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Wake up economists! – Currency-issuing central governments have no budget constraint

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Abstract

Despite what mainstream economists preach, currency-issuing central governments have no budget constraint. It is therefore incumbent upon them to use their unique spending and taxing powers to achieve the broader goal of sustainable development. Their failure to do so has meant that nations have fallen well short of realising their full potential. Rather than accept the neo-liberal myth that ‘small government is best’, the citizens of a nation should welcome the central-government’s responsible use of their unique spending and taxing powers to provide sufficient public goods and critical infrastructure, achieve and maintain full employment, resolve critical social and environmental concerns, and meet the requirements of an aging population. Should central governments fail in their responsibility to prudently use their unique powers, public disapproval is best registered through the ballot box, not through degenerative debates that distort the facts about the operation of a modern, fiat-currency economy.

1. Introduction

The mainstream view of currency-issuing central governments is that they are budget-constrained like any other entity in the economy (Barro, 1993). Hence, in order to spend, it is claimed that central governments must earn revenue by levying taxes and selling publicly-provided goods and services. Moreover, should spending exceed revenue (a budget deficit), it is argued that central governments must either borrow from the private sector by issuing government securities, sell public assets through a privatisation process, or, if possible, call upon funds acquired from previous budget surpluses. Furthermore, because mainstream economists believe that central governments compete with the private sector and other levels of government for limited funds, it is also contended that deficit-spending leads to higher interest rates which, by crowding out private-sector investment, generates no appreciable

increase in national output (Gans et al., 2009). Finally, mainstream economists argue that budget deficits reduce the future spending power of central governments which undermines their capacity to provide public goods and meet the future needs of an aging population.

In consequence, mainstream macroeconomists have long been recommending that central governments should, on average, operate small budget surpluses over the business cycle. This, they believe, will boost national savings, relieve inflationary and interest rate pressures, and provide the room and stability to facilitate and promote a thriving private sector (McTaggart et al., 2006). They also believe it will enable central governments to store away the funds needed to cope with the budgetary requirements of an aging population (Commonwealth of Australia, 2010). With respect to this later issue, mainstream economists have also called upon central governments to promote superannuation in the belief that self-funded retirement will both reduce the future tax impost on the working population and leave central governments with more spending power to address other pressing concerns.

By embracing *modern monetary theory*¹, I aim to demonstrate that these mainstream claims are false. Currency-issuing central governments have no budget constraint and their failure to fully exploit their unique spending and taxing powers for public purposes has meant that nations have fallen well short of realising their full potential. Worse still, many countries are now precariously positioned with regards to achieving the triple-pillar goals of ecological sustainability, distributional equity, and allocative efficiency that ecological economists believe are necessary to achieve the broader goal of sustainable development, otherwise known as sustainable qualitative improvement (Daly, 1992; Lawn, 2007).

In order to achieve my aims, I will begin by explaining why currency-issuing central governments have effectively unlimited spending power. I will then look closely at central-government spending and why, despite having no budget constraint, central governments are required to tax the private sector. Having done this, I will explain the real reason behind central banks having to issue bonds in response to a central-government deficit. In the process, I will debunk the mainstream view that central-government deficits discourage private-sector investment by exerting upward pressure on interest rates. Continuing on with a similar theme, I will then focus on the effect that central-government budgets have on private-sector net savings. The implications of central-government budgets on international trade and the productive capacity of nations will also be explored.

Having outlined the basics of modern monetary theory, I will then proceed to discuss some of its broader implications. The areas covered include: the macroallocation of resources – that

is, what proportion of the incoming resource flow should be allocated to the private and public sectors of the economy; how full employment can be achieved in a non-inflationary and ecologically sustainable manner; the implications of inflation-control for the central-government budget position; how taxation, given the macroeconomic need for it, can be used as a policy instrument; what is the most appropriate means of controlling inflation at the margin; and the relationship between central-government budgets, sustainable productive capacity, and an aging population. It is my hope that, by raising these areas of concern, this paper can assist in overturning the false underestimation of the role that central governments can play in achieving the goal of sustainable development.

2. Currency-issuing central governments have no budget constraint

Imagine that I, as an Australian citizen, have performed an extraordinary deed for my country. To reward my efforts, the Australian Federal Government takes the unprecedented step of granting me three unique means of financing my spending. In the first instance, it provides me with a printing press that enables me to produce as many Australian \$100 notes I like and spend them into existence. Secondly, it provides me with an open cheque-book that allows me to write cheques to whatever value I like and spend them into existence. The cheques never bounce. If I exhaust my cheque-book, I immediately receive a replacement. Finally, I am given a bottomless, plastic swipe card that enables me to conduct electronic transactions to whatever value I like. The transactions are always accepted as payment. Following an electronic purchase, the balance appearing on the seller's bank account rises by the value of the transaction.

Now, answer this question: Would I have any need to earn money, borrow money, tap into my savings, or sell some of my existing assets to finance my spending? The answer, of course, is no. My spending power would effectively be unlimited.² Moreover, my spending power would bear no relation to my financial circumstances prior to being rewarded in the above manner. Irrespective of whether I previously possessed net financial assets worth \$1 million or net liabilities of \$1 million, my capacity to spend would be exactly the same. If I was in the latter position, all I would have to do *vis-à-vis* the former position is write myself an additional cheque to the value of \$2 million.

What's the relevance of this? Although somewhat simplified, this is precisely the same privileged position enjoyed by every currency-issuing central government.³ Central governments have no need to 'earn' revenue, 'borrow' funds, or sell assets through a

privatisation process to finance their spending.⁴ Nor is their capacity to spend affected in any way by whether they are operating a budget surplus or deficit. In sum, modern monetary theory reveals that currency-issuing central governments have no budget constraint despite what you read in virtually every macroeconomics textbook.⁵

Interestingly, whenever I pose this question to an audience, I typically get an answer like, “Yes, but taking advantage of this privileged position would be hyper-inflationary and lead to outrageously high interest rates”. I’ll say more about the macroeconomic effects of central-government spending and taxation shortly, but this is an answer to a different question. When forced to deal only with the question asked above, no mainstream economist is able to demonstrate that a currency-issuing central government is budget-constrained. Some economists revert to the budget-constraining logic of a gold standard when exchange rates were fixed and a nation’s currency was convertible into a commodity of intrinsic value. But these circumstances are irrelevant in a contemporary, fiat-currency world dominated by flexible exchange rates. On some occasions, I get a response, such as, “Off the top of my head, I can’t explain why a central government is budget-constrained, but there is something wrong with this reasoning somewhere. I’d need a bit more time to think about it.” Given how fundamental the concept of a central-government budget constraint is to the mainstream macroeconomic framework, this constitutes an extraordinarily insipid explanation from anyone claiming to be a competent economist. In actual fact, it says more about the false perceptions of public finance and the unwillingness of many economists to abandon them.

Being free of a budget constraint does not mean that a currency-issuing central government can spend irresponsibly or recklessly. Nor does it mean that a currency-issuing central government has no need to impose taxes on the private sector. No, furthermore, does it mean that it has no need to issue government securities if operating a budget deficit. As I will soon explain, central-government taxation serves as a means by which a currency-issuing central government can destroy private-sector spending power. Although taxation can and should be used as a policy instrument, its primary macroeconomic purpose is to enable a central government to nullify the inflationary impact of its own spending. As for bond issuance, it is needed to enable central banks to conduct monetary policy on behalf of central governments. For reasons already given, bond issuance is never needed to finance a budget shortfall.

Because there *is* such a thing as responsible central-government spending and taxation, one might ask why there is any purpose in highlighting that currency-issuing central governments are not budget-constrained. After all, if a currency-issuing central government

can never fully exploit its unlimited spending power, what benefit is there in having it? The benefit exists in the sense that once a central government has imposed the taxation required to quell the inflationary effect of its own spending, it matters none whether it is operating a budget surplus or deficit. The prevailing budget position has no bearing on central-government 'debt', which never technically exists; has no bearing on a central government's capacity to spend in the future; and has no bearing on the tax burden of future generations, except that the current budget stance might affect the future productive capacity of the nation's economy, which, in turn, can alter the amount of private-sector spending that must be destroyed to quell the inflationary effect of future central-government spending. I will return to this latter point in my discussion on the intergenerational debate.

I might add that, beyond this section of the paper, I will be referring to central governments only. State/provincial and local governments are different in that they are not the issuer of the nation's currency. Hence they, like households and firms, are budget-constrained. Quite clearly, a currency-issuing central government is a unique entity within any national economy. Exceptions include central governments which have thoughtlessly relinquished monopoly ownership of the nation's currency in order to be part of a regional currency. A good example of this is the European Union (EU) and the Euro.

Before moving on, state/provincial and local government budget deficits need not be a concern if the size of the deficit poses no threat to the broader national economy. In some cases, and because non-central governments can be more responsive to local needs, a non-central-government deficit can serve as a more effective means of carrying out the public spending that would otherwise be part of a larger central-government deficit. In other instances, non-central governments are constitutionally responsible for delivering specific government services. To provide such services at the desired level, it may be necessary for non-central governments to go into deficit. Non-central government deficits need never be a funding concern because a currency-issuing central government can always bankroll them in the same way they bankroll the deficits of millions of citizens (e.g., recipients of welfare payments). To prevent state/provincial and local government budget deficits from destabilising the national economy, a central and a non-central government can always come to a suitable funding arrangement, such as the former promising to bankroll the latter's deficit so long as the latter keeps the deficit within an agreed limit.

3. Why do currency-issuing central governments spend and tax the private sector?

There are many reasons why currency-issuing central governments create 'money' for themselves and spend it into existence. In a nutshell, central-government spending is required to transfer resources from the private to the public sector, thus enabling it to supply the physical goods that society desires but which the private sector does not provide in sufficient quantities. In other words, central-government spending is required to supply physical goods with *public goods* characteristics.⁶ This includes some of the critical infrastructure needed to maintain a nation's productive capacity. In some cases, central governments may provide goods that citizens do not desire but which governments believe are in their best interest to consume (merit goods). Central-government spending is also needed to allow central governments to own, maintain, and operate natural monopolies; to establish and resource government bureaucracies; to maintain law and order; to meet the nation's military requirements; and to define and protect private property rights.

There are three further reasons for central-government spending. The first is to provide spending power for welfare recipients. The second is to supply the net financial assets that the private sector requires to satisfy its savings desires. The third, which has largely been abandoned since the 1970s, is to ensure full employment, which central governments can achieve by bridging the gap between the actual and full-employment levels of national output. There is an urgent need for central governments to reinstate full employment as an economic and social policy. I will later outline a means by which this can be achieved in an efficient, ecologically sustainable, and non-inflationary manner.

In the process of spending money into existence to achieve the above goals, central governments create the spending power they require to access natural resources (the true input of the economic process), capital and labour (the resource-transforming agents of the economic process), and final goods and services. Imagine, therefore, a situation where a central government, aware that it need not raise revenue to finance its spending, elected not to tax the private sector. A significant problem would immediately arise. This is because, firstly, central-government spending involves having to compete with the private sector for resources, capital, labour, and final goods and services. Secondly, central-government spending constitutes a significant proportion of total national expenditure. Clearly, in these circumstances, central-government spending would be inflationary.

Given a particular interest rate setting, how does a central government quell the inflationary impact of its own spending? That is, how does it reduce the inflationary pressure

of its own spending to an acceptable rate – say, 2-3% per annum? Quite simply, it provides ‘spending room’ for itself by destroying some private-sector spending power. How does it do this? It taxes the private sector. Thus, central-government taxation constitutes an essential inflation-quelling device. Indeed, from a macroeconomic perspective, it exists as little else. Of course, central governments do not act in this way – they act as if they are budget-constrained. But as much as they levy taxes in the belief that tax revenue finances their spending, what they are really doing is inadvertently quelling the inflationary impact of their own spending, albeit they do it imperfectly on most occasions.

Many economists have difficulty accepting the idea that taxation serves to destroy private-sector spending power. I find this puzzling. Consult any macroeconomics textbook and you will always find a reference to taxation as an ‘automatic stabiliser’. Taxes tied to income and expenditure levels are labelled automatic stabilisers because, in boom times, tax ‘revenue’ rises, whilst in a recession, tax ‘revenue’ diminishes. This helps to automatically smooth out or stabilise the boom-bust business cycle. But stabilisation is not achieved because of any rise and fall in central-government revenue, but because, in boom times, taxes destroy more private-sector spending power than in a recession.

Some economists respond by saying that the extra tax ‘revenue’ accumulated during boom times provides the central government with the financial wherewithal to increase spending during a recession without the need to boost taxation levels. In other words, it is the fiscal capacity to spend countercyclically that underpins the stabilisation role of taxation. This isn’t so. To begin with, the additional tax ‘revenue’ raised during boom times is no real increase in revenue at all, since it does not augment a central government’s spending power. Secondly, the ability to increase spending without having to raise taxes during a recession indicates that, with private-sector spending weak, the level of taxation required to quell the inflationary impact of central-government spending is much less than in boom times.

4. Central-government budgets and interest rates

Mainstream models of money markets are based on the assumption that interest rates are a function of interacting money supply and money demand forces. In such models, it is assumed that individuals have the option of possessing two kinds of financial assets – bonds offered for sale by the central government or non-interest bearing cash. It is further assumed that bonds yield a fixed annual payment and that the effective interest rate on bonds is inversely related to their purchase price. For example, if a bond yielding a \$100 annual

payment is priced at \$1,000, the effective interest rate on the bond is 10% per annum. If the same bond is later sold for \$2,000, the effective interest rate falls to 5% per annum.

Clearly, the lower is the price of bonds (i.e., the higher is the effective interest rate), the greater is the opportunity cost of holding non-interest bearing cash. Thus, *ceteris paribus*, as the effective interest rate on bonds rises, the quantity of money or cash demanded declines. With this in mind, mainstream economists claim that if a central bank purchases government bonds from the private sector to increase the money supply, the equilibrium interest rate will fall. This is because, at the previous interest rate, the larger money supply will exceed the demand for money. In order for both to equate, the demand for money must rise. For this to occur, the effective interest rate on bonds must decline, which it does as the central-government purchase of bonds increases bond prices.

It is from this view of interest rate determination that mainstream economists argue that central-government deficits place upward pressure on interest rates. They contend that central-government spending in excess of taxation requires the central government to sell bonds to 'finance' the budget shortfall. With the money supply unchanged (money injection equals money extraction) and the private-sector's transaction demand for money now greater, it is contended that the interest rate must rise until the demand for money and the money supply again equilibrate. At the going equilibrium price level, this reduces or 'crowds out' private-sector investment, thus resulting in a smaller increase in aggregate spending than that initially undertaken by the central government. Provided the equilibrium national output is less than the potential output level, national output rises. But, in doing so, the price level increases, thereby reducing the real money supply. This leads to a further increase in the interest rate, a further crowding out of private-sector investment, and a decline in the equilibrium national output level. Overall, the increase in national output is much less than the initial boost in central-government spending. With the central government's future capacity to spend supposedly undermined by the need to repay a larger public debt, many mainstream economists question the social benefit of deficit-spending in all but exceptional circumstances.

The most significant problem with this mainstream reasoning is that it omits the most influential interest rate variable and the operating factors affecting it. The critical variable is the short-term interest rate or the interest rate charged on funds loaned overnight – often referred to as the overnight cash rate.⁷ That the overnight cash rate is the most influential interest rate variable is evidenced by the fact that, when conducting monetary policy on behalf

of central governments, almost all central banks seek to maintain a specifically targeted cash rate. Central banks do not target bond prices, which is what we would expect if the bond price constituted the most important determinant of interest rates.

How, then, does a central-government budget deficit affect the overnight cash rate? Before this question can be answered, a few details need to be outlined. Firstly, the cash rate is not set in stone by a central bank. The cash rate always remains free to rise and fall as per changing market forces. Thus, to keep the cash rate at the target level, a central bank must manipulate market forces by engaging in open market operations (i.e., the buying and selling of government securities).

Secondly, in addition to setting an overnight cash rate, the central bank also sets a support rate which it pays on commercial bank reserves held with the central bank. In many countries, the support or default rate on surplus funds is something less than the overnight rate. For example, the Reserve Bank of Australia pays a default rate equal to 0.25% less than the target cash rate. In some countries, however, the default rate is zero, meaning that any funds left overnight with the central bank earn no interest income. Importantly, the default rate serves as the interest rate floor for the entire economy.

Thirdly, because a budget deficit involves an injection of more spending power than that destroyed by taxation, a budget deficit involves a net injection of spending power into the national economy. A budget deficit ultimately manifests itself as excess reserves in the clearing balances of a nation's commercial banks at the central bank (Mitchell and Muysken, 2008).

Given the above, and since commercial banks are profit-seeking entities, commercial banks will endeavour to offload excess funds at market rates rather than earn interest income at the lower default rate. Competition between the banks to offload excess funds exerts downward pressure on the overnight cash rate. Since the overnight cash rate is the most influential interest rate variable, and given that a central government's fiscal stance has the greatest impact on the nation's cash rate, it is abundantly clear that budget deficits exert downward pressure on interest rates. This is precisely opposite to conventional wisdom, and is in part evidenced by a cash rate in the USA that is only marginally above 0% at present despite the US Federal Government running the largest budget deficits as a percentage of GDP since World War 2 (Fullwiler and Wray, 2010).

Of course, this still leaves open the question as to how a central bank defends the target cash rate when the central government operates a budget deficit. It does so by draining excess

liquidity (excess reserves), which it accomplishes by selling government bonds. Hence, rather than financing a budget shortfall, the sale of government securities serves to maintain the target cash rate when the central government is operating a budget deficit.⁸

Importantly, the funds used to purchase the government securities come from the net government spending accompanying the central government's budget deficit (Nugent, 2003). Consequently, any notion that increased central-government spending leads to a rationing of finite savings that would otherwise be used for private-sector investment purposes (e.g., DeLong, 2002) is false. This, along with the fact that budgets deficits do not lead to higher interest rates, indicates that budgets deficits do not crowd out private-sector investment.

It is true that undesirable inflationary pressures induced by taxation levels insufficient to quell the inflationary impact of a central government's own spending can force a central bank to reduce private-sector demand, which it can do by raising the target cash rate. However, this would constitute an artificial rise in interest rates, since the natural pressure on the cash rate would still be downward. It would also constitute an example of excessive government spending, the possibility of which I referred to earlier. It would not be a case of budget deficits *per se* exerting upward pressure on interest rates. Given, therefore, the lack of inflationary pressure and a cash rate of little more than 0% in the USA, it is clear that the huge budget deficits currently being operated by the US Federal Government are in no way excessive or 'irresponsible'.

5. Central-government budgets, private-sector net savings, and international trade

To further investigate the role and implications of a central-government budget, the macroeconomy can be divided into two main sectors – a consolidated central-government sector, which includes the central government, the central bank, and treasury; and a consolidated non-central government sector, which includes the domestic private sector and the foreign sector.⁹ This division of sectors is represented by the following accounting identity found in every macroeconomics textbook:

$$(G - T) = (S - I) - (X - M) \tag{1}$$

where G = central-government spending; T = central-government taxation; S = private-sector savings; I = private-sector investment; X = exports; and M = imports.

Importantly, the consolidated private sector depicted in the right-hand side of equation (1) must equal the central-government budget position depicted in the left-hand side of the equation. If we assume that net exports ($X - M$) equal zero, net private savings must equal the central-government budget. Hence, irrespective of the private sector's net savings desires, a central-government deficit would, under these circumstances, translate dollar-for-dollar into a rise in net private savings. Conversely, a central-government surplus would translate into a decline in net private savings. The reason for this is simple – only a currency-issuing central government can create net financial assets, which it can only do via deficit-spending (Mitchell and Muysken, 2008). The same also holds for the destructive impact of a budget surplus on net financial assets. Private-sector financial institutions can also create financial assets, but they are always matched by an equal and offsetting financial liability. No net financial assets can ever be created or destroyed by the private sector.

In reality, net exports are unlikely to be zero. Consequently, a central-government deficit will not always translate into positive net private savings, let alone into net private savings on a dollar-for-dollar basis. Depending on the size of, and sign on, net exports, it is quite conceivable for net private savings to be positive when a central government is operating a budget surplus.¹⁰ However, for this to continue, it is necessary for net exports to remain positive. This is all well and good except that it involves the citizens of a nation having to relinquish more useful products to foreigners than vice versa to obtain the additional financial assets desired.¹¹ Moreover, it relies on foreign governments continuously running budget deficits or foreigners going increasingly into debt to finance their import spending.¹² Whilst the former is sustainable, the latter is not. Furthermore, the desire of foreigners to run down their net savings can suddenly halt, as can the desire of foreign governments to keep running budget deficits. In addition, exported products constitute the goods and resources that an exporting nation could have otherwise consumed or utilised itself. Thus, maintaining net private savings when the central government is operating a budget surplus comes at a significant opportunity cost.

Many economists would respond by saying that a nation that exports more than it imports would not be rendering itself worse off because it is the utility associated with the goods being traded that matters. Presumably, the utility gained from consuming the goods being imported is greater than the utility foregone from having exported useful goods. If not, the economic welfare enjoyed by a net-exporting nation would decline and international trade would, in this case, be a pointless exercise.

Unfortunately, matters related to international trade are rarely straightforward. To begin with, international trade is conducted by individual persons and organisations, not nations, who, by exporting, may forego some utility in the present to maintain net savings that can be used to purchase goods and services in the future. In this sense, the foregone utility in the present represents the cost that individuals are willing to incur to accommodate their net savings desires. Of course, there is a limit to how far individuals will go when doing this – they will only incur the cost (foregone present benefits) if it remains lower than the present value of the benefits of any future consumption financed by the current savings. Moreover, it is a cost that could be avoided if the central government was prepared to run a budget deficit sufficient in magnitude to accommodate the private-sector's net savings desires.

How does a central government circumvent this cost when its spending involves the private-sector transfer of something real to the central government – i.e., the handing over to the central government of natural resources or final goods and services or the offering of labour and capital? It does so by returning, often freely, the real stuff under its control in the form of useful goods and services. Thus, unlike exporting, real stuff is not transferred to and enjoyed by foreigners. Consequently, a nation's citizens are not required to forego some utility in the present to have their net savings desires accommodated.¹³

This raises the question as to whether it is worthwhile at all for a nation to net export. I will not go into the full details here, but it is my contention that net-exporting (mercantilism) makes little sense when a nation's central government, armed with unlimited spending power, cannot only match the net-import spending of foreigners, but can direct its spending in such a way as to freely distribute much-needed goods to the nation's poorest citizens. A case in point is China. For all its massive GDP growth of late, its citizens consume a smaller-than-usual proportion of the nation's real output.¹⁴ Why would the Chinese Government want poor Chinese workers employed in the production of plasma-screen televisions for the benefit of rich-country consumers when these workers could be put to use by the Chinese Government to provide quality housing, food, education, and health facilities to a large number of needy Chinese citizens?¹⁵ In view of the low wages being paid to many Chinese workers engaged in China's export industries, a well-targeted spending programme by the Chinese Government aimed at replacing net-export spending would result in little if any loss of real GDP. Nor would it result in any loss of employment and productive capacity, which would be better catered to meet China's needs. In addition, the ability to accommodate the net savings desires

of Chinese citizens would not be compromised. In all, net-exporting is a defective means of furthering a nation's economic development.¹⁶

Secondly, the mutual benefits of international trade rest entirely on the presumption that international trade is governed by the principle of comparative advantage, which is itself premised on the immobility of capital and balanced trade. Find any macroeconomics textbook and it will explain how two nations can be rendered better off by trading in goods and services where they respectively enjoy a comparative advantage. By comparative advantage, economists mean the competitive advantage enjoyed by a nation in terms of the *relative* rather than absolute cost of production. Almost without exception, a nation with an absolute cost advantage over another in the production of *all* goods and services will only enjoy a comparative cost advantage over the same nation in the production of *some* goods and services. Because of this, countries are encouraged by economists to specialise in the production of goods and services where they enjoy a comparative advantage and exchange some of them for goods and services where they have a comparative disadvantage.

What is often overlooked with this argument is that the capacity of nations to exploit the benefits of comparative advantage depends on the inability of capitalists to readily relocate capital across international borders. If capital is highly mobile, capitalists are incentivised to shift their capital to low-cost production sites, where, instead, international trade is governed by the principle of absolute advantage (Daly and Cobb, 1989; Ekins et al. 1994; Daly, 1996; Lawn, 2007).¹⁷ This latter scenario is exactly what occurs at present and is the defining feature of globalisation – the integration of many national economies into a single global economy through free trade and free capital mobility (Daly, 2007). This stands in direct contrast to internationalisation – which largely existed up to 1971 – where national economies not only existed as separate and autonomous entities tied together in recognition of the importance of international trade, treaties, and alliances, but where people residing within nations were viewed as a community of citizens rather than a collection of individual consumers, and where the mobility of capital was considerably limited. As a consequence of the latter condition, international trade was essentially governed by the more desirable principle of comparative advantage.

In a world economy that has become progressively globalised over the past three to four decades, firms in rich countries have increasingly relocated their operations off-shore to exploit the cheaper natural resources and lower labour and environmental compliance costs in poor nations – a shift known as ‘industrial flight’. It is the threat of industrial flight that often

forces governments to introduce inadequate regulations, avoid them altogether, or weaken those already in existence. A good example is climate change, where there is considerable concern about the potential impact that a carbon price could have on local industries.

Many ecological economists believe that the forces of globalisation are leading to a global ‘race to the bottom’, which is manifesting itself in the form of downward pressure on wages, conditions of employment, and environmental standards, and which is allowing and indeed compelling many corporations to exploit profit opportunities that are often detrimental to the new host country and its trading partners. Ecological economists have therefore called for urgent institutional reform at the international level – in particular, reform of the World Bank, International Monetary Fund (IMF), and World Trade Organisation (WTO). They believe that reforms should be aimed, firstly, at limiting the mobility of international capital to the extent needed to ensure balanced trade, which would restore comparative advantage as the principle governing international trade. Secondly, they believe that nations should be able to levy green tariffs, subject to WTO approval, which would prevent corporations from obtaining a competitive advantage by operating in countries that permit the over-exploitation and unsustainable use of natural resources (Daly, 1996, 2007; Lawn, 2007).

With regards to limiting the mobility of international capital, a so-called IMPEX system of exchange rate management has recently been proposed (Iggulden, 1996; Lawn, 2007). Without going into any great detail, the IMPEX system would be overseen by a revamped IMF. Each participating nation would have its own IMPEX facility that would operate independently and be managed as a sub-branch of its central bank. All international transactions in and out of a country would pass through its IMPEX facility. Exporters would be required to exchange the foreign currency they earn into domestic IMPEX dollars that would only come into existence as a consequence of the exportation of goods and services.¹⁸ Exporters would then be free to exchange the IMPEX dollars into the domestic currency. The domestic IMPEX dollars would subsequently be available to would-be importers who would be compelled to purchase IMPEX dollars to obtain the foreign currency needed to purchase foreign goods. Domestic IMPEX dollars would not be available to foreign nationals. Should exports be high in a particular country and the demand for imports initially low, the price of the nation’s IMPEX dollars would fall, thus making imports increasingly attractive. Clearly, the price of IMPEX dollars in each country would fluctuate. So, too, would the exchange rates between different currencies, for as much as the IMPEX system would guarantee that a nation’s total trade is balanced (i.e., importing would not be possible

until IMPEX dollars became available via the exportation of goods and services), differing relative strengths of nations and the nature of goods and services traded would lead to trade imbalances between individual nations. This, in turn, would lead to the continuous market adjustment of exchange rates.¹⁹

Importantly, the IMPEX system would not regulate the total level of exporting and importing of a particular nation. However, because it would guarantee that a nation's total trade is balanced, then, as per equation (1), a central-government deficit would be required to enable the private sector to increase its net savings. A central-government surplus would, on the other hand, reduce net savings.

6. The implications of modern monetary theory

In what follows, some of the implications of modern monetary theory will be outlined and discussed. The failure to understand the fundamentals of modern monetary theory, particularly as they relate to many key areas of concern, has led most mainstream economists to underestimate the role that central governments can play in achieving society's goals – in particular, the three goals of ecological sustainability, distributional equity, and allocative efficiency which must be simultaneously resolved to achieve the broader goal of sustainable development. I would like to think that the following section can help to overturn this false underestimation.

6.1 The macroallocation of resources

The allocation of resources refers to the relative division of the incoming resource flow to the production and provision of various goods and services. In a strict welfare-related sense, the allocation of resources is efficient if it maximises the economic welfare enjoyed from all new goods produced and eventually consumed. In mainstream parlance, the allocation of resources is viewed from a microeconomic perspective – namely, how much of what particular resources should be allocated to produce various quantities of goods X, Y, Z, etc. In recent times, ecological economists believe it is also necessary to view the allocation of resources from a macroeconomic perspective (Daly and Farley, 2004). By this, ecological economists mean that it is important to consider what proportion of the incoming resource flow should be allocated to the public-sector provision of goods and services *vis-à-vis* the private sector.

There is a very good reason for this macroeconomic perspective. A great majority of the goods and services provided by the public sector are infrastructural goods that are needed to

maintain a nation's productive capacity. Many of these goods have public goods characteristics. In addition, as explained earlier, most net-exporting countries would be better off by having their central governments match the net-export spending of foreigners to not only prevent the net loss of real resources from their shores, but to direct these resources to useful domestic purposes. Overall, while the efficient allocation of resources to the private sector can be largely left to market forces, the macroeconomic division of the incoming resource flow to the private and public sectors must be made through political and democratic processes.

There are a number of factors that bias against a desirable macroallocation of resources. One of these factors is the neo-liberal position that individuals are better placed than governments to determine what goods they want.²⁰ It is based on the false view that central-government expenditure involves the spending of tax-payers' money – money that individuals would have otherwise spent themselves. Whilst it is true that taxation destroys private spending power, the 'money' spent by central governments is not tax-payers' money. Tax payers do not, it must be stressed, fund any central-government spending.

There is little doubt that individuals are better placed to know what goods they want than governments, although it is interesting that anti-government protagonists rarely question the influence of private-sector advertising on people's desires. Nevertheless, what individuals want will always include a mixture of private and public goods. Hence, many individuals will be more than happy to have some of their spending power destroyed, and thus forego trivial private goods, to allow central governments to provide much-wanted public goods in a non-inflationary manner. This said, neo-liberals have been very successful at convincing people that spending power is best served in their hands; that government spending crowds out private-sector investment; and that the public sector is a less-efficient provider of goods and services than the private sector, even though the latter has yet to be conclusively demonstrated (Bishop and Thompson, 1992; Brown, 1996; Martin and Parker, 1997; Estache and Rossi, 2002; Hall and Lobina, 2005). In keeping with their 'small government is best' philosophy, neo-liberals have been equally successful in persuading central governments to privatise public assets, to opt for lower tax rates instead of higher government spending as a means of implementing an expansionary fiscal policy, and, whenever budget surpluses occur, to pass some of them on in the form of tax cuts.

Only infrequently do textbooks make mention of the possible implications that variations in fiscal policy settings can have on a nation's economy. Yet it is unquestionably true that

government spending and taxation have vastly different macroeconomic effects. Fiscal expansion via tax cuts or the issuing of stimulus cheques triggers a more immediate macroeconomic response than more direct increases in government spending, such as public works programmes, and is invariably a preferred means of responding to a severe GDP downturn (e.g., the recent response by The Australian Federal Government to the Global Financial Crisis). There are also suggestions that tax cuts have positive incentive effects that boost labour productivity.

Although increases in output generated by personal income tax cuts can stimulate private-sector investment in productive capital, particularly if the increase in output is viewed as a permanent change, there is a tendency for most of any increased output to involve the production of consumption goods. Conversely, increased central-government spending is invariably aimed at augmenting the nation's stock of infrastructural capital, which, while more lagged in terms of its immediate impact on national output levels, is often more beneficial in terms of boosting a nation's productive capacity. It is for this reason that some observers believe the recent preference for tax cuts over increased government spending has contributed in no small part to infrastructural bottle-necks. They also believe it has adversely affected the long-term productive capacity of many nations.

A greater detrimental influence on the macroallocation of resources has been the perceived notion that currency-issuing central governments are budget-constrained. Even when it is believed that central governments have a key role to play in providing and maintaining critical infrastructure and other public goods, there is the view that central governments are fiscally constrained in their capacity to do so. It is not uncommon to hear how wonderful it would be if central governments could spend more money of health, education, public transport, the arts, etc. if only they didn't have to balance the budget or restrict the deficit to a particular ratio to GDP. Of course, as argued, no such fiscal constraint exists. The real constraints on central governments are the scarcity of resources, the limits at any point in time of a nation's productive capacity, and the extent to which the public will tolerate the destruction of its spending power to enable central governments to perform their service-delivery function in a non-inflationary manner. Whilst the former limits are largely biophysical and technological, the latter is merely a social constraint played out in political institutions. Above all, decisions regarding the appropriate macroallocation of resources are essentially political, not financial.

6.2 Achieving full employment in a non-inflationary and ecologically sustainable manner

In the thirty-year period following World War 2, virtually all central governments used discretionary fiscal policy in an attempt to maintain full employment. As imperfect as the approach was, central governments largely achieved their objective by varying their spending to the levels estimated to bridge the gap between the actual and full-employment levels of national income. To perform this function, central governments almost continuously operated budget deficits. In general, budget surpluses only materialised as a consequence of the large 'tax revenues' automatically generated during boom times. I might add that this was achieved at a time (e.g., pre-1971) when central governments were subject to spending constraints that no longer exist. Except for EU nations, central governments are, at least from a fiscal perspective, better placed than ever to achieve and maintain full employment.

Unfortunately, the explicit goal of full employment was abandoned following the 'stagflation' episode experienced by most OECD countries during the 1970s.²¹ At the time, it was wrongly believed that persistent inflation was the consequence of demand-pull factors when the primary cause was cost-push factors (e.g., the 1973 and 1979 oil-price shocks and rapid real wage growth).²² Because it was surmised that lower government spending was needed to relieve the pressure on price-inflation, it was subsequently believed that central governments could no longer rely on discretionary fiscal policy to maintain full employment. This left the door open for the monetarists to convince governments that 'inflation targeting' was necessary to stabilise macroeconomic systems. According to the monetarists, inflation-control, if complemented by a range of microeconomic reforms, would restore investor and consumer confidence, increase resource use efficiency and labour productivity, boost national output, and reduce unemployment rates.

To control inflation, monetarists believed it was necessary to use monetary policy rather than fiscal policy settings, which began in earnest in the late-1970s as central governments, through the agency of central banks, valiantly strove to limit the growth of the money supply. The failure of this approach led central governments to refocus their monetary policy efforts towards the manipulation of interest rates. This was seen as a more achievable goal than money supply regulation, yet one that would still allow central banks to manipulate aggregate spending within the economy. To accomplish this, central banks have since employed open market operations to keep the rate of price-inflation within a desirable target band (2-3% per annum). In circumstances where aggregate spending is weak, central banks are expected to lower interest rates in order to boost demand, facilitate increases in national output, and lower

unemployment. Should, as intended, real GDP subsequently grow strongly for a period, central banks are expected to quell any emerging inflationary pressures by raising interest rates. Apart from reacting to variations in the inflation rate and other inflation-related signals (e.g., wages growth), the extent and direction of interest rate changes has depended largely on where the official unemployment rate stands in relation to the *non-accelerating inflation rate of unemployment* or NAIRU. The NAIRU represents the point at which further reductions in the unemployment rate causes the rate of price-inflation to rise above the upper end of the desirable target band. Once the official unemployment rate falls to the NAIRU, central banks are quick to tighten monetary policy settings to prevent the emergence of undesirable inflationary pressures.

Although unemployment and inflation rates have generally been lower than that experienced during the 1970s period of stagflation, the monetarist approach has failed to achieve and maintain full employment. Indeed, full employment has not existed in the industrialised world since the early-1970s.²³ There have, nonetheless, been many false claims that full employment has been achieved at various stages over the past two decades. For example, just prior to the recent Global Financial Crisis, many economists and senior bureaucrats claimed that Australia's official unemployment rate of around 4% effectively amounted to full employment (*The Australian*, 9 and 16 August, 2007). This assertion was false. At the time, there were around 470,000 unemployed Australians and a further 400,000 Australians whom were underemployed (ABS, 6202.0). By also taking account of hidden unemployment, the Centre of Full Employment and Equity estimated that the true unemployment rate at this time – that is, the percentage of the labour force that would have been unemployed if all employed people were working the number of hours they desired – was approximately 8.9% (CLMI, 2010). Australia might well have been suffering from a skills shortage, as it continues to do, but it was certainly not suffering from a shortage of willing labour. The poor matching of the supply and demand for labour skills in Australia – often the result of inadequate or misdirected training and education resources²⁴ – has meant that the NAIRU has been much higher than necessary, thus leaving even more people on the unemployment scrap-heap.²⁵

As for inflation-control, I believe that the 'success' achieved over recent decades can be largely attributed to lower cost-push pressures aided by a significant shift in global manufacturing to low-wage nations and suppressed resource prices arising from the failure of governments to ensure resource prices reflect the full cost of resource use. A lack of properly

developed pollution markets has also kept the cost of production artificially low. Whilst the shift in global manufacturing has disadvantaged many low-wage labourers in the industrialised world, and has been less beneficial to Third-World labour than is widely claimed, suppressed resource prices and the associated over-exploitation of natural capital assets has occurred to the detriment of future generations.²⁶ Thus, I believe inflation-control, as practiced in recent decades, has been realised at considerable and needless expense.

Modern monetary theorists believe that the failure of monetarism to generate full employment should be of no surprise given that its NAIRU focus inevitably results in a sacrificial pool of unemployed labour. Monetarists disagree by claiming that the NAIRU is a 'natural' unemployment rate whereby any unemployment at the NAIRU is either frictional or voluntary (Brown, 1988). According to modern monetary theorists, the major shortcoming of the monetarists' argument is the assumption that labour-market clearances always lead to full employment. Mismatches of the supply and demand for labour skills aside, it is generally argued that unemployment exists either because: (a) an institutional constraint prevents the real wage from falling to the market clearing rate; or (b) the gap between dole payments and market-clearing low wages is sufficiently small to provide low-wage workers with an incentive to permanently withdraw their labour – that is, to voluntarily remain unemployed and claim unemployment benefits. If unemployment is due to (b), it is argued that the generosity of welfare payments should be reduced and the qualifying test for the receipt of unemployment benefits should be tightened. If unemployment is due to (a), the conventional solution is to deregulate labour markets to facilitate their smooth and rapid clearance. However, as modern monetary theorists explain, the proposed solutions to (a) and (b) ignore the link between labour markets and product markets (Wray, 1998; Mitchell and Mosler, 2002; Mitchell and Muysken, 2006, 2008). It is merely assumed that employers are always willing and able to employ someone as long as the real wage is no greater than the marginal product of labour. Yet employing more labour is only worthwhile if the additional output generated can be sold in product markets.

As we have seen, if a tax-paying private sector desires to net save, and the central government runs a budget surplus, then unless net exports are sufficiently large, aggregate demand will be insufficient to ensure all output is sold. In these circumstances, the sale of all the output produced by a fully-employed economy can only eventuate if the central government engages in deficit-spending. In Australia's case, where it runs a perennial current

account deficit, full employment is clearly unachievable unless the Federal Government runs a budget deficit.²⁷

An examination of Australia's actual and full-employment levels of GDP shows that, since the mid-1970s, a continuous unemployment gap has existed (Mitchell and Muysken, 2008).²⁸ In the twenty years prior to the mid-1970s, when something approaching full employment was the norm, this gap effectively did not exist. The same can be said of most industrialised countries.

Many a debate has taken place to explain the existence and magnitude of the unemployment gap. Whilst it is true that factors other central-government spending have played their part, the indisputable fact is that insufficient spending has been the most critical. Since we would expect the private sector to want to maintain positive net savings, and given that Australia has been a persistent net-importer over recent decades, it is abundantly clear that Australia's failure to achieve and maintain full employment can be put down to the unwillingness of successive Federal Governments to maintain budget deficits over the business cycle.

Monetarists are likely to respond by arguing that a central-government deficit designed to lower the unemployment rate below the NAIRU would lead to excessive price-inflation and unacceptably high interest rates. To prevent this from occurring, and to provide support for deficit-spending, a number of modern monetary theorists have ingeniously developed the concept of a Job Guarantee – an employer-of-last-resort policy which differs significantly to the traditional Keynesian pump-priming exercises of the 1950s and 1960s (Wray, 1998; Forstater, 2000, 2002; Mitchell and Mosler, 2001; Michell and Watts, 2002; Mitchell and Muysken, 2008).

If introduced, the Job Guarantee would provide all unemployed people with jobs primarily designed to produce goods and services with public goods characteristics. All Job Guarantee workers would receive a minimum living wage. Apart from assisting central governments to achieve a Rawlsian-like equity goal, a minimum living wage would: (a) set a wage floor for the entire economy, and (b) circumvent any competition for labour with the private sector that would otherwise drive up wages and be cost-push inflationary.

Because not all unemployed people want full-time work, a Job Guarantee programme would include fractional jobs. Also provided would be training and work flexibility. This would induce private-sector employers to do likewise, thereby allowing governments to simplify existing industrial relations regulations. The consequent increase in labour market

flexibility would promote job sharing, which would reduce the need for central governments to facilitate increases in real GDP to achieve full employment.

The beauty of the Job Guarantee is that it employs a NAIRU-like approach to prevent any runaway episodes of demand-pull inflation. How? Let's assume that the additional aggregate spending required to institute the Job Guarantee begins to exert some demand-pull inflationary pressure. If the pressure exerted is moderate, the central government may be required to reduce its spending elsewhere or raise taxes, but, by and large, it can simply allow the inflationary pressure to reduce private-sector spending. Although this would reduce private-sector employment across a range of wage levels, it would be matched by an increase in the number of people employed by the Job Guarantee at the minimum living wage, thereby enabling full employment to be maintained at a lower level of real GDP. The spillover of labour from the private sector to the Job Guarantee would continue until a non-inflationary ratio of Job Guarantee workers to conventional workers was reached, where upon the stabilisation of the inflation rate would arise as a consequence of the newly engaged Job Guarantee workers having less spending power than when previously employed at higher, private-sector wages. This non-inflationary ratio of Job Guarantee workers to conventional workers is referred to by Mitchell and Muysken (2008) as a 'non-accelerating inflation employment buffer ratio' or NAIBER. Unlike the strict NAIRU approach to inflation-control, the Job Guarantee does away with a sacrificial pool of unemployed labour, which is unnecessary, insidious, and unjust.

A further advantage of the Job Guarantee is that it is a more precise means of stabilising inflation. This is because the conventional NAIRU approach requires central bankers to estimate the NAIRU and then estimate the appropriate interest rate to achieve it. There is much guess-work involved. Conversely, with the Job Guarantee, there would be no need to estimate the NAIBER, nor any need to determine the level of spending required to achieve it. The NAIBER would simply fluctuate in accordance with variations in private-sector spending. Moreover, central-government spending on the Job Guarantee would automatically adjust as either more unemployed people entered Job Guarantee offices (increased government spending) or as more Job Guarantee workers took up growing private-sector job offers (decreased government spending). Indeed, the level of spending on the Job Guarantee would always adjust to the exact amount required to achieve a non-inflationary form of full employment – no more, no less. This would not only be superior to the NAIRU approach to

inflation-control, but would constitute a major advance over the imprecise pump-priming exercises of the Keynesian era.

As an ecological economist, I have been concerned about the ecological sustainability implications of the Job Guarantee. After all, if a nation is situated on an ecological precipice, a Job Guarantee would initially increase real GDP and tip a nation's economy into unsustainable territory.²⁹ At first blush, it would seem that the Job Guarantee is inconsistent with achieving ecological sustainability. This need not be the case. One of the policies recommended by ecological economists to achieve ecological sustainability is a comprehensive cap-auction-trade system to keep the rate of resource throughput within the ecosystem's sustainable carrying capacity (i.e., within the regenerative and waste assimilative capacities of the natural environment). Should such a policy be in place, it would be impossible for the demand stimulus generated by the Job Guarantee to translate into an unsustainable level of real GDP because the intensity of resource throughput required to produce the nation's real output would, as a consequence of the caps, be restricted to the maximum sustainable rate. Since the aim of the cap-auction-trade system is to compel resource buyers to purchase the limited number of resource-access permits periodically auctioned by a government authority, the demand stimulus would simply increase permit prices. This, in turn, would increase the cost of resource use, raise the cost of production, inflate goods prices, and lower real income. The fall in real income would deflate private-sector spending and reduce private-sector employment. With a Job Guarantee in place, the workers laid off in the private sector would obtain Job Guarantee occupations. Thus, even in circumstances where ecological limits render the stimulation of aggregate demand untenable, the Job Guarantee would always ration paid work to the extent required to achieve and maintain full employment (Lawn, 2009). Hence, the Job Guarantee would serve as an invaluable distributional device in an ecologically-constrained world.³⁰

6.3 Inflation-control and central-government budgets

Let's assume that a nation is generally a net importer and its private sector wishes to net save (e.g., Australia). As explained, a central-government budget deficit would be required to achieve and maintain full employment. Furthermore, if the full-employment outcome was achieved through the introduction of a Job Guarantee, it would be one consistent with an acceptable level of price-inflation. This leads to an important conclusion. Should undesirable inflationary pressures not arise until the nation's output reaches the full-employment level,

and should the full-employment level of national income necessitate deficit-spending on the part of the central government, then *the point at which no additional tax impost is required to nullify demand-pull inflationary pressures must be one that leaves the central-government budget in deficit.*

It is therefore instructive to consider the change in circumstances for a nation if, with a Job Guarantee in place and its income at the full-employment level, private-sector spending rises. The boost in private-sector spending would lead to new private-sector employment offers at above-minimum wages which would presumably be taken up by Job Guarantee workers. Central-government spending would consequently decline. As such, the point at which no further tax impost would be necessary to quell demand-pull inflationary pressures would coincide with a smaller central-government deficit. Thus, for people in the private sector who find budget deficits distasteful, the message is clear and simple – increase your spending.

6.4 Taxation as a policy instrument – Ecological tax reform (ETR)

From a macroeconomic perspective, we have seen that central-government taxation does not finance government spending but serves as an inflation-quelling device. Given the macroeconomic need to impose taxes, some economists believe that central governments should choose from the range of tax options available to achieve other policy goals. Taxes constitute a powerful policy instrument because, as a means of destroying private-sector spending power, they can be used by governments to discourage undesirable activities or so-called ‘bads’.

It is becoming increasingly apparent that a large proportion of today’s most disconcerting bads are ecologically-related – a consequence of the open-access feature of the natural environment. At the same time, many desirable outcomes, such as the employment of willing labour, income generation, and the production of better quality goods are being discouraged by the over-taxing of labour, earned income, and value-adding in production. For this reason, many economists have long been calling for ecological tax reform (ETR), which essentially involves the imposition of taxes on resource depletion and pollution and a reduction in tax rates on labour and earned income (Daly, 1996; O’Riordan, 1997; Roodman, 1998; Hoerner and Bosquet, 2001; Schöb, 2005).

In most cases, ETR is promoted as a revenue-neutral means of achieving a range of environmental and social goals.³¹ In reality, the impact of ETR on tax revenue, or equivalently, on the amount of private-sector spending power destroyed, is unpredictable

since it depends on the success or otherwise of ETR measures. For example, if the decline in resource depletion and pollution induced by environmental taxes is greater than forecast, the amount of private-sector spending power destroyed would be less than expected. Hence, there would be a need for the central government to: (a) increase other tax rates if it wants to maintain revenue neutrality; or (b) reduce its spending, which, if a Job Guarantee is in place, would automatically occur as private-sector spending increased. That said, the lack of a central-government budget constraint means that tax-revenue neutrality is altogether irrelevant.

Ecological economists are comfortable with the idea that conventional ETR measures can have positive social and employment implications (Victor, 2008). As such, they believe that tax reductions on labour and earned income should remain an essential feature of any ETR package. They are, however, much less confident that the depletion/pollution tax element of a conventional ETR approach can bring about ecological sustainability (Daly, 1992, 2007; Lawn, 2007). These misgivings stem from the argument that sustainability is essentially a resource throughput problem, yet the beneficial function of market prices, and this includes tax-adjusted resource prices, is strictly confined to improving the efficiency with which a given rate of resource throughput is allocated to alternative product uses.

There is no doubt that a more efficient allocation of natural resources is socially desirable with obvious environmental benefits *per unit of economic activity*. The problem, according to ecological economists, is that any efficiency gains secured in an economic system devoid of an explicit limitation on the rate of resource throughput are likely to be overwhelmed by the scale effect of increased economic activity. Should this occur, the aggregate rate of resource throughput and any subsequent environmental stress increases rather than diminishes. This is often referred to as the ‘Jevons’ effect’ (Jevons, 1865; Blake, 2005).³² Because the conventional ETR approach does not involve an explicit limitation on the rate of resource throughput, ecological economists argue that conventional ETR measures cannot prevent the intensity of environmental stress from eventually exceeding the ecosystem’s carrying capacity.

To achieve ecological sustainability, ecological economists believe it is necessary for an ETR package to include a separate policy instrument in the form of quantitative throughput controls, which must be based on ecological rather than economic criteria (Daly, 1991; Lawn, 2000, 2007). Ecological economists are therefore in favour of tradeable resource use and pollution permits – essentially ‘cap-auction-trade’ systems – rather than direct depletion and pollution taxes.³³

How do cap-auction-trade systems successfully deal with the sustainability issue in a manner that depletion/pollution taxes cannot? As alluded to earlier, a restriction (cap) on the number of permits auctioned by a government authority limits the rate of resource throughput to one that is within the regenerative and waste assimilative capacities of the natural environment. This immediately resolves the sustainability goal.³⁴ In addition, the price paid by resource buyers and polluters for the limited number of permits, which is determined by demand and *constrained* supply forces in the various resource and pollution markets, serves as a throughput tax to facilitate the efficient allocation of the incoming resource flow.³⁵ As an added bonus, the private-sector spending power destroyed by the sale of permits allows a central government to reduce tax burdens on the poor, thus enabling it to redistribute spending power in an effort to resolve society's equity goals. All up, cap-auction-trade systems achieve everything that is likely to be generated by depletion and pollution taxes except they go one step further and ensure ecological sustainability.

One of the major criticisms of cap-auction-trade systems *vis-à-vis* depletion/pollution taxes is the belief that permit prices would fluctuate wildly, whereas taxes can be maintained at constant rates for as long as desired. Critics of cap-auction-trade systems argue that the former is not conducive to private-sector investment or the development and uptake of resource-saving and pollution-reducing technologies. A case in point is the growing preference for a carbon tax over an emissions-trading system to deal with climate change (e.g., Hansen, 2010).

I have a real problem with this criticism. Firstly, ecological sustainability demands quantity certainty and this, as argued, cannot be achieved with taxes. Secondly, the efficient allocation of a sustainable resource flow demands price flexibility which, again, cannot be achieved with taxes. Both are facilitated by cap-auction-trade systems. Finally, robust investment is not dependent upon stable prices. Investment decisions in most industries are based on projected price trends, not on day-to-day price fluctuations. In any case, should permit prices fluctuate violently in the short-term, the variation in the destruction of private-sector spending power is automatically dealt with by a Job Guarantee.

Consider, then, the introduction of an emissions-trading system where a government authority announces that it will progressively tighten the emissions cap and where it has been estimated that the total demand for permits is likely to remain steady. Despite possible short-term fluctuations, the price of permits would generally rise over time, which would gradually increase the cost of polluting. This would induce investment in pollution-reducing measures

and increase the efficiency with which a sustainable rate of resource throughput – guaranteed by the cap – is allocated. All other arguments against cap-auction-trade systems, such as logistical complexity, vulnerability to corruption, and measurement and monitoring difficulties apply equally to tax systems.

I mentioned that there is a tendency for central governments to over-tax earned income. It is my belief that ‘unearned’ income should not only be taxed, but, where feasible, should be completely confiscated. Unearned income usually exists in the form of an economic rent, which constitutes the difference between the payment received for the sale of natural resources, labour, capital, or final goods and services and the minimum payment required for each to be supplied in the market. Retention of economic rents is unjust and contributes to the inequitable distribution of income and wealth. What’s more, economic rents fuel destabilising asset-price bubbles and encourage unproductive forms of investment.

Economic rents invariably have a scarcity-related foundation, which is why they often apply to natural resources and certain forms of labour. Economic rents associated with natural resources can be captured by the cap-auction-trade systems previously outlined. As for labour, ecological economists believe that maximum income limits should be introduced on the basis that any income received above a certain level is equivalent to an economic rent.³⁶ They suggest that the maximum should be set at the salary of the Prime Minister or President of most Western democracies or at a reasonable order-of-magnitude difference above the minimum wage (Pizzigati, 1992; Daly, 1996).³⁷

Some observers stress that maximum income limits stifle effort and incentive. There is no reason for this. Provided maximum income limits exist at the point where economic rents emerge, there ought to be no disincentive effect since the continued supply of a production factor, once the minimum supply price has been received, is the defining condition of an economic rent. Should the setting of a maximum income limit lead to the widespread withdrawal of labour or any other factor of production, it simply indicates that the limit is too low and should be adjusted upwards.

6.5 Controlling inflation at the margin – via changes in interest rates, taxation, or government spending?

It should now be evident that there are three main ways that a central government can quell demand-pull inflationary pressures. It can: (a) call upon the central bank to manipulate

interest rates on its behalf; (b) alter the tax impost on the private sector (i.e., alter the amount of private-sector spending power it destroys); and/or (c) vary its own spending.³⁸

Which of these should be used to precisely control inflation at the margin? Let's consider each more closely, starting with interest rates. It has already been pointed out that interest rate modifications, via changes in monetary policy settings, are a very imprecise means of controlling inflation. Apart from having to estimate the appropriate interest rate and its impact on private-sector spending, the impact is often lagged and rarely consistent throughout the economy (i.e., some sectors are more sensitive to interest rate changes than others). In addition to this, some observers are critical of the indiscriminate way in which monetary policy affects private-sector spending power. Increases in the rates of foreclosure and bankruptcy that follow interest rate hikes serve as ample evidence that the burden of tight monetary policy settings is disproportionately borne by the most vulnerable members of society – namely, small-businesses owners and low-paid workers with home mortgages.

As for taxation, here, too, is a problem of imprecision. A central government must not only consider what taxes should be adjusted, but what the tax rate should be in each instance. Moreover, this must be considered in the knowledge that the amount of private-sector spending power ultimately destroyed by taxation is influenced by the automatic stabiliser effect of many taxes. Clearly, if a central government is relying upon taxation to precisely control inflation at the margin, it will have little option but to continuously adjust tax rates. Because the size and direction of the adjustments cannot be *a priori* known, it would be impossible to predict the impact of taxation policy on future market prices. Unlike a well-announced cap-auction-trade system, this would be highly destabilising. On the positive side, taxation is a more discriminate instrument than interest rate changes. Furthermore, as we have seen in relation to ecological tax reform, taxation can be targeted to achieve other policy objectives.

The pros and cons of controlling inflation through measured changes in central-government spending are similar to those applicable to taxation. On this occasion, a central government must determine what area of government spending should be altered and by how much. Although there is considerable discretion over what forms of government spending can be varied, the multiplier effect on private-sector spending is difficult to estimate. In addition, the inflation-controlling influence of a given change in government spending can differ depending upon its impact on individual markets. Where a rise or fall in central-government spending noticeably alters the demand for labour, capital, or natural resources in markets that

are already tight, the inflationary/deflationary influence of a change in government spending would be much greater than where such markets are loose.

With this in mind, if a nation's economy is in deep recession, an increase in government spending is unlikely to drastically tighten labour and capital markets because both types of markets would be respectively characterised by idle labour and underutilised capital. However, if the resource throughput needed to generate the depressed level of real GDP already exists at the maximum sustainable rate, and a comprehensive cap-auction-trade system is introduced to ensure ecological sustainability, an increase in central-government spending would almost certainly trigger an inflationary episode. What this indicates, but is often overlooked, is that the point where cost-push inflationary pressures are likely to emerge throughout the economy is largely determined by the most limiting factor of production, since it is the most limiting factor of production that determines a nation's 'sustainable' potential output level (Boulding, 1990).³⁹ The limiting factor will not always be the supply of willing labour, as is often assumed. This means that cost-push inflationary pressures can emerge well before real GDP reaches the full-employment level. Having said this, potential cost-push pressures are rarely reflected adequately by price signals, particularly when the limiting factor is the ecosphere's regenerative and waste assimilative capacities, because markets continue to understate the full cost of natural resource use and pollution.

Assuming there is government intervention to help markets better reflect pollution and resource use costs, it is still possible for changes in central-government spending to control inflation at the margin. However, the possibility depends upon the introduction of a self-adjusting mechanism like the Job Guarantee. As explained earlier, the Job Guarantee involves the hiring of labour at the minimum wage. If introduced, the Job Guarantee would circumvent any inflationary pressure that might emerge in labour markets. It is true that the Job Guarantee would not circumvent any inflation-inducing price rises that might emerge in natural resource and pollution markets. Nevertheless, any workers made redundant as a consequence of reduced private-sector spending caused by ensuing inflationary pressures would be redeployed by the Job Guarantee at the minimum wage. This would continue until the NAIBER was attained. Hence, the Job Guarantee would always ration paid employment *to the extent necessary to render labour the most limiting factor of production*. In other words, the Job Guarantee would always ensure that the nation's sustainable potential output level coincides with the full employment of labour.⁴⁰

What can one make of all of this? Firstly, if a nation's rate of resource throughput is well within ecological limits and its economy is in recession, traditional Keynesian pump-priming remains a functional means of boosting real GDP to something near the full-employment level. Secondly, marginal variations in Keynesian-like spending are unlikely to serve as a means of controlling inflation with any sense of precision. Having said this, interest rate changes and taxation adjustments are unlikely to do so either. Moreover, they do not guarantee full employment. Thirdly, central-government spending should generally reflect a desirable macro-allocation of resources and any need for additional spending during a deep recession. Fourthly, central-government taxation should not exceed the level required to nullify most of the inflationary pressure of central-government spending. Taxation should never be increased to 'balance the budget' and should always be imposed in ways that can achieve other policy goals. Fifthly, since interest rate changes are an imprecise and indiscriminate means of controlling inflation, the central bank's target cash rate should remain constant and be set at a rate that reflects the capacity of the nation's real wealth to sustainably generate a flow of real goods and services. This would ensure that financial claims on real goods and services do not outgrow the quantity of new goods and services made available for sale. It also means that the target cash rate should be somewhere between 1% and 2% (Lawn, forthcoming). Lastly, because of the automatic adjustment feature of the Job Guarantee, it would, if introduced, serve as the ideal means of controlling inflation at the margin. Hence, overall, it should be variations in central-government spending, via a Job Guarantee, which should be used as the prime inflation-controlling device, not interest rate changes or taxation.

6.6 The intergenerational debate

In more recent times, a debate has transpired over whether it will be possible for nations, like Australia, to sustainably and equitably meet the needs of an aging and growing population. As part of this so-called intergenerational debate, a widespread concern has emerged as to whether central governments will be able to cope with the expected rise in the pension bill and health and aged-care expenditures. Whilst the apprehension about the capacity of nations to meet the needs of an aging and growing population is legitimate, the budgetary concern is not. Unfortunately, the pre-occupation with the latter concern is putting at risk the capacity to deal adequately with the more pressing former concern.

To deal with the budgetary stress that many observers believe will emerge in the future, two policy solutions have been proposed. In the first instance, it has been widely recommended that central governments should operate and store away budget surpluses to provide the additional funds they will need in coming decades. Secondly, workers have been increasingly encouraged to direct some of their current income into superannuation schemes. Apart from enabling retirees to receive a retirement income in excess of the pension, the second policy has been promoted on the basis that it will reduce the future taxation demands on tomorrow's working population.

Despite the potential benefits that could arise from the first part of the second policy suggestion, both policy solutions are rooted on the false premise that the intergenerational dilemma is finance-based. Because a currency-issuing central government has no budget constraint, it always possesses the spending power required to accommodate the financing needs of an aging population. It therefore makes no sense for a central government to store away funds it can always create for itself at any time in the future.

In addition to this, it needs to be recognised that the future taxation demands on the working population are not necessarily reduced by the introduction of superannuation schemes. Indeed, if excessively generous, superannuation schemes can increase the future tax burden on the working population. To adequately explain this, we first need to understand why a central government must tax the working population to allow the needs of retirees to be adequately met. Consider the following hypothetical situation. We shall assume that:

- everyone aged 18 years and above (18+) is a member of the labour force;
- everyone under the age of 18 (0-17) is a dependent;
- every member of the labour force is fully employed and the productivity of an individual worker is not aged-related;
- the workforce receives, as income, the monetary value of all real output produced;
- the workforce, which constitutes the entire private sector, spends all its untaxed income on the new goods and services produced – hence, if the workforce is not taxed, it purchases all the goods and services available for sale and its net savings desires are zero;
- the workforce donates goods and services directly to dependents (i.e., working adults freely hand over goods and services to young, dependent, family members);
- there is no foreign sector;
- the central government neither spends nor taxes the private sector;

- the central government has issued the nation's currency at some previous point in time, which is now being used as a medium of exchange;
- banks have created additional 'money' in the form of demand deposits (financial assets) which are always matched by a financial liability (loans);
- 100% of the nation's spending is conducted by the private sector;
- over time, the population remains constant as does the ratio of under-18 to 18+ year-old citizens;
- there are no productivity increases over time;
- the same quantity of real output (real GDP) is produced over time;
- aggregate demand is also constant over time;
- there is minimal price inflation (2% per annum), which is deemed acceptable.

Some time in the future, the central government introduces a pension scheme for people aged 65 years and above. As a consequence:

- everyone aged 65 and above becomes a member of the non-working population;
- everyone below the age of 65 is either a member of the working population (18-64) or dependent upon the working population (0-17);
- the nation's real GDP declines because people aged 65+ no longer work;
- the workforce continues to receive the monetary value of all real output produced;
- the workforce also continues to spend its entire untaxed income on new goods and services produced – hence, its net savings desires remain at zero;
- the working population directly transfers some of the goods and services its purchases to dependents (people aged 0-17), but does not do the same for retirees;
- retirees depend upon a fortnightly pension received from the central government;
- there is no other central-government spending.

Because there are now more financial claims on goods and services than there are goods and services available for sale, the introduction of the pension scheme is potentially inflationary. To nullify the inflationary impact of retirees' spending, the central government must destroy some of the spending power of the working population, which it does by taxing them. The tax impost on the working population does not finance retirees' pension cheques, as is commonly believed, but provides the spending 'room' for retirees to purchase goods and

services in a non-inflationary manner. If the central government has been democratically elected to introduce the pension scheme, the tax impost on the working population effectively constitutes the political means by which the working population is compelled to ‘donate’ some of the goods and services it produces to retirees.

Believing that superannuation will reduce the tax impost on the working population, the central government introduces a compulsory superannuation scheme. As a consequence:

- the working population, which continues to receive the entire nation’s money income, is compelled to save a small proportion of its money income to fund its future retirement spending (superannuation);
- the remainder of its income is used to purchase goods and services;
- as for retirees, they no longer receive a fortnightly pension cheque – they instead receive a fortnightly ‘super’ cheque drawn from the savings built up over their working lives;
- the pension scheme is scrapped and there is no central-government spending;
- retirees, who do not contribute to the production of new goods and services, use their ‘super cheques’ to purchase some of the new goods and services produced by the working population.

Because the working population is now spending less than it could to build up its savings for retirement, some limited spending room is made available for retirees to purchase goods and services in a non-inflationary manner. Provided the aggregate value of the working population’s net savings (superannuation contributions) equals the aggregate value of retirees’ spending, there is no additional inflationary pressure in the economy. However, if the former exceeds the latter, there is unemployment and the central government must deficit-spend to return the economy to full employment. Conversely, if the latter exceeds the former, an unacceptable rate of price-inflation begins to emerge. To prevent this, the central government must provide some additional room to facilitate the non-inflationary spending of retirees. It does this by destroying some of the spending power of the working population, which it accomplishes by taxing them. This second case is important because it disproves the claim that superannuation eliminates all need for a central government to tax the working population to enable retirees to meet their spending requirements.

Let’s assume that all retirees receive a super cheque rather than a pension cheque. Whether the working population needs to be taxed and, if so, how much, depends on the following factors. The first is the ratio of retirees to the working population. *Ceteris paribus*, if this ratio

increases and the working population is already being taxed to nullify the inflationary impact of retirees' spending, the tax impost on the working population must be increased. There are two main influences on the ratio of retirees to the working population – one is the age structure of the population; the other is the average age of retirement. Should the average age of retirement and of the population generally both increase, the ratio will rise.

The second factor is the size of retirees' fortnightly super cheques relative to the working population's fortnightly superannuation contributions. If the former increases relative to the latter, insufficient spending room will be available via the forced net savings of the working population to permit the non-inflationary spending of retirees. Once again, the tax impost on the working population must be increased.

The third major factor is a nation's sustainable productive capacity. Clearly, if this capacity rises, the working population is able to produce more goods and services for itself, its dependents, and retirees. Consequently, less spending room must be created to nullify the inflationary impact of a given level of retirees' spending. As such, the tax impost on the working population can be reduced.

Some people believe the first factor can be averted by increasing the birthrate or by raising the minimum retirement age. However, increasing the birthrate merely postpones the problem. Worse still, it leads to a growing population which, by placing greater stress on the natural environment, reduces a nation's sustainable productive capacity. Increasing the retirement age can help but this raises the issue of whether people should be forced to work later into their lives. Many see such a proposal as a sign of regress rather than progress.

Ultimately, it is the third factor which is most crucial. After all, living longer is considered desirable and so an aging population should be welcomed. Our attention must therefore focus on boosting a nation's sustainable productive capacity. To achieve this, it is necessary to maintain adequate investments in capital goods and critical infrastructure as well as improve the technology embodied within them. Appropriate investment levels are also required in the areas of education, training, and health – in particular, preventative health measures. Likewise, preservation and investment in natural capital is needed to maintain critical ecosystem services and a sustainable flow of natural resources into the economy. I might also add that achieving and maintaining full employment is also vital given the extent to which human capital can quickly depreciate when labour is left idle. Very importantly, all such investments need to be made both *now* and into the future. What's more, many of these investments need to be undertaken by central governments.

What are most central governments doing in this regard? Over the business cycle, they are running budget surpluses in the false belief they need to accumulate future spending power. Some central governments have been running large deficits, but virtually all of them have earmarked harsh austerity measures to reign in their ‘profligate’ spending. How do they plan to do this? By reducing their spending on capital goods, infrastructure, education, and natural capital maintenance, thereby undermining the future capacity of their nations to meet the requirements of an aging population.

In the end, the ability of a nation to meet the requirements of an aging population has no financial basis. It depends entirely upon its sustainable productive capacity – that is, on the ability of its workforce to utilise natural and produced capital to generate a sustainable flow of real goods and services. Achieving such a goal, which *will* minimise the future tax impost on the working population, requires sufficient on-going public-sector and private-sector investments. The only constraints to this are technological, biophysical, cultural/behavioural, and political. They are not financial.

7. Concluding remarks

In this paper, I have demonstrated that currency-issuing central governments have no budget constraint. Rather than fear central-government budget deficits, people should ignore mainstream and neo-liberal rhetoric and welcome the central-government use of its unique spending and taxing powers to achieve a range of social, economic, and environmental goals. Having said this, I am in no way recommending that governments should supplant the private sector when it comes to the production and supply of private goods in a competitive market environment. Indeed, as I have been at pains to emphasise, there is still such a thing as excessive and irresponsible government spending which central governments should at all times avoid. But I would argue that attempts to run budget surpluses, as mainstream economists advocate, generally lead to excessive and irresponsible levels of government taxation. Unfortunately, over the past thirty years, there has been more of the latter than the former.

Inappropriate fiscal policy, along with the degenerative forces of globalisation, has resulted in a massive running down of the productive capacity of many rich nations, which has left in its wake a welfare-dependent underclass and an inability of many nations to produce their way out of an economic recession. Whilst deep economic recession has been largely avoided over the past twenty years, it has been kept at bay by a private-sector debt-

fuelled consumption ‘binge’ subsidised and prolonged by the importation of cheap Third-World goods (produced by underpaid Third-World labour), over-inflated asset prices, and the expropriation of environmental source and sink capacity from future generations. The Global Financial Crisis and the problems confronting most rich nations are the outcome of economies having grown beyond their sustainable carrying capacity and a neo-liberal, monetarist experiment that has gone horribly and predictably wrong. Critical decisions need to be made very soon by central governments across the world. One of them should be the abandonment of monetarism and the responsible exploitation of their unique spending and taxing powers. As for EU countries, which have relinquished monopoly ownership of the national currency, the solution is a painful albeit necessary one. I don’t expect the EU to last into the foreseeable future.

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Endnotes

¹ Modern monetary theory is the term used to define and explain the workings of a monetary system characterised by a floating exchange rate and the monopoly provision by a central government of a fiat currency (Mitchell and Muysken, 2008).

² My spending power would only be limited by the raw materials, labour, capital, and final goods and services available for sale. In the context of this discussion, this is a trivial issue.

³ A couple of points. Firstly, this assumes that the central government is the monopoly owner and issuer of a fiat currency (i.e., a currency not converted into, say, gold, as was the case with the gold standard during the Bretton Woods era). Secondly, there must be a flexible exchange rate in place.

⁴ May I say, currency-issuing central governments do not 'print money' in order to spend. They sometimes issue cheques; however, in this computer age, they predominantly spend by electronically crediting bank accounts. Similarly, they electronically debit bank accounts when they tax the private sector. Currency-issuing central governments merely print and mint enough notes and coins to meet the cash transaction needs of the private sector. There is virtually no association between the quantity of cash within the economy and the size of a nation's money supply.

⁵ Again, the spending power of a currency-issuing central government is limited by the raw materials, labour, capital, and final goods and services available for sale from the private sector. In a democracy, the spending power of a currency-issuing central government is also politically limited. That is, the electorate can eject a currency-issuing central government that spends on a scale that the electorate finds distasteful.

⁶ Public goods are goods with two main characteristics: (a) the non-rivalry of consumption/use; and (b) the non-excludability of consumption/use. Public goods are goods that can be desired and demanded by society but, because of their characteristics, cannot be provided in sufficient quantities by the private sector (market failure).

⁷ Each country has a different term for the short-term interest rate. The overnight cash rate is an Australian term. In the USA, it is referred to as the Fed funds rate; in Japan, it is referred to as the overnight call rate.

⁸ Should the central bank have no cash rate target, it would simply not act. In these circumstances, the overnight cash rate would fall to the default rate. This is precisely what happened in Japan in the 1980s. Despite large central government deficits, interest rates in Japan effectively fell to zero, which was the default rate on excess reserves.

⁹ For ease of exposition, the spending and taxation of non-central governments are ignored. This leads to no loss of analytical insight.

¹⁰ For example, based on equation (1), it is possible to have $-10 = 10 - 20$ (i.e., budget surplus of 10; net savings of 10; and net exports of 20).

¹¹ Of course, these financial assets will be denominated in the foreign currencies acquired.

¹² This is logically determined by applying equation (1) for the rest-of-the-world, which, in the example given in footnote 10, would have net exports of -20. That is, either: $20 = 0 - (-20)$ (i.e., budget deficit of 20; net savings of 0), or $0 = -20 - (-20)$ (i.e., balanced budget; net savings of -20). Some other combination is also possible with net exports of -20, but it would still require either a budget deficit or negative net savings. With any other combination, the budget deficit or negative net savings is simply larger in magnitude (e.g., $30 = 10 - (-20)$ or $-10 = -30 - (-20)$).

¹³ This is true in aggregate rather than at the individual level. Through redistribution, some citizens will receive more goods and services from the central government than other citizens. Overall, it is possible for the goods and services received by a citizen from the central government – more likely a wealthy citizen – to be less than the quantity of goods and services foregone by having some of their spending power destroyed through taxation.

¹⁴ As at 2007, China's total consumption expenditure (public and private) constituted just 49% of its GDP. At the same time, the values for the USA and Australia were 87% and 75% respectively. Between 1970 and 2007, the lowest values for the USA and Australia were 79% and 69% respectively. As for China, its value of 49% in 2007 was fractionally higher than the lowest value achieved during the 1970-2007 period, which was 48% in 2006. The ratio of China's total consumption to GDP peaked at 73% in 1972. Data sourced from the World Bank (see <http://data.worldbank.org/indicator/NE.CON.GOV.ZS>).

¹⁵ As at 2005, 36% of the Chinese population earned less than \$US2 per day.

¹⁶ Some people would respond by saying that the increased production in China has occurred because of the vast foreign investment by transnational corporations. True, but the Chinese Government could always favour foreign investment by corporations producing goods and capital needed by China, which it could do by using its spending power to finance suitable tendering contracts. It could also provide low-interest or no-interest loans to Chinese entrepreneurs to establish new and much-needed Chinese enterprises. The source of the poverty data is the World Bank (see <http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS>).

¹⁷ Many observers continue to use the term 'comparative advantage' when referring to contemporary international trade issues and concerns. In the process, they reveal their ignorance, since they never argue that a country should continue to produce and perhaps export particular goods because it produces some of them at a lower *relative* cost than other nations. They always argue that a nation should only continue to produce particular goods if they produce them at a lower *absolute* cost. Hence, they talk in terms of absolute advantage but refer to it as comparative advantage. These observers need to revisit their textbooks.

¹⁸ Because one nation must import goods and services to enable another to export goods and services, if every nation introduced the IMPEX system, there would be no trade, since no nation could import prior to exporting. To overcome this potential stalemate, a small quantity of IMPEX dollars would need to be made available upfront by the respective IMPEX facilities in each participating country.

¹⁹ It has been suggested that the IMPEX system would reduce if not eliminate exchange rate variations arising out of currency speculation.

²⁰ I mean 'liberal' in the British and Australian tradition, which contrasts significantly from the American view of liberalism.

²¹ Stagflation consists of a persistently high inflation rate and unemployment rate – the latter of which is generally the product of sluggish GDP growth.

²² It was estimated that, in Australia in the 1970s, the real wage overhang (i.e., the extent to which real wages had outgrown the productivity of labour) was in the order of 5-10% (Norris, 1989).

²³ The only real exception was Japan in the late-1970s and early-1980s.

²⁴ The decline in Australia of trade-related apprenticeships, the ridding of technical high schools, and the blind desire of the Federal Government to increase university participation regardless of social requirements has also played a part in this mismatch. The mismatch is now being inadequately dealt with by a policy of issuing temporary work visas for suitably skilled foreigners.

²⁵ The NAIRU is higher because a shortage of labour with specific skills and qualifications leads to wage rises in some labour markets despite the existence of surplus and unwanted labour in other labour markets. The excess wage pressure leads to accelerated price inflation that, under present arrangements, demands a tight monetary policy response from the central bank.

²⁶ It is often claimed that globalisation has dragged many people in the Third World out of poverty. What is often overlooked is that this emergence from poverty merely refers to people whose incomes have risen above US\$2 per day. Whilst this is preferable to incomes below US\$2 per day, to enjoy higher incomes, many people must now endure longer working hours and poor working conditions. Moreover, to obtain employment, many people have been forced to uproot themselves from their communities. This has not only been socially disruptive, it has reduced the self-sufficiency of many rural communities. In numerous cases, the increase in output that has increased incomes has come at an enormous environmental cost – something that not only threatens the long-term viability of employment and associated incomes, but also the health of many people in so-called developing nations. The increased social and environmental cost of globalisation is rarely contrasted against the increase in Third-World wages and incomes. The image of the progress emanating from increased globalisation is therefore considerably distorted (see Lawn and Clarke, 2008).

To make matters worse, much of what is produced by Third World labour is eventually consumed in the First World, of which the latter is willing to pay reasonable prices to obtain. Although low-paid work in Third World countries is often low-skilled work, there is little doubt in my mind that Third World workers are being paid wages well below the marginal value product of their labour. Consequently, there is also no doubt in my mind that globalisation amounts to the Third World subsidisation of First World consumption and recent wealth accumulation and has played no small part in the 'relative' success of First World nations since the mid-1970s.

²⁷ This reasoning also helps one to understand why, in Australia, household debt reached monumental proportions during the previous Liberal-National Coalition Government's final term, and why the attainment of a low unemployment rate (though never full employment) was dependent upon the rise in household debt. At this time, the Coalition Government ran budget surpluses, the private sector obviously did not wish to rigidly maintain its net savings, and the current account was in deficit. Clearly, for Australia's national spending to be of the level required to keep unemployment low, the private sector had to go increasingly into debt, which was unsustainable. Interestingly, when the Rudd Labor Government issued stimulus cheques in the early stages of the Global Financial Crisis, it was estimated that quite a large proportion of the spending power issued was used by the private sector to reduce its debt. It did so, not only because it made sense to retire some of the debt accumulated during the reign of the Coalition Government, but because the deficit spending of the Rudd Government meant the private sector could now do so without having to drastically reduce its own spending.

²⁸ Computation of the unemployment gap is based on the achievement of a steady unemployment rate requiring real GDP to equal the sum of labour force expansion and the growth in labour productivity, *other things equal*.

²⁹ It is important to recognise that goods and services are not made *from* labour and capital, but *by* labour and capital. As the resource-transforming agents of the production process, labour and capital cannot produce anything without the prior input of natural resources (low-entropy matter-energy). Thus, any attempt to increase real GDP to boost employment levels must result in the use of more natural resources. Claims that services can be provided without having to increase resource use are false (see Daly, 2007; Lawn, 2009).

³⁰ Some observers would no doubt object to the idea of a portion of the labour force being 'forced' out of the private sector and into a lower-paid Job Guarantee occupation (i.e., the NAIBER would initially be higher than the NAIRU). This is a potentially undesirable aspect of the Job Guarantee. However, consider the following. Firstly, having some people employed on a lower income is more equitable than having a great deal more people permanently unemployed under a NAIRU policy stance. Secondly, the higher resource costs induced by a cap-auction-trade system would presumably: (a) stimulate the development and uptake of resource-saving technology; and (b) facilitate the allocation of the incoming resource flow to higher value-adding forms of production. In other words, higher resource costs would increase labour productivity over time. I believe this would result in the NAIBER being considerably lower than the NAIRU in the long-run, which is an undeniably better outcome on all fronts.

³¹ In modern monetary theory parlance, this would amount to being neutral in terms of its destruction of private-sector spending power.

³² There are many reasons why the Jevons' effect is likely to occur. They include: (a) thermodynamic limits to increased technical efficiency and materials recycling; (b) the fact that market prices only reflect the relative and not absolute scarcity of natural resources; and (c) currently-living people discount future values while, at the same time, future generations are unable to bid for resources in the present. For more, see (Daly, 1991; Lawn, 2007; 2010).

³³ A more detailed description of a system of tradeable permits can be found in Lawn (2007), Chapter 11.

³⁴ There is much more to achieving ecological sustainability than restricting the rate of resource throughput. Other requirements, such as maintaining adequate biodiversity levels, would also have to be met, although these will all be futile if the rate of throughput is unsustainable. Many of these additional requirements are outlined in Lawn (2007).

³⁵ It is the constraint on supply forces that ensures ecological limits, not just ecological costs, are internalised into resource prices.

³⁶ Income received above the maximum limit would be taxed at a 100% rate.

³⁷ Some have suggested that this order-of-magnitude difference should not exceed ten times the minimum income (e.g., Pizzigati, 1976), which is similar to the difference between the wages of CEOs and lowest-paid company employees in the 1950s.

³⁸ It is true that private-sector spending can be influenced by a changing exchange rate. However, exchange rates cannot be easily manipulated by central governments because exchange rates are heavily influenced by the speculative buying and selling of currencies on foreign-exchange markets. Also, the buying back of the domestic currency by selling foreign currencies is limited by the holdings of foreign-currency stocks.

³⁹ By 'sustainable' potential output level, I mean the maximum output level that a nation can potentially produce from the maximum sustainable rate of resource throughput.

⁴⁰ It should be noted that the more ecologically unsustainable is the current level of real GDP, the greater is the need to ration paid employment to achieve a non-inflationary form of full employment, which would mean having more people employed on the Job Guarantee.