledging work from such sources because to acknowledge is to legitimize. That creates the strange situation in economics whereby something is not thought or known until the right person says it. This pattern applies to income inequality, the macroeconomics of debt deflation, the economics of international capital controls, and Phillips curve inflation theory, to name a few instances.

These observations lead to a second concern which is, after the initial fuss dies down, Piketty's book may end up being gattopardo economics that offers change without change (Palley, 2013). The public discourse on income and wealth inequality has been increasingly owned by progressive economists, both because of their early identification of the issue and the logical coherence and empirical consistency of their explanation. That has placed mainstream economics on the political defensive. Piketty provides a mainstream neoclassical explanation of worsening inequality in the first section of his book. That creates a gattopardo opportunity whereby inequality is folded back into mainstream economic theory which remains unchanged.

Using a conventional marginal productivity framework, Piketty provides an explanation of rising inequality based on increases in the gap between the marginal product of capital, which determines the rate of profit (r), and the rate of growth (g). Because capital ownership is so concentrated, a higher profit rate or slower growth rate increases inequality as the incomes of the wealthy grow faster than the overall economy.
The conventional character of Piketty's theoretical thinking rears its head in his policy prescriptions. His neoclassical growth framework leads him to focus on taxation as the remedy. There is little attention to issues of economic institutions and structures of economic power because these are not part of the neoclassical framework. That substantially explains progressive economists' diffident embrace of the book. Furthermore, even if technically feasible, Piketty's tax prescriptions are politically naïve given capital increasingly controls the political process.

These features have led some critics to raise old "Cambridge" arguments about the intellectual incoherence of marginal productivity income distribution theory. Critics also assert Piketty conflates physical and financial capital, overlooking the role of finance in determining rates of return and patterns of income and wealth distribution. There are two problems with these responses. First, mainstream economists determined long ago to turn a blind eye and deaf ear to such arguments. Second, these arguments miss the bulls-eye which is the nature of capitalism.

A better response is for critics to stick with the rate of profit versus growth argument while dumping the neoclassical marginal productivity aspect of Piketty's theoretical argument. Mainstream economists will assert the conventional story about the profit rate being technologically determined. However, as Piketty occasionally hints, in reality the profit rate is politically and socially determined by factors influencing the distribution of economic and political power. Growth is also influenced by policy and institutional choices. That is the place to push the argument, which is what critics of mainstream economics have been doing (unsuccessfully) for decades. The deep contribution of Piketty's book is it creates a fresh opportunity in this direction.

Mainstream academic economists will try to block that and push the gattopardo tactic. My prediction is "r minus g" algebra will make its way into the curriculum, with the profit rate explained as the marginal product of capital; Chicago School economists will counter the economy has mechanisms limiting prolonged wide divergence of r and g; and Harvard and MIT graduate students will have opportunities to do market failure research arguing the opposite. The net result is economics will be left essentially unchanged and even more difficult to change.

Piketty's phenomenal success raises excruciating dilemmas for progressive economists. His book has raised the political profile of inequality; he seems admirably modest; he insistently expresses solid liberal views regarding the toxic effect of gilded age inequality on democracy; and he recommends wealth taxation. Criticism of any kind can appear as churlishly raining on his parade. Identical dilemmas hold regarding economists like Paul Krugman who is brilliantly reliable in his critique of Republicans, less reliable in his critique of Democrats, and unreliable in his critique of mainstream economics. To criticize risks undercutting these sources of allied support.

Nevertheless, these things need to be said. Shared values and shared analysis are different. Shared values can create short-term agreements that obscure long-term conflicts inherent in differences of reasoning. Ideas matter and failure to articulate ideas truthfully can have dire consequences. Academic economists have an obligation to state the theoretical issues clearly. Piketty's book is an academic treatise with public policy implications, which means it is right to point out its neoclassical tendencies and gattopardo dangers.

The book has already had an enormous positive political impact. In my view, speaking truth about its limitations will not diminish that impact. Neoclassical economists have always talked of capital (K). The forbidden subject is capitalism. Piketty has whetted the public's appetite with his talk of capital. Friendly criticism may get the public thinking about capitalism and what is needed to make capitalism deliver shared prosperity.

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