Reconciling the policy goals of full employment and ecological sustainability

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Abstract: Ecological economists believe that the growth in real Gross Domestic Product (GDP) is ecologically unsustainable. They have subsequently called for a transitional shift to a steady-state economy. The dilemma that ecological economists face in trying to promote ecological sustainability is its potential employment implications. This paper outlines some policy initiatives to reconcile the conflict between the sustainability and full employment objectives. They include: policies aimed specifically at severing the GDP-employment link; judicious combination of supply-side and demand-side solutions; ecological tax reform – a revenue-neutral tax package involving a reduction in taxes on such ‘goods’ as labour, income, wages, and profits and an increase in taxes and charges on such ‘bads’ as resource depletion and pollution; a job guarantee to absorb all remaining unemployed workers; and in view of the constraints that a steady-state economy imposes on demand-side solutions, such as the Job Guarantee, a Basic Income to remunerate non-paid household and volunteer work. Set at something less than a living wage, the Basic Income encourages workers to reduce their hours of employment or exit the labour force altogether.

Keywords: ecological sustainability; full employment; ecological tax reform; job guarantee; basic income.


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1 Introduction

A relatively new group of economists labelled ‘ecological economists’ believe that the marginal benefits of growth are now being exceeded by the marginal costs and, as a consequence, economic welfare is in decline [1]. Ecological economists have therefore
called for a halt to the high-growth policies being widely adopted by governments. They wish to see a transitional shift to a steady-state economy (see the introductory paper for a description of the steady-state economy [2]). The acute problem that ecological economists face in trying to promote the transition towards a steady-state economy is its potential employment implications. This paper will canvass the issues relevant to the achievement of full employment in a low-growth or steady-state economy. To do this, the paper is organised as follows. First, it is argued that a critical step towards achieving full employment is the severing of the GDP-employment link. Second, the various means to achieving full employment in a low-growth or steady-state economy are surveyed and discussed, including the use of an ecological tax reform package. In this section, an IS-LM-EE framework is revealed as a means of assessing the use of expansionary demand-side policies in circumstances where the incoming resource flow is limited to an ecologically sustainable rate. Third, a job guarantee being promoted by Mitchell and Watts [3] is analysed in the context of the IS-LM-EE framework. The final section includes a brief appraisal of whether a Basic Income should be introduced to encourage workers to reduce their work hours and/or exit the labour force.

2 Full employment in a low-growth or steady-state economy

Assume for a moment that, to achieve ecological sustainability, a low-growth economy is required in the short to medium-term and a steady-state economy is required in the long-run. How might full employment be achieved when high levels of unemployment exist in countries with high prevailing growth rates? As an advocate of the steady-state economy, I would begin my answer by asking two further questions: Is there a need to increase real GDP to reduce unemployment simply because there is, under current institutional arrangements, a link between the two? Can we not try to sever this link?

To the first question – no, an increase in real GDP is not required to achieve full employment. As will soon be explained, full employment is potentially attainable even if there is a need to reduce real GDP. As for the second question, empirical evidence suggests that most countries should do all they can to sever the GDP-employment link [2]. With many macroeconomies now exceeding their optimal scale and a great number in excess of their maximum sustainable scale [4–6], policy-makers have little choice but to sever the GDP-employment link. To do otherwise is to condemn most nations to a gradual decline in sustainable economic welfare.

2.1 Severing the GDP-employment link

The most plausible way to sever the GDP-employment link is to minimise the need for paid forms of employment. This can be achieved by focusing economic activity on improving the quality of all newly produced goods and reducing the rate at which the stock of human-made capital wears out and must be replaced (i.e., by increasing the service and maintenance efficiencies of human-made capital). Both courses of action minimise the need for employment because, ceteris paribus, more durable goods with higher use values command higher selling prices. This translates to higher profits and wages, the latter of which can reduce the need for work and increase the potential for job-sharing.
Having said this, there are three main obstacles preventing most people from reducing their work hours. The first is the unequal distribution of wealth. The distribution of wealth is critical because wealth provides the owner a flow of income without the need for excessively laborious work. Since the majority of a nation’s citizens possess little income-generating wealth, they are compelled to work long hours to obtain a share of the annual output of newly produced goods. Without wanting to downplay the significance of relative income shares across the total population, not enough attention is given to the distribution of wealth which, by the way, is often more unequal than the distribution of income [7–10]. Policies therefore need to be introduced to bring about a more equitable distribution of wealth.

The second major obstacle is the degenerative influence that an unfettered global market with highly mobile capital flows has on the wages and conditions of employment [11–14]. As long as the international trading environment continues to apply standards-lowering pressure on national economies, it will be difficult to bring about the increase in hourly wages required to reduce the need for work and to share the workload across the entire labour force. A so-called IMPEX system of exchange rate management is a pro-trade arrangement that has been put forward as a way of both permitting exchange rate flexibility and internalising the cost of domestic environmental and social standards into the price of foreign-made goods [14]. Provided increases in wages and conditions of employment reflect rises in labour productivity, the IMPEX system allows domestic standards to be raised without reducing the international competitiveness of domestic producers [15]. It therefore promotes the domestic economic conditions conducive to job-sharing.

The third major obstacle is the inflexibility of labour markets. Caused mainly by the existence of archaic industrial relations systems, labour market inflexibility forces many people to work excessive hours at a time when some people are underemployed while others cannot find work at all. Although labour market rigidities have been lessened in many countries over the last decade, the rapid rise in casual employment is a measure of the inappropriate reform of most industrial relations systems [16]. Moreover, there have been many instances where modifications to industrial relations systems have led to the erosion of workers’ wages and conditions of employment. Clearly, policy-makers need to install a form of labour market flexibility that both protects workers’ pay and conditions and increases their options beyond the current restrictive choice of either too many hours in a full-time occupation or a more appropriate number of hours in a casual job. Only then will the potential for job-sharing truly emerge.

2.2 Supply-side solutions

Supply-side solutions to the unemployment problem involve the implementation of incomes policies, labour market programmes, and initiatives designed to increase the flexibility of labour markets. While I have already talked about labour market flexibility as a means to facilitate job-sharing, labour market flexibility can also increase the productivity of labour. Furthermore, productivity rises can be enhanced if policies are juxtaposed with an industrial relations system that promotes harmonious workplace relationships, horizontal decision-making structures, and incentive-based means of remuneration. Rises in labour productivity increase the four efficiency ratios I referred to in the introductory paper [2]. This applies upward pressure on the real hourly wage that, in turn, lessens the need to work. Interestingly, studies by Weitzman, Estrin, and Bandy
and Brummitt report that productivity benefits are greatest when employment conditions are based on collective enterprise arrangements rather than individually negotiated contracts [17–19]. Regrettably, the latter are becoming part-and-parcel of the industrial relations landscape of most countries [20].

What is the recent employment record of many industrial relations systems? Although the changes typically introduced in most countries have helped to reduce unemployment rates, they have not brought about full employment. In addition, the increase in casual employment and the number of people working longer hours suggests that the benefits of lower unemployment are coming at the expense of higher psychic costs and a growing gap between rich and poor. Also, the increase in productivity over the past decade, which is measured in terms of output per unit of labour, may be illusionary if, as revealed in the introductory paper [2], the fall in three of Australia’s four efficiency ratios is a superior guide to labour productivity and representative of productivity movements in most countries.

As for labour market programmes, most involve some form of training and skills development plus the introduction of incentives to encourage employers to take on more employees [21]. Despite the success of a limited number of well targeted labour market programmes in Australia, evidence suggests they are not very cost effective. In addition, many labour market programmes appear to have done little more than shuffle existing unemployment queues. Few have increased employment levels to any great extent [22–23].

Finally, an incomes policy is designed to directly control aggregate wage outcomes as well as wage relativities between different occupations. Usually implemented at the national level, an incomes policy involves the adjustment of wages in response to price changes and advances in labour productivity. Ideally, wage adjustments are regulated to prevent the erosion of real wages and to ensure wage rises are commensurate with productivity gains. While some would argue that the setting of a real wage floor can act as a stumbling block to unemployment reduction, others claim that the lowering of real wages at the bottom end of the wage scale encourages firms to adopt low-skilled job hiring strategies at the expense of capital investment, employee training, and research and development [24–26]. Thus, by guarding against lower real award rates, an incomes policy can promote the type of investment needed to increase labour productivity, boost real wages, and sustain employment growth [27].

On the down side of the ledger, an incomes policy reduces labour market flexibility and relies on bureaucrats rather than the market to alter wage relativities in response to productivity changes across different occupations. Apart from the negative impact of inflexible labour markets already outlined, this prevents labour markets from responding adequately to a nation’s current and future labour requirements. An incomes policy can therefore lead to an undesirable imbalance between the demand and supply of certain forms of labour. Should an incomes policy be totally abandoned? Probably not. There will always be a good case for having real wages maintained at the lower end of the relative wage scale to ensure a society’s poorest workers are able to live decently. Bottom-end real wages can be adjusted by an independent authority such as the Industrial Relations Commission that presently exists in Australia.

All in all, supply-side solutions are vitally important insofar as effective policies can boost labour productivity, increase real wages, and lower unemployment. Having said this, any suggestion that all unemployment is supply-side related and/or the result of
voluntary labour withdrawal is patently untrue. To some extent, persistent unemployment continues to be the manifestation of deficient aggregate demand [28–29]. Unfortunately, the need to make a transition towards as steady-state economy places severe constraints on the use of demand-side policies to achieve full employment — as will now be demonstrated.

2.3 Demand-side solutions

Demand-side solutions involve the stimulation of aggregate demand to boost real output that, in turn, creates more employment opportunities. Demand-side policies essentially take the form of either a fiscal or monetary expansion. Expansionary fiscal policy involves the increase in government spending and/or the decrease in income taxes to augment the spending power of consumers. For some time now, expansionary fiscal policy has been out of favour with governments and policy-makers alike. There are a couple of reasons for this. First, it is feared that increased government spending can lead to higher interest rates that can crowd out private investment and consumer spending. Mitchell and Watts [30] refute this assertion by arguing that the role of government debt is not to finance an increase in government spending but to maintain reserve balances in the short-term money market in order to defend the overnight cash rate. Lack of support by the central bank leads to a decline on the overnight cash rate, not a rise as conventionally understood. Thus, according to Mitchell and Watts, the notion of financial crowding out is meaningless.

Second, governments are increasingly concerned about the possibility of expansionary fiscal policies leading to high inflation and a long-run unemployment crisis. Mitchell and Watts [3] again refute such a suggestion. They argue, firstly, that inflationary pressure exists only when the economy is operating at the full employment level of national income. If unemployment exists as a consequence of deficient demand, the economy can safely respond to nominal impulses be expanding real output. Second, if a job guarantee scheme is made the centre-piece of a stimulatory policy, the payment of a minimum award wage to JG employees ensures price stability by defining the private sector wage structure. While I agree with Mitchell and Watts on this aspect, I believe there is the potential for inflationary pressure to emerge from a different source — namely, from the rise in the price of low entropy resources as the economy approaches ecological limits. More on this soon.

Doubts surrounding the use of expansionary fiscal policies have led many governments to rely on expansionary monetary policies to stimulate investment and consumer spending. Nevertheless, loose monetary policy has only been used to stimulate the economy when in recession and never to the extent needed to achieve full employment. The failure to do this is again related to fears that an expansion of such magnitude leads to an unacceptable level of inflation that eventually results in an unemployment rate higher than the one existing prior to the policy’s implementation.

Let us assume, for the moment, that the standard fears concerning the long-term inflationary and crowding out effects of expansionary fiscal and monetary policies are unfounded. Since both involve the stimulation of the economy, to what extent can they be used if a steady-state economy necessitates the cessation of a high-growth policy? To formally analyse the possibilities, a recently established IS-LM-EE framework can be employed [31–32]. The framework involves the incorporation of an ‘environmental equilibrium’ or EE curve into the standard IS-LM model. The EE curve represents the
locus of real output/real interest rate combinations that ensures natural capital maintenance [32]. The need to prevent natural capital depletion arises because of the complementary relationship between natural and human-made capital [33]. In a sense, the EE curve serves as an ecological ‘Plimsoll Line’ and is downward sloping because the opportunity cost of employing cleaner production techniques increases as the real interest rate rises [32]. That is, a higher real interest rate results in the use of dirtier production techniques that subsequently leaves a nation producing a much lower output level from the maximum sustainable rate of resource throughput. Figure 1 depicts an environmental-macroeconomic equilibrium whereby the interest rate/output combination of $R_0, Y_0$ leads to environmental equilibrium as well as equilibrium in both the goods and money markets. To be consistent with Mitchell and Watts [30], the LM curve is assumed to be horizontal.

**Figure 1** Environmental-macroeconomic equilibrium

Whereas natural economic forces exist to ensure the economy adjusts towards the IS and LM curves, the same cannot be said of the EE curve [32]. Various approaches can be taken to ensure environmental equilibrium. One method is to use fiscal and monetary policy settings to adjust the IS and LM curves so that the intersection of both curves lies on the EE curve. Another is to introduce assurance bonds and a system of tradeable resource use permits [32]. How does the latter method succeed? Since the relevant government authority auctions off a limited number of permits, it restricts the incoming resource flow to the maximum sustainable rate. This ensures operation on a given EE curve. Second, the premium paid for the permits by resource buyers internalises
ecological limits, not just costs, and serves as a throughput tax to facilitate the efficient allocation of the incoming resource flow. Moreover, by encouraging resource-saving technological progress, the permit premium also induces rightward shifts of the EE curve. This allows a nation to progressively increase its sustainable income level towards the biophysical maximum of $Y_S$ [34].

Assurance bonds are also required because, as a consequence of the Entropy Law, a quantitative restriction on the incoming resource flow has no influence on the qualitative nature of outgoing waste. Pollution taxes are a possible option, however, because the cost of pollution often takes considerable time to emerge, polluters only pay for the cost of their pollutive activities at some stage in the future. Since people have a tendency to discount future values, the prospect of having to pay later on is less of a disincentive to pollute than having to pay upfront. Assurance bonds overcome this problem by bringing the potential ecological damage caused by highly toxic and intractable wastes into the present decision-making domain of producers [35]. This promotes an accelerated rate of investment into pollution-reducing human-made capital that, in due course, reduces the pollution impact on the natural environment.

Figure 2 illustrates the impact of an expansionary fiscal policy on equilibrium output where assurance bonds and a resource use permit scheme have been instituted. Initially, the economy is situated at the equilibrium point $a$ where the equilibrium interest rate/output combination is $(R_0,Y_0)$. Due to an increase in $G$, the IS curve shifts rightward to $IS_1$. A new macroeconomic equilibrium is established at point $b$ where, if no environmental constraint is imposed, the equilibrium output level increases to $Y_0^1$. However, the new macroeconomic equilibrium is inconsistent with environmental equilibrium. The excess demand for low entropy resources leads to a rise in resource prices as resource buyers bid up the price of the limited number of resource use permits. This increases the resource input cost of the production process. Exactly how much of this transfers into higher goods prices depends on the extent of any resource-saving technological progress induced by the higher resource costs. If there is no subsequent technological progress, three things will happen. First, the EE curve will maintain its present position at $EE_0$. Second, higher resource input costs will flow on into higher goods prices, thereby reducing the supply of real money balances (i.e., $M/P$ falls). This leads to a reserve deficit in the short-term money market and upwards pressure on the overnight cash rate. Consequently, the LM curve shifts upward to $LM_1$. Third, the higher interest rate reduces private sector investment. A movement along the new IS curve is therefore experienced. With a new environmental-macroeconomic equilibrium at point $c_1$, real output falls to $Y_1$ (i.e., $Y_1 < Y_0$).
What, however, if the higher resource costs lead to the development of resource-saving technological progress? The EE curve will shift rightward. The shifts from EE$_0$ to EE$_1$, EE$_2$, and EE$_3$ represent different degrees of technological progress, whereby the shift to EE$_3$ represents the highest progress. The movement of the LM curve also depends on the extent of any technological progress. Consider the shift of the EE curve to EE$_1$ and the accompanying shift of the LM curve to LM$_2$. In this particular instance, there has been a small increase in resource-saving progress. While, to some extent, this nullifies the impact of higher resource input costs, it is insufficient to prevent goods prices from rising. Nevertheless, the rise in goods prices is less than the case of no technological progress. Consequently, the LM curve does not shift as far upward, however, it shifts sufficiently enough to restore environmental-macroeconomic equilibrium, this time at point $c_2$. Overall, real output falls slightly to $Y_2$ (i.e., $Y_2 < Y_0$).

The shift of the EE curve to EE$_2$ is the result of a much larger increase in technological progress. On this occasion, there is no rise in goods prices and, therefore, no shift of the LM curve. Because the real interest rate remains unchanged, private sector investment is unaffected. The new environmental-macroeconomic equilibrium moves to point $b$ and, overall, real output increases to $Y_0^1$ – the same output level when no environmental constraint is imposed. Where the EE curve shifts to EE$_3$, the extent of the
resource-saving technological progress is sufficient to cause goods prices to fall. This leads to a downward shift of the LM curve to LM₃, a lower real interest rate, and subsequent rise in private sector investment. A new environmental-macroeconomic equilibrium emerges at point c₃ with a corresponding increase in real output to Y₃ (i.e., Y₃ > Y₀).

Note the benefit of having in place a resource use permit scheme to restrict the incoming resource flow to the maximum sustainable rate. The LM curve automatically shifts to ensure the IS and LM curves intersect at a point lying on the newly positioned EE curve. In addition, the induced technological progress leads to a beneficial shift of the EE curve and the potential to sustain a higher output level. Having said this, a rise in real output is dependent on a significant degree of technological progress. With the potential for real output to fall, the imposition of a macro-environmental constraint severely limits the capacity to employ an expansionary fiscal policy to achieve full employment.

Figure 3 illustrates the impact of an expansionary monetary policy. The economy is initially at the equilibrium point a where the equilibrium interest rate/output combination is (R₀, Y₀). An increase in M leads to a system-wide surplus and downward pressure on the overnight cash rate. The LM curve shifts downward to LM₁. A new macroeconomic equilibrium is established at point b where, if no environmental constraint is imposed, the equilibrium output level increases to Y₀₁. Again, the new macroeconomic equilibrium is inconsistent with environmental equilibrium. The excess demand for low entropy resources again leads to a rise in resource prices and an increase in the resource input cost of the production process. If the increase in resource input costs fails to induce any technological progress, the EE curve maintains its present position at EE₀. In addition, the higher resource input costs flow on into higher goods prices such that the LM curve shifts back to its original position. Overall, the new environmental-macroeconomic equilibrium is back at point a. In addition, real output remains unchanged at Y₀.

The shifts from EE₀ to EE₁, EE₂, or EE₃ represent different degrees of technological progress. Once again, the movement of the LM curve depends on the extent of any technological progress. The greater is the degree of technological progress, the larger is the new equilibrium output level. A combined shift of the EE curve to EE₃ and the LM curve to LM₂ (minimal technological progress) brings about a new environmental-macroeconomic equilibrium at point c₁ and an increase in real output to Y₁; a shift of the EE curve to EE₂ and no accompanying shift of the LM curve (larger increase in technological progress) produces a new equilibrium at point b and a rise in real output to Y₀₁; while a combined shift of the EE curve to EE₃ and the LM curve to LM₂ (considerable technological progress) brings about a new equilibrium at point c₂ and an increase in real output to Y₂. In this latter case, real output increases beyond the level achieved when no environmental constraint is imposed (i.e., Y₂ > Y₀₁).

Given the above, is an expansionary fiscal or monetary policy to be preferred or an expansionary monetary policy? This will depend on the relative slopes of the IS, LM, and EE curves. Figures 2 and 3 confine the analysis to circumstances where the EE curve is steeper than the IS curve which biases the analysis in favour of an expansionary monetary policy. In any event, the IS-LM-EE model demonstrates that the use of either fiscal or monetary policies to achieve full employment is severely constrained. In a low-growth or steady-state economy, it is highly doubtful whether demand-side policies can be relied upon, alone, to achieve the full employment objective.
3 Specific policy initiatives to achieve ecological sustainability and full employment

In this particular section of the paper, a number of specific policy initiatives will be analysed and discussed. Some fall under the banner of supply-side solutions and others demand-side solutions. The last of these initiatives discussed—the remuneration of non-paid work—is an explicit attempt at lowering the full employment level of income to overcome the current predicament of having to boost real GDP to meet the full employment objective.

3.1 Ecological tax reform

Ecological tax reform (ETR) has emerged as a policy response by ecological economists to a variety of sustainable development-related issues [1–11,36–38]. Usually promoted on a revenue-neutral basis, ETR involves a combination of tax cuts on "goods" such as labour, income, wages, and profits and tax impositions on such "bads" as resource depletion and pollution. Ecological economists argue that the former encourages value-adding in production which boosts, among other things, real wages. This allows
workers located on the backward-bending section of their labour supply curve to reduce their working hours and increase their welfare. Hence, ETR goes a long way towards severing the GDP-employment link.

Another key element of an ETR package is that it alters the cost structure of commercial operations. By rendering resource use more expensive and reducing the cost of hiring labour, employers will, as much as possible, substitute the latter for the former, although it must be said that in view of the considerable degree of complementarity between resource input and human-made capital (which includes labour), the scope for substitution is small. But whatever scope there is, more people and fewer resources are likely to be employed to produce a given level of real output.

Finally, the increase in taxes and charges on depletion and pollution encourages technological progress that further reduces the resource intensity of economic activity. In doing so, it lessens the throughput of resources required to keep the stock of human-made capital intact (i.e., increases the maintenance efficiency of human-made capital). This shifts the EE curve in Figure 1 to the right and increases a nation’s sustainable income.

Some ecological economists have argued that an ETR package designed simply to manipulate resource prices via tax adjustments will not ensure ecological sustainability. This is because ecological sustainability is a throughput problem and thus requires an instrument other than the manipulation of relative prices to be adequately resolved [39–40]. Indeed, it has been argued by Lawn [36] that a basic ETR package will ensure the satisfaction of only two of the five behavioural modes required to achieve sustainable development. To guarantee ecological sustainability (i.e., operation on the EE curve) and to greatly increase the probability of satisfying all five behavioural modes, an ETR package can be strengthened by the incorporation of assurance bonds and a system of tradeable resource use permits [36].

Overall, a well targeted ETR package can promote the transition towards a steady-state economy while simultaneously reducing, though not entirely alleviating, the unemployment problem. Indeed, ETR can facilitate employment growth even while real GDP is falling. The question that still remains is this: Is a well targeted ETR package enough to guarantee full employment? The answer is probably not, and so there is a need for additional policy responses – including the use of demand-side solutions.

3.2 The Job Guarantee

The Job Guarantee (JG) is a demand-side policy which involves the government acting as a buffer-stock employer to continuously absorb unemployed labour displaced by the private sector [3]. JG employees are paid a minimum award wage to ensure they live decently and to establish a wage floor for the entire economy [41]. Spending by the government on the JG increases (decreases) as jobs are lost (gained) in the private sector. In doing so, the JG achieves ‘loose’ full employment. But does it ensure price stability? Certainly, by paying ‘buffer-stock’ employees a minimum award wage, the JG stifles the emergence of wage-related inflation [42]. But there is another source of cost-push inflationary pressure to consider. It comes in the form of rising low entropy resource prices as the economy approaches ecological limits. As was demonstrated from the IS-LM-EE analysis above, a fiscal expansion is likely to lead to higher prices as the excess demand for low entropy resources forces resource buyers to bid up the price of the limited number of resource use permits. This increases the real interest rate, crowds out private investment, and results in a lower equilibrium output level. We might therefore
expect, in the short-run, for private sector employment to fall and the number of JG employees to rise beyond the previous unemployment level.

The cost-push pressure exerted by higher resource prices also has some implications for Mitchell’s [43] use of the JG to control inflation. Mitchell is entirely correct to reject the popular NAIRU approach to inflation control since, although it succeeds on the inflation front, it results in unacceptable levels of involuntary unemployment [44]. In response, Mitchell [43] and Mitchell and Watts [30] have put forward an alternative inflation-control mechanism. They have referred to it as the NAIBER – the notion of a ‘non-accelerating inflation buffer employment ratio’. It works in the following manner. First, assume that a NAIRU policy is being employed and exists at a 6% unemployment rate. The JG is now introduced to eliminate all but frictional unemployment. For argument sake, assume inflationary pressures now emerge. The government dampens private sector activity by, for example, increasing the corporate tax rate. A smaller percentage of the labour force will now be employed in the private sector while more will become JG employees. Assuming an appropriate increase in the corporate tax rate, the ratio of JG workers to private sector employees rises until the inflation rate is again stabilised. In other words, the NAIBER is achieved. Both inflation control and full employment are simultaneously resolved.

Given the above, the NAIBER is likely to be higher than the NAIRU in the short-run. For some observers, this will be undesirable. Many will see the role of the JG as an employer-of-last-resort [45]. They will also point out that an increasing number of people will be paid the lower JG floor wage. This is undoubtedly true, however, consider the fact that, unlike unemployed labour, JG workers will retain and acquire new and existing skills. This will achieve a number of objectives. First, it will maintain the productivity and self-esteem of the entire labour force. This will facilitate increases, over time, in the floor wage. Second, JG workers will constitute a more credible threat to private sector employees than unemployed labour. Presumably the NAIBER will serve as a more effective inflation control mechanism than the NAIRU [43]. Third, because the combined labour force will be more productive, the NAIBER is likely to be considerably lower than the NAIRU in the long-run.

Of course, this all changes once the inflationary impact of higher resource prices emerges. Assuming the economy is operating at the ecological precipice – something that most economies already appear to have reached [6] – the introduction of the JG pushes the economy beyond the sustainability threshold and, in doing so, increases the real interest rate, crowds out private investment, and results in a lower equilibrium output level. We might therefore expect, in the short-run, private sector employment to fall even further and the number of JG employees to rise beyond the previous NAIBER level. Consequently, what I would call an ‘ecologically sustainable non-accelerating inflation buffer employment ratio’ – the ESNAIBER – is likely to be higher than the standard NAIBER in the short-run.

What about the long-run? The much higher price for low entropy resources brought about by the introduction of tradeable resource use permits should induce a much greater rate of technological progress and shift the EE curve to the right more rapidly. This will not only allow higher levels of real GDP to be obtained from the maximum sustainable rate of resource throughput, it should reduce any inflationary pressure that a JG scheme might create. This, in turn, will keep interest rates low and encourage producers to adopt the best available ‘green’ technologies. The ESNAIBER is therefore likely to be lower
than the NAIBER in the long-run that, as already explained, should be lower than the NAIRU. We should ultimately expect fewer JG employees under a ESNAIBER policy than the number of people unemployed under a NAIRU policy – a desirable outcome in itself.

The importance of combining the JG scheme with an ETR package is not only demonstrated by the above. There are two other positive elements that should also be considered. First, the higher price paid for resource use permits serves to deflate the economy by the precise amount needed to bring about the ESNAIBER. There is no need to adjust tax rates, as in the NAIBER situation, since the resource use permit market fulfils this role as the demand for resource use permits fluctuates relative to their limited supply. Second, it has been shown that the economy need not be approaching ecological limits in order for its physical expansion to result in the decline in sustainable economic welfare (see Figure 3 in [2]). Assume, for a moment, that the introduction of the JG scheme leads to a larger economy. By encouraging the development and use of efficiency-increasing technology, a well designed ETR package ensures that any growth will largely be the consequence of positive shifts in the uncanceled benefit (UB) and uncanceled cost (UC) curves, not because of any movement along the two curves (see Figures 4 and 5 in [2]). This ensures that full employment is obtained without a nation having to experience a decline in economic welfare.

There is one final aspect of the JG requiring attention. To be successful, the JG must ultimately meet the preferences of the labour force. To do this, it is necessary for a JG programme to include a range of fractional jobs – all with the benefits and privileges of full-time employment (e.g., annual and sick-leave entitlements). Given that the average full-time job in most countries involves approximately 37.5 hours of work per week, or 7.5 hours daily, fractional positions should be established to allow individuals to work 7.5 hours (one day), 15.0 hours (two days), 22.5 hours (three days), 30.0 hours (four days), and 37.5 hours (five days) per week. Better still, a flexible JG programme should include the possibility for people to work half-days (3.75 hours per day) for, say, a minimum of two half-days per week. Not unlike the disciplining effect of a minimum or floor wage, the flexibility of fractional employment would force the hand of the private sector to do likewise, thus helping to facilitate a ‘standards-guaranteeing’ form of labour market flexibility.

3.3 Greening the Job Guarantee

It has been suggested that the inflationary pressure caused by ecological limits to macroeconomic expansion can be avoided if JG jobs are sufficiently ‘green’ (i.e., environmental rehabilitation and/or low resource-intensive activities). Unfortunately, if the economy already exists at the ecological precipice, inflationary pressure cannot be averted because all activities, no matter how sensitive they are to the natural environment, must involve the use of additional resources. Since the intensity of resource use varies minimally across different industries and across different activities [2,46–47], the introduction of a JG scheme unavoidably results in resource demands exceeding the maximum sustainable resource supply – at least until efficiency gains have been made across the entire economy. It is because of this that the ESNAIBER will be higher than the NAIBER in the short-run.

Despite this, a JG scheme can still be designed in such a way as to generate long-term environmental benefits. For example, JG employees engaged in reforestation and other
environmental rehabilitation activities can assist in the augmentation of both the stock of natural capital and its productivity. This can go along way towards raising the growth and exploitative efficiencies of natural capital [2]. But such a process is rather slow and subject to eventual biophysical limits [48]. Of course, the process can be accelerated if the JG scheme is complemented by an ETR package that includes tradeable resource use permits and assurance bonds.

In all, a JG scheme introduced to eliminate unemployment will almost certainly reduce the number of private sector employees in the short-run should the nation’s economy already exist at its maximum sustainable scale. Such a scheme immediately consumes resources while any ecological ‘breathing space’ provided by increases in the growth and exploitative efficiencies of natural capital – both of which permit more resources to be sustainably exploited from the stock of natural capital – takes considerable time to emerge. This having been said, eventual advances in the maintenance efficiency of human-made capital can dramatically reduce the ESNAIBER and, in the long-run, lead to a far greater proportion of people employed in the private sector.

3.4 A guaranteed Basic Income

Although rarely motivated by the full employment objective, some observers have long advocated a Basic Income (BI) to overcome the income insecurity associated with unemployment [49–53]. The BI is usually proposed in the form of an unconditional and universal transfer payment financed by increased tax rates or a widening of the tax base. Set above the absolute poverty line, the BI replaces existing forms of public assistance (e.g., unemployment benefits, disability allowances, and old-age pensions) [52].

The aims of the BI are many, but the primary objective is to ensure that each and every citizen is provided with a basic living wage irrespective of their contribution to society or their physical and mental capacity to make a contribution. By avoiding a link between the transfer payment and work, advocates of the BI claim that individuals are afforded ‘real freedom’ – an absence of financial restraints on behaviour and the means by which a person can realise their genuine aims and desires [54]. One of the other potential benefits of the BI is that it can reduce people’s need and/or incentive to work and can thus precipitate a labour supply withdrawal. This, in turn, can reduce the full employment level of income, thereby limiting the need to undertake expansionary demand-side measures to reduce unemployment.

Critics of the BI claim, first and foremost, that it does not guarantee full employment [16,55–56]. Indeed, while the BI provides a liveable wage for people who choose not to work, it does not guarantee work for those who still seek it. This will be of great significance if employment itself serves a critical welfare function [2,57]. Unfortunately, high unemployment is likely to persist because the BI cannot, without the discipline of unemployment, attenuate emerging wage-price or price-price pressures [16]. Thus, like the NAIRU approach to inflation control, the BI is non-inflationary only if there is a sufficiently large pool of unemployed labour.

Second, critics point to two major problems associated with the need to have a sufficient number of people in paid forms of employment to produce the level of national output required to support the BI. They are: (a) what if, following the introduction of the BI, there is not enough people engaged in paid forms of employment?; (b) is it fair that
those who remain engaged in paid employment should 'pay' for the non-work of those who subsequently exit the labour market? We shall deal with the first question shortly. As for the second question, one of the powerful selling points of the BI is that it affords people the freedom from work exigency. Unfortunately, if it is necessary to have a certain number of people engaged in paid forms of employment to support the BI, the freedom from work exigency afforded to one person can very easily become the source of another worker's alienation [16].

Third, BI critics have demonstrated that the BI constitutes an indiscriminate form of Keynesian expansion. Like any indiscriminate demand-side approach, the BI has the potential to trigger periodic phases of demand-pull and induced cost-push inflation at low rates of unemployment, only to be followed by a contractionary fiscal policy and high rates of unemployment [16]. Advocates of the JG claim that a buffer-stock employment programme avoids this dilemma by providing the minimum demand expansion required to achieve full employment.

Finally, critics argue that the objective of the BI to reduce unemployment is flawed because, apart from the potential problems outlined above, it encourages an artificial labour supply withdrawal [16]. It is this supposed flaw in the BI model that forms the basis for the first question raised above. Naturally enough, the legitimacy of this criticism depends very much on what is meant by 'artificial' since, as we have seen, inducing an exodus of labour can be of great value in reducing unemployment should the economy be teetering on an ecological precipice. One can identify three main sources of a genuine or 'real' labour supply withdrawal. Two of these have already been outlined and discussed but are worth repeating. They include:

1. Increased labour market flexibility. As explained in Section 2.1, flexible labour markets enable people who would like to reduce their work hours, but presently cannot, to in fact do so.

2. Increased labour productivity. Improvements in labour productivity lead to higher real wages that allow people to reduce the number of hours they work.

3. Government cash payments to reflect the contribution that non-paid work makes to the social product (e.g., non-paid household work, child rearing, and volunteer work).

Why is the latter an example of a real labour supply withdrawal? Because the cash payment not only reflects the contribution one makes to a nation’s real income, thereby ensuring that any withdrawn labour is precisely matched by a real demand-side outcome, it overcomes the subsidisation by those who continue to work for the non-work of those who do not.

Of these three sources of genuine labour supply withdrawal, it is the latter that is most relevant to the BI. To what extent the BI induces a real or artificial labour supply withdrawal depends on how much the BI exceeds the level of remuneration approximating the non-paid work contribution made by the average citizen towards the social product [58]. I refer to the average citizen because it would be far too complex to determine the exact non-paid work contribution made by each person and remunerate them accordingly. It is also administratively simpler to provide the BI on a universal basis.

Clearly, a BI set at the basic living wage – as most BI proponents advocate – would far exceed the average person’s non-paid work contribution and precipitate a large
artificial withdrawal of labour. However, a BI set, for example, equal to the unemployment benefit paid in most developed countries (about 30–40% of the minimum wage) would be much closer to the mark. Whilst a BI of this sort would significantly and desirably reduce the number of people engaged in the labour market, it would induce little in the way of an artificial labour supply withdrawal. Should the potential still exist for an artificial labour supply withdrawal, it would be minimised by making available a range of fractional job positions under the JG programme that, over time, would compel the private sector to offer a similar range of fractional job opportunities.

There are, however, two additional reasons for providing a BI at the level proposed above. First, Cowling et al. [16] have argued that any policy initiative aimed at contributing to the full employment objective must not violate social attitudes towards work and non-work. If the dominant social view is that no-one should receive ‘something for nothing’ (such as a BI at the living wage), then it is utterly inconsistent for people to receive ‘nothing for something’. The BI would go along way towards honouring the rightful receipt of ‘something for something’ – even if it was, as I have recommended, administered in a very blunt and universal manner. Also, business concerns about the incentive effects of a BI can also be alleviated if the combined payment of the BI plus a full-time JG position equals the minimum income level, and the BI is deficit-financed [59]. This is because the minimum hourly JG wage would be lower than the rate paid if the JG existed alone (i.e., where 100% of a JG employee’s minimum income was derived from the JG compared to approximately 30% and 70% respectively by a combined BI and JG). Assuming that the private sector can attract labour by paying an hourly wage for low-skilled jobs equal to that of a JG job, the minimum hourly wage paid by the private sector would fail. In fact, a deficit-financed BI would serve as a private sector subsidy on the employment of labour. This would further assist in the implementation of ecological tax reform (ETR).

Second, the failure of most governments to remunerate non-paid work distorts worker incentives. In stark contrast to any fears that a BI would induce an artificial withdrawal of labour, the non-payment of household and volunteer work has long induced an artificial influx of reluctant workers into conventional labour markets. Regrettably, this has placed enormous pressure on families and other critical institutions, norms, and customs. The BI proposed in this paper would correct this destructive labour market distortion. Of course, one would prefer to see traditional non-paid work remain unpaid on the basis that it constitutes an integral part of a nation’s social capital (i.e., people undertake such work because they feel morally obligated to do so). But if market forces have the propensity to deplete social capital [1,60–61], and its preservation and replenishment requires non-pecuniary assets to be valued in the same way as other assets, the case for a limited BI is further enhanced.

4 Conclusion

The immediate need for lower rates of growth and the eventual desirability of a steady-state economy places considerable constraints on the ability of policy-makers to achieve full employment at a time when unemployment coincides with high rates of growth. But lower unemployment levels can still be achieved if the GDP-employment link is severed and a great deal more is done to successfully facilitate genuine increases
in productivity, resource-saving technological progress, and qualitative improvements in the stock of human-made capital. Nevertheless, full employment will require these initiatives to be supplemented by a range of well-crafted policy measures. These include a buffer-stock employment programme, such as the Job Guarantee; an ecological tax reform package incorporating tradeable resource use permits and assurance bonds; and a universal Basic Income that, by remunerating people for their non-paid contribution towards the social product, induces a real labour supply withdrawal and thus reduces the full employment level of income.

References and Notes


15. The IMPLEX system of exchange rate management is ‘protectionist’ in the sense that it protects hard-won social and environmental standards. It does not protect inefficient industries. The question that is often posed when measures are taken to protect social and environmental standards is thus: Would it not allow rich countries to stay rich and keep the Third World poor? Consider what Daly has said about the internalisation of social and environmental standards into the prices of foreign goods. To wit: “Granted this makes it harder for poor countries to export – so does a decent minimum wage and the existence of free labour unions and the outlawing of child labour within the poor country. In my view it is not all bad to make it harder for poor countries to export to the USA. That means that instead of planting all their
land in bananas or fancy fruits and flowers for export, the poor country might have to plant more rice and beans for its own citizens. And to sell the rice and beans to its own citizens, it will have to worry about their purchasing power – about domestic jobs and decent wages, and the distribution of income within their country. And they might worry a bit less about cutting wages and social benefits in order to be more competitive in the global market, as they must do in the export-led model of development to which the IMF and WTO are so totally committed. Admittedly, less export revenue will be available to buy expensive toys for the elite, but even that might not be all bad. Maybe they will begin to invest some of their surplus in their own country.” Taken from an internet seminar on Daly’s book, entitled: Beyond Growth [1] (see http://csf.colorado.edu/seminars/daly97/proceedings).


20 Collective arrangements also point to the need for corporate law reform. Existing laws entrench the division between owners (stockholders), managers, and employees. They have played a significant role in the development and evolution of industrial relations systems that are, in a strict Hegelian sense, dialectical nature. Dialectical systems hinder rather than advance the knowledge-building process (see Boulding, K. (1970) A Primer on Social Dynamics, New York: The Free Press.). One might ask the political-economic question of why so much attention has been given to labour market reform and yet so little to corporate reform? See Lawn [2] on how corporate reform might be conducted.


33 The complementary relationship between natural and human-made capital means that natural capital maintenance is necessary to ensure ecological sustainability of the economic process.

There is another potential benefit of tradeable resource use permits. A recent simulation exercise has shown that, for some period of time, the price of a non-renewable resource can fall at the same time the resource is becoming increasingly scarce (see Lawn, P. (2002) ‘How well do resource prices serve as indicators of natural resource scarcity?’, *Flinders University Working Paper in Economics* 2002, October, Vol. 7). It may, therefore, be inadequate to rely on markets to ensure resource prices reflect the relative and absolute scarcity of various resource types. Such a conclusion also raises further doubts about the use of reactionary fiscal and monetary policy settings to achieve an environmental-macroeconomic equilibrium.

Costanza, R. and Perring, C. (1990) ‘A flexible assurance bonding system for improved environmental management’, *Ecological Economics*, Vol. 2, pp.57–76. With assurance bonds, a polluting firm pays upfront a bond equal to the cost of the worst-case pollution scenario. Should the owners of the firm be able to demonstrate that the pollution generated has had no deleterious impact on the natural environment, they receive the bond back in full plus any interest accrued over the period in which the bond has been held by a government authority. If the pollution has had an undesirable impact on the natural environment, the bond is confiscated either in full (where pollution damage equals the worst case scenario) or in part (where pollution damage is something less than the worst case scenario). If the worst case scenario is unacceptably risky (i.e., it involves highly toxic substances), the generation of the substances in question may require prohibition or generation under very strictly controlled conditions.


One of the other benefits of a JG scheme is that allows a government to indirectly implement a progressive industrial relations policy. For example, a government could introduce post-industrial workplace practices (i.e., greater participatory democracy through the devolution of power in the workplace) that would give people the choice between a potentially demeaning but higher-paid job in the private sector or a self-actualising but lower-paid JG job. In the same way the JG wage acts as a disincentive for the private sector to pay very low wages, so the JG scheme can act as a disincentive for the private sector to generate demeaning jobs and/or introduce draconian workplace practices.


Indeed, the need for a pool of unemployed labour is a defining condition of the NAIRU – a ‘non-accelerating inflation rate of unemployment’.

Advocates of the JG will point out that the outcome of a NAIRU policy – namely, a sacrificial pool of unemployed people – is far less desirable.


58 Virtually all people contribute to the social product by why of some form of non-paid work. Even ‘drop outs’ and people who would exit the labour market in the presence of a BI must engage in the generation of surplus value to survive or live comfortably. Note, also, that in so-called primitive societies, everyone had a crucial role to play and was not ‘paid’ for their work. They contributed to the social product and were then distributed their entitlement. While modern societies differ greatly, there remains some requirement on the part of each citizen to generate surplus value. The BI, as I am proposing here, would merely acknowledge this contribution.

59 If the government’s aim is for the BI to be budget-neutral, tax rates must be raised. To attract labour, the private sector would have to offer a higher pre-tax wage. If the tax rises are imposed on capital, the desire to invest will weaken. Neither would appease business interests and concerns.
