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**THE FLIMSY FOUNDATIONS OF NEOLIBERAL MACROECONOMICS:
DAVID GORDON ON SAVING, INVESTMENT AND THE NATURAL RATE OF
UNEMPLOYMENT**

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Abstract: David Gordon was, at once, a highly creative economist with an enormous range of interests, while also uncompromising in maintaining rigorous research standards. He was focused equally on hard-core academic research and pressing policy issues. He was also openly committed to the political left, with this commitment animating all his work. One distinctive feature of Gordon’s work was his keenness to dive into the most important topics engaging mainstream economists and to inject explicitly left political economy perspectives into these mainstream debates. This paper focuses on two important examples of Gordon’s contributions that examine front-and-center mainstream macroeconomics questions. The first is the relationship between aggregate saving and investment. The second is the development of the concept of the ‘natural rate of unemployment.’ The evolution of mainstream research on these two questions played a critical role in overturning what had been, over the first two post-World War II decades, a prevailing Keynesian/social democratic consensus, at both the levels of analytic economics as well as economic policy. As the paper reviews, Gordon challenges the analytic findings and policy implications of these perspectives at their core. Gordon’s own basic premises and results are straightforward. He argues that, in fact, investment decisions, not saving rates, are the main driver of economic activity in capitalist economies and that operating capitalist economies at something akin to genuine full employment—i.e. in the range of 2 – 3 percent official unemployment—is a realistic goal. As such, these papers by Gordon contribute significantly toward envisioning a post-neoliberal social structure of accumulation that is committed to the egalitarian principles that were central to Gordon’s life work.

INTRODUCTION

David Gordon was a rare combination. He was, at once, a highly creative economist with an enormous range of interests, while also uncompromising in maintaining rigorous research standards. He was focused equally on hard-core academic research and pressing policy issues. He was also openly committed to the political left, with this commitment animating all his work.

He was a true pioneer in many areas.¹ In macroeconomics and economic history, Gordon was the initial leader contributing to what he himself termed the “social structure of accumulation” (SSA) mode of analysis. Gordon applied the SSA approach to understanding the evolution of labor conditions and class conflict in the U.S., as well as, more broadly, the long-term trajectory of the U.S. and global economy. This framework enabled him to inject institutional and historical richness to the literature on the long waves of capitalist development as well as the related issues of macroeconomic crises under capitalism.

Distinct from, but still connected to, these macro-oriented questions, Gordon opened up new thinking on the social determinants of productivity growth. Gordon’s starting point here was the recognition that workers showing up at their jobs do not produce at uniform rates regardless of working conditions. Gordon rather postulated that the wages workers receive and their workplace conditions will significantly affect their level of effort. Correspondingly, a major part of what business owners and managers do every day is try to elicit the maximum effort from their employees at the lowest possible cost to themselves. Of course, these workplace issues were explored by, among others, Karl Marx himself, when he developed the distinction in *Capital* between “labor” and “labor power.” Gordon brought new attention to these questions, through his original perspectives and modeling approaches.

Another distinctive feature of Gordon’s work was his keenness to dive into the most important topics engaging mainstream economists and to inject explicitly left political economy perspectives into these mainstream debates. Moreover, Gordon’s work in these areas deployed the same technical tools that mainstream economists relied upon, in particular econometric modeling. Almost unique among left political economists, Gordon was an excellent applied econometrician. These skills proved indispensable with a large number of projects aimed at challenging, on their own turf, the most basic presumptions of the professional mainstream.

In this paper, I focus on two important examples of Gordon’s contributions that examine front-and-center mainstream macroeconomics questions. The first is the relationship between aggregate saving and investment. The second is the development of the concept of the ‘natural rate of unemployment.’ Without question, the evolution of mainstream research on these two questions played a critical role in overturning what had been, over the first two post-World War II decades, a prevailing Keynesian/social democratic consensus, at both the levels of analytic economics as well as economic policy. Starting in the 1970s, the Keynesian/social democratic

¹ An excellent collection of some of Gordon’s most significant papers in all of his areas of work is Gordon (1998).

consensus was supplanted at the level of analytic macroeconomics by the interrelated “monetarist,” and “new classical,” schools of thought, along with a somewhat more conventional pre-Keynesian neoclassical framework. At the level of global policymaking, the Keynesian/social democratic consensus was replaced by what has become known as neoliberalism. Neoliberalism as a policy framework is built on the analytic foundations of monetarism, new classical, and right-of-center neoclassical macro.

These transformations in the spheres of both analytic macro and macro policy have had fundamental impacts globally, as I discuss briefly in what follows. Specifically, the idea that high levels of aggregate saving are a primary driver of healthy economic growth led mainstream economists to support measures that, in the interest of raising saving rates, would entail reductions in mass consumption and sharp cuts in government social programs. The concept of the natural rate of unemployment provided the justification for abandoning the goal of full employment under capitalism, despite the fact that something close to full employment was sustained in most advanced capitalist economies from roughly 1950 – 1970. Under the neoliberal policy regime, high unemployment rates became justified as the only means of preventing inflationary pressures from getting out of control. Overall, the ascendancy of monetarist/new classical/conservative neo-classical macro theory and neoliberal macro policy have been the foundations for advancing austerity programs in both the advanced economies and the developing world.

As I will review, Gordon challenges these analytic findings and policy implications at their core. He presents extensive critical literature reviews as well as original econometric findings regarding both questions. At the same time, Gordon’s basic premises and results straightforward. He argues that, in fact, investment decisions, not saving rates, are the main driver of economic activity in capitalist economies and that operating capitalist economies at something akin to genuine full employment—i.e. in the range of 2 – 3 percent official unemployment—is a realistic goal. As such, these papers by Gordon contribute significantly toward envisioning a post-neoliberal social structure of accumulation that is committed to the egalitarian principles that were central to Gordon’s life work.

SAVING, INVESTMENT AND MACROECONOMIC ACTIVITY

Causal Saving vs. Causal Investment

In pre-Keynesian mainstream analysis, the saving rate was regarded as a central variable determining the pace and level of overall activity. According to this perspective, high saving rates produced an ample supply of credit at relatively low interest rates, providing the financial wherewithal for the growth of investment. Correspondingly, low saving rates created a scarcity of credit and high interest rates that discouraged new investment. James Meade aptly characterized the pre-Keynesian model as one in which “a dog called *saving* wagged its tail labelled *investment*,” (quoted in Bridel 1987a, p. 161).

A major thrust of the Keynesian revolution, of course, was to reject the notion that saving determines the rate of investment activity through its impact on credit supply and the interest

rate, and indeed, to establish the independence of investment from saving: to shift, again in Meade's words, to a model in which "a dog called *investment* wagged its tail labeled *saving*." In this Keynesian view, firms' investment decisions are made on the basis of their profit expectations. The interest rate at which they can borrow is only one factor, and probably only a secondary one, in establishing investors' profit expectations. More important, Keynes argued that any growth of activity, initiated through investment spending and propagated through the multiplier, would raise both the level of total income and, in particular, the level of saving. Two major implications flowed from such reasoning: that saving is a passive variable, fluctuating along with aggregate income, whose changes in turn are determined by the level of investment' and that increases in investment are self-financing, in that, through the multiplier, investment growth generates an amount of saving commensurate with a given increase in activity. As Joan Robinson wrote in 1962, it is "the central thesis of the *General Theory* that firms are free, within wide limits, to accumulate as they please, and that the rate of saving of the economy as a whole accommodates itself to the rate of investment that they decree," (pp. 82 – 83).

By the 1980s, what we may call the "causal investment" Keynesian framework had been eclipsed in mainstream macroeconomics, with the "causal saving" perspective having been restored to its pre-Keynesian hegemony. Moreover, this counterrevolution was not simply a matter for high theorists to ponder. Focusing on the U.S. economy, two central macro policy ideas flowed directly out of the causal-saving vs. causal-investment debate. The first was that the private saving rate in the United States was too low to sustain a healthy economic growth path—that U.S. consumers were, indeed, engaged in what two leading mainstream macroeconomists at the time described as "collective profligacy," (Bernheim and Shoven 1991). The second was over the extent to which borrowing by the federal government "crowded out" private investors from financial markets. These perspectives on insufficient saving by private households and excessive borrowing by the federal government led to two major policy conclusions: 1) Private consumption needed to be discouraged and private saving increased, with increased taxes on individual consumption being the policy mechanism proposed to deliver this outcome; and 2) Federal government spending needed to be curtailed.

In combination, these policy measures would amount to an austerity program for everyone in the U.S. other than the rich. This is, first, because the non-rich consume a much higher fraction of their income than the rich. A consumption tax would therefore fall disproportionately on the non-rich. In addition, roughly 70 percent of the federal government budget, in the 1980s and currently as well, consists of spending in three areas—pensions, health care, and the military. None of the mainstream economists in the 1980s were proposing significant cuts in the military budget, which was then, and remains today, virtually untouchable politically. As such, the only remaining areas available in which to make large-scale cuts in the overall federal budget would be with the federal pension and health-care programs supporting the non-rich, including Social Security, Medicare and Medicaid. In short, the return of the causal-saving perspective as a dominant idea in mainstream macroeconomics provided the analytic legitimacy for attacking living standards for the U.S. middle-class, working people and poor, and supporting the overall rise in U.S. income inequality that has persisted since the 1980s.

This was the prevailing analytic and policy environment in the U.S. when Gordon wrote his two ambitious companion papers that revisited the causal-saving versus causal-investment

debate, "Putting the Horse (Back) Before the Cart: Disentangling the Macro Relationship between Investment and Saving" (1995), and "Must We Save Our Way Out of Stagnation" (1996). The latter paper was published only months after Gordon's tragic passing in March 1996. Of course, Gordon was by no means the first author to explore this topic from a heterodox perspective. But he was one of the first to do so through in-depth econometric modeling, and in particular through constructing econometric models that enabled direct comparisons between the two competing perspectives. I focus here primarily on the 1996 paper, since it was Gordon's last contribution on this topic. This later paper provides the additional benefit that it was published along with commentaries by two leading macroeconomists, the mainstream neo-classical Stanley Fischer and the heterodox Keynesian Steven Fazzari.

Gordon introduces the 1996 paper by describing the two kinds of arguments mobilized on behalf of what he described as the "apparently self-evident proposition" of the causal-saving perspective among mainstream macroeconomists.

First, the standard national-income accounting identity is marshalled to emphasize the tightness of the investment-saving relationship. Assuming that net exports do not play a crucial role in equilibrating national saving and investment, it follows *ex post* that investment cannot increase without simultaneous and commensurate increases in either private saving or the government surplus. Second, it is widely observed that there is a close cross-national relationship between national investment rates and national saving rates. This pattern has suggested to many mainstream economists that an individual country cannot boost its investment share without first permissively increasing its own net national saving rate (1996, p. 96).

However, Gordon makes clear from the outset that, in fact, these two arguments actually establish nothing about the causal relationship between saving and investment. As he writes:

The standard accounting identity does not tell us that we must *first* increase saving before we can *subsequently* expand investment, merely that the two must move together *ex post*. The relationship between net national investment and net national saving, further, tells us only that they vary closely together across countries, not that net investment rates in some countries are higher than in others *because* net national saving rates in those countries are higher. Indeed, given what little this raw material can tell us, one could just as easily argue that conventional policy wisdom has stood economic behavior on its head. If investment must equal saving *ex post*, it could logically be the case *ex ante* that investment changes first and that saving comes subsequently into balance with investment, rather than the other way around. And if investment and saving move closely together over time and across countries, it could be the case that variations in investments *predetermine* variations in saving rather than changes in saving predetermining changes in investment (1996, pp. 96 – 97).

Gordon's Saving/Investment Modeling Framework

The aim of Gordon's papers is to develop econometric tests through which we can effectively evaluate the competing claims of the causal-saving vs causal-investment perspectives. Gordon examines the question through four interrelated modeling approaches. These include:

1. Replicating what were, at the time, the highly influential neoclassical models of Martin Feldstein and co-authors on the intertemporal causal relationship between saving and investment.
2. Developing his own "structuralist" macro model that synthesizes Keynesian and Marxian features.
3. Within this structuralist model, pursuing single-equation tests for both consumption and investment functions.
4. Specifying alternative systems of equations that test for simultaneity and several possible channels of determination between saving investment. These systems of equation tests include:
 - a. A synthetic atheoretical vector autoregression (VAR) model; and
 - b. A system of equations with behavioral features, based on his structuralist model. Through this behavioral system of equations he then estimates the impacts of alternative mainstream policy approaches as well as policy approaches derived from his structural model to boost saving and investment.

We now move now to considering each of these components of Gordon's approach.

Replication of Feldstein models

In 1980, Martin Feldstein and Charles Horioka published a highly influential econometric paper which examined the causal relationship between saving and investment. Feldstein and Horioka's test consisted of running regressions of the form:

$$(I/Y)_i = \alpha + \beta(S/Y)_i$$

where I is domestic investment, Y is gross domestic product (GDP), S is national saving (private plus government) and the i subscript indexes the various countries in the data sample. Feldstein used a sample of sixteen industrialized countries. Saving and investment were measured both net and gross of depreciation allowances (i.e. consumption of the existing fixed capital stock).

In the basic model, estimated by ordinary least squares (OLS) using data averaged over the period 1960 – 74, the estimates of β were 0.89 using gross measures of S and I and 0.94 using net measures, with R^2 's of 0.91 and 0.87 respectively. Feldstein and Horioka recognized that the saving rate is an endogenous variable in a long-run growth process, and therefore, that this endogeneity could bias OLS estimates of β . They therefore also ran the same regressions under a two-stage least squares (2SLS) specification for the 12 countries for which sufficient

data were available. The results of the 2SLS regressions were very close to those of the OLS equations. Feldstein and Horioka interpreted these results as confirming the robustness of the causal-saving perspective across a range of industrialized economies. Feldstein and Horioka also interpreted them as demonstrating that national saving rates were more significant than access to international capital markets in determining domestic investment rates.

The Feldstein/Horioka paper generated a large literature challenging their findings and interpretations from a range of perspectives. One central issue in this literature was whether Feldstein and Horioka gave sufficient attention to the dynamic adjustment process between saving and investment, and specifically whether their model allowed for the possibility of the causal arrow running in the opposite direction—i.e. with investment causing saving rather than the other way around. That would mean specifying the saving variable as the dependent variable on the left-hand side of the equation and investment becoming a right-hand side explanatory variable.

These critiques led Feldstein, now writing with Philippe Bachetta, to explicitly address this intertemporal causal relationship between saving and investment. Gordon describes the Feldstein/Bachetta model as proposing “to estimate simple adjustment equations in which the change in investment or saving varies in response to the previous year’s gap between investment,” (1996, p. 102).

The Feldstein/Bachetta specification is as follows:

$$I_t/Y_t - I_{t-1}/Y_{t-1} = d_0 + d_1(I_{t-1} - S_{t-1})/Y_{t-1}$$

and

$$S_t/Y_t - S_{t-1}/Y_{t-1} = e_0 + e_1(I_{t-1} - S_{t-1})/Y_{t-1}$$

In describing the operations of this model, Gordon writes:

If investment is responsive to saving, we should find that an increase in the past period’s gap (indicating an excess of investment) would cause investment to decline, resulting in a negative (and significant) value for d_1 . If saving is responsive to investment, we should find that an increase in the lagged gap would boost saving, resulting in a positive (and significant) value for e_1 (1996, p 103).

Gordon utilizes the Feldstein/Bachetta specifications to estimate a dynamic adjustment process for the U.S. economy between 1955 and 1989. He considers the dynamic relationship between saving and investment on a quarterly basis over a 6-year period, totaling to 24 quarters. This contrasts with Feldstein and Bachetta’s data sample, which is a pooled cross section across 23 OECD countries. Gordon argues that Feldstein and Bachetta’s data sample is flawed because it could potentially conflate temporary and cross-national relationships.

Gordon's results with the U.S. data run contrary to those of Feldstein and Bachetta. More specifically, Gordon finds that, over an initial 5 – 7 quarter period, the cross-correlations between investment and saving—tested with both investment and saving as leads and lags—show no consistent causality running either way. Saving and investment are rather simultaneously codetermined within this relatively short time frame. However, moving beyond this initial 7 quarters, Gordon finds that that the lagged values of investment correlate to a substantially higher extent with future values of saving than lagged values of saving have with future values of investment. As such, Gordon concludes that while the short-term relationship between saving and investment is codetermined, when we move beyond this roughly two-year time frame, causality appears to be running primary from investment to saving.

Gordon's Structuralist Model

Unlike Feldstein and Bachetta, Gordon does not consider the results of these bivariate dynamic adjustment tests as providing anything more than suggestive preliminary evidence concerning saving-investment causality. Gordon rather argues that these results suggest the need for a framework that can explain both the simultaneous determination of saving and investment within a relatively short time period, such as two years, along with the longer-term causal dominance of investment over saving. This is the framework that Gordon develops with his structuralist model, which builds from features of both Keynesian and Marxian analytic traditions.

From the Keynesian tradition, Gordon's structuralist model explores the channels through which investment can autonomously stimulate output and saving. Gordon's model also recognizes, as another more Keynesian feature, that the financial system will play a central role in establishing investment as the causal variable driving saving. This is because, for private investors to pursue profit opportunities, there needs to be adequate financing available for these investments to be undertaken at affordable borrowing costs. As such, the financial system must be sufficiently flexible in its capacity to supply credit so that the existing pool of saving at any given time does not act as a hard constraint on investors pursuing profit opportunities. Coming primarily from the Marxian tradition, Gordon's structuralist model gives prominence to the influences of class and income distribution in the simultaneous determination of investment and saving.

The basic intuition of the model is straightforward, even while the econometric modeling can become complex, especially given that Gordon is committed to testing for robustness through alternative empirical specifications. The first major feature of the model is its two-class consumption function. "Worker" households need to spend most of what they receive in wages to maintain their living standard. For a given level of income, their consumption rate for worker households will be in the range of 90 to 95 percent of their income. Their household saving rate will be correspondingly low to negligible—i.e. in the range of 5 – 10 percent, if that. By contrast, "Capitalist" households receive income primarily from the financial assets that they own. The capitalist households save most of their income through purchasing and accumulating these financial assets.

Given these two distinct sets of saving behavior between worker and capitalist households' saving rates, what would we anticipate with respect to aggregate household saving? Assume first a given level of national income. With this given level of national income, the overall level of household saving will tend to be relatively low when the distribution of income is more egalitarian, given that workers' saving rates are relatively low. Correspondingly, still with a given level of national income, the economy's household saving rate will be higher when national income is skewed to the wealthy, since capitalists and the rich will save a much higher fraction of their income than workers.

But this straightforward dynamic is upended as soon as we relax the assumption of a given level of national income. If we assume instead a rising level of national income, the absolute amount of saving by worker households will increase along with their rising level of income, even if the share of their income that they save remains relatively low—i.e. even if their consumption rate remains fixed in the range of 90 – 95 percent. At this higher level of national income, the economy's overall pool of saving will therefore increase even under an egalitarian income distribution in which the saving rate by worker households remains low.

This then brings us to the next crucial question: What will be the dynamic that can raise the economy from a lower to a higher level of activity and therefore raise the economy's pool of saving even under a relatively egalitarian income distribution? At the level of straightforward accounting, it will be the national income identity $Y = C + I + G + NX$ (with Y as national income, C is aggregate consumption, I is private investment and NX is net exports). But of course, we need to move beyond the accounting identity to identifying the central behavioral relationships in the model.

Within a Keynesian framework, we assume that the consumption/saving rate will vary in close correspondence with income levels, i.e. $C = f(Y)$. This fixed relationship between consumption and income levels will apply to both worker and capitalist households in Gordon's model. Since Gordon is focusing on the U.S. economy in these studies, he reasonably assumes that the economy will not be geared toward an export-led growth approach. NX is therefore going to be a relatively less significant factor in establishing changes in the U.S. economy's overall level of activity. Government spending is of course significant, at roughly 35 percent of total spending in the U.S. economy, broken down to about 20 percent federal spending and 15 percent through state and local governments. But variation in G will generally follow in response to changes in the level of private activity. This leaves I , the level of private investment spending, as the critical private-sector channel through which overall activity will vary, and specifically, through which the economy will move from a lower to a higher level of activity.

This means that a macro model that incorporates Keynesian features must focus on explaining the factors that will influence private investment. Gordon postulates—drawing now from both the Keynesian and Marxian analytic modes—that the main factor driving private investment is capitalists' expectations of profit, measured relative to the borrowing costs they would incur to obtain the funds to undertake investments. Here as well, the forces influencing

investment decisions will have ambiguous impacts, considered in combination. That is, at a given level of national income, capitalists will be positively motivated to invest by a higher profit share of total national income. But a higher level of demand—as measured with a higher capacity utilization rate and associated with a more egalitarian income distribution—will expand market activity. A higher capacity utilization rate can then mean higher absolute amounts of profit for business, even if the capitalists share of national income—their profit share—is lower.

Gordon's model shows how these countervailing factors, brought together as a whole, can then manifest themselves through what Gordon observed—that investment and saving will be codetermined over the short-term of approximately two years, with the economy's level of activity and distributional structure either held constant, or changing only modestly. But over the longer-term, investment becomes the autonomous driver, either pushing the economy upward to higher levels of activity or downward into recession.

Within this framework, Gordon tests saving, investment and net exports as a function of capacity utilization, the rate of profit and the real interest rate. All three explanatory variables do contribute to explaining both saving and investment, with high utilization and profit rates both exerting positive pressure on investment, while rising real interest rates will dampen investment but contribute positively, if modestly, to the saving rate.

Simultaneous Equation Tests

As noted above, Gordon develops two types of simultaneous equation tests to shed further light on the dynamic adjustment process between saving and investment. He begins with an atheoretical vector autoregression (VAR) model. Gordon's VAR model includes seven variables that incorporate both the orthodox and structuralist perspectives. These are: personal saving; government saving, business saving, nonresidential investment, capacity utilization, after tax profitability and the 3-month Treasury bill rate. To observe as fully as possible the interrelationships between these variables, Gordon estimated the VAR equations with one to eight lags with each of the seven variables. Through this specification, Gordon is able to observe the extent to which, for example, changes in investment will impact the economy's level of saving as well as the other five variables in the VAR model 3 months later, 6 months later, 9 months later and so on up until 2 years after the initial change in the investment level. Correspondingly, Gordon is also able to observe how changes in the saving level will impact investment along with the other five variables with these same lags of 3 months, 6 months, 9 months and so on.

The results of model are unambiguous. Focused on the saving/investment relationship among the seven variables in the VAR model, Gordon finds that after 8 quarters, the relative impact of the change in investment levels on the level of personal saving is more than 20 times greater than the relative contribution of changes in personal saving levels on investment. Similarly, the contribution of a change in investment in one time period to its own level in future time periods is roughly 10 times greater than the impact of personal saving, business saving and government saving combined on investment levels. Gordon concludes from these VAR tests that "investment is a

relatively more predetermined variable in the VAR system than are any of the components of net national savings." (1996, p. 142).

The final set of exercises Gordon performs involve constructing a simple structural macro model derived from his consumption, investment and net export equations. He seeks to analyze interactions within this system of equations by considering policy simulations associated with mainstream policy proposals and his own structuralist approach to boosting saving and investment.

Gordon attempts four policy simulation exercises within this structuralist simultaneous equation system, two each for the neoclassical and structuralist perspectives. The neoclassical policy simulations involve a "saving windfall," that is, a change in personal saving propensities and a "consumption tax" that would reduce the government deficit without reducing private saving. The two structuralist experiments are a "productivity windfall" that would raise profitability without reducing wages and a surge in "investors spirits" that would get reflected in a decline in long-term interest rates.

The results show that the neoclassical and structuralist policy simulations are both capable of increasing saving, but that the structuralist simulations are far more capable of raising investment performance. As Gordon acknowledges, these tests may be biased because the model was derived from his own theoretical framework. He therefore runs the same four policy simulation exercises using the macro model developed by Ray Fair. The results Gordon obtains working with the Fair model are similar to those he obtained with his own structuralist model.

Assessing Gordon's Results

Gordon's results are persuasive in demonstrating the weak analytic foundations on which the causal saving framework is based. It follows that these weak analytic foundations cannot support the policy proposals that mainstream macroeconomists, particularly in the U.S., had advanced based on this causal-saving framework, i.e. an austerity agenda targeted at raising taxes to reduce mass consumption and cutting federal government spending on social programs, including Medicare, Medicaid, and Social Security.

At the same time, one can raise questions about Gordon's own model and results. One set of questions concerns the role of interest rate variation in his model. Within the orthodox model, the responsiveness of interest rates to saving rates is central—i.e. when the pool of saving increases, interest rates will fall. This, in turn will induce investment. In most causal investment models, starting with Keynes, the role of interest rate variation as a determinant of overall economic activity is greatly diminished. However, in Gordon's single-equation investment function, the interest rate has consistently high levels of statistical significance, and the magnitude of these impacts are high—approximately equal to Gordon's profit rate explanatory variable. Indeed, Steven Fazzari, the discussant on Gordon's 1996 paper with a more Post-Keynesian orientation, commented that "in some ways Gordon's results are good news for the neoclassical

analysis that emphasizes relative price effects as the key transmission mechanism between saving and investment," (1996, p. 169).

Moreover, in Gordon's structuralist policy experiment with his simultaneous equation system, the factor inducing a surge in 'investors' animal spirits' is a fall in the interest rate spread, with long-term rates falling relative to short-term rates. But Gordon does not provide a mechanism for explaining how this relative fall in the long-term rates will result. Had Gordon lived beyond the publication of this 1996 paper, this would certainly have been an issue that he would have been able to examine further and clarify.

A second concern is that Gordon does not explore in detail how the relationship between saving and investment could potentially vary when the economy moves from conditions of high unemployment to something approximating full employment. This is the point that Stanley Fischer emphasizes in his comments on Gordon's paper. Fischer writes:

In a closed economy with unemployment, an exogenous increase in investment demand is likely to increase saving, while an exogenous increase in the demand for saving would affect investment only by reducing the interest rate and thus would have at most a small positive effect on investment. But in a fully employed closed economy, an increase in investment demand could not in the short run stimulate more output and therefore would increase investment only to the extent that it increased the interest rate and thereby stimulated saving (1996, pp. 161-162).

In fact, Gordon's model does address the effects of moving from an under-employed to a fully employed economy. His empirical investigation is over the five full business cycles between 1955.4 and 1989.2. These five cycles, of course, incorporate fluctuations in the rate of unemployment and capacity utilization. It is true that, within his full period, Gordon does not explicitly attempt to distinguish between phases of unemployment versus periods of full employment. However, he does explicitly control for the effects of labor market tightening by including capacity utilization as a variable in his tests. The robustness of his findings, including the consistent high level of significance for the utilization variable and the absence of significant serial correlation, make clear that his results are robust relative to both the upward and downward phases within any given business cycle.

But there is another, more basic point to consider here. It is that the very meaning of full employment, or the non-accelerating-inflation-unemployment-rate (NAIRU) is a subject of considerable controversy. It is likely that Gordon and Fischer would not have agreed on a proper definition of full employment and, therefore, on how a transition from an underemployed to a fully employed economy would impact the determinants of saving and investment over the course of a single business cycle, or as a trend between multiple business cycles. In this regard, it is important to highlight Gordon's insistence that his model carries no presumption about whether the economy will tend to full employment, even when operating at full capacity. This because, in his view, considerations about labor supply are determined largely independently of the economy's rate of investment growth.

It is to Gordon's perspectives on the set of labor market issues considered within the framework of the concepts of the Natural Rate of Unemployment and NAIRU that we now turn.

DEMYSTIFYING THE NATURAL RATE OF UNEMPLOYMENT

Gordon's entire body of research work was deeply committed to understanding the life conditions, experiences, and opportunities for working class people, focused primarily on the U.S. working class. This is the background Gordon brought to his work on the "natural rate of unemployment" and "non-accelerating inflation rate of unemployment" (NAIRU). In the interests of simplicity and clarity, I will refer in places to the NAIRU as the "inflation-safe unemployment rate."

Gordon explored these issues carefully in two papers, "Six-Percent Unemployment Ain't Natural: Demystifying the Idea of a Rising "Natural Rate of Unemployment," in 1987 and "The Un-Natural Rate of Unemployment: An Econometric Critique of the NAIRU Hypothesis," in 1988. Gordon makes clear, especially in the 1988 paper, that he considered these two papers to be preliminary explorations. He had returned to these research questions at the time of his 1996 death. Indeed, the interconnections that he saw between issues around unemployment and the "natural rate" and his subsequent work on saving and investment that I reviewed above was part of his motivation for beginning to work again on the natural rate literature shortly before his passing.

Mainstream Macro Abandons Full Employment

Gordon's goal with these two papers is to vigorously challenge the core ideas emanating out of the natural rate/NAIRU literature, as these ideas became ascendent starting with the initial formulations in the late 1960s by Milton Friedman (1969) and Edmund Phelps (1967). As Gordon discusses in his 1987 paper, it was on the basis of the natural rate concept that the mainstream of the profession abandoned the commitment to building full employment economies that had been a centerpiece of macroeconomic policy since the end of World War II.²

This commitment to full employment was established as the central aim of post World War II economic policy in the aftermath of the calamitous 1930s Great Depression, in which unemployment rose to 25 percent in the U.S. and comparable, if not higher, levels in Western Europe. The precise meaning of the term "full employment" was never fully agreed upon at this time. But it is pertinent to recall the experience in the advanced economies—i.e., the member countries of the Organization for Economic Cooperation and Development OECD—in the initial post World War II decades. During the period 1950 – 69, the median unemployment rate among the OECD economies was 2.1 percent. That was regarded at the time as a reasonable, and evidently attainable, definition of a full employment economy. The roughly 2 percent of the workforce that remained unemployed over this period were mostly "frictionally" unemployed people—i.e. they were mostly between jobs, receiving job training or relocating.

² Following Gordon, I will use the term "natural rate" to refer interchangeably between the initial conceptualization by Friedman and Phelps and subsequent developments falling more explicitly under the NAIRU rubric.

The U.S. never succeeded in pushing unemployment down to the median OECD level in this period. U.S. unemployment averaged 4.4 percent between 1950 – 1969. Nevertheless, even in the U.S., policymakers' target was to keep unemployment no higher than the overall 4 percent rate and preferably to push it lower. Thus, in the 1960s, the U.S. Labor Department defined "low unemployment" as being 3 percent unemployment or less. In his 1987 paper, Gordon himself posited an unemployment rate close to 3 percent as "meaningful full employment" and held that this target was both "desirable and plausible." Even when, as a result of government spending on the Vietnam War, U.S. inflation began to rise moderately in the late 1960s, President Johnson himself remarked that "if rising prices are a problem, they're a lot better than a stagnant economy and high unemployment."³

However, the commitment to full employment among mainstream economists eroded rapidly in the early 1970s, diminishing to a near-vanishing point in subsequent decades. The work of Friedman and Phelps was highly influential. But still more impactful was the sharp increase in inflation that resulted from the two "oil shocks" in the 1970s—i.e. when the Organization of Oil Producing Countries (OPEC) managed to nearly double the global price of crude oil in 1973 and again in 1979. As a result, the overall U.S. inflation rate (CPI-U) rose averaged 7.6 percent from 1974 to 1980. Inflation rose at similar rates throughout the OECD economies over these years. This ushered in the era of "stagflation," characterized by the concurrent rise of inflation and unemployment, with unemployment between 1974 – 1980 averaging 6.9 percent in both the U.S. and throughout the OECD economies.⁴

The mainstream of the profession had become convinced from this experienced that higher and higher unemployment rates were required to tame inflation, and therefore that "full employment" as it had been understood in the 1950s and 1960s was no longer a realistic policy goal. This transition among economists is the starting point for Gordon's work on this issue. Thus, Gordon observed in his 1987 paper that:

The notion of "full employment" has become something of a joke among mainstream economists, the sort of antiquarian curiosity one expects to find in museum gift shops. It was once a fine idea, one hears, but we can hardly aspire to such noble policy objectives in the present brittle condition of the advanced economies (1987, p. 223).

Gordon explains that the profession had developed a range of explanations for the implausibility of meeting the full employment objectives. But, as Gordon writes, "one of the most crippling, a relatively recent entrant into the lexicon of economic apologetics, is the notion of the 'natural rate of unemployment,'" (1987, p. 224).

Holes in the Natural Rate Model

³ The figures and quotations in this paragraph along with related observations References to this and related observations during this period are presented in Baker, Pollin, and Zahrt (1996).

⁴ Figures on U.S. and OECD inflation and unemployment from <https://fred.stlouisfed.org/>

The concept of the natural rate is that there is in any economy at any given time an unemployment rate at which labor- and product-market balance ensures neither an acceleration nor a deceleration of unemployment. Thus, if unemployment begins to fall below this 'natural rate,' inflation will begin to surge and, left to its own devices, continually accelerate. Since accelerating inflation is understood to be highly undesirable, it means that the unemployment rate cannot be allowed to fall below its "natural" rate.

Gordon argues that, in itself, this idea is "neither crippling nor insidious," (1987, p. 224). That is, if the "natural rate" is, is in the range of the rough 2 percent unemployment rate that prevailed among the OECD economies from 1950 – 69, the idea is not problematic. What was objectionable for Gordon was that, at the time he was writing, the natural rate was understood to be well above that 2 percent threshold. Indeed, Gordon documented the rise of what the economics mainstream defined as the natural rate from 4 and 6 percent over the 1970s and 1980s. Even at present, after 30 years in which the U.S. unemployment rate averaged 2.1 percent, the economy's "long-term natural rate," according to the Federal Reserve's own definition, is at 4.5 percent.

Gordon's basic argument is that the mainstream perspective on the natural rate is seriously deficient because "central factors in determining the relationship between unemployment and inflation are left outside the core of the analysis," (1987, p. 237). Gordon emphasizes two elisions in the natural rate analytic framework. The first concerns the relationship between wage growth and productivity growth. Within the natural rate framework, businesses set prices as a markup relative to their unit labor costs with the aim of maintaining at least a stable profit rate through their price markups. If wages and productivity grow together, then businesses unit labor costs will remain stable. There will be no incentive for businesses to increase their price mark-ups in order to maintain their profit rates. However, if wages rise faster than productivity, then unit labor costs rise, and businesses will therefore become motivated to raise prices in order to maintain their existing profitability level. Inflation is expected to accelerate in this situation.

A key question within this framework is therefore how workers might be able, under certain conditions, to bargain up wages faster than productivity is improving. The answer is that, under low unemployment conditions, workers gain leverage to bargain up their wages. Business owners are forced to accede to these higher wage demands because, in this low unemployment rate economy, it would be otherwise difficult for the businesses to keep their labor force and productive operations running smoothly. In these conditions, businesses then attempt to cover their increased labor costs by raising their prices, thus shifting the burden of their higher unit labor costs onto consumers in order to maintain their profitability level. This is the basic explanation as to how low unemployment rates can lead to accelerating inflation.

Gordon points out that this logical chain focuses only on the relationship between wages, unemployment and inflation. It ignores considerations of variable productivity growth, even though, simply as a matter of accounting, changes in productivity growth factor in equally in determining unit labor costs. Gordon says that mainstream economists ignore consideration of variable productivity growth because they assumed productivity growth to be an exogenous variable within this frame of analysis—that is, productivity growth is assumed to vary based only

on the level of capital stock and on investments to upgrade capital stock. Contrary to this mainstream perspective, Gordon draws on the extensive work he had done on the social determinants of productivity in arguing that this mainstream framework is underspecified. Gordon writes:

Managers and workers are people with warts and dreams; the character of their relationships is just as likely to affect the intensity and effectiveness of their work and planning as is the quantities of capital with which they work. Second, these social determinants of productivity levels and growth are not exogenous to the kinds of macro-economic processes with which they natural rate hypothesis is concerned. If real-wage growth slows, for example, workers may reduce their work intensity out of frustration. As inflationary instability renders economic horizons cloudier and planning for the future more and more problematic, managers similarly may make less and less determined or effective efforts to improve the productivity of their current factors of production. As economic problems develop in one quarter, in short, productivity growth rates may dampen in another (1987, p. 240)

The second objection Gordon raises with the natural rate framework is with labor supply. By definition, unemployment results from a surplus of labor supply over labor demand at a given point in time. Within the natural rate framework, movements in the unemployment rate are focused only on variation in labor demand. But Gordon argues, within the logic of the analysis, that unemployment could also rise, due to a decrease in total labor supply as opposed to an increase in labor demand. Gordon further notes that, in an inflationary environment, real wages will stagnate or decline if nominal wages are not rising in step with price increases. This situation, in turn, could produce an increase in labor supply, with workers attempting to raise their total number of working hours to compensate for the cut in their real wage per hour. Unemployment could therefore increase as a result. Gordon argues that this dynamic is not likely to be self-correcting. As unemployment rises, other factors again held constant, real wages could continue to stagnate or decline. This could force households to try to supply even more hours to maintain their standard of living.

Gordon's Alternative Model

In his 1987 econometric paper, Gordon fleshes out more specific factors that he says will influence the dynamic between unemployment and inflation. He focuses on two sets of relationships—wage-setting and price setting.

With respect to wage setting, Gordon argues that businesses attempt to set wages so as to extract the maximum degree of effort from workers at the lowest possible cost. This 'labor extraction' channel is one way in which Gordon introduces social determinants of variable productivity into his model. Gordon postulates that this labor extraction effect will vary based on two interrelated factors: 1) whether the workplace is unionized; and 2) the effectiveness of labor disciplinary measures, given the broader bargaining environment. In other words, Gordon is postulating that anything like a natural rate analytic framework needs to take account of how intensively businesses will attempt to push workers and how much leverage workers will have to

resist such efforts. Gordon argues that these factors will vary over time. This variation, in turn, will impact the relationship between unemployment and inflation. With respect to price determination, Gordon postulates that this will be impacted by variation in the competitive environment and by how market conditions impact firms' capacity to mark up prices over unit labor costs.

Gordon incorporates specifications of these factors as explanatory variables in equations with inflation and nominal wages respectively as dependent variables. In both sets of equations, Gordon reports that the tight relationship between inflation, unemployment and nominal wages declines significantly (i.e. their coefficient values decline), while the overall explanatory power of the more fully specified equations increases relative to the bivariate specifications (their R^2 values increase). Gordon explains his results as follows:

In the inflation equation, wages are only partly passed on for two main reasons: when demand growth is rapid, firms limit price increases in order to hold onto or expand their market shares; and when demand growth is slow, supply-side bottlenecks develop which either reduce competitive pressure or increase effective unit costs. In the wage-change equation, two factors seem to play the largest role in moderating the effect of price changes on wage changes: 1) Firms target wages are defined solely with respect to labor extraction strategies and not with respect to product prices; while workers' target real wage demands are likely to moderate if recent real wage growth has been especially rapid; and 2) wages in the union sector both appear to exhibit some inertia and are modulated by fluctuations in the real wage share through "productivity bargaining," (1988, p. 122).

Questions and Extensions with the Gordon Model

This work of Gordon on the natural rate, similar to his papers on saving and investment, represented a major advance over the then prevailing orthodox models. This is true, in particular, because Gordon's model allows for the possibility that other variables will play a significant role in establishing the relationship between unemployment and inflation. Specifically, the influence of these additional variables in Gordon's model, in addition to the inflation and unemployment rates themselves, create the prospect that the inflation-safe unemployment rate could be driven down, to a point that corresponds to something close to a full employment economy, i.e. to an unemployment rate in the range of 2 – 3 percent.

That said, it will also be useful to address some concerns and explore some further implications that emerge with Gordon's work. These include the following:

Labor supply and inflation. Gordon is persuasive in arguing that variation in labor supply should be brought into the analysis. However, within Gordon's own example, it would appear that labor supply increases resulting from eroding real wages would likely generate a self-correcting dynamic in terms of dampening inflationary pressures. This is contrary to Gordon's own argument. The logic is as follows: if inflation is eroding real wages, and people enter the labor market to earn extra income to compensate for the deterioration of their real wages, the

impact should be to lower real wages further as the labor supply expands. The unemployment rate should correspondingly rise with the expansion of the labor supply. This would result in a self-correcting dynamic, in that the decline in real wages and the rise in unemployment would produce a reduction in inflationary pressures.

Oil price shocks. Gordon’s analysis underplays the role of supply shocks, and spikes in oil prices in particular, as contributing to inflation and the movement of the natural rate of unemployment itself. As noted above, the primary driver of inflation in the 1970s was the rough doubling of oil prices in 1973 and again in 1979. That is, the 1970s experience with stagflation was not primarily due to any aspects of the bargaining environment between workers and business owners or general changes in businesses’ markup strategies. Gordon does take account of the oil shocks in his analysis, by following the modeling approach of his brother Robert Gordon, in distinguishing between a “no shock” versus what he terms a “non-accelerating-inflation shock-accommodating rate of inflation (NASARU).” But Gordon chooses to focus primarily on “no shock” scenarios. As such, he does not examine carefully the extent to which the oil price shocks created an inflationary inertia within the U.S. and global economies—that is, the sharp spikes in oil prices feeding into the economy’s overall dynamic of both wage and price setting. The impact of the combination of the oil price shocks and inertia were almost certainly the most critical factors leading to stagflation in the 1970s. These developments were also critical to mainstream economists concluding that inflation could be controlled only through a rising natural rate.

Costs and benefits of inflation. As with the mainstream economists, Gordon does not explicitly address one big question with respect to inflation—that is, what exactly are its overall social costs and benefits under a range of alternative circumstances. The mainstream literature proceeds almost uniformly under the assumption that inflation inflicts costs on the economy without producing any benefits. But in fact, under a range of circumstances in which price increases remain within a moderate level, inflation can be associated with both a more egalitarian income distribution as well as more rapid economic growth. In fact, there is little evidence showing that overall economic performance is harmed by moderate rates of inflation, if the inflation is resulting from tight labor markets as opposed to supply shocks and inertia. This conclusion was supported forcefully in research published in 1995 by Michael Bruno, then the chief economist of the World Bank, and later to become Governor of the Bank of Israel. Studying the relationship between inflation and economic growth for 127 countries between 1960 and 1992, Bruno and his colleagues found that average growth rates fell only slightly as inflation rates increased to between 20 and 25 percent. Of particular note, Bruno found that between 1960 and 1972—i.e. prior to the initial 1973 oil shock—economic growth on average increased as inflation rose from negative or low rates to the 15 to 20 percent range. This is because, as Bruno explains, “in the 1950s and 1960s, low-to-moderate inflation went hand in hand with vary rapid growth because of investment demand pressures in an expanding economy, (1995, p. 13).”⁵

⁵ Bruno’s findings have been supported in more recent research, including Pollin and Zhu (2005) and Anwar and Islam (2011). This most recent study also finds that allowing higher inflation rates in the framework of a growing economy can contribute to reducing income inequality and poverty in developing countries.

Given this body of evidence, it is critical that the costs and benefits of inflation—and how these relative costs and benefits might change at lower or higher inflation rates—need to be addressed as part of any critical assessment of the natural rate literature.

The centrality of class conflict. It is not surprising that Gordon's papers recognize the central role of class conflict in establishing what the natural rate would be at any given time. The inclusion of unionization rates and the ability of businesses to raise labor intensity rates as variables in his model stand in sharp contrast with the mainstream natural rate models, then and now. Moreover, Gordon was prescient in incorporating these factors into his model, as their significance became increasingly evident in the 1990s.

In fact, Gordon's brother Robert Gordon did briefly acknowledge the issue of relative class strength in a 1997 paper which attempted to explain why the natural rate/NAIRU was varying over time. This issue was treated only as an aside in Robert Gordon's paper which otherwise focused on econometric issues. Nevertheless, Robert Gordon did observe the following:

The two especially large changes in the NAIRU [i.e. inflation-safe unemployment rate]...are the increase between the early and late 1960s and the decrease in the 1990s. The late 1960s were a time of labor militancy, relatively strong unions, a relatively high minimum wage and a marked increase in labor's share in national income. The 1990s have been a time of labor peace, relatively weak unions, a relatively low minimum wage and a slight decline in labor's income share (1997, p. 30).

Even more pertinent, the central importance of class conflict in establishing the natural rate was also recognized in the 1990s by then Federal Reserve Chair Alan Greenspan himself. Thus, the journalist Bob Woodward's paean to Greenspan published in 2000, *Maestro: Greenspan's Fed and the American Boom*, includes the following revealing passage:

The old belief held that with such a low unemployment rate workers would have the upper hand and demand higher wages. Yet the data showed that wages weren't rising that much. It was one of the central economic mysteries of the time. Greenspan hypothesized at one point to colleagues within the Fed about the "traumatized worker"—someone who felt job insecurity in the changing economy and so was accepting smaller wage increases. He had talked with business leaders who said their workers were not agitating and were fearful that their skills might not be marketable if they were forced to change jobs (2000, p. 168).

Greenspan openly acknowledged his "traumatized worker" explanation for the dampening of inflationary pressures in his regular semi-annual testimony to Congress in July 1997. Saluting the economy's performance that year as "extraordinary" and "exceptional," he remarked that a major factor contributing to its outstanding achievement was "a heightened sense of job insecurity and, as a consequence, subdued wages."⁶

⁶ Greenspan's testimony can be found on the Federal Reserve site at

What becomes clear is that Gordon's deep background on issues of class conflict in capitalist economies was the basis for him being able to develop an understanding of the natural rate literature that was far more insightful than what mainstream researchers at the time had produced. The empirical realities of "traumatized workers" that were startling to Alan Greenspan therefore came as no surprise to Gordon. This was true, even while, as Gordon himself recognized at that time, his published work on this topic was a starting point, but only a starting point, for building more robust models of the dynamics between inflation and unemployment.

CONCLUSIONS

Since the 1970s, mainstream macroeconomics has been guided by a few core theoretical concepts associated with the monetarist/new classical counterrevolution and the pre-Keynesian neoclassical framework that supplanted the Keynesian/social democratic consensus of the initial post World War decades. This paper examines the contributions by David Gordon which challenged two of these core theoretical concepts. The first was that increasing saving rates exert causal influence over the growth trajectory of capitalist economies. This causal-saving perspective runs exactly contrary to the Keynesian causal-investment macroeconomic framework which, as Joan Robinson wrote was "the central thesis of the *General Theory*." The second was that unemployment rates must be maintained well above full employment in order to prevent inflationary pressures from overwhelming the economy. This 'natural rate' proposition provides the justification for abandoning the central policy aim of the initial Keynesian revolution, which was to create a more egalitarian version of capitalism committed to genuine full employment.

Under the neoliberal social structure of accumulation that has dominated economic policymaking in the advanced economies since the late 1970s, high saving rates were considered a cornerstone for promoting economic growth. Within this perspective, relatively high levels of aggregate private consumption as well as generous social spending programs discouraged both private and public saving rates. Mass consumption and public social spending therefore had to be cut in behalf of raising aggregate saving rates. Similarly, under the natural rate framework, maintaining inflation rates at negligible levels was prioritized over achieving full employment. Job opportunities for tens of millions of people were thereby sacrificed following from the this tenet. The implementation of these neoliberal propositions throughout the advanced economies has resulted in four decades of significantly slower average growth rates and sharp increases in income inequality.

Many other researchers have advanced valuable critiques of both of these core mainstream macro ideas, both at the time that Gordon was writing and in the subsequent 25 years. Still, as we have seen, Gordon injected original perspectives into this literature. He was able to do this because of the breadth of his research program as well as his underlying commitment to the left political economy project. As one clear case in point, Gordon's structuralist macro model grew initially out of his more historical and institutional work on social structures of accumulation. In turn, his structuralist model became the centerpiece for his

econometric exercises testing the robustness of the causal-saving versus causal-investment macro approaches. Similarly, his decades of work examining class conflict in workplaces and the social determinants of productivity enabled him to recognize major elisions in the natural rate model. These weaknesses of the natural rate model had gone almost entirely unremarked in the hundreds of research papers on the topic produced by mainstream economists.

Gordon's skills as an applied econometrician enabled him to produce the valuable empirical findings that I have reviewed here. As Gordon himself acknowledged, the results of his econometric exercises were by no means definitive in overturning either the causal-saving model or the natural rate. But they did succeed in landing serious blows against both propositions. As such, Gordon's critical work on these mainstream macro issues cleared vital space from which other researchers, especially those of us sharing his commitments to the left political economy project, can continue to advance.

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