Fiscal sustainability, economic instability and the solvency of non-governmental agents

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Chapter 1
Introduction

1.1 The link between fiscal sustainability, economic instability and the solvency of non-governmental agents

In several countries the public debt/GDP ratio showed the largest ever peacetime increase during the last 20 years of the twentieth century (Masson and Mussa 1995:4). According to numerous analysts, the continuous and increasing accumulation of debt has rendered fiscal policy unsustainable in many countries. The last two decades of the twentieth century also stands out for the marked slow-down in the economic growth rate of many countries, thus affecting the sustainability of their fiscal policies (Masson and Mussa 1995:13). Although the 1990s marked the longest post-WWII economic boom in the United States (US), the average growth rate during the boom was low. Godley (2000a) notes that the average growth rate in the US for the nine year-period since 1991 has been 3.7%, which is only 0.2% higher than the average for the post-WWII period. He further notes that there have been many nine-year periods since WWII with a higher average growth rate. The lower growth rate in many countries has slowed the growth in tax collections, which in turn has put upward pressure on the deficit and debt positions of these countries. To prevent continuous increases in their debt/GDP ratios, governments have had to curtail the level of government expenditure and the rate at which government expenditure grew. The failure, and some would argue inability, of several governments to curtail expenditure and expenditure growth has resulted in the accumulation of debt relative to GDP.

The period since 1980 also saw marked increases in interest rate levels (Masson and Mussa 1995:18). As governments also pay these interest rates on the securities they issue, interest expenditure relative to total government expenditure and GDP has increased in several countries. This put further pressure on the deficit and debt positions of governments. In addition, many analysts argue that one reason for the high interest rate level of this period is the excessive deficits and debt/GDP ratios of governments.

The question whether the higher interest rates were a result or primary cause of the higher deficits and debt gave rise to a major debate during the 1980s and 1990s (Ciocca and Nardozzi 1996:109; Easterly and Schmidt-Hebbel 1994:51; Tanzi and Lutz 1993:247; Smithin 1994a:164).

Towards the latter half of the 1990s several countries, including South Africa, initiated steps to check the increase in their public debt/GDP ratio and in so doing establish fiscal sustainability. Probably the most noticeable example of a government that took steps to check the increase in its debt/GDP ratio is the US government under President Bill Clinton (Friedman 2000:9-10; Elmendorf and Sheiner 2000:57,59). Aided by the long economic upswing of the 1990s, the Clinton administration reversed the upward trend of the public debt/GDP ratio following the deficit years of the Reagan and Bush administrations. Ironically, two Republican administrations allowed the accumulation of debt whereas a Democratic administration reversed the trend.

In accordance with the Maastricht treaty of 1992, member countries of the European Community (now the European Union) agreed to limit their public debt/GDP ratios to 60% and their budget deficit/GDP ratios to 3% before they could enter the single currency arrangement between member countries. However, they were not all equally successful in this endeavour.

Some developing countries also took steps to check the increase in their debt/GDP ratios. In South Africa, the incoming ANC government faced since 1994 the difficult task of stabilising the debt/GDP ratio. The new government soon experienced tension between its aims of stabilising the public debt/GDP ratio and eradicating the backlog in social service delivery. Nevertheless, it succeeded in stabilising the ratio by means of strict budgetary discipline.

The above demonstrates why issues regarding public debt have resurfaced during the 1980s and 1990s and why fiscal sustainability remains an issue. The mainstream rule on how to re-establish fiscal sustainability is unambiguous: government should, on average,

run a sufficiently sized primary budget surplus (i.e. non-interest revenue less non-interest expenditure). However, policy makers in several countries have found that the establishment of fiscal sustainability is not always so straightforward. Several countries failed to stabilise their debt/GDP ratio despite the steps they took to do so. Some of the governments failed because they experienced problems in reducing expenditure, primarily social expenditure on entitlements, social welfare and development. For instance, several industrialised countries have experienced (and still experience) difficulty in reducing social security entitlements, whereas some developing countries have experienced (and still experience) difficulty in reducing expenditure on basic goods and services. In some developing countries it is also difficult to reduce the number of civil servants, in particular because government is one of the only institutions in those countries that provides relatively secure employment.

In those countries that did succeed in stabilising and even reducing the ratio, the steps to stabilise the debt/GDP ratio included forced cutbacks in expenditure, often social expenditure, and coincided with an increase in private debt/GDP ratios. This increase in private debt/GDP ratios suggests the possibility that the stabilisation and reduction of the public debt/GDP ratio may be related in some way to the debt problems in the private sector. However, the mainstream rule for maintaining and restoring fiscal sustainability does not consider this possibility explicitly.

The US is a prime example of a country where the decrease in the public debt/GDP ratio coincided with an increase in private debt/GDP ratios (Godley 2001; 2000a; 2000b; 2000c). From the mid-1990s the US government ran primary surpluses in excess of what was needed to stabilise its public debt/GDP ratio. This caused a decline of 8% in public debt in the US in 2000 (Financial Markets Center 2001) so that federal government debt held by the public fell below 35% of GDP in 2001, down from the 50% some six years earlier (Board of Governors 2001:11-13). However, this reduction in its public debt/GDP ratio coincided with an increase in the debt positions of other sectors. The Financial Markets Center (2001) reports that total outstanding household debt in the US increased from 87% of disposable income in 1990 to 101.2% at the end of 2000. Total debt service

payments increased to 14.08% of disposable income in 2000, the highest level since 1986/7. In addition, the net worth of households and non-profit organisations fell in 2000 for the first time in 50 years. The US corporate sector is not in a much better position. The net new issue of equity since 1994 has been negative (Financial Markets Center 2001; Kaufman 2000:348). Debt as a percentage of net worth climbed from 51.5% at the end of 1998 to 56.3% in 2000. Thus, the debt/equity ratio of the US corporate sector has clearly increased. Debt as a percentage of tangible assets increased from 40% in 1990, to 45.8% in 1998, to 50.1% in 2000. The financial sector also saw an increase in its leverage to levels never seen previously. Outstanding financial sector debt as a percentage of outstanding domestic non-federal non-financial debt increased from 31.3% in 1990 to 56.4% in 2000 (Financial Markets Centre 2001).

In the period prior to 1998 the East Asian economies represent another example of a reduction in public debt/GDP ratios that coincided with an increase in private debt/GDP ratios. Kregel (1998:11) notes that the budgets of most East Asian crisis economies were either balanced or in a surplus, whereas the financial position of their corporate and financial sectors in particular deteriorated. The total short-term debt owed to foreign banks by the five crisis economies (Indonesia, Malaysia, the Philippines, Thailand and Korea) increased from $137.5 billion at the end of 1995 to $166.3 billion at the end of 1996 and to $175.1 billion by mid-1997, whereas the share of public debt in this total *decreased* from $20 billion at the end of 1995 to $16.7 billion in mid-1997 (Radelet and Sachs 1998:26).

Although it did not experience such a spectacular crisis as that of the Asian countries, South Africa between the period 1994 and 1998 represents another example of a country where the stabilisation of the public debt/GDP coincided with an increase in private debt/GDP ratios. While the South African government stabilised the public debt/GDP ratio at just below 50% during this period, the household debt/disposable income ratio increased from approximately 55% to approximately 65% in 1998 when high interest rates and imminent or actual bankruptcies stemmed the tide of debt accumulation (SARB 2000:9). It would therefore appear that in many countries the stabilisation and reduction

of the public debt/GDP ratio has been accompanied by an increase in the debt/GDP ratio of non-governmental agents, the tide of which is only stemmed by bankruptcies of some private sector agents. This confirms the suggestion that the stabilisation and reduction of the public debt/GDP ratio may be linked to the debt problems in the private sector and the question is whether the reduction of public debt could, in some way, cause the increase in the debt/GDP ratios of non-governmental agents.

The possible link between public and private debt positions suggests that the debate on fiscal sustainability may have focused too narrowly on the implications for the *public* sector of policy steps to ensure fiscal sustainability. The question should be broadened to also ask: what is the impact of establishing fiscal sustainability on the financial position of non-governmental agents and sectors? This sectoral impact of establishing fiscal sustainability constitutes the first main issue of this study. Such sectoral impacts may also mean that the mainstream rule on fiscal sustainability is too crude and may need refinement. This raises another question: how should a concern for the possible sectoral impact influence the mainstream rule for running a sustainable fiscal policy and the conditions and circumstances for applying that rule?

Even though there may be sectoral effects of establishing fiscal sustainability, could one not argue, from a mainstream point of view, that these effects are short-run effects and that the economy always returns to a stable equilibrium in the long-run? Therefore, whatever sectoral problems may arise from establishing fiscal sustainability, they are bound to be transitory and, therefore, do not warrant much concern. Underlying this mainstream position is its very 'classical' view that an economic system is inherently stable and that instability is caused by external (exogenous) shocks to the economic system. After such a shock the economy reverts to a unique and stable long-run equilibrium where all markets (i.e. the goods, labour, bond and money markets) clear.

The assumed inherent stability of the mainstream model means that, should government commit itself to a sustainable fiscal policy, it in fact contributes to the stability of the economy. In addition, mainstream theory identifies government (deficit) policy as one of

the major sources of instability, so that a sustainable fiscal policy means that government itself will not be the source of an external shock.

However, several economists, such as Keynes, Davidson, Lachmann and Shackle (who happen to belong to diverse schools of thought), argue that the economy does not have a tendency to return to some unique long-run equilibrium. Thus, the effect of an economic shock, including the establishment of a sustainable fiscal policy (which then weakens the financial position of non-governmental agents) will not necessarily be transitory. Therefore, should the establishment of fiscal sustainability have a negative impact on the financial position of non-governmental agents, the economy may experience instability and a 'shift' in equilibrium. Note that the equilibrium these authors consider merely means a position of rest that is dictated by the principle of effective demand and where such equilibrium may exclude the clearing of markets, particularly the labour market.[1]

Nevertheless, why would the economy be unstable and not return to a stable, unique long-run equilibrium, as the mainstream model would have it? Davidson, Lachmann, Shackle and others argue that mainstream theory displays a significant shortcoming in its complete disregard of fundamental uncertainty. In a fundamentally uncertain world, economic instability can be generated from within the economic system, so that the potential for instability is inherent in the economic system. The instability generated from within the system is in addition to external shocks to the economy, which can also cause economic instability. These economists trace the roots of such instability back to uncertainty and the formation of subjective expectations in the face of uncertainty. (Hence, they are denoted as subjectivists.) Uncertainty and subjective expectations may, therefore, cause economic instability. Furthermore they argue that instability may have long-run consequences, causing the economy to not necessarily return to a stable long-

[1] This is the Marshallian concept of equilibrium, where a market may be in equilibrium, i.e. in a position of rest, without having cleared. In such a market there are no forces at work to cause a change in price and quantity. For instance. because it may not be profitable for companies to employ additional labour, the labour market may not clear even though the supply of labour may exceed its demand. The Marshallian concept differs from the mainstream one, which on the partial equilibrium level views equilibrium and market clearing as synonymous, and on the general equilibrium level is Walrasian in nature because it views general equilibrium and, thus, the long run equilibrium path of the economy as a position where all markets clear (for more on this see Kregel 1976).

run equilibrium position, but to experience 'shifting' equilibria. However, some external shock, such as a government that restores fiscal sustainability, may also intensify uncertainty, which, in turn, prevents the economy from countering the shock and returning to a pre-shock equilibrium.

The possibility of inherent instability, generated from within the system, also reveals another dimension to fiscal sustainability. It concerns the relationship between fiscal sustainability and economic stability. This relationship constitutes the second main issue of this study. Sustainable fiscal policy paths may be rendered unsustainable by economic instability, shifting equilibria and shocks. Economic instability, generated among non-governmental agents, may spill over into government and 'destabilise' the latter's financial position and cause fiscal policy to become unsustainable. In addition, in an economic system where instability can be generated from within the economy, there may be a need for government to stabilise the economy by means of a deficit policy. Thus, at times it may be necessary for government to increase the debt/GDP ratio and to run a larger deficit outside the 'rule' for sustainability as part of a policy to stabilise the economy. A stabilisation policy, in effect, implies that government counters the instability by running an unsustainable fiscal policy. It would seem that the issue of fiscal sustainability and the policy aimed at economic stability are inextricably enmeshed, and may constitute two sides of the same coin.

The 'enmeshment' of the two policies presents a possible dilemma to the government. When restoring fiscal sustainability, it may have to increase its primary surplus. However, the primary balance comprises the very same variables (expenditure and revenue) that government uses to stabilise the economy. Therefore, the question is: if government restores fiscal sustainability after having increased the deficit to stabilise the economy, will the stabilisation steps remain effective? An additional question is whether or not restoring fiscal sustainability can contribute to and cause economic instability. Thus, government has to determine when and how it should restore fiscal sustainability if it wants to, and has to, consider issues of cyclical stability. Given that uncertainty may

time and again cause economic instability, government may face this dilemma recurrently.

The important question is whether the assumption regarding inherent stability is itself sustainable, and whether significant cyclical downturns accompanied by significant endogenous deficits (i.e. deficits caused by the impact of the business cycle on the budget) and/or significant pressure on government to run a stimulating deficit policy, are things of the past. If cyclical downturns and pressure on government are recurring phenomena, then policy-makers should take into account the reasons for such recurrence. This question also implies that the mainstream rule for the maintenance and establishment of a sustainable fiscal policy is too crude and may need refinement to take into account the 'enmeshment' of stabilisation policy and policy steps aimed at the sustainability of fiscal policy.

1.2 The structure of this study

Chapter 2 provides the background to the issue of fiscal sustainability. It also examines the more empirical question of how sustainable fiscal policies are internationally and proceeds to describe some of the significant changes that took place in the variables that determine fiscal sustainability. These variables include the public debt/GDP ratio, the real economic growth rate and the real interest rate. The chapter also provides an overview of the evolution of the international and domestic debate on the issue. It traces the origin of the debate to as far back as the differences between Adam Smith and the Mercantilists on public debt. This overview shows that there has always been room for different interpretations of what constitutes a sustainable fiscal policy. However, it also shows that at present there is one dominant view, denoted as the mainstream view, regarding what constitutes a sustainable fiscal policy. It dominates the public debate and informs policy-making in industrialised, numerous developing and emerging market countries. The chapter proceeds to describe a sustainable fiscal policy according to the current (rather mathematical) understanding of mainstream economics in terms of the short- and long-run indicators of fiscal sustainability. Thus, this chapter depicts and

examines the origin, development and nature of the issue of fiscal sustainability, on both a theoretical and an empirically descriptive level.

For an in-depth understanding of the mainstream view, chapter 3 explores the mainstream theory that underpins its view on fiscal sustainability. The mainstream view regarding the causes of fiscal unsustainability and the variables that could be used to attain fiscal sustainability are rooted in this broader framework. Thus, the chapter links the mainstream view on fiscal sustainability to theories on government dissaving, interest rates, intertemporal utility maximisation and economic growth. The chapter does not endeavour to discuss these theories extensively, but merely to position the mainstream view on fiscal sustainability within the broader constellation of these theories and to provide a basis for comparison with the subjectivist approach (chapter 5, see below).

Chapter 4 studies the sectoral impact of establishing a sustainable fiscal policy. This was identified above as the first main issue of this study. This chapter examines whether or not the mainstream rule for the establishment of fiscal sustainability focuses too exclusively on the public sector. It also introduces and develops a new technical framework, called the 'general balance framework', that links the budget constraints of government and non-governmental agents on a macroeconomic level. This tool of analysis, when combined with theory on economic behaviour, can be used to track how the effect of changes in the budgets of one group of agents is transmitted to the budgetary position of other agents. This chapter uses the 'general balance framework' to examine whether or not fiscal sustainability (i.e. the sustainability of government) should be considered together with the financial sustainability of non-governmental agents. The framework also is instrumental in analysing the twin problems of instability and sustainability in later chapters.

The sectoral impact of establishing fiscal sustainability may neither be transitory nor disappear in the long-run if the economy is not inherently stable, i.e. if there is no guarantee that the economy will return to a unique and stable long-run equilibrium. If the economy is not inherently stable, there may also be a recurring need for government to

stabilise the economy while it also has to maintain the sustainability of fiscal policy through time. However, economic instability and a policy aimed at economic stability may have implications for the sustainability of fiscal policy, whereas fiscal sustainability may have implications for economic stability. Thus, one cannot consider stabilisation policy without also considering fiscal sustainability, and *vice versa*. Therefore, the thesis sets out to integrate the theory on fiscal sustainability with theory on economic instability.

As noted earlier, economists such as Davidson, Lachmann and Shackle trace the roots of instability to uncertainty and to the formation of subjective expectations. Chapter 5 examines how uncertainty affects the economy through its impact on expectations and those economic variables that determine whether or not fiscal policy and the financial position of non-governmental agents are sustainable. It reviews the main subjectivist views and shows the relevance of these views to the issues of fiscal and financial sustainability and economic stability.

Chapter 6 analyses whether and how the financial unsustainability of non-governmental agents may cause economic instability through the spreading of financial unsustainability via the linkages between the financial positions of non-governmental agents. The 'general balance framework' is instrumental in this analysis. The chapter recasts the financial instability hypothesis of Minsky in the 'general balance framework'. Minsky argued that economic instability is the result of a weakening of financial positions that spreads. However, his analysis of the financial position of economic agents focuses on the changes within those positions, while it merely mentions that the weakness of one position is transmitted to others through financial layering and income multiplier effects. The 'general balance framework' allows one to trace the transmission better because the framework makes the linkages between financial positions explicit. Because the 'general balance framework' allows one to distinguish between various non-governmental agents, the framework is ideally suited to analyse whether and how the contagion of unsustainability in non-governmental sectors may spread and be amplified and

aggravated via the linkages between budgetary positions, to produce system-wide economic instability.

If the economy is not inherently stable and if economic instability causes fiscal unsustainability, government may time and again have to consider the impact of restoring fiscal sustainability on the financial position of non-governmental agents. Chapter 7 argues that stabilisation policy and the policy aimed at restoring and maintaining fiscal sustainability are so enmeshed that they cannot clearly be separated and have to be considered together: they are two sides of the same coin. Thus, this chapter considers the re-establishment of fiscal sustainability if cycle-related factors caused fiscal unsustainability. It also distinguishes between two such factors. The first occurs when economic instability spills over into the financial position of government, causing fiscal unsustainability. The second occurs when government decides to run a stabilisation policy through an increase in the deficit that places the public debt/GDP ratio on an unsustainable path. This chapter also considers the establishment of fiscal sustainability if the cause of the unsustainability is socio-political or a shock such as a natural or man-made disaster and, therefore, not cycle-related.

The discussion in chapter 7 provides the theoretical background for refining the mainstream rule in chapter 8 into a menu of new rules for the successful return to a sustainable fiscal policy. With the application of the new rules, policy-makers will acknowledge explicitly the inextricable enmeshment of fiscal sustainability and economic stability issues. The rules take into account the sectoral effects discussed in chapter 4, the uncertainty discussed in chapter 5, and the spreading of economic instability discussed in chapter 6. The menu of rules form a framework for the sophisticated, non-mechanical and more effective, and potentially less harmful application of the mainstream rule – essentially a normative approach to the implementation of the rule.

Chapter 2

Fiscal sustainability: the origin, development and nature of the issue

Since the late 1980s and early 1990s, fiscal sustainability has drawn increased attention (see table 1). This may be attributed to the substantial increase in the public debt/GDP ratio in many countries. Blejer and Cheasty (1993:9) state that the debt crisis highlighted the importance of long-run government solvency. In addition, there was a shift from Keynesian to classical orientated economic thinking and its conservative fiscal stance. As a result, many mainstream economists currently favour balanced budgets and even budget surpluses. International organisations such as the International Monetary Fund (IMF 1995; 1996) and international credit agencies (Adelzadeh 1999) support this view.

Table 1- Countries that received attention with regard to the fiscal sustainability issue

Country or group of countries	**Author**
OECD countries	Leibfritz *et al.* 1994; Lane 1993; Corsetti and Roubini; 1991
G7 countries	Ball and Mankiw 1995
USA	Bohn 1998; Ball *et al.* 1998; Congress of the US, 1996; Tanner and Liu 1994; Quintos, 1995; Cebula and Rhodd 1993; Hakkio and Rush 1991; Joines 1991; Heilbroner and Bernstein 1989; Kremers 1989; Miller 1983
Europe	Vanhorebeek and Van Rompuy 1995; Caporale 1993; Blanchard *et al.* 1985
Belgium	Vuchelen and Rademakers 1995; 1996; Vuchelen 1985; 1993; De Grauwe 1993; 1994; Dornbusch and Draghi 1990; Heyndels and Vuchelen 1986; 1988; Lejeune and Vuchelen 1985
The Low Countries	Moerman and Vuchelen 1985
Spain	Gonzalez-Paramo *et al.* 1992
Sweden	Lachman 1994
France	Cordier and Enfrun 1992
Italy	Gaiotti and Salvemini 1992; Giavazzi and Spaventa 1988; Dornbusch and Draghi 1990; Masera 1987
Greece and Ireland	Gagales 1991; Dornbusch and Draghi 1990
India	Parker and Kastner 1993
Tanzania, Zimbabwe, Namibia, Kenya, Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius and others	Gordon 1997; Osoro 1997; Taiwo 1994
South Africa	Heyns 1993a; 1993b; ABSA 1996; Roux 1993; Van der Merwe 1994; Schoeman 1994; Cronje 1995; 1998; Fourie and Burger 1999; 2000

In South Africa fiscal sustainability started receiving attention in particular during the 1990s, against the backdrop of a significant increase in the public debt/GDP ratio in the early 1990s (Cronje 1995; Van der Merwe 1994; Roux 1993; and several articles by Heyns). Despite this significant increase, the public debt/GDP ratio was still less than that of many other countries (with the new 1999 SNA-data it was less than 50% in 2000). However, because of high nominal interest rates on debt, interest payments constituted a large and increasing percentage of government expenditure (sometimes in excess of 20% of total expenditure). Economists, politicians and the media alike noted the high opportunity cost of every rand spent on interest, in particular in a country with large backlogs in service delivery. Hence, the need to reduce the deficit and public debt. Considering the above, this chapter attempts to answer the following questions:

1) What is fiscal sustainability all about?
2) How sustainable are fiscal policies internationally? In particular, what is the track record of the main variables relevant to the issue of fiscal sustainability? What changes in these variables contributed to the resurfacing of the issue? Data on several countries, including South Africa, are presented.
3) How did the debate on fiscal sustainability evolve?
4) What is a sustainable fiscal policy according to the current understanding of mainstream economics?

The chapter includes an overview of the evolution of the debate and demonstrates that there is room for different interpretations of what constitutes a sustainable fiscal policy. When one considers the rather technical (mathematical) presentation of the issue by mainstream economists, it is not always apparent that different interpretations can exist. The mathematical format of the presentation may all too easily create the impression that the interpretations and advice offered are found directly in the technical (as opposed to behavioural) equations in which the discussion is couched. Thus, the overview of the development of the fiscal sustainability issue must reveal that there are different interpretations and advice, which are embedded in different assumptions about the *behaviour* of economic agents.

One missing link in the modern debate on fiscal policy is that between fiscal sustainability and the proper role of government in the economy. The former is couched in technical analysis, whereas the latter is more philosophical and is essentially a debate about first principles. The absence of a link explains to some extent the impression that the use of technical equations is sufficient to determine what is fiscally sustainable.

2.1 What is fiscal sustainability all about?

Fiscal sustainability resurfaced as an issue during the 1980s and 1990s. To understand its significance one needs to know what the debate is about. In what came to be a leading contribution to the field of fiscal sustainability, Blanchard (1993:309) states that the key issue is whether or not the current course of fiscal policy can be sustained without public debt exploding or imploding. If debt tends to explode, government will have to increase taxes, reduce expenditure, monetise or even repudiate debt. Thus, the central issue is the tendency of public debt over time. If it is stable and neither explodes nor implodes, fiscal policy is sustainable. To Easterly and Schmidt-Hebbel (1991:37; 1994:68-70) public debt is also the central question on fiscal sustainability. However, their concern is 'sustainable deficit levels' rather than 'fiscal sustainability'. A sustainable deficit level is one that is consistent with a stable debt/GDP ratio.

According to Zee (1988:666) sustainability is a positive (as opposed to a normative) concept into which, unfortunately, normative considerations were injected. Zee argues that sustainability as a positive concept merely means stability. From this point of view he defines fiscal sustainability: "A sustainable level of public debt is therefore one that allows the economy, in the absence of unanticipated exogenous shocks, to converge on a steady state." It is not sustainable beyond this level of public debt. (For a related view, see Smyth and Hsing (1995) who consider what level of debt/GDP will maximise economic growth.) In contrast to Blanchard and Easterly and Schmidt-Hebbel, the central issue to Zee is the convergence to a steady state of the economy. Thus, Zee's definition is broader than that of Blanchard and Easterly and Schmidt-Hebbel. However, what is notable about his point of view is that public debt also must not exceed its sustainable

level. Thus, in general fiscal sustainability is closely associated with the level and the change in the level of public debt, and in particular the change in public debt relative to output (income). Zee argues further that a continuous increase in public debt is not synonymous with an unsustainable fiscal policy, but merely the symptom of an unsustainable fiscal policy. The cause lies in the expenditure and revenue structure of government. The symptom together with the cause constitutes an unsustainable fiscal policy. The symptoms have *severe* and *accumulating* consequences for the economy so that the expenditure and revenue structure of the government *cannot* be sustained. Hence, the unsustainability of fiscal policy.

Equation 1 provides a formal statement of the conditions for fiscal sustainability (Roux 1993:327; Hemming & Miranda 1991:70-72). Equation 1 is discussed in more detail in section 2.4.

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t + R_{gt}/Y_t \qquad (1)$$

where D_g: Total public debt

Y: Nominal GDP

B_g: The nominal primary balance of the public sector (+ deficit; - surplus), i.e. the gap between *non-interest* expenditure and total revenue

r_g: The real interest rate applicable to the public sector

g: The real economic growth rate

R_g: A residual factor applicable to the public sector. It also catches the effect of debt monetisation (Fanizza and Mourmouras, 1994:10-11).

The relationship between r and g in equation 1 indicates whether or not government can run a primary deficit:

- If r > g, the relationship will be positive, indicating upward pressure on the debt/GDP ratio. This is the typical case in South Africa since the late 1980s (Fourie 2001:317) and in the G7 countries since the early 1980s (Eltis 1998:129; see also Wray

1997:548-554). Government will need to run a primary surplus (a negative B in equation 1) to prevent an increase in the debt/GDP ratio;

- If $r < g$, the relationship will be negative, indicating downward pressure on the debt/GDP ratio. Government can run a primary deficit (a positive B in equation 1) within the limits set by equation 1 without putting upward pressure on the debt/GDP ratio.

*Un*sustainability is indicated as a position where the real interest rate, r_{gt}, exceeds the real economic growth rate, g_t, *and* where the primary balance, B_t, is persistently either in a deficit, or in a surplus not large enough to cover the excess of the real interest rate over the real growth rate. This simply means that the growth in tax collections cannot keep up with the growth of the interest cost. As a result, government has to borrow increasingly to pay for interest cost (Congdon 1987:78; 1989:28).

2.2 *How sustainable are fiscal policies internationally?*

In equation 1 three variables seem relevant in terms of mainstream theory. These are the real interest rate, the real economic growth rate and the public debt/GDP ratio. In particular, the difference between the real interest rate and the real economic growth rate determines whether government must run a primary surplus or deficit. If the (r-g) differential is positive government needs to run a primary surplus and *vice versa* if the differential is negative. The differential together with the debt/GDP ratio (usually its initial value or its value in a previous period) determines the primary balance government needs to run to prevent a change in the debt/GDP ratio. This section examines the movement internationally and in South Africa in the differential and the debt/GDP ratio.

2.2.1 Interest rates and growth rates since 1980: Implications for fiscal sustainability

What is the nature of the differential between interest rates and GDP growth rates in practice? Have there been any significant changes? It seems to be agreed that the world entered a high-interest-low-growth era in the 1980s and 1990s, as opposed to the low-interest-high-inflation era of the 1970s. In the G7 group, the average real growth rate for 1970-79 was 3%, in contrast with an average long-term real interest rate level of 0.2% (and –0.8% for short-term rates) (Ciocca and Nardozzi 1996:30). Masson and Mussa (1995:13,15-18) argue that the lower growth rates accompanied by increasing unemployment, particularly in Europe, contributed to the increase in deficits as revenue declined and benefit programmes for the unemployed expanded. In the 1980s and 1990s the relationship between g and r was reversed, as shown in Table 2.

Table 2 - G7 countries: Real economic growth rates and real interest rates, 1980-96 (percentage)

	1980-89			1990-96		
	g	i(long)	i(short)	g	i(long)	i(short)
Canada	2.5	5.1	5.2	0.4	4.7	6.3
France	2.2	3.5	4.9	1.2	5.5	5.8
Germany	1.9	3.9	4.7	2.7	3.7	4.3
Italy	3.4	4.3	3.6	1.5	6.0	6.8
Japan	3.6	3.9	4.2	1.8	7.2	7.6
UK	2.7	4.6	4.1	1.1	4.5	4.9
USA	2.3	3.3	5.1	1.4	1.5	3.7
Mean	**2.6**	**4.1**	**4.5**	**1.4**	**4.7**	**5.6**

Source: OECD Economic Outlook quoted in Eltis (1998:129). g = economic growth rate, i(short) = 3-month TB rates or 3-month interbank rates. i(long) = 10-year government bond rates. The mean is unweighted. Rates adjusted for consumer inflation.

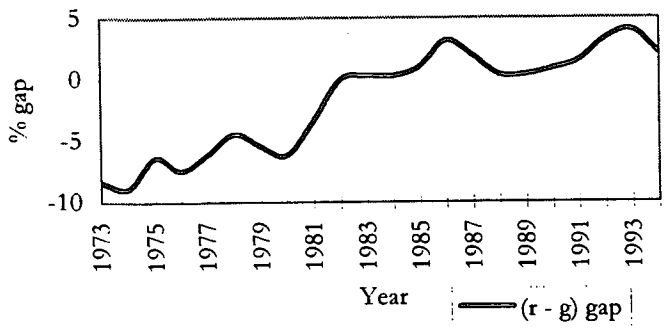
Two matters are apparent:

a) The post-1980 phase can be characterised as a high real interest rate era that persisted into the 1990s. Masson and Mussa (1995:15-18) argue that anticipated inflation exceeded actual inflation (because of persistent inflationary expectations), causing the actual real interest rate to be higher than the expected real interest rate. Phelps and Zoega (1998: 788) confirm the significant increase in the average level of real interest rates in the world since approximately 1981/82 (see also OECD 1993). Easterly and

Schmidt-Hebbel (1994:29) argue that the increasing liberalisation of interest rates since the mid-1970s caused deficits to become more sensitive to real interest rates.

b) Real growth rates for the major industrial countries have declined, and real GDP growth rates have been significantly *below* real interest rates since the 1980s: r > g by an average of 2% for G7 countries (see diagram 1, which shows a positive (r-g) gap since 1980). The gap appears to have increased in the 1990s, even though both r and g have been at lower levels. This is in direct contrast to the 1970s - an era of widespread and sustained high *inflation* - when g exceeded r by some margin (*i.e.* a negative (r-g) gap).

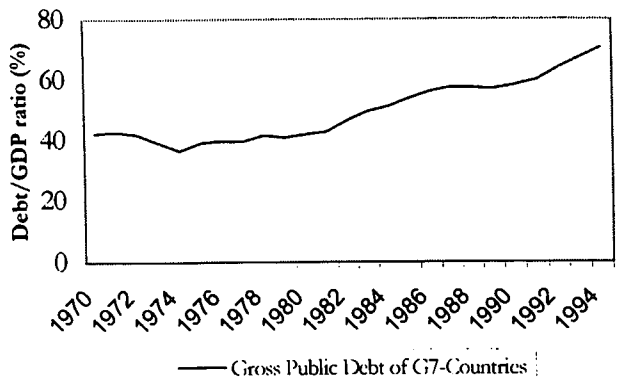
Diagram 1 - The average interest-growth gap for G7 countries 1973-94



Source: Tanzi and Fanizza (1995) and IMF

One, not unexpected, consequence of this evolving pattern has been that increasing debt and fiscal sustainability have become a real problem in many countries. Growth in tax revenues has been sluggish and debt servicing has taken up an increasing share of current expenditure, crowding out other expenditure and/or creating large budget deficits. Diagram 2 shows the significant increase in the debt/GDP ratio in G7 and industrial countries since the early 1980s to the mid-1990s. This coincided with the inversion of the relationship between the real interest rate and the real growth rate.

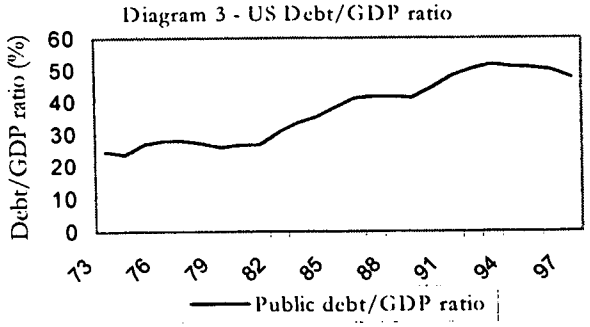
Diagram 2 - Gross Public Debt/GDP of G7-Countries



Source: Tanzi and Fanizza (1995)

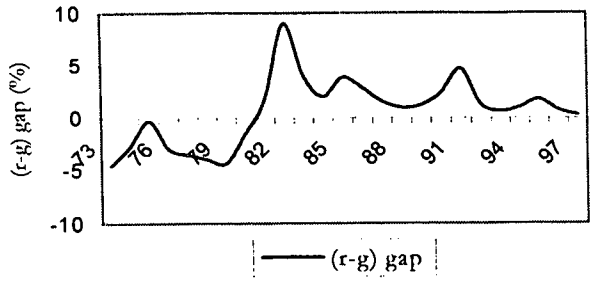
A common pattern seems to emerge: high global real interest rates manifested in most countries since the early 1980s, which in most cases were accompanied by declines in growth rates to well below the real interest rate. In addition, this pattern in interest rates and growth rates coincided with rising public debt/GDP ratios. Since the mid-1990s the public debt/GDP ratios in some of the major industrialised countries stabilised, as can be seen for the US in diagram 3. Diagram 4 shows that the stabilisation of the US debt/GDP ratio coincided with a decrease in the US (r-g) gap.

Diagram 3 - US Debt/GDP ratio



Source: IMF

Diagram 4 - (r-g) gap in US



Source: IMF

Developing countries with significant foreign debt have experienced additional problems. These stem from the same phenomenon: the combination of low growth (limited ability to repay foreign-denominated public debt given low tax revenues) and high global interest rates (high debt servicing obligations in the budget), resulting in rising foreign debt (Gibson 1996: 286). The debt service ratio (debt service/exports) of LDCs also increased from 15.9% in 1973 to 23% in 1986. Thereafter it decreased to 15.8% in 1994, not because of an increase in exports, but because of the restructuring process of foreign debt, some defaults and an unwillingness on the part of the international financial community to grant further loans to LDCs (Eng *et al.* 1998:14-15). Cebula and Rhodd (1993) argue that the high interest rate level in the US caused the third world to pay high interest rates on their foreign debt, which increased the probability of debt crises.

As far as African countries are concerned, Gordon (1997:6-8,13) notes that in future some countries may expect lower growth rates than those they currently experience. The growth rates of countries such as Namibia, Botswana, Kenya and Zimbabwe are inflated because of continuous large increases in government employment. Since this practice is unsustainable, expected future growth is lower. Gordon (1997:13) notes that this is especially important in determining whether or not fiscal policy in African countries is sustainable, i.e. sustainability should not be measured on mere forward projections of the currently inflated growth rates.

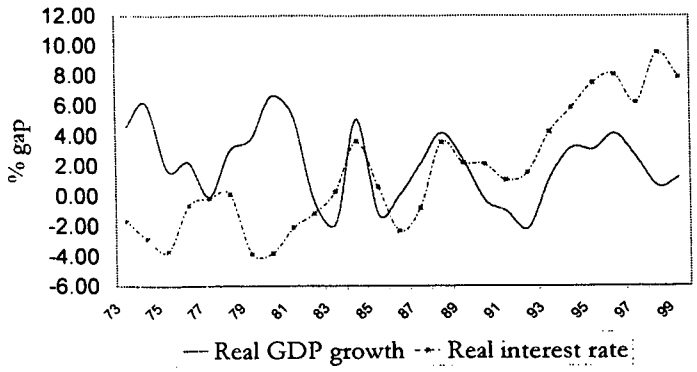
Far Eastern countries are notable exceptions to these movements in the gap between the real interest rate and the real economic growth rate. The monetary policies of many of these countries resulted in low and even negative real interest rates. These countries also experienced phenomenal real economic growth rates, sometimes exceeding ten percent. As a result the real economic growth rate exceeded the real interest rate. After the financial crisis of 1997/98, many economists argued that the crisis was the result of loose monetary and credit policy (cf. Bisignano 1999), which resulted in excessive credit creation and real interest rates that were too low - even below the real economic growth rate. To some economists this assessment of the crisis and its causes is sufficient reason why countries should not repeat these policies. In their opinion the crisis demonstrates the mainstream viewpoint that it is futile to attempt to manipulate the growth rate and interest rate level over the long-run.

However, it is notable that the fiscal policies of the Far Eastern countries were very prudent, even though they could afford to run primary deficits. Most of these countries ran budget surpluses and from 1986-98 the debt/GDP ratios of countries such as Malaysia, Thailand, Singapore and Indonesia declined, in some cases even dramatically. It still remains a question whether or not these contractionary fiscal policies impacted negatively on these economies and ultimately contributed to the crisis that unfolded in that part of the world in the late 1990s.

2.2.2 The South African case

Since the late 1980s the South African economy has been characterised by very high real interest rates. At times these even exceeded 10% for the private sector and 8% for government. On average the real growth rate has remained below 2% since the mid-1980s with a slight improvement in the mid-1990s to just over 2%. Diagram 5 shows the clear inversion in the (r-g) gap between the 1970s and the 1990s.

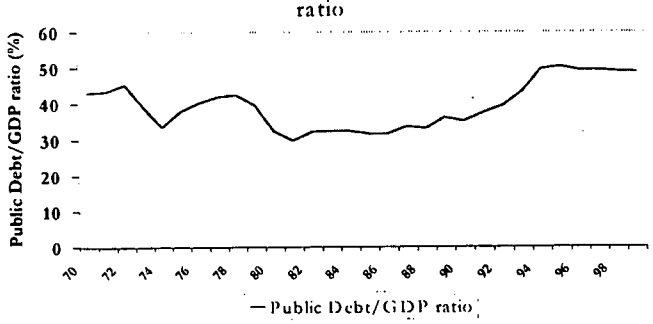
Diagram 5 - The real interest rate and growth rate in South Africa



Source: IMF

Diagram 6 shows the strong increase in the debt ratio for the period in the 1990s when r > g (accompanied by large budget deficits; see Fourie 2001: 301; 306; 317).

Diagram 6 - South African Public Debt/GDP ratio



Source: IMF

Reasons offered for the large (r-g) gap include, among others, the risk premium required by foreign and local investors due to political and emerging market risk and the monetarist inspired policies of the SA Reserve Bank. The Bank argued that its policies were aimed at stemming growth in the money supply, which in the 1980s (but not in the late 1990s) appears to have contributed to inflation. In the 1990s a conservative policy was followed to protect the external value of the currency (without much success).

Thus, as an apparent result of financial market behaviour and monetarist inspired policy

the gap between r and g widened, requiring increasingly larger primary surpluses to avoid an exploding debt/GDP ratio. From the mid-1990s the government has run significant primary surpluses (Fourie 2001:306). Government has to a large extent achieved its deficit targets, reducing the conventional deficit from 8.3% of GDP in 1992/93 to 2.4% in fiscal 1999/2000 and 2000/2001.

Has sustainability been attained in South Africa? The real growth rate is still quite low (on average 1% at most in the past decade) and significantly below the real interest rate. With a debt ratio of approximately 45% at the end of the 1990s, the situation translated to a required primary surplus of 2.7% of GDP.

Ultimately, sustainability is more than an exercise in fiscal accounting. It has a broader social and political context, especially in a middle-income country where the role of government is politically important *and* controversial. (Social issues are also important in developed countries. For instance, Vitaliano and Mazeya (1989) explored the impact that a rising debt/GDP ratio in the US had on the distribution of income. In particular, they focussed on how different income groups benefited from the increased payment of interest on government debt.) While deficit targets in South Africa have been met, it appears to have occurred at the expense of cuts in service delivery. (Other reasons for the lack of service delivery may include capacity constraints and real increases in public sector wages.) Government has fallen far short of the targets for housing and other key social services (Adelzadeh 1999: 2). Pressure may mount in future to step up the rate of service delivery. This in turn may endanger the sustainability of fiscal policy. Brixen and Tarp (1996) already indicated in 1996 that increased service delivery by government depends on whether economic growth improves. They calculated that a 3.5% real growth rate would allow government to start addressing the backlog in service delivery. Their pessimistic scenario, with a real growth rate of 2%, required a more stringent fiscal and monetary policy and thus a failure to address the backlog in service delivery. An average growth rate of 2.3% for the period 1995-99 and the failure to reach the targets for service delivery, seem to confirm the pessimistic scenario of Brixen and Tarp *ex post facto* as the most accurate. Whether the attempt to achieve fiscal sustainability via a primary surplus

continues to be *politically* sustainable, remains to be seen. The 1999 general election showed signs of increasing tensions between Cosatu and government. Cosatu criticised the Growth, Employment and Redistribution (GEAR) policy as being too much 'Washington' without sufficiently considering the impact on the poor and on the objectives of the Redistribution and Development Program (RDP). These differences were smoothed over during the election, but seem sure to resurface – especially given the size the primary surplus has to be to prevent an increase in the debt/GDP ratio. Once they resurface, increased attention will once again be paid to fiscal sustainability.

2.3 *The evolution of the theory of fiscal sustainability*

This section focuses on the evolution of the debate internationally and in South Africa. It indicates that rival interpretations did and still coexist, giving policy-makers a choice of theory to guide them in their policy decisions. However, nowadays the existence of this choice is not always clear. The mainstream view dominates discussions in both academic and policy-making spheres, whereas alternative views receive scant or no attention at all. Nonetheless, alternative views do exist and have existed for a long time. The germ of the Keynesian and functional finance view on public debt and deficits can already be found in the views on public debt and deficits expressed by the Mercantilists and Malthus. At present policy-makers should be made aware of these alternative views so that they may recognise that the mainstream view is not the only possible and credible view.

2.3.1 The international evolution of the debate

The international evolution of the debate on fiscal sustainability is divided into three periods. The first period covers the early, pre-Keynesian views, the second period covers the views in the 1930s and 1940s, when Keynesian theory was on the advance and the third period covers the modern, mainstream views on fiscal sustainability. Lastly, the subsection focuses on the search in modern theory for the sources of the high real interest rates that have characterised economies in the 1980s and early 1990s.

2.3.1.1 Early views

Although the term 'fiscal sustainability' is of recent vintage (second half of the twentieth century), concern over the effects of public debt and in particular an ever-increasing debt burden, is not new. Adam Smith (1994 [1776]:1009-1011), quoting Pliny, reports how the Romans reduced the amount of copper in the as (the denomination of their coin). This inflated the money supply, making it easier to repay debts incurred in the Punic wars. Mundell (1993:12) relates how from the thirteenth century onwards the city-state of Venice, in its successive wars with Genoa, amassed large debts. As Venice did not repay the accumulated debts in full in peacetime, the amount of debt grew over time. The Venetians called this debt *Monte vecchio* meaning 'old mountain', which refers to the mountain of debt – an indication of the size of the debt burden. In Great Britain the history of public debt goes back to the 1688 revolution (Kaounides and Wood 1992:xiv). Mundell (1993:12) reports that in Hume's time (eighteenth century) British public debt was three times the national income. By the time of the American Revolution (1776) interest on public debt in Britain absorbed 70% of tax revenue. A rising public debt was also one of the causes of the French Revolution (1789) (Schama 1989:60-71).

As public debt was mostly incurred in the course of war, it is not surprising that classical economists such as Hume, Smith, Ricardo and Mill perceived it as something negative. According to Hume (as quoted in Kaounides and Wood (1992:xvii)) "...either the nation must destroy public credit, or public credit will destroy the nation." Kaounides and Wood (1992:xvi) as well as Rowley (1986:49) argue that the views of classical economists on public debt are rooted in a deep suspicion regarding the size of government and the threat of inflation or bankruptcy implicit in a large public debt. Although big governments do not necessarily incur large debts, whereas small governments may, classical economists believe that big governments are more prone to incur large debts (Rowley 1986:57). According to classical economists, governments are partisan, corrupt and inefficient (Rowley 1986:58). Kings and despots still ruled many of these governments. It is therefore not surprising that classical economists who emphasise individualism feared the danger of a large government.

Adam Smith (1994 [1776]:1004) opines that, should governments use taxes rather than debt to finance war, this would shorten the duration of wars and cause governments to think twice before initiating hostilities. Smith (1994 [1776]:1002-1003) argues that the creation of public debt prevents the formation of new capital. In addition, he rejects the Mercantilist notion of Melon, that the payment of interest on domestically held debt represents no burden as it is a case of "...the right hand which pays the left." (1994 [1776]:1005). He bases his rejection on a distinction between the owners of land and capital stock and bondholders. Interest represents a transfer from the former to the latter. Thus, it is a disincentive to owners of land and capital stock, which may cause them to accumulate less capital or to emigrate (1994 [1776]:1005-1006).

To Ricardo (1973 [1817]:162-163) the burden of public debt is that it reduces the accumulation of capital at the time when debt is incurred. Because aggregate income is not affected, interest payments and the repayment of domestic debt does not represent a burden. However, he does note (1973 [1817]:163) that the increase in taxes caused by a high debt may cause those who have to pay the taxes to emigrate in an attempt to avoid paying taxes. Modern, mainstream economists are in tune with Ricardo (1973 [1817]:164) when he argues that to diminish debt requires "...the excess of the public revenue over the public expenditure."

Mill is no friend of public debt either. However, his view is more qualified than that of Hume, Smith or Ricardo. Given the right circumstances, he recognises a need for public debt (1886:527). These include first, foreign loans that absorb excess foreign saving. Secondly, if government borrowing generates saving that would not take place in the absence of public debt. This implies a supply-induced demand, where the supply of government securities creates a demand for them. Therefore, this action does not affect the saving that finances capital. Other possibilities include the absorption of saving that would have been invested in unproductive capital or used to finance foreign capital. The former takes place when there is an over-accumulation of capital. Thus, the absorption of these saving will not cause unemployment (1886:527-528). However, beyond these cases, public debt represents a burden as it absorbs saving that could otherwise have been

used productively. In this case the creation of public debt causes the interest rate to increase (1886:527), resulting in less capital accumulation.

The only dissenting voice among classical economists was that of Malthus. In what may be considered a precursor of the work of Keynes, Malthus (1836:322-327;365) described how over-saving causes a *general* excess supply of goods and thus, a *general* shortage of demand. Malthus (1836:322) takes issue with Ricardo who argues that an excess supply in one market means an excess demand in another, so that in the aggregate supply still needs to equal demand. The shortage of demand, or 'effectual demand'[1] as Malthus (1836:326) called it, introduces a role for public debt and especially for the interest on debt. According to Malthus (1836:409), the interest on debt, presumably paid for by taxes, "...contribute[s] powerfully to distribution and demand;... ; they ensure the effective consumption which is necessary to give the proper stimulus to production;...". Hence, he argues (1836:411) against the unqualified notion that "...the sudden diminution of a national debt and the removal of taxation must necessarily tend to increase national wealth, and provide employment for the labouring classes." Notwithstanding this view, Malthus (1836:412) warns against an excessive public debt. The reasons include first, the necessity to levy a tax to pay interest on debt and which may interfere with production and secondly, the negative sentiment created by debt. Thirdly, there is the danger that inflation may erode the interest income of bondholders and lastly, the danger that deflation may render it impossible for taxpayers to pay enough taxes to service debt. Hence, Malthus (1836:412) argues that it is "...desirable gradually to diminish the debt, and more especially to discourage the growth of it in future, even though it were allowed that its past effects had been favourable to wealth, and that the advantageous distribution of produce which it had occasioned, had, under actual circumstances, more than counterbalanced the obstructions which it might have given to commerce."

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[1] Clarke (1988:266-267) argues that Keynes borrowed the term "effective demand" from Malthus and considered the work of Malthus to contain the germ of his own theory on effective demand. In another brilliant insight which foreshadows the income multiplier, Malthus (1836:326 footnote) argues that "Parsimony, or the conversion of revenue into capital, may take place without diminution of consumption, if the revenue increases first."

2.3.1.2 Keynes and the changing view on public debt – the 1930s and 1940s

The classical view on public debt achieved its most theoretically refined state just prior to the Keynesian revolution. In what became known as the Treasury View set out in its 1929 memorandum, the British Treasury formulated the rationale for the balanced budget norm (Clarke 1988). The Treasury did this in the face of growing criticism of its inactivity regarding the growing unemployment problem in Great Britain. However, with the onset of the great depression, governments found in Keynesian theory a rationale to run budget deficits. With governments running deficits in several successive periods, it is no surprise that the issue of growth in public debt resurfaced.

In addition to this development, public debt/GDP ratios incurred by those countries that participated in WWII increased substantially. Thus, the advent of Keynesian economics and the large public debt/GDP ratios caused by the war set the scene for the emergence of new views on deficits, debt and fiscal sustainability. Some of the views include those of Lerner (1948; 1951; 1961), Kalecki (1944), Hansen (1947), Schumacher (1944) and Domar (1944). These early views were very much embedded in Keynesian theory.

Kalecki (1944:40) argues that an increase in public debt always finances itself, because it stimulates national income, which, in turn, causes saving to increase. This line of argument is based on the standard Keynesian income multiplier effect. Schumacher (1944:115) argues that the deficit only absorbs saving that would not be absorbed otherwise. This is in line with the early Keynesian view (which originates in Keynes' *Treatise* (1930a)) that an excess of saving will not cause a decrease in the interest rate to stimulate investment. The excess saving will merely remain idle as long as investment remains below a full-employment level. As such, a budget deficit can absorb the idle saving. In addition, the increase in public debt need not cause the interest rate to increase if the central bank sufficiently expands the money supply (Kalecki 1944:41-42).

Lerner's (1948; 1951; 1961) argument is similar to that of Kalecki and Schumacher. In what he coined the 'functional finance' view (1951:122-138,270-288), he argues for the

use of deficit finance to pursue full-employment. As long as output is below full-employment there is no reason to expect inflation as a result of deficit finance (1951:279-283) and government could rely on the income multiplier to move the economy to full-employment (1951:250-257). He further argues (1951:276-278) that a deficit financed by money creation will be more expansionary than one financed through domestic borrowing. Borrowing entails the extraction of liquidity from the economy where after it can be spent, whereas money creation entails the creation of additional liquidity. Hence his statement (1951:278): "... borrowing ... postpones the day when deficits are no longer necessary."

Neither is Lerner (1951:272-274) concerned about the size of the domestic public debt. The repayment of domestic public debt is like repaying debt to oneself. Thus, because individuals will not be worse off, no concern is warranted if domestic public debt is high. Lerner shares this view with Ricardo and Mercantilists such as Melon, who holds that the repayment of debt and interest is like the right hand paying the left. Neither was Lerner last to consider this issue. In a more modern vein, Heilbroner and Bernstein (1989:51, 132) agree with Lerner. Langdana (1990:98) also expresses a view similar to that of Lerner. However, Peacock (1986) notes that the focus should be on how the size and structure of the debt affects the growth, allocation and distribution of resources. Such a view is closely associated with the view that debt *does* carry a burden.

In a point particularly relevant to a discussion of fiscal sustainability, Lerner (1951:274-275) argues that a 'functional finance' policy naturally limits any increase in the public debt. As soon as the economy reaches full-employment, there is no need for further fiscal stimulus. Thus, no additional borrowing needs to take place.

At that time Hansen also contributed to the discussion. Hansen's statement (Domar 1944:799) that public debt should be considered in relation to national income laid the foundation for the modern sustainability theory. Hansen (1947: 276-279) took Lerner to task regarding his view that, as a nation owes its domestic debt to itself, the amount is not important (Lerner 1948: 367-369; 1951:272-274; 1961; 380-385). He points out that

Lerner himself qualified this view when he considers the tax rate necessary to pay the interest on the debt. Tax rates need not increase if income increases sufficiently to yield enough taxes to pay the interest. However, if income does not increase sufficiently, tax rates must increase. This introduces the question of the size of the income multiplier. Hansen allows for the possibility that the multiplier may be too small for tax rates to remain unchanged. He is less optimistic than Lerner regarding the ability of government to stimulate economic growth with deficit spending.

In addition, in a paragraph that anticipates the modern debate on fiscal sustainability, Hansen (1947:277) states "Federal expenditure in the postwar in the United States will certainly be so high that if *taxes do not exceed the interest payments on the debt*..., we should experience inflation." [my italics]. When taxes do not exceed interest payments, government finances interest with new debt. Hansen thus reacts to Lerner who held that "...interest does not have to be raised out of current taxes." Hansen argues that the statement by Lerner becomes invalid if debt finance causes inflation instead of a higher output. Thus, Hansen sees a limit to the ability of government to stimulate the economy. In modern terms one could argue that Hansen is in favour of a primary surplus because deficits fail to stimulate output and cause inflation. (The term 'primary surplus' did not exist at that time.) Hansen also prefers low interest rates. This eases the task facing government when it has to manage and reduce a large public debt (Hansen 1947:148-151).

By far the most sophisticated analysis of fiscal sustainability during that time was by Domar (1944). Domar is the father of the formal mathematical treatment of fiscal sustainability that is still in use today. Although Kalecki, Hansen and Lerner had an intuitive understanding of the issue, Domar clearly demonstrates the technical relationship between the various variables that determine fiscal sustainability (1944:816). Contrary to what Hansen proposed, Domar (1944) did not call for a reduction of public debt through expenditure cutbacks or increases in the tax rate. Instead, he proposed larger budget deficits, which in his view should stimulate the economy.

According to Domar, a higher deficit generates a higher economic growth, which in turn, generates enough tax revenue to annually service the debt (Domar 1944: 802-803). If the tax generated through the higher deficit did not sufficiently service it in total, the problem "...does not lie with the deficit financing as such, but in its failure to raise the national income." (Domar 1944: 806). Domar clearly placed his trust in the effect government deficits will have on economic growth through the Keynesian income multiplier (Domar 1944:801; 819). He agrees with Lerner on this issue. Thus, government had to 'grow the economy out of its public debt burden'. He demonstrated that, given a large enough income multiplier, the deficit used to stimulate the economy would not cause an increase in the public debt/GDP ratio. A prerequisite for this is that the fiscal stimulus must raise the real economic growth rate above the real interest rate.

Domar relies on the Keynesian income multiplier to show that the interest on public debt need not impose an increasing burden on taxpayers in the form of a higher tax rate. He does not agree with Hansen that government should run a surplus to reduce debt when faced by too small an income multiplier. The size of the income multiplier itself should rather be addressed. This is especially evident in the last paragraph of his article (1944:823): "..., the public debt and its burden loom in the eyes of many economists and laymen as the greatest obstacle to all good things on earth. The remedy suggested is always the reduction of the absolute size of the debt or the prevention of its further growth. If all people and organizations who work and study, write articles and make speeches, worry and spend sleepless nights – all because of fear of debt – could forget about it for a while and spend even half of their efforts trying to find ways of achieving a growing national income, their contribution to the benefit and welfare of humanity – and the solution to the debt problem – would be immeasurable." For a more recent expression of the same idea, see Heilbroner and Bernstein (1989:53).

A few differences between Hansen and Domar may be noted. Hansen considers the impact deficits may have on inflation, whereas Domar assumes a constant price level (1944:802). According to the Keynesian view, an economy needs a fiscal stimulus only when there is unemployment. This is most clearly expressed in Lerner's functional

finance view. In the presence of unemployment fiscal deficits can cause inflation only if bottlenecks exist that dampen the size of the multiplier. Thus, unlike Hansen, Domar was optimistic about the ability of an economy to overcome bottlenecks.

The contributions by Domar and Lerner in particular, and the earlier contribution by Malthus, indicate that with different sets of assumption on economic behaviour, different views on fiscal sustainability can exist. This is especially relevant in view of mainstream attempts to portray the mainstream version of sustainability theory as a positive theory with no normative elements (cf. Zee 1988), thereby establishing it as the only theory of fiscal sustainability.

2.3.1.3 The modern, mainstream view: The return of classical morals

Following the developments of the 1940s, less attention was paid to the theory on fiscal sustainability during the ensuing three decades. This lack of attention may be attributed to the strong economic performance of many countries. In addition, the Domar view seemed vindicated. During this period the real interest rate did not exceed the real economic growth rate (Eltis 1998: 131). Governments could run deficits without a concomitant increase in public debt/GDP ratios. The strong economic performance in the form of high economic growth rates also allowed many governments to reduce public debt/GDP ratios (Masson and Mussa 1995:4b).

However, this all changed during the 1980s. According to the above data, public debt/GDP ratios surged globally during this period. Consequently, attention was again focused on the sustainability of fiscal policy. This is evident from the attention fiscal sustainability received in many countries (Bank for International Settlements 1992; Bohn 1998; Ball *et al.* 1998; Kremers 1989; De Grauwe 1994:48-62). This resulted in a multitude of new developments regarding the theory of fiscal policy. However, modern theory displayed marked changes from that of the 1940s.

Whereas Domar considered it normal for the real interest rate to be lower than the real economic growth rate, modern theory assumes that it is normal and 'prudent policy' for the real interest rate to exceed the real economic growth rate. It represents prudent policy both because, according to the mainstream view, a higher interest rate is more likely to prevent inflation, and because an economy is dynamically efficient when the real interest rate exceeds the real growth rate (see chapter 3). For instance, Sargent and Wallace (1981:6) in their seminal article entitled 'Some unpleasant monetarist arithmetic' assume that "...the real rate of interest exceeds the growth rate of the economy. We have made that assumption because it seems to be maintained by many of those who argue for a low rate of growth of money no matter how big the current deficit is." It is obvious in Eltis (1998:131) that the view held by Sargent and Wallace is widespread among mainstream economists. Eltis (1998:131) states that Domar's assumption of a constant and especially low interest rate represents an aberration from the real world. Abel *et al.* (1989) share this view with Eltis. The implication of this for fiscal sustainability is that if it is normal for the real interest rate to exceed the real growth rate, it means that it is also considered normal for government to run a primary surplus.

There are further differences between Domar and mainstream views that form the basis of the modern fiscal sustainability theory. The Domar model assumes a fixed, and (compared to today's standards) low interest rate (1944:800), that itself is *unaffected* by the size of the deficit. However, due to the advent of mainstream theory and its subsequent influence on the behaviour of lenders in credit markets, the size of the budget deficit and public debt *does* feature in the pricing of loans. For instance, it influences the international credit rating of a country. A large deficit and public debt are seen as factors that reduce the credit rating of a country. This, in turn, increases the interest rate that a country pays on international credit markets.

Mainstream economists agree with Hansen – who proposed a budget surplus to prevent inflation since the income multiplier will be too small – and reject Domar and Lerner – who held that government could grow the economy out of the burden of public debt by relying on the income multiplier. For instance, Posner (1987:403) rejects the Lerner view

that internal debt represents no burden on future generations. He sees the increase in future tax rates to stabilise the debt/GDP ratio, as a burden. Tax rates need to increase only in the absence of the multiplier. Thus, he agrees with Hansen. If, according to mainstream economists, a government cannot grow the economy out of its public debt burden, what policy decisions should it enact to ensure a sustainable fiscal policy?

To mainstream economists fiscal policy is unsustainable if the debt/GDP ratio increases at an accelerating rate (from, say, 50% to 51% in 2000 and then from 51% to 54% in 2001, etc.). The cause of unsustainability lies in the difference between the *levels* (and not the composition) of expenditure and revenue. Thus, according to Blanchard (1993:309), Buti (1990:14-15), Delarosière (1986:25), Chouraqui *et al.* (1986:16) and Miller (1983:11), the direct cure for an unsustainable increase in debt is either to reduce non-interest expenditure or to increase taxes. This requirement is demonstrated in section 2.4, which sets out measures to determine what adjustments in expenditure and taxes are required to establish fiscal sustainability. As a policy prescription it traces its origins to Ricardo (see above). Hopkin and Reddaway (1994:307), like Blanchard, stress the necessity to adjust expenditure and taxes and argue that monetary policy must ensure a reduction in interest rates to accompany the process. Hallet and McAdam (1996) also note the importance of adjustments in expenditure and taxes, but argue that tax reform is a further prerequisite to prevent a reduction in GDP, the denominator of the debt/GDP ratio.

A further development in the mainstream view expressed by Horne (1991:1-2) is to differentiate between fiscal sustainability and government solvency. A policy government currently pursued may not be sustainable if it causes an increase in the debt/GDP ratio. However, as government may reverse the policy in future, an unsustainable fiscal policy does not necessarily imply that government is insolvent. Only if government is unable to reverse an unsustainable policy, is it insolvent. If public debt and interest payments are co-integrated with GDP, it may constitute evidence in support of government solvency (Kremers 1989:221-225). However, it may be noted that if the behaviour of government ensured solvency in the past, it does not guarantee such

behaviour in the future. Another way of statistically testing government behaviour is to determine whether the primary balance is mean reverting and, in particular, whether the primary surplus is an increasing function to the size of the public debt/GDP ratio (Bohn 1998). However, this is again an indication that policy was solvent in the past. Thus, to determine whether or not government is currently solvent even though public debt/GDP ratio is increasing, requires from a mainstream analyst to determine whether or not government will be able to reverse its policy through an adjustment in expenditure and taxes.

The modern, mainstream view is a continuation of the classical view held by Smith, Ricardo and Mill. The views of Malthus, Keynes, Lerner and Domar challenged the classical view and form the foundation for an alternative view to the mainstream view of today. Although mainstream literature on fiscal sustainability may devote little attention to them, authors such as Heilbroner and Bernstein (1989) and Galbraith and Darity (1994) use this foundation to challenge the mainstream view.

2.3.1.4 Modern theory and the search for the sources of the high real interest rates

As the debate on fiscal sustainability resurfaced in the 1980s, many commentators noted that the increase in the debt/GDP ratios in many countries coincided with increases in the interest rate level. Given that the fiscal sustainability equation (equation 1) links the interest rate and the debt/GDP ratio, modern theorists focused their attention on the causal link between the interest rate and the debt/GDP ratio. Various explanations have been given for this causal link. These explanations are not restricted to the formal long-run steady state growth model environment, but avail themselves of more general views of purported linkages and dynamics between variables in the medium to longer run.

One prominent line of explanation identifies high levels of public deficits, or public debt, as a primary factor: "Economic studies based on non-Keynesian theory have found a close positive correlation, with reference to the 1980s and 1990s, between the public deficits or debts and the real – more often short-term – interest rates in the industrial

countries. The prevailing interpretation has been that the deficits on current account of the public sector ... and the public debts – implying a larger offer of bonds and an increased demand for loanable funds – would cause a mechanical upward pressure on interest rates ('crowding out')" (Ciocca and Nardozzi 1996: 109). Cebula and Rhodd (1993:443), Friedman (1992:301; 1988:174) and Cebula (1987:56) express a similar view. Anyanwu (1998:34) found that for African countries there is a statistically significant relationship between budget deficits and interest rates (deposit rates).

One question within this approach is whether it is high debt or large deficits that cause high interest rates. Currently the stronger consensus seems to be that debt, rather than deficits, is the culprit (cf. Tanzi and Fanizza 1995; Tanzi and Lutz 1993). Easterly and Schmidt-Hebbel (1994:51) found that in countries with a low debt/GDP ratio, such as Chile and Morocco, an increase of 1 percentage point in the deficit/GDP ratio increases the real interest rate by only 0.1 to 0.2 percentage points. However, in countries with high debt/GDP ratios, such as Colombia, Pakistan and Zimbabwe, an increase of 1 percentage point in the deficit causes the real interest rate to increase by as much as 1.1 to 2.7 percentage points. They also argue that high debt/GDP levels reduce the substitutability between public and private debt, so that government must offer a higher interest rate to attract buyers of government securities.

In contrast, a theory based on Ricardian equivalence would predict *no effect* of deficits at all: consumers realise that higher deficits imply higher future taxes and therefore raise their own saving to exactly offset higher public deficits. "The implications of pure Ricardian equivalence is that total saving, and hence interest rates, are not affected by government deficits." (Ford and Laxton 1995: 1) In this vein, Evans (1985) found no significant impact of debt and deficits on interest rates.

Countering this, Ford and Laxton (1995: 1) argue that, given the presence of a high degree of integration between the capital markets of industrial countries, "...an increase in the level of world government debt would raise the world real interest rate and, all else equal, the interest rates in individual countries." Tanzi and Lutz (1993:247) express a

similar view. They find that "... the rise in government debt since the late 1970s has had a substantial effect on real interest rates in these industrial countries, contrary to the Ricardian hypothesis. Between 1978 and 1993 the OECD wide net debt-GDP ratio rose from 21.2% to 39.7%, an increase of 18.5 percentage points. Based on our parameter estimates, this has boosted real interest rates by 250 to 450 basis points" (Ford and Laxton 1995: 2). This would explain most of the increase in rates observed during this period (see the Table above). Sutherland (1995:16) argues that consumption decreases (and thus, saving increases) only at high levels of debt as a result of increases in debt.

An alternative, Keynesian interpretation proposed by Ciocca and Nardozzi (1996: 108-9) points to high rates as an uncertainty and policy risk premium. Thus, for the period 1979-1983 Ciocca and Nardozzi (1996:54) ascribe higher interest rate levels to a "...shift in the Federal Reserve's policy stance [that] meant uncertainty as to the higher level of interest rates needed to curb inflation in the new monetary policy regime." Later in the 1980s there was another cause for the uncertainty (Ciocca and Nardozzi 1996: 109-110): "As well as creating uncertainty and concern *per se*, the precarious, if not worsening, situation of public finance invests the financial markets with the fear that the monetary policy is not supported by the budgetary policy and is thus neither safe nor credible. The negative repercussion of an upsurge in interest rates are manifested through an increased demand for money rather than through the increased offer of government bonds."

The OECD Outlook (1993:23, 26) offers the following composite list of causes: large budget deficits, lags in market adjustment and inflationary expectation adjustment to the general disinflationary thrust of monetary policies since the early 1980s, and financial liberalisation measures which have increased the extent to which key market interest rates reflect underlying market forces rather than administrative, non-price methods.

Smithin (1994a) propounds a reverse causality: that high real interest rates are the main *cause* (rather than the consequence) of large deficits. He uses a post-Keynesian approach that views the money supply as endogenous and interest rates as being determined by the central bank. He also offers empirical evidence that, in the period since 1980, the interest

rate increases frequently *preceded* budget deficit increases: "The direction of causality suggested here therefore runs from concern over inflation in the wake of the inflationary decade of the 1970s, through very high real rates of interest as a result of the attempts of key central banks to deal with this problem via monetary policy, and on to large measured budget deficits emerging both directly, as a result of higher financing costs, and indirectly because of the monetary policy induced recessions" (1994a:164).

Masson and Mussa (1995:15-17) argue that in the post-WWII period up to 1980 expected inflation regularly fell short of actual inflation. Thus, nominal interest rates did not discount the full effect of inflation. This caused a decrease in the debt/GDP ratio. However, in the post-1980 period expected inflation exceeded actual inflation, hence putting upward pressure on real interest rates and the debt/GDP ratio.

In addition, Raga (1986:176) argues that the oligopolistic nature of financial markets meant that banks could pass the upward pressure that increases in debt put on interest rate, on to the consumer to safeguard their margins. This could not happen if the market were more competitive.

These alternative explanations, and their relative merits, are not the focus of this chapter. However, they do serve to illustrate that different explanations of the causes of the fiscally undesirable relationship between r and g (*i.e.* where $r > g$) may point to different options or possibilities for establishing fiscal sustainability. One key question addressed in later chapters is whether the (r-g) gap falls within or beyond the grasp of policy. It is clear from the above that mainstream theory (the 'non-Keynesian theory' mentioned above by Ciocca and Nardozzi) ascribes the increase in real interest rates to the increasing demand for loanable funds caused by the increase in debt, deficits and government dissaving.

2.3.2 The South African debate

With the onset of a higher public debt/GDP ratio in South Africa during the late 1980s and 1990s, the sustainability of fiscal policy received increasing attention. The issue was especially pertinent given increasing demands for higher social expenditure and a business sector that clamoured for a reduction in the tax burden as a prerequisite for increased investment.

Already during the late 1980s, Black and Cooper (1988) argued that government should have reduced public debt by retiring existing public debt with the proceeds of new bonds, rather than by using it for the acquisition of new capital. In the early and mid-1990s, several commentators argued that fiscal policy was unsustainable (Roux 1993; Van der Merwe 1994; Schoeman 1994; Cronje 1995). Roux (1993:332-333) argued that government would be able to finance higher social expenditure only if economic growth improved. Otherwise, debt-financed increases in social expenditure would cause an increase in the public debt/GDP ratio. Van der Merwe (1994:12) argued that fiscal policy in South Africa was unsustainable due to the large gap between the real interest rate and the real economic growth rate, the large size of the deficit and because large interest payments constrained the ability of government to spend on essential services. Van der Merwe also argued that government should revert to the classical doctrine of running a balanced budget unless it finances investment or extraordinary expenditure. This view is in line with views especially prevalent among mainstream economists since the 1980s. He explicitly warned that if South Africa did not restructure government finances, the country was heading for a debt trap. Schoeman (1994:10) also warned that as long as government runs a large deficit in the face of a real interest rate that exceeds the real economic growth rate, the public debt/GDP ratio would tend to explode. Government would be on its way to consume all available resources. Hence, he argued for a decrease in the deficit to arrest the increase in the public debt/GDP ratio. In the same vein Cronje (1995:21) argued that government has no room at all to run a larger deficit. This is also in line with the view of Standish and Beelders (1991:11-12) who argued that an increase in public debt causes a decrease in private expenditure, whereas an increase in fiscal

deficits causes an increase in the money supply. Cronje (1998) also noted that markets were paying increasing attention to the sustainability of fiscal policy.

Not only markets were paying more attention to the issue of fiscal sustainability. Government too, explored the issue (cf. Wickens 1992). Although government never explicitly stated fiscal sustainability as an objective, it did state the reduction of public debt as an explicit objective. Government justified this stance on the grounds that it dissaved and thereby reduced the pool of resources available for private investment. In addition, the interest burden was 'crowding out' discretionary fiscal policy. The latter reason provided government with an explanation as to why the Growth, Employment and Redistribution (GEAR) policy, which calls for a reduction in the deficit and the interest burden, was not inconsistent with the Reconstruction and Development Program (RDP), which calls for larger social expenditure.

Probably the most prolific author on the stance of fiscal policy in the 1990s was Heyns. In the early 1990s Heyns published a series of articles and papers regarding various aspects of South African fiscal policy (Heyns 1991; 1993a; 1993b; 1993c; 1994; ABSA 1996). Heyns (1991) indicated the shifts in emphasis that took place in South African fiscal policy during the 20th century. As was the case in many other countries, the 1980s saw a shift from Keynesian policy that aimed at 'balancing the economy' (1991:387) to a 'financially healthy' policy that was more classical than Keynesian (1991:388-389). Heyns (1991:389) noted that this shift in thought was especially evident in the financial press and the rhetoric of government. One of the reasons (Heyns 1991:389) for this shift in thought was the disillusionment with a policy that attempted to maintain a structural budget deficit but which caused an increasing debt and interest burden.

Although Heyns argued for a reduction in the debt and interest burden of government, he cautioned against judging the performance of government only in terms of its balance sheet and net worth. Government should rather be judged in terms of its functions (1993a:17-19, 21; 1993b:68-72; ABSA 1996:19). In the mainstream view these functions, seminally defined by Musgrave (1959: 5-27; Musgrave and Musgrave 1973: 5-

21), relate to allocation, distribution and macroeconomic stability. To judge government solely in terms of its balance sheet and net worth is to treat government as if it were a firm. A firm maximises its profit. It incurs current expenditure only to generate the income that maximises profit. However, some expenditure by government are ends in themselves. Essential consumption expenditure by government does not necessarily have lesser priority than capital expenditure. Heyns points out that the productivity of government should be measured in terms of its success in reaching its economic objectives (which encompass allocation, distribution and stability objectives).

In addition, Heyns refers to the classification of government expenditure in capital and current outlays and the way in which each can be financed. According to classical theory (see section 2.3.1.1 above), the principles of prudent fiscal policy prescribe that capital expenditure can be financed with loans. Because capital expenditure is expected to cause an increase in future income, government will be able to collect the necessary taxes to service the loans without the need to increase tax rates. In addition, the debt/GDP ratio does not increase if investment causes future income to increase. Current expenditure on the other hand is *assumed* not to yield a future return. Thus, it should be financed from revenue. If it is financed with loans, the debt and interest burden can be expected to increase, implying an increase in the debt/GDP ratio. However, due to present accounting practice, capital expenditure on human capital formation is classified as current expenditure. Thus, the current deficit, as measured by present accounting practices, overstates government dissaving. Therefore, it overstates the degree to which government adds to the interest and debt burden of future generations.

Heyns (1994:9) also argues for the consideration of public debt within the broader framework of general government and for the inclusion of the discounts on government bonds in the interest cost of government (ABSA 1996:19). The exclusion of these costs understates the current deficit.

Heyns also clears up some misconceptions by explicitly distinguishing between a fiscal policy that is unsustainable and a government that is in a debt trap. Even though fiscal

policy in South Africa could be considered unsustainable, it does not mean that the South African government was in a debt trap (Heyns 1993c:83). A debt trap (ABSA 1996:5) is a case where: a) the debt/GDP ratio is increasing, b) the debt/GDP ratio increases at a rapid pace and c) there is little scope to reverse the increase through tax increases or expenditure decreases. The distinction between fiscal unsustainability and a debt trap broadens the discussion of fiscal sustainability and prevents an overly pessimistic view in the face of a mounting debt burden. The distinction Heyns makes between an unsustainable fiscal policy and a debt trap is similar to that of Horne between an unsustainable fiscal policy and an insolvent government (see section 2.3.1.3 above).

Fourie and Burger (2000; 1999) focus on the relationship between fiscal sustainability and the financial sustainability of non-governmental agents. They argue that the establishment of fiscal sustainability may shift the unsustainability from the government to private sector agents. This point is developed further in this thesis.

2.4 What is a sustainable fiscal policy?

The following section provides an exposition of what constitutes mainstream theory on fiscal sustainability. The discussion highlights the importance mainstream economists attach to adjustments in the levels of non-interest expenditure and taxes, summarised as changes in the primary balance, to establish fiscal sustainability. The discussion analyses contemporary theory on fiscal sustainability on two levels, one more theoretical, the other more pragmatic. Because fiscal sustainability is a long-run issue, the analysis of the theoretical level is conducted in terms of long-run dynamic relationships between the various variables that determine fiscal sustainability. The long-run dynamic relationships are usually portrayed over an infinite horizon. The analysis of the more pragmatic level focuses on policy decisions taken in discrete time, i.e. in terms of annual budgets or three-year rolling budgets. The more pragmatic side of the argument is based on a need for indicators that demonstrate whether or not fiscal policy decisions taken for these discrete periods of time are sustainable.

Because all the indicators that measure the sustainability of fiscal policy are derived algebraically from the budget constraint of government, a discussion of fiscal sustainability must begin with the budget constraint of government (Blanchard 1993:314). The first part of this section examines the budget constraint. The second part looks at the long-run framework used to analyse fiscal sustainability. It represents the theoretical level of the story. The third part depicts the pragmatic level in terms of the short-run indicators of fiscal sustainability. The fourth part depicts some alternative indicators. The section uses numerical examples to facilitate the intuitive understanding of the equations presented.

2.4.1 The budget constraint of government

The budget constraint that government faces over the long-run is derived from the equation that depicts the change in the short-run debt position of government. According to Blanchard (1993:314) the (short-run) budget constraint is contained in equation 2 (see also Fanizza and Mourmouras (1994:3-5)):

$$dD/ds = G + H - T + rD = B + rD \qquad (2)$$

where D: Debt

G: Government spending

H: Transfers

T: Taxes

r: The real interest rate

B: The primary deficit = G + H –T = the difference between non-interest expenditure and revenue

s: Time

Also see Tanner (1995) who expresses the budget constraint in terms of the total level of debt (in contrast to equation 2 that depicts only the change in the debt). For a discussion on the primary balance, see Blejer and Cheasty (1991:1655).

Example 1

In the case of equation 2, assume that G + H – T in absolute terms equals 1.5, existing debt D equals 50, while the real interest rate equals 8%. Then the change in debt for one period is:

$dD/ds = 1.5 + 0.08(50)$

$= 5.5$

If the interest rate is 2%, the change in debt, *ceteris paribus*, is:

$dD/ds = 2.5$

Equation 3 depicts in present value terms the long-run, infinite horizon budget constraint of government (Roubini 1991:S51). The manner in which Roubini portrays the budget constraint indicates that the initial amount of government debt, D(t), plus the present value of future non-interest expenditure, $\int e^{-rj}G(t + j)dj$, equal the present value of future tax receipts, $\int e^{-rj}T(t + j)dj$, (all values are real):

$$\int_0^\infty e^{-rj}G(t + j)dj + D(t) = \int_0^\infty e^{-rj}T(t + j)dj \qquad (3)$$

where G(t + j): Non-interest expenditure in period t + j (j periods counting from time t)

T(t + j): Tax revenue in period t + j (j periods counting from time t)

r: The real interest rate

All the indicators of fiscal sustainability are derived from the above budget constraints. The following sections illustrate these indicators.

2.4.2 *The dynamic framework of fiscal sustainability*

The budget constraint is always true *ex post* (Blanchard 1993:315; Horne 1991:67), either through changes in taxes and expenditure or through the monetisation or repudiation of debt. However, *ex ante* the question is whether and to what degree government needs to make an adjustment in expenditure and revenue to ensure fiscal sustainability. If no adjustment is needed, fiscal policy is sustainable and government has a positive or zero net worth (Cronje 1998). The infinite horizon budget constraint of government is used to calculate the net worth of government. Equation 3 can be rearranged to indicate that the present value of all future primary surpluses must equal or exceed the initial government debt (see also Kremers 1989:221):

$$D(t) \leq \int_0^{\infty} e^{-rj}[T - G](t + j)dj \qquad (4)$$

For government to have a positive or zero net worth, D(t) in equation 4, which denotes debt, must be smaller than the discounted value of the amount with which future taxes exceed non-interest government expenditure. If the net worth of government is negative, fiscal policy is unsustainable. This requires an adjustment in either government expenditure or revenue or both to prevent insolvency. (Note that the budget constraint includes expenditure, revenue and the deficit. At any given time government can only change two of the three, whereas the third must be left to adjust to the changes in the other two (Eatwell *et al.* (New Palgrave) 1987:555).)

Blanchard makes the assumption that if government makes an adjustment, taxes are more likely to increase than expenditure is to decrease. Thus, he derives an equation that indicates the sustainable tax ratio (tax revenue as a percentage of GDP):

$$t^* = (r-g)\{\int (x+h)e^{-(r-g)s}ds + D_0/Y_0\} \qquad (5)$$

where t*: The sustainable tax ratio (taxes-to-GDP ratio)

x: Government spending on goods and services as percentage of GDP

h: Transfers as percentage of GDP

g: The growth rate

D_0/Y_0: The initial debt/GDP ratio

Although both equations 4 and 5 appear in theoretical discussions, neither can be calculated, as both require projections into infinity (Blanchard 1993:316). In addition, because policy decisions depend on specific economic circumstances, policy-makers take decisions for discreet periods of time. Even if it were possible to know the long-run path of the economy, it is unlikely that government will set the levels of taxes and expenditure once and for all. Policy-makers do not operate in this way as 'they must be seen to *do* something'. Thus, decisions that may affect the level of the debt/GDP ratio may be a continuous phenomenon.

The manner in which policy-makers operate necessitates the use of an indicator to determine whether or not there is a need for a future reversal of policy. The indicator must show such a need by indicating whether a continuation of the present policy stance (as expressed in the present relation between the levels of expenditure and revenue) causes the debt/GDP ratio to explode, implode or remain stable. Bispham (1987:67-70) developed a set of equations that fulfils this need. He first considers the case where the size of the budget deficit remains in a fixed relation to GDP. If the budget deficit remains a constant proportion of GDP and no interest is paid on debt, then the debt/GDP ratio tends to a finite constant as $t \rightarrow \infty$:

$$D_t / Y_t \rightarrow \frac{q}{g}(1+g) \qquad (6)$$

where D: Debt

Y: Nominal GDP

q: The budget deficit as proportion of nominal GDP

g: Nominal economic growth rate

Example 2

Because in this case no interest is paid, the budget deficit equals the primary deficit. If the budget deficit, q, equals 3% of GDP in future (a ratio sometimes assumed as prudent by politicians and the popular press) and the real growth rate, g, is constant at 5%, then equation 6 indicates that the debt/GDP ratio will stabilise on:

$$D/Y = (q/g)(1 + g)$$
$$= (0.03/0.05)(1 + 0.05)$$
$$= 0.63$$

If interest is paid and the primary deficit is a constant ratio of GDP, the overall budget deficit ratio is not constant. Thus, interest payments can cause the overall budget deficit to change. What happens to the debt/GDP ratio depends on the relationship between the interest rate (r) and the economic growth rate (g). If r = g, then:

$$D_t / Y_t = tq + p \qquad (7)$$

where p: The initial debt ratio

q: The primary deficit

As $t \rightarrow \infty$:

$$D_t / Y_t = tq + p \rightarrow \infty$$

Thus, with $D_t/Y_t \rightarrow \infty$ the ratio explodes. Whether the explosion has a positive or negative value depends on the sign of q, i.e. whether government runs a primary deficit or surplus.

Example 3

This example demonstrates that government should not run a primary deficit when r = g. Suppose the initial debt/GDP ratio, p, equals 20% and the primary deficit equals 3%, then after respectively 10, 30 and 50 years, the debt/GDP ratio equals:

D/Y = tq + p

For 10 years:

D/Y = 10(0.03) + 0.2 = 0.5

For 30 years:

D/Y = 30(0.03) + 0.2 = 1.1

For 50 years:

D/Y = 50(0.03) + 0.2 = 1.7

If government does not run a primary deficit, but balances its primary balance, then the debt/GDP ratio remains constant. After 50 years the ratio is:

D/Y = 50(0) + 0.2 = 0.2

Thus, the ratio remains stable at 0.2.

Equation 7 is used only where r = g. If r ≠ g equation 8 is used:

$$D_t / Y_t = q(\frac{1+g}{r-g})[(\frac{1+r}{1+g})^t - 1] + p(\frac{1+r}{1+g})^t \qquad (8)$$

When r < g, equation 8 and 8.1, to which equation 8 reduces when r < g, indicates that the debt/GDP ratio will not explode. Instead the debt/GDP ratio will converge to a stable ratio. Because the claim government makes on saving does not continuously crowd out

investment when the debt/GDP ratio stabilises, fiscal policy does *not* become unsustainable.[2]

$$D_t / Y_t \rightarrow -q(\frac{1+g}{r-g}) = q(\frac{1+g}{g-r}) \qquad (8.1)$$

Example 4

Assume that the real interest rate equals 2% and the real growth rate equals 5%. The higher the primary deficit is as percentage of GDP, the higher will be the value at which the debt/GDP stabilises. However, the ratio will not explode, i.e. there is no continuous and accelerating increase in the ratio. Consider two possible cases, in the first the primary deficit equals 3% of GDP and in the second it equals 1%. In the former the ratio stabilises at:

$$\begin{aligned} D/Y &= q(1+g)/(g-r) \\ &= -0.03(1+0.05)/(0.02-0.05) \\ &= 1.05 \end{aligned}$$

whereas in the latter case it stabilises at:

$$\begin{aligned} D/Y &= -0.01(1+0.05)/(0.02-0.05) \\ &= 0.35 \end{aligned}$$

[2] This does not preclude the possibility that the fiscal policy will not become unsustainable. For this to happen, equation 8 must be set in a framework where outcomes are not certain, but only probable. It is then possible to show that even if the expected debt/GDP ratio is expected to converge to a stable ratio, there may still be a probability (although a small one) that the interest rate can exceed the economic growth rate. For more on this see Abel (1993); Ball *et al.* (1998); and the remark by Bohn (1998:962) on bad states of the world even if government can run primary deficits in most states of nature.

To determine what happens to the debt/GDP ratio if r > g, equation 8 is rewritten as:

$$D_t / Y_t = q(\frac{1+g}{r-g})(\frac{1+r}{1+g})^t - q(\frac{1+g}{r-g}) + p(\frac{1+r}{1+g})^t \qquad (8.2)$$

The middle term in equation 8.2 can be ignored because it is a constant. If r > g the change in the debt/GDP ratio depends on the size and sign of p (the initial debt/GDP ratio) and q (the primary deficit). If both are positive, the debt/GDP ratio explodes as $t \rightarrow \infty$. This is the case where fiscal policy is unsustainable. This means that unless expenditure is cut or taxes are increased, the debt/GDP ratio will explode if the interest rate exceeds the economic growth rate and government runs a primary deficit, or a primary surplus that is too small. If both p and q are negative, government has an explosive positive net worth position. Although an explosive positive net worth is unlikely to appear in reality, fiscal policy will also be unsustainable. However, if one is positive and the other negative the two terms in equation 8.2 operate in opposite directions. What happens to the ratio depends on whether:

$$\left| q(\frac{1+g}{r-g}) \right| < |p|$$

or

$$\left| q(\frac{1+g}{r-g}) \right| > |p| \qquad (9)$$

It is possible to calculate the values of q and p so that the left- and right-hand sides of equation 9 are equal for all time, but Bispham argues that such an eventuality is highly unlikely. Instead, government may decide to let the value of the primary balance change so that the direction of inequality in equation 8.2 is reversed from time to time. This would mean that, whereas government would at times allow the primary surplus to be too small to prevent an increase in the public debt/GDP ratio, it must at other times run a

primary surplus large enough to reduce the ratio. This behaviour relates to the behaviour Bohn considered. A sustainable fiscal policy would be associated with a statistical pattern of mean reversal in the deficit.

Example 5

Equation 8.2 describes the necessity for the primary surplus to be large enough to prevent a continuous and accelerating increase in the debt/GDP ratio, i.e. to prevent an unsustainable fiscal policy. A continuous and accelerating increase in the debt/GDP ratio occurs only when $r > g$. Suppose the real interest rate equals 8%, the real growth rate equals 5%, while the initial debt/GDP ratio equals 50%. Three scenarios are presented.

Scenario 1

In the first scenario the primary *surplus* is large enough to prevent a continuous increase in the debt/GDP ratio.

$$
\begin{aligned}
D/Y &= q((1+g)/(r-g))((1+r)/(1+g))^t - q(1+g)/(r-g) + p((1+r)/(1+g))^t \\
&= -0.01429((1+0.05)/(0.08-0.05))((1+0.08)/(1+0.05))^t \\
&\quad + 0.01429(1+0.05)/(0.08-0.05) \\
&\quad + 0.5((1+0.08)/(1+0.05))^t \\
&= 0.5 \text{ for whatever value of t, because the first and third terms are equal but opposite in sign}
\end{aligned}
$$

Note that $-0.01429((1+0.05)/(0.08-0.05))$ in the first term equals the 0.5 that appears in the third, whereas the rest of the first and third terms is the same. This demonstrates the logic behind equation 9 above.

Scenario 2

In the second scenario government also runs a primary *surplus*. However, it is too small to prevent a continuous increase in the debt/GDP ratio. If the primary surplus was smaller than in scenario 1, the first term will be smaller than the third. Thus, it will be

too small to cancel the third. For example, if the primary surplus/GDP ratio equals 0.01, then the debt/GDP ratio after 30 years will equal:

$$\begin{aligned} D/Y &= -0.01((1+0.05)/(0.08-0.05))((1+0.08)/(1+0.05))^{30} \\ &\quad + 0.01(1+0.05)/(0.08-0.05) \\ &\quad + 0.5((1+0.08)/(1+0.05))^{30} \\ &= 0.6992408 \end{aligned}$$

Scenario 3

In the third scenario government runs a primary *deficit* that also causes the debt/GDP ratio to increase. The difference between the second and third scenarios is that the rate of increase in the third is faster. To demonstrate this, scenario three depicts the evolution in the debt/GDP ratio for periods of 10, 20 and 30 years.

After 10 years:

$$\begin{aligned} D/Y &= +0.01429((1+0.05)/(0.08-0.05))((1+0.08)/(1+0.05))^{10} \\ &\quad - 0.01429(1+0.05)/(0.08-0.05) \\ &\quad + 0.5((1+0.08)/(1+0.05))^{10} \\ &= 0.826 \end{aligned}$$

After 20 years:

$$\begin{aligned} D/Y &= +0.01429((1+0.05)/(0.08-0.05))((1+0.08)/(1+0.05))^{20} \\ &\quad - 0.01429(1+0.05)/(0.08-0.05) \\ &\quad + 0.5((1+0.08)/(1+0.05))^{20} \\ &= 1.257 \end{aligned}$$

After 30 years:

$$\begin{aligned} D/Y &= +0.01429((1+0.05)/(0.08-0.05))((1+0.08)/(1+0.05))^{30} \\ &\quad - 0.01429(1+0.05)/(0.08-0.05) \\ &\quad + 0.5((1+0.08)/(1+0.05))^{30} \\ &= 1.828 \end{aligned}$$

Note that from zero to 10 years the debt/GDP ratio increased with 0.326 (that is: 0.826 minus 0.5), from 10 to 20 years the ratio increased with 0.431 (that is: 1.257 minus 0.826) and from 20 to 30 years the ratio with 0.571 (that is: 1.828 minus 1.257). Thus, the ratio increases faster the further one moves into the future. Hence the conclusion Bispham makes that the ratio will explode as $t \rightarrow \infty$. This may be contrasted with example 4 above where the ratio does not explode but stabilises. *Thus, the debt/GDP ratio can only explode when the real interest rate exceeds the real growth rate.* In addition, note that after 30 years the ratio in scenario 3 is much higher than in scenario 2, the scenario where government ran a primary surplus, but the surplus was too small to prevent the ratio from increasing. Thus, the smaller the primary surplus and the larger the primary deficit, the higher will be the rate at which the debt/GDP ratio increases.

Equations 6 to 9 provide a set of test indicators to determine whether or not fiscal policy is sustainable *given* that the current primary balance is maintained and that the interest rate and economic growth rate are on a stable long-run path (thus, they are not expected to change). However, note that fiscal policy is sustainable only if the assumptions made about expenditure, taxation, the interest rate and economic growth rate hold. As these assumptions refer to the future, they are expectations. This is an early indication of the role expectations play in efforts to determine whether or not fiscal policy is sustainable. As expected values represent softer data than past data, policy decisions based on the results of equations 6 to 9, must be approached with caution. The caution must take the form of regular *ex post* checks to determine whether or not the values ascribed to the above variables turned out as expected.

2.4.3 Short-run indicators of fiscal sustainability: The primary balance and changes in the debt/GDP ratio

Although equations 6 to 9 may assist government in determining whether or not its policy is sustainable in the long-run, policy decisions are nevertheless taken in discrete time and not over an infinite or very far off horizon. This requires a set of indicators that allows government to judge the implications of its decisions for discrete periods of time. In addition, government may feel more confident about its expectations for the immediate

future than about its expectations for the more distant future. The lack of confidence in expectations about distant periods limits the applicability of equations 6 to 9. Thus, government may have more confidence in the sustainability of its policy when judging it in terms of the short-run indicators.

Short-run indicators used to asses the sustainability of fiscal policy usually are defined in terms of a single period, usually a year. The focus is on the size of the primary surplus (i.e. the difference between the *non-interest* expenditure and income) and the change in the debt/GDP ratio (World Bank 1988:56; Fanizza and Mourmouras 1994:11). The focus on the primary surplus is deliberate. With regard to expenditure government has to focus on those expenditures it can change, i.e. discretionary expenditure (Blejer and Cheasty 1991:1655). Interest payments represent a contractual agreement. Thus, interest payments cannot be decreased at the discretion of government. Should government then decide to adjust its expenditure to stabilise the debt/GDP ratio, only elements of non-interest expenditure can decrease. (Note, however, that it is a simplification to state that all non-interest expenditure is discretionary. Many governments incur large expenditure items in the form of entitlements, including pensions. Some of these entitlements are just as binding and non-discretionary as interest payments. For studies on the relationship between pensions, public debt and the sustainability of fiscal policy see Blejer and Cheasty (1991:1672; 1993:290-292), Bovenberg and Peterson (1992), Jensen and Nielsen (1995) and Masson and Mussa (1995).)

Equation 1, set out in section 2.1, is the most commonly used short-run measure of fiscal sustainability:[3]

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t + R_{gt}/Y_t \qquad (1)$$

[3] Equation 1 is for the non-inflationary case. For the inflationary case it would be $\Delta D_{gt}/Y_t \equiv [(r_{gt} - g_t)/(1 + g_t)]Dgt_{-1}/Y_{t-1} + B_{gt}/Y_t + R_{gt}/Y_t$ (difference in bold) where r and g are real and all others nominal. For conciseness only the non-inflationary case is shown.

The *bold* area in equation 1 refers to the interest component of government expenditure. Note that r > g indicates upward pressure on the debt/GDP ratio, while r < g indicates downward pressure.

The *shaded* area in equation 1 indicates the *non*-interest flows of government. If it is positive, government runs a primary deficit, putting upward pressure on the debt/GDP ratio. If it is negative, government is running a primary surplus, implying downward pressure on the debt/GDP ratio. Depending on the magnitudes and signs of the two areas there will be a net positive or negative effect on the debt/GDP ratio.

The primary balance is:

$$B_g \equiv I_g + G - T \qquad (10)$$

where I_g: Investment by the public sector

G: Consumption expenditure by the public sector

T: Tax revenue

To establish sustainability, government should run a primary surplus sufficient to cover the excess caused by the real interest rate over the real growth rate. Fanizza and Mourmouras (1994:11-12) call this a sustainable primary surplus. The size of the primary surplus required to stabilise the debt/GDP ratio is (Congdon 1988:218; Bank for International Settlement 1992:27; Gonzalez-Paramo *et al* 1992:275; Blanchard *et al.* 1985:7):

$$- B_{gt}/Y_t = (r_{gt} - g_t)D_{gt-1}/Y_t \qquad (11)$$

or equivalently:

$$B_{gt}/Y_t = (g_t - r_{gt})D_{gt-1}/Y_t \qquad (11.1)$$

Equation 11 can be used to make some general illustrative calculations. For a debt/GDP ratio of approximately 60%, which is the norm for the Euro group of countries, each 1

percentage point gap between r and g implies a required primary budget surplus of 0.6% of GDP. In the G7 case, in the early 1990s, this would translate to an average required primary budget surplus of approximately 1.2% of GDP to achieve fiscal sustainability, given the prevailing (r-g) gap of just over 2%. The higher the existing debt ratio, the larger the primary surplus required per 1 percentage point (r-g) gap.

Example 6

Should government want to prevent an increase in the debt/GDP ratio, equations 1 and 11 demonstrate the necessity for government to run a primary surplus when $r > g$. When $r < g$ they describe the ability of government to run a primary deficit without a concomitant increase in the debt/GDP ratio. Assume that in period t-1 public debt equals 50, GDP equals 100 and economic growth in period t equals 5%. Four scenarios are presented. In scenario 1 the interest rate equals 8% and government runs a primary surplus large enough to prevent an increase in the debt/GDP ratio. In the second scenario the interest rate also equals 8%, while government runs a primary deficit. In the third and fourth scenarios the real interest rate equals 2%. In the third scenario government runs a primary deficit, whereas in the fourth scenario it runs a primary surplus.

Scenario 1:

In this case government runs a primary *surplus* of 1.5.

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t$$
$$= (0.08 - 0.05)50/105 - 1.5/105$$
$$= 0$$

In this case the primary surplus is large enough to prevent an increase in the debt/GDP ratio. To reduce the debt/GDP ratio, government must run a primary surplus that is larger than the one needed to prevent an increase in the ratio. Note also that the primary surplus required to prevent an increase in the debt/GDP ratio equals 1.5/105, which equals 0.01429 or approximately 1.4% of GDP. This is the same primary surplus needed to prevent an increase in the debt/GDP ratio in scenario 1 of example 5. This indicates the consistency between equations 7.2 and 9.

Scenario 2:

In scenario 2 government runs a primary *deficit* of 1.5.

$\Delta D_{gt}/Y_t = (0.08 - 0.05)50/105 + 1.5/105$

$= 0.029$

The primary deficit causes the debt ratio to increase from 0.5 in period t-1 to 0.529 in period t (0.5 + 0.029 = 0.529). Thus, when the real interest rate exceeds the real growth rate and government runs a primary deficit, the debt/GDP ratio increases. However, as scenario 3 demonstrates, this is not the case when the real interest rate falls short of the growth rate.

Scenario 3

In scenario 3 government also runs a primary *deficit* of 1.5.

$\Delta D_{gt}/Y_t = (0.02 - 0.05)50/105 + 1.5/105$

$= 0$

Scenario 4

Should government run a primary *surplus* when the real interest rate falls short of the real growth rate, the debt/GDP ratio decreases.

$\Delta D_{gt}/Y_t = (0.02 - 0.05)50/105 - 1.5/105$

$= -0.029$

Thus, the debt/GDP ratio decreases from 0.5 in period t-1 to 0.471 in period t (0.5 – 0.029 = 0.471).

The requirement to run a primary surplus does not imply that government should at all times run a sufficiently sized primary surplus to prevent an increase in the debt/GDP ratio. Government can alternate periods in which the primary surplus is too small to prevent an increase in the ratio, with periods in which the actual primary surplus exceeds the required ratio (something equation 9 also describes).[4] However, government should

[4] A note should also be made with regard to the difference in accrual and cash flow accounting. In the GFS system transactions are recorded on a cash flow basis. Thus, should government acquire an asset, the total

on average run a sufficiently sized primary surplus to maintain a stable debt/GDP ratio. Thus, government can vary the size of the primary surplus over the course of the business cycle or another period of its choice. The point mainstream theory makes is that policy-makers should plan to run a sufficiently sized primary surplus *on average*. This will result in a primary surplus that exhibits a pattern of mean reversal over the long-run (given that mean reversal also occurs in economic growth). Therefore policy-makers can consider fiscal policy sustainable if they plan to run a sufficiently sized primary surplus on average. It can also allow the debt/GDP ratio to increase temporarily in the expectation of higher economic growth later on that will reduce the ratio. For instance, government may expect a higher growth rate if it made an investment that increases private sector productivity. A higher economic growth may allow the collection of more taxes without the need to increase the tax rate. A future decrease in the ratio means that the required size of the primary surplus will also decrease.

Galbraith and Darity (1995:10) propose another angle to determine whether or not the fiscal policy pursued by government is sustainable. This is based on their interpretation of Blanchard. The question is not whether or not government will someday reverse a policy that currently causes the debt/GDP ratio to increase, but rather whether or not the real burden of interest is greater than the 'largest feasible primary surplus'. This implies that the maximum sustainable debt is determined by the ratio of the largest feasible primary surplus to the real interest rate. This approach also allows considerations of political sustainability. If there is a limit to the extent to which expenditure can be reduced or taxation increased, there also is a limit to the size of the largest feasible primary surplus. This places a limit on the maximum feasible size of public debt.

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payment for the asset is recorded as expenditure. This differs from an accrual system where only the depreciation (consumption of capital is counted as an expenditure). The result is that government expenditure and the primary balance may temporarily overstep their sustainable level. However, in subsequent years government receives tax income that it would not have received had it not invested in the asset, while its expenditure is not as high as it would be if it depreciated the asset. As a result the primary surplus will exceed its sustainable level.

2.4.4 *Alternative indicators*

Alternative indicators include measures of the medium-term and long-term tax gaps (Wickens 1992; Blanchard 1993:316) and the sustainable conventional balance. The sustainable conventional deficit[5] (defined as the sustainable difference between total government expenditure and revenue) is derived from equation 11 and equals the growth rate multiplied by the debt ratio:

$$\begin{aligned} Def_t/Y_t &= (r-g)D_{t-1}/Y_t - rD_{t-1}/Y_t \\ &= -g.D_{t-1}/Y_t \end{aligned} \qquad (12)$$

In the typical Euroland case the maximum deficit that governments could run without putting upward pressure on the debt/GDP ratio would be: 2*0.6 = 1.2% of GDP.

To calculate the medium-term tax gap ($t^*_n - t$), the real interest rate, real economic growth rate and the projected path of non-interest expenditure are taken as given. The required tax rate necessary to stabilise the debt/GDP ratio is then given as (Blanchard 1993:316):

$$t^*_n = \Sigma(g + h)/n + (r-g)D_0/Y_0 \qquad (13)$$

where b: Debt/GDP ratio

g: Government expenditure/ratio

h: Transfers/GDP ratio

r: The real interest rate

g: The real growth rate

n: The number of years over which g and h are incurred

[5] However, note that Chalk (1998) argues that the deficit/GDP ratio is not necessarily reliable to analyse the health of fiscal policy in conditions where government derives income from a non-renewable resource and where the latter is sensitive to changes in the terms of trade.

Equation 13 holds if the values of n and (r-g) are not large. The long-run tax gap is similar to the medium-term tax gap. However, it is specified for a period of 30-40 years and allows for factors that change expenditure (e.g. demographics) (Wickens 1992).

Blanchard (1993:316) also derives an equation to determine the cost should a government delay the adjustment necessary to stabilise the debt/GDP ratio. The longer the delay, the higher the debt/GDP ratio becomes. This requires a higher tax rate to stabilise the ratio (at its higher level). Equation 14 is used to calculate the required adjustment per period:

$$dt^*/ds = (r - g)(t^* - t) \qquad (14)$$

where s: Time

The result of equation 14 is multiplied by the number of periods with which the adjustment is delayed. If (r - g) = 2% and (t^* - t) = 5%, then over ten years, t^* will have to increase by 1% to ensure stability in the debt/GDP ratio, i.e. 0.1% per year of delay multiplied by the ten years of the delay.

2.5 *Conclusion*

The above discussion provides an overview and definition of what constitutes a sustainable fiscal policy. The historical overview demonstrated that different views on what constitutes a sustainable fiscal policy coexisted in the past. Currently such a divergence in opinion seems to be largely absent due to the predominance of the mainstream view. Policy-makers need to understand that the validity of the mainstream view is conditional on the validity of the broader mainstream theory in which the issue of fiscal sustainability is rooted. Thus, if the validity of mainstream theory is questionable in general, it also means that the validity of the mainstream view on fiscal sustainability is questionable. This opens the door for exploring alternative theoretical frameworks to underpin sustainability theory. The next chapter examines the broader mainstream theory that underpins the mainstream view on fiscal sustainability. This will allow one to

contrast the mainstream view with one that allows for the sectoral, uncertainty and stability issues examined in later chapters.

Chapter 3
The roots of mainstream theory on fiscal sustainability

The discussion so far has been confined to theory that focuses directly on fiscal sustainability. However, in mainstream theory, fiscal sustainability is not a self-contained issue. Both the mainstream view on the causes of fiscal unsustainability and its views on which variables could be used to ensure fiscal sustainability are rooted in a broader framework. This chapter focuses on the broader framework and represents an exposition of the mainstream theory that underpins the mainstream view on fiscal sustainability. It provides a basis for comparison with the subjectivist analysis of chapter 5.

According to mainstream theory, set out in chapter 2, government should on average run a sufficiently large primary surplus to ensure that it has a positive or zero net worth. A positive or zero net worth means the present value of all future primary balances equals or exceeds the liabilities of government. Fiscal policy is then sustainable because there is no continuous increase in the public debt/GDP ratio. Failure to run the required primary surplus causes the debt/GDP ratio to increase continuously. This chapter considers four issues that underpin this mainstream definition of fiscal sustainability and that relate to the broader mainstream theory in which the mainstream view on fiscal sustainability is rooted.

The first issue, discussed in section 3.1 below, concerns the mainstream description of what causes fiscal unsustainability. The chapter shows that mainstream theory considers dissaving by government to be the cause of fiscal unsustainability. This links the debate on fiscal sustainability to the debate on government dissaving. The existence of this link serves as a first indication of the importance of saving in the mainstream view of fiscal sustainability. The rest of the chapter is devoted to exploring its importance.

The second issue, discussed in section 3.2 below, is the dependence of fiscal sustainability on individual saving behaviour and, therefore, intertemporal utility maximisation. Chapter 2 demonstrated that the debt/GDP ratio can increase unboundedly

only if the real interest rate exceeds the real growth rate. Whether or not the real interest rate exceeds the real growth rate depends in mainstream theory on the level of capital accumulation, which in turn depends on the level of individual saving that maximises the intertemporal utility of individuals.

Section 3.3 examines why no variable in the sustainability equation (e.g. in equation 1 in chapter 2) except the primary balance is regarded as a target for policy intervention to secure fiscal sustainability. Why could government not stimulate growth so that the growth rate exceeds the real interest rate? Such a policy would 'grow the economy out of its public debt burden' and attain sustainability without the need for a primary surplus. This is what Domar (1944) proposed as a solution to countries heavily indebted with WWII debt. Alternatively, why can the real interest rate not be decreased to a desirable level? The answer to these questions lies in the mainstream theories on production and long-term growth.

Section 3.4 examines the link between fiscal sustainability and the *justification* for a primary deficit. According to mainstream theory, a primary deficit is justified if government increases the intertemporal utility of individuals through the primary deficit. This brings neoclassical growth theory into play. Thus, section 3.4 examines the nexus between neoclassical growth theory and mainstream theory on fiscal sustainability. Neoclassical growth theory shows that an increase in the intertemporal utility of individuals is possible only if the real growth rate exceeds the real interest rate. Should government run a primary deficit when the real interest rate exceeds the real growth rate, not only will the debt/GDP ratio increase, but the intertemporal utility of individuals will also decrease. Thus, section 3.4 demonstrates that the justification to run a primary deficit coincides with the ability of government to run it, as both depend on a negative (r-g) gap.

In addition to the above issues, the chapter considers also in-house (i.e. mainstream) critique levelled at mainstream theories that attempt to explain individual saving behaviour. Chapter 5 considers the external critique, in particular, subjectivist critique.

3.1 *Dissaving as the cause of fiscal unsustainability: Old wine in new bottles?*

In order to understand what, according to mainstream theory, causes fiscal unsustainability, one needs to look beyond the direct theory on fiscal sustainability. Underlying the notion of fiscal sustainability is the idea that government should not continuously dissave as it causes a continuous increase in the debt/GDP ratio, an increase in interest rates and a reduction in investment (Buiter and Kletzer 1992:290; Friedman 1992:301-302; Cebula 1987:7-58). (See Posner (1987) who makes the same point using a mainstream interpretation of Domar. For a slightly alternative view, see Cavaco Silva (1986:78-79) who argues that deficits crowd out portfolio investment, but not investment demand (real investment)).

In the eyes of a mainstream economist, a government that dissaves cannot sustain its current levels of expenditure and receipts. Before the Keynesian revolution it was considered a canon of prudent fiscal policy to run a balanced budget (cf. the Treasury View and the views of classical economists such as Smith and Ricardo, mentioned in chapter 2). In particular, it was held that government should not borrow to finance current expenditure.

Despite the simple assertion that a government that dissaves cannot sustain its current levels of expenditure and receipts, the link between fiscal sustainability and government dissaving is complex (Hemming and Mackenzie 1991). To facilitate the exposition equation 1 is recalled (assume that the residual, R, is zero):

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t \qquad (1)$$

Note that the expenditure included in the primary balance in equation 1 consists of both non-interest current expenditure and capital expenditure. Thus, equation 1 can be rewritten as:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + C_{gt}/Y_t + I_{gt}/Y_t \qquad (1.1)$$

where C: The non-interest current balance

I: Investment by government

In equation 1.1 the current deficit (including interest expenditure) equals:

$r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t =$ *current deficit as percentage of GDP*

Suppose government decides to let its capital, K, expand at the same rate as GDP. This assumption is in line with neoclassical growth theory, e.g. the Solow model, which states that the capital/income ratio remains constant unless economic agents accept a change in the marginal product of capital (the interest rate). If agents do not want a change in the total capital/income ratio, then government too must keep its share of capital/income constant (unless a declining share of government in the capital/income ratio is offset by an increase in that of the private sector, something which cannot continue indefinitely). The result is equation 1.2:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + C_{gt}/Y_t + gK_{gt-1}/Y_t \qquad (1.2)$$

where $gK_g = I_g$ so that the capital of government grows at the economic growth rate

Once capital expenditure and interest cost are determined, the only variable that could adjust to ensure that government runs a sustainable primary surplus, is the non-interest current balance (C in equation 1.2). Thus, to prevent an increase in the debt/GDP ratio, government should run a non-interest current surplus equal to the required primary surplus (where a surplus has a positive value) plus capital expenditure. Hence, equation 2:

$$-C_{gt}/Y_t = -(B_{gt} - gK_{gt})/Y_t = (r_{gt} - g_t)D_{gt-1}/Y_t + gK_{gt-1}/Y_t \qquad (2)$$

The sustainable non-interest current balance represents the amount with which revenue has to exceed non-interest current expenditure to ensure that there is no increase in the debt/GDP ratio *and* that the total capital/GDP ratio of government remains constant.

If in the past government borrowed only to finance investment, then D = K. If it also borrows to finance investment in the current period, then the change in the debt/GDP ratio equals the current balance/GDP ratio. This requires capital expenditure to generate a return in the form of higher tax revenue without the need to increase tax rates. Otherwise, the capital expenditure is no different from current expenditure. However, Buiter *et al.* (1993:87-88) argue that: "...returns on investment projects (even socially desirable ones) need not accrue as cash appropriated by government." Barring the problem that Buiter *et al.* mention, equation 1.2 then reduces to equation 1.3, which, with D = K, reduces further to equation 1.4:

$$\Delta D_{gt}/Y_t \equiv r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t - g_tD_{gt-1}/Y_t + gK_{gt-1}/Y_t \qquad (1.3)$$

$$\Delta D_{gt}/Y_t \equiv r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t \qquad (1.4)$$

Thus, should government dissave, so that $r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t > 0$, there will be an increase in the debt/GDP ratio, given that the capital/GDP ratio of government remains constant. To prevent dissaving and an increase in the debt/GDP ratio, government should run a non-interest current surplus equal to its interest cost. This is the case both when $r > g$ and $r < g$.

Note further that debt can increase with g_tD_{gt-1} without putting any upward pressure on the debt/GDP ratio. Recall from chapter 2 that the sustainable size of the conventional deficit is g_tD_{gt-1}/Y_t. Thus, the conventional deficit must be used to finance government investment. Therefore, with D = K, the reduction in the debt/GDP ratio brought about by $-g_tD_{gt-1}/Y_t$ in equation 1.3 will then equal the increase brought about by g_tK_{gt-1}/Y_t. Otherwise, the debt/GDP ratio increases or the capital/GDP ratio decreases.

Example 1

The above can be illuminated by means of an example. Assume that the real interest rate equals 8%, the growth rate 5%, debt and GDP in period t-1 equals 50 and 100 respectively. The primary surplus equals 1.5. Government used debt-finance in the past only to finance capital and thus, the public capital stock equals 50. Should government grow the public capital stock at a rate equal to the growth rate, government investment equals 2.5 (that is: 0.05(50)). With a primary surplus of 1.5 and government investment of 2.5, the non-interest current *surplus* equals 4 (1.5 + 2.5). Thus, equation 1.2 is:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + C_{gt}/Y_t + gK_{gt-1}/Y_t$$
$$= (0.08 - 0.05)50/105 - 4/105 + 2.5/105$$
$$= 0$$

In this case government is not dissaving as 0.08(50)/105 – 4/105 (which is $r_{gt}D_{gt-1}/Y_t$ + C_{gt}/Y_t = current deficit as percentage of GDP) equals zero. However, if the non-interest current surplus was smaller government is dissaving. For example, if the non-interest current surplus equals 3.5, the current deficit equals 0.08(50)/105 – 3.5/105 = 0.5/105. The debt/GDP ratio will increase with the same amount as the current deficit/GDP ratio.

If government dissaved in the past, so that D > K, then the non-interest current surplus must exceed the surplus that government would run in the absence of past dissaving. The amount of this excess must be equal to the interest rate multiplied by the debt incurred to finance current expenditure. Thus, government must reduce non-interest expenditure or increase tax rates so that the interest on this debt is paid from tax income. Government will pay the interest for as long as it has not repaid the debt. The value of the government bonds issued to finance current expenditure will then be equal to the discounted value of all future non-interest current balances. Thus, fiscal policy will be sustainable and equation 1.4 becomes equation 1.5 for the case where debt/GDP is not allowed to change so as to maintain the net worth of government. Note that this is equivalent to equation 3 in chapter 2.

$$D_{gt-1}/Y_t = -C_{gt}/r_{gt}Y_t \qquad (1.5)$$

Thus, it can be concluded from the above that underlying the notion of fiscal sustainability in mainstream theory is the idea that government should not continuously dissave as this causes the debt/GDP ratio to increase continuously. Mainstream theory argues further that if there is a need for government to dissave from time to time, government needs to alternate periods of dissaving with periods of saving to ensure stability in the debt/GDP ratio over time. It also means that if government decides to borrow to finance current expenditure, it should pay the interest from tax revenue to prevent any further increase in the debt/GDP ratio. Therefore, the mainstream view on fiscal sustainability is merely a more nuanced version of the old classical view and Treasury View. According to this view, government should in general not dissave, as "[i]t is widely accepted that fiscal deficits are bad..." (Blanchard *et al.* 1985:5). The conditions under which government is allowed to dissave are very limited and include for instance times when consumption is not optimal (a case of dynamic inefficiency, addressed below) and cases where government can improve the welfare of liquidity constrained individuals (Inman 1990:81).

The above indicates the negative view of government dissaving held by mainstream economists. Dissaving means that government violates its budget constraint. The next section indicates that saving and, in particular, the level of saving that maximises the intertemporal utility of individuals, sets the limits to that constraint.

3.2 *The importance of utility in mainstream theory*

In mainstream theory utility rules the roost. Mainstream theory maintains that individuals maximise utility by means of three types of trade-offs: the trade-off between work and leisure, the trade-off between consumption now and consumption later and the trade-off between the consumption of various goods. The first two trade-offs, that between work and leisure and that between consumption now and later, determine the supply in the labour and bond markets respectively. The trade-off between the

consumption of various goods determines the demand in the different goods markets, which in turn help companies to derive their demand for labour. Of particular importance to a discussion on fiscal sustainability is equation 3, the trade-off between consumption now and later. This equation represents a standard and simple version of the intertemporal utility function of the individual, which assumes that individuals are alive for two periods. The individual works in period t and is retired in period t+1.

$$U_t = C_t + C_{t+1}/(1+r) \qquad (3)$$

where U_t: Utility

C_t: Current consumption

C_{t+1}: Deferred consumption, i.e. saving plus the return on saving

r: The discount rate that measures the time preference of individuals. In equilibrium it equals the interest rate.

Equation 3 indicates that total utility at time t, U_t, equals the utility an individual derives from current consumption (C_t) and future consumption, C_{t+1}. Future consumption is discounted to period t by rate r.

According to mainstream theory, when government incurs debt, it taps into the saving of individuals. Hence, government will affect the intertemporal utility of individuals. Not only individuals, but also companies exhibit maximisation behaviour. They constitute the demand side in the labour and bond markets and the supply side in the goods markets. Thus, in all markets agents who exhibit maximisation behaviour occupy both the supply and demand sides. The difference between individuals who maximise utility and companies who maximise profit is that individuals maximise utility out of their own volition. Companies, on the other hand, do not maximise profit out of their own volition. They are *forced* to do so because individuals maximise their utility and because of the competitive nature of factor and goods markets. Companies compete to raise funds in the bond market, a market where the individuals who buy the securities maximise their utility. Individuals buy *only* the securities of companies who maximise the return on

saving because then individuals maximise the utility of their deferred consumption. The side-effect of the maximisation of profits is that companies can pay capital its marginal product, so that capital is fully rewarded for its contribution to the production process. This causes the interest rate to equal the marginal product of capital.

3.2.1 Stability in the utility functions

In mainstream theory the utility functions that describe the above trade-offs must be stable to ensure general equilibrium in the Walrasian sense, i.e. where there is no excess or shortage in any market. Consider the need for stability in equation 3. If saving is the deferment of consumption and if any change in saving causes an equi-proportionate change in investment, then the act of saving implies the conclusion of a forward contract to buy a specific good at a specific price at a specific time in the future (this is a point first noted by Keynes (1936:210-211)). Without such a forward contract it makes no sense to argue that an increase in saving causes an *automatic* increase in investment. An *automatic* increase in investment can only take place if the *specific* goods produced in future with the increment to investment are *assured* of a market at the right price at the right time. Thus, forward contracts ensure that the markets for different consumption goods clear in future.

A change in preferences on what and when to consume will cause disequilibrium in markets and cause intertemporal utility not to be maximised. Since the auctioneer in the Walrasian model rules out trading at false (non-equilibrium) prices and since utility needs to be maximised, changes in preferences must to a large extent be ruled out. Those changes that are allowed to take place must be infrequent, small, swift and not disturb equilibrium too much (Lachmann 1986:162). Once the individual makes his decision on saving and consumption, there is no place for a change in preferences.

Successive generations may prefer different saving rates, but since each saving rate means a different equilibrium growth path, the *actual* existence of long-run equilibrium requires a stable saving rate over all generations. It makes no sense to explore the

characteristics of any *particular* long-run equilibrium, if the long-run equilibrium path changes frequently.

3.2.2 Theories on saving and the maximisation of intertemporal utility

The intertemporal maximisation of utility by individuals sets the limits to what is a sustainable fiscal policy. This subsection is a brief exposition of the mainstream theories that explain saving behaviour and therefore underpins the mainstream view on what determines the sustainable limits to fiscal policy. As section 3.5 indicates, these theories form the soft underbelly of the mainstream view on the intertemporal maximisation of utility. These theories are criticised even from within the mainstream camp. The weaknesses of these theories do not only pertain to the theories themselves, but also have wider implications for the theories they underpin. These include, among others, the mainstream view on fiscal sustainability.

According to Mankiw (1997:408) and Fabozzi and Modigliani (1996:394), the view that individuals maximise their intertemporal utility originates with Fisher. Before Fisher's time, however, Wicksell had identified the trade-off between consumption now and later (Wicksell, 1935,I:209) and called the marginal product of future consumption the marginal productivity of waiting (Wicksell, 1935,I:184). Intertemporal utility is maximised when consumption is smoothed over time. A smooth pattern of consumption over time means that the marginal utility (in present value terms) of an extra unit of consumption is equal in every period. Should the marginal utility of an extra unit of future consumption, in present value terms, exceed (fall short of) the marginal utility of an extra unit of current consumption, total utility would increase if more (less) consumption is deferred and less (more) is consumed currently.

The Fisher view was further refined in the life cycle hypothesis of Modigliani (1949; 1954; 1960; 1963; 1966; 1975; 1979; 1986; 1988 – all these articles except for (1986) and (1988) may be found in Abel (1980)) and the permanent income hypothesis of Friedman (1957). The work by both Friedman and Modigliani represents attempts to

explain the so-called 'consumption paradox' which had its origin in the work of Kuznets. Kuznets observed that the marginal propensity to consume of individuals differs depending on whether it is measured with cross-section or time-series data. Cross-section data confirmed the consumption function specified by Keynes. However, time-series data appeared to depict a different relationship between consumption and income. In particular, the time-series function has an intersect close to zero and a slope close to one (it would equal one if every generation is equal in number and wealth to the previous one and if the retired dissaved completely). However, the cross-section function has a smaller slope and a positive intersect.

According to the permanent income hypothesis, people distinguish between the permanent and transitory components of income. Consumption is determined by the permanent component of income. Thus, if income drops below permanent income, consumption remains the same and the individual will dissave to an extent equal to the difference between the cross-section and time-series functions. The reverse is true for individuals who temporarily earn more than their permanent income. Individuals also save in anticipation of a temporary decline in their income (Campbell 1987:1250).

The life cycle hypothesis concludes that individual saving depends on the individual's position in his life cycle, i.e. individual saving behaviour depends on age. The primary purpose of saving is to provide for consumption when the individual retires. When an individual is young his income is usually low. However, he expects his income to improve. Thus, the current income of an individual is less than his average expected income, calculated over his career. Such an individual usually dissaves; in other words, his expenditure exceeds his income. This can only happen if the individual is not liquidity-constrained.

As the individual grows older his income increases. As a result, his financial position improves as he works his way from a negative to a positive net financial asset position. Thus, he saves a larger proportion of his income the more his income exceeds his average expected income, calculated over his career. The individual also needs to ascertain his

life expectancy to determine the amount of future consumption he needs to finance. The proportion the individual saves then depends on age, life expectancy, the marginal product of capital and total utility – the latter depends on thrift and thus, the rate at which future consumption is discounted.

The process of financial asset accumulation continues until retirement. Thereafter the individual dissaves to such an extent that as his actual age approaches his expected age his net financial asset position tends to zero.

Some mainstream economists consider the life cycle hypothesis of saving and the permanent income hypothesis of consumption as mere versions of the same theory. Romer (1996) and Hall (1978), for instance, talk about the life-cycle/permanent income hypothesis of consumption. Modigliani and Ando (1960:74) maintain that, although there are similarities between the two theories, there are also important differences. Although the focus of the two theories differs, their essential message is the same: individuals maximise their intertemporal utility. As a result their consumption is smoothed over time. Thus, the life cycle hypothesis and the permanent income hypothesis are only more refined versions of the theory expounded by Fisher.

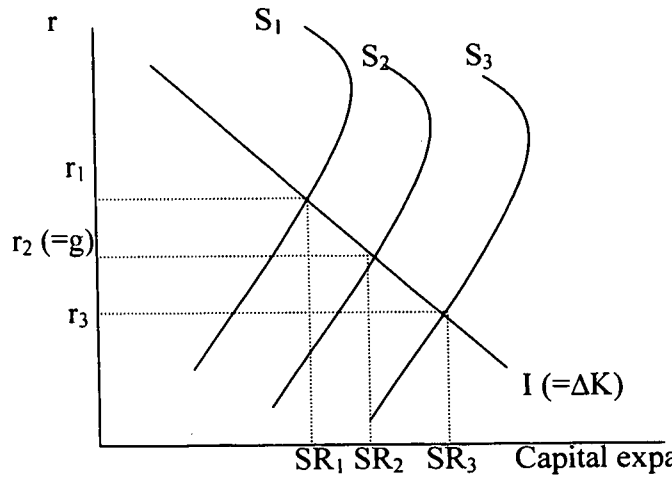
3.2.3 Production theory and the interest rate: The relationship between the marginal product of capital and the interest rate

Section 3.2.2 described the mainstream view on individual saving behaviour. This view assumes that individuals prefer current to future consumption. Thus, saving must yield a return equal to the discount rate or required rate of return of individuals to induce individuals to save. The income saved by individuals must be transformed into an asset to yield this return. Therefore, by saving individuals supply the funds that investors, who create assets, demand. The demand for funds depends on the return investors can afford to pay the suppliers of funds. In mainstream theory every factor that enters the production process receives a reward equal to its marginal product. Because investors use the supply of funds to create capital goods, the return they can afford to pay suppliers equals the marginal product of capital. Thus, the interest rate equals the marginal product

of capital. This section examines briefly the mainstream argument that an increase in the saving rate causes the marginal productivity of capital and thus, the real interest rate to decrease. Because the growth rate is a given in the mainstream model (at least in the version that underpins the mainstream theory on fiscal sustainability), the determinants of the real interest rate level are also the determinants of the *gap* between the real interest rate and the real growth rate ((r-g) gap). As chapter 2 demonstrates, the (r-g) gap determines whether the debt/GDP ratio can explode and thus, the possibility of fiscal *un*sustainability. Thus, saving behaviour, through its impact on the interest rate and the (r-g) gap, determines whether there is the possibility of fiscal unsustainability. The mainstream view on the determination of the interest rate also forms the basis for the view that monetary policy cannot decrease the real interest rate.

According to mainstream theory, the marginal product of capital decreases as the capital/income (and capital/labour) ratio increases (Solow 1970:17). This results from the assumption that constant returns to scale characterise production. If society wants to save more from its income, and thus increase its capital/income ratio, it must accept a lower interest rate because the interest rate companies can afford to pay decreases. Thus, the higher the saving rate and capital/labour ratio, the smaller the (r-g) gap becomes. Eventually it becomes negative. Graphically this behaviour of the interest rate can be portrayed with the familiar loanable funds framework (see fig.1). Suppose that in the past function S_1 described saving behaviour. The investment function is I, where investment is the change in the capital stock, ΔK. The interest rate then equals r_1 in fig.1, and the saving rate (saving/GDP ratio) SR_1. Should society continue to save at rate SR_1, the interest rate remains at r_1. If the growth rate, g, is lower than r_1, the (r-g) gap will be positive. Thus, fiscal policy can become unsustainable. Note that the interest rate used in this context equilibrates the real variables of saving and investment. Insofar as these variables are stable and remain on their long-run equilibrium path, the interest rate does not change. Given the long-run equilibrium path, the only factor that temporarily can disturb the interest rate is a disturbance in the money supply.

Figure 1



What happens to the interest rate if society becomes thriftier? The saving function shifts to the right to S_2. Companies must transform the increment in saving into capital to yield interest income. The ability of companies to pay additional interest income depends on the extent to which the increase in capital raises the level of total income. Therefore, the impact on the interest rate of a change in the saving rate depends on the impact of the additional capital on income. In mainstream theory the impact of an increase in capital on income is usually described in terms of a Cobb-Douglas production function. In terms of a basic Cobb-Douglas production function (equation 4) output is a function of capital and labour. Constant returns to scale imply that when both labour and capital inputs are doubled, output also doubles. For simplicity, technology is assumed given and remains unchanged (hence, the Solow residual ΔA equals zero).

$$Y = AK^{\alpha}L^{1-\alpha} \qquad (4)$$

where Y: Output

K: Capital

L: Labour

A: Factor indicating the impact of technology on output

α: The amount with which output increases if capital increases by one unit. It is also the share of capital in output (so that $1-\alpha$ is the share of labour in output).

Thus, the total change in output equals the change in output caused by changes in capital and labour respectively:

$$\Delta Y = \alpha\Delta K + (1 - \alpha)\Delta L \qquad (5)$$

In terms of equation 5, if both capital and labour increases by one percent, output also increases by one percent ($\Delta Y = 1/100 = \alpha(1/100) + (1 - \alpha)(1/100)$). However, if only capital increases by one percent, without an increase in labour, the percentage change in output will fall short of one percent and equal $\alpha(1/100)$. As a result the marginal product of capital diminishes with an increase in capital. The marginal product of capital is (Dernburg 1985:334):

$$\delta Y/\delta K = \alpha(Y/K) \qquad (6)$$

Note in equation 6 that if only capital increases, so that the percentage change in Y is smaller than in K, the marginal product of capital and hence the interest rate, must decrease. It is this feature of investment that causes the investment function, I in fig.1, to have a negative slope, i.e. a higher investment rate, *ceteris paribus*, causes a lower interest rate. Thus, if society becomes thriftier so that the saving rate increases to SR_2, the interest rate decreases to r_2 because of the decrease in the marginal product of capital. The (r-g) gap will equal zero, if the growth rate, g, equals r_2. If society decides to increase the saving rate even further, to SR_3, the interest rate also decreases further, to r_3. The growth rate then exceeds the interest rate and fiscal policy cannot become unsustainable. Thus, the negative slope of the investment function means that a small capital/output ratio is associated with a high interest rate, a positive (r-g) gap and thus, the possibility for fiscal policy to become unsustainable. A large capital/output ratio is associated with a low interest rate, a negative (r-g) gap and no possibility for fiscal policy to become unsustainable.

3.3 *Why is policy in the long-run ineffective in reducing the real interest rate and in increasing the real growth rate?*

Because of the close link between the marginal product of capital and the real interest rate, the real interest rate is not amenable in the long-run to the influence of monetary policy. The central concepts are the Wicksellian money rate of interest (sometimes called the 'market rate'), which is analogous to the real interest rate charged by banks, and the 'natural interest rate' (Wicksell,1936;1898:102-121). Wicksell (1935,II:193) defines the natural interest rate as: "The rate of interest at which *the demand for loan capital and the supply of savings* exactly agree, and which more or less corresponds to the expected yield on the newly created capital, will then be the normal or natural real rate." Thus, the natural rate in essence is the interest rate used in section 3.2 above. The natural interest rate equals the marginal product of capital at full-employment. A reduction in the market rate (through an increase in the money supply) below the natural rate may stimulate investment. However, as the economy is assumed to be at full employment (everyone willing to accept a wage equal to the marginal product of labour has employment), it also causes inflation for the period during which the natural rate exceeds the market rate (Wicksell,1935,II:195-196).

Wicksell did not work in a Walrasian general equilibrium model where false prices are ruled out by assumption. In addition, contrary to current, mainstream theory, Wicksell (1935,II:194) held that the money supply was always elastic and inexhaustible. Thus, he saw no need for the market rate to return automatically to the level of the natural rate to restore general equilibrium. However, modern, mainstream theory, with its closer ties to Walrasian theory, does see a need in the longer run for the real interest rate to equate the marginal product of capital. Through the Fisher-effect inflation causes nominal interest rates to increase to restore the pre-inflation level of the real interest rate. Thus, the real interest rate will again equal the marginal product of capital or in Wicksellian terms, the market rate increases to again equal the natural rate. This causes investment and economic growth to return to their original levels. The return of the growth rate to its original level means that monetary policy will not be successful in increasing the growth rate permanently.

Through the combination of the Wicksellian model and the Fisher-effect, the marginal product equals the real interest rate in the long-run. Thus, monetary policy cannot in the long-run manipulate the real interest rate.

3.4 *The nexus between neoclassical growth theory and mainstream theory on fiscal sustainability*

This section illustrates the limited role of government as an institution to improve individual utility. As such, it indicates when it is and is not justified for government to run a primary deficit. In particular, it demonstrates how an unsustainable fiscal policy increasingly violates the ability of individuals to maximise their intertemporal utility. The justification to run a primary deficit coincides with the ability of government to run it, as both depend on a negative (r-g) gap. In this sense the (r-g) gap represents the nexus between growth theory – that describes the justification to run a primary deficit – and fiscal sustainability theory – that describes the ability to run a primary deficit. As Boadway and Wildasin (1993) argue, changes in the debt/GDP ratio has wealth effects when $r \neq g$. This nexus allows mainstream theorists to maintain that a continuously increasing debt/GDP ratio is the result of a government that continuously and increasingly drives a wedge between the actual and maximum level of intertemporal utility and the economy further away from the 'golden rule' level of capital accumulation. This occurs only when government runs a primary deficit in the presence of a real interest rate that exceeds the real growth rate; thus, when fiscal policy is unsustainable.

The mainstream view on fiscal sustainability is built on the theories of individual saving behaviour, interest rate determination and mainstream assumptions on what determines the growth rate. The population growth rate and improvements in technology determine the growth rate in neoclassical growth theory. In the absence of technological improvements the growth rate equals the population growth rate. Thus, the growth rate is an exogenous variable. There are second-generation neoclassical growth models – so-called 'new growth models' – in which the growth rate is endogenous (Romer 1996; Zagler 1998). In these models, resources spent on the creation of human capital (e.g.

education expenditure) cause the growth rate to increase. However, because mainstream theory on fiscal sustainability takes the growth rate (and interest rate) as given, it still is, explicitly or implicitly, embedded in the older generation growth models where the growth rate is exogenously determined (for an example see Ball *et al.* 1998). This is further borne out by Heyns's critique (cf. chapter 2 above) that expenditure on human capital formation is still regarded as current, rather than capital, expenditure. Therefore, the growth models discussed in this chapter refer to the older generation neoclassical models.[1]

In neoclassical growth theory the role of government is limited to the improvement of individual utility. However, the opportunity to improve utility is limited and depends on whether the economy is dynamically efficient or inefficient. An economy is dynamically efficient if the real interest rate exceeds the real growth rate and *vice versa* if the economy is dynamically *in*efficient (Myles 1995:492-493). The concept of dynamic efficiency originates in the Diamond growth model (Diamond 1965). The (two-generation) Diamond model is the mainstream model that explicitly links individual utility, long-term economic growth and actions of government. It presents an economy with full-employment and economic growth at the 'natural rate'. The natural rate depends *only* on the population growth rate and the state of technology. As a result, fiscal policy cannot influence the economic growth rate.

In the Diamond model the (r-g) gap depends on the level and rate of capital accumulation. Where g = r the economy is at the 'golden rule' rate of capital accumulation, so-called because at that level consumption attains its highest possible level on a balanced growth path (Romer 1996:18). (For work prior to Diamond on the

[1] In mainstream literature these older growth models are denoted 'neoclassical', hence the use of the term in this chapter. The meaning of the term neoclassical in this context should not be confused with the meaning it has in the term 'neoclassical synthesis'. The latter refers mostly to short-run models while the neoclassical growth model is solely a long-run model. None of the Keynesian elements incorporated in the neoclassical synthesis (e.g. the multiplier and consumption function) appear in the neoclassical growth model. Thus, acceptance of the neoclassical growth model is not limited to neoclassical synthesis economists. New-classical economists accept it too (or slightly different versions of it). The neoclassical growth model can be interpreted, as the discussion on intertemporal utility will indicate, as a macroeconomic extension of micro-theory on Pareto efficiency.

'golden rule' level of capital accumulation, see Solow (1956), Swan (1956), Phelps (1961) and an exposition of the Solow growth model in chapter 1 of Romer (1996).) Therefore, the case of $r \neq g$ has two connotations: that of deviation from the 'golden rule' rate of capital accumulation, and that of fiscal sustainability.

Only when the economy is dynamically *in*efficient, i.e. when $r < g$, can government improve on the level of utility established in the market. Government does so by transferring resources from the younger to the older generation in *all* future periods. The term 'dynamic' in 'dynamically efficient' refers to the time element in the transfer programme. Without government intervention the economy would still be at equilibrium. However, because government can improve utility without decreasing the utility of anyone else, the equilibrium established without government intervention is not Pareto-efficient (Romer 1996:83-84). Hence the term '*in*efficient' in 'dynamically *in*efficient'. Note however, that dynamic *in*efficiency represents an exception for mainstream economists (cf. Eltis 1998; Boadway and Wildasin 1993: 42). Abel *et al* (1988) argue that most OECD economies are dynamically efficient. Because the interest rate decreases with an increase in the saving rate (cf. section 3.1 above), Solow (1970:28) maintains that when the growth rate exceeds the interest rate, it represents a case of 'saving with a vengeance'.

If the economy is dynamically efficient, i.e. when $r > g$, government cannot improve on the utility established by the market. Should government transfer resources between generations, intertemporal utility decreases.

The resources government transfer can be financed with either taxes or debt. This section demonstrates, in terms of mainstream theory, when it is more advantageous to utility to finance the transfer with debt rather than with tax. This section first shows the change in utility that occurs if government finances the intertemporal transfer with a tax. This is then compared with the case where government finances the transfer with debt. A comparison between the two ways of financing a transfer demonstrates that when the $r < g$, utility improves with more when debt-finance is used. However, when $r > g$ debt-

finance causes a larger deterioration in intertemporal utility. The scene is then set to consider the question whether or not the use of debt is a sustainable fiscal policy. The discussion demonstrates that when r > g a primary deficit also causes, in addition to a continuously increasing debt/GDP ratio (cf. equation 8.2 in chapter 2), an accelerating reduction in intertemporal utility. This does not occur when r < g, because the debt/GDP ratio stabilises even if government runs a primary deficit (cf. equation 8.1 in chapter 2). Lastly, because the section compares a transfer financed with a tax with a transfer financed with debt, it must also consider Ricardian equivalence.

In the model used below there are two generations alive in each period. Resources are transferred from the younger to the older generation. Thus, a generation finances a transfer when they are young and receives a transfer in the next period when they are old.

3.4.1 The use of a tax-financed transfer

In this case government levies a tax on the younger generation and transfers the resources thus obtained to the older generation. The transfer/GDP ratio remains fixed, so that the transfer grows at the same rate as GDP. Whether or not the total consumption (utility) of each generation, spread over the two periods that a generation is alive, increases, depends on whether the real interest rate exceeds or falls short of the real growth rate. The analysis focuses on the utility of generation 1 in period t+1 and t+2. Equation 3 above measures the utility generation 1 gains from its total consumption, i.e. in period t+1 and t+2. This yields equation 3.1 (for more detail, see appendix):

$$U_{t1} = C_{t+1} + C_{t+2}/(1 + r)$$
$$= Y_{t+1} + ((1 + g)(1 + g)/(1 + r))G_t - ((1 + g)(1 + r)/(1 + r))G_t \qquad (3.1)$$

where Y_{t+1}: Income of generation 1 in time t+1

G_t: The value of the transfer at time t

r: The discount rate (= the interest rate)

g: The growth rate

Equation 3.1 demonstrates that total intertemporal utility equals the income individuals received, Y_{t+1}, plus the net utility added by way of the transfer activities of government, $((1 + g)(1 + g)/(1 + r))G_t - ((1 + g)(1 + r)/(1 + r))G_t$. Without a transfer, utility would have equalled Y_{t+1}. With the transfer, the second and third terms on the right-hand side are added. If $g > r$, the second term on the right-hand side will be larger than the third, so that utility increases. However, if $g < r$, utility decreases with the transfer, as the second term on the right-hand side will be smaller than the third. Thus, government can improve on the utility delivered by the market only if $r < g$. However, as mentioned above, such a situation is considered the exception.

3.4.2 A debt-financed transfer with debt repayment

What is the difference between a debt- and a tax-financed transfer? Does debt-finance have an advantage over tax-finance? As in the case with the tax-financed transfer, the ability of government to increase utility according to mainstream theory, depends on whether the real interest rate exceeds or falls short of the real growth rate. However, the use of debt has a slightly different impact on utility. Consider the utility of generation 1 as depicted in equation 3.2:

$$\begin{aligned} U_{t1} &= C_{t+1} + C_{t+2}/(1 + r) \\ &= Y_{t+1} + ((1 + g)^2/(1 + r))G_t - ((1 + r)^2/(1 + r))G_t \end{aligned} \qquad (3.2)$$

Equation 3.2 demonstrates that utility equals the income individuals received, Y_{t+1}, plus the net utility added by way of the transfer activities of government, $((1 + g)^2/(1 + r))G_t - ((1 + r)^2/(1 + r))G_t$. If $g > r$, the second term on the right-hand side is larger than the third. Thus, intertemporal utility increases. However, if $g < r$ the second term on the right-hand side is smaller than the third. Thus, utility decreases. To compare the use of debt- and tax-finance compare the third terms of equation 3.1 and 3.2:

$$U_{t1} = Y_{t+1} + ((1 + g)^2/(1 + r))G_t - ((1 + r)^2/(1 + r))G_t \qquad (3.2)$$

$$U_{t1} = Y_{t+1} + ((1 + g)(1 + g)/(1 + r))G_t - ((1 + g)(1 + r)/(1 + r))G_t \qquad (3.1)$$

If $g > r$, i.e. the case where government can improve utility according to mainstream theory, the third term in equation 3.1, $((1 + g)(1 + r)/(1 + r))G_t$, is larger than that in equation 3.2, $((1 + r)^2/(1 + r))G_t$. Thus, given the size of the transfer, government increases utility with more if it uses debt-finance. If $g < r$, the third term in equation 3.1 is smaller than that in equation 3.2. Thus, the amount with which utility decreases when government borrows, exceeds the amount with which utility decreases if government uses a tax.

3.4.3 Is the use of debt a sustainable fiscal policy?

The policy whereby government borrows in one period and repays the loan plus interest in the next period constitutes a sustainable fiscal policy. In period t+1 government collects taxes equal to $(1 + r)G_t$ to repay what it borrowed from generation 0 in period t plus interest. In period t+1 government borrows from generation 1 to spend on a transfer to generation 0 (see appendix for more on the tax and expenditure). This non-interest expenditure equals $(1 + g)G_t$. Thus, the primary surplus of government, i.e. the difference between the taxes it collected and its expenditure (the transfer), equals $(1 + r)G_t - (1 + g)G_t = (r - g)G_t$. This also is its net borrowing, i.e. the difference between the loan it repaid to generation 0 and the amount it borrowed from generation 1. If G_t, the debt incurred in period t, is the only debt government incurred, then recalling equation 11 of chapter 2, it seems that the primary surplus is sufficiently large to prevent an increase in the debt/GDP ratio. Thus, fiscal policy is sustainable.[2] In addition, because the debt/GDP ratio remains constant in every period, government's claim on saving grows at the same rate as the economy. However, if expenditure exceeds $(1 + g)G_t$ or taxes fall

[2] The case described here assumes that government repays debt in any given period, while in the same period, government then also borrows again. Thus, government repays $(1 + r)G_t$ and incurs *new* debt of $(1 + g)G_t$. When $g > r$ this is equivalent to saying government does not repay its past debt and incurs additional debt to the value of $-(r - g)G_t$. As Heilbroner and Bernstein (1989:52-53) put it: "... the federal government, which *is* a whole – are never paid off in a growing economy, even though each bond and note is fully discharged." This is what is implied when O'Connell and Zeldes (1988) and Ball *et al.* (1998) states that government can run a Ponzi-game when $g > r$ and the statistical probability that r will exceed g is negligible. In the case where $g < r$, government has to *repay* debt equal to $-(r - g)G_t$.

short of $(1 + r)G_t$, the claim government makes on saving grows at a rate larger than g, the economic growth rate. The public debt/GDP ratio will then increase.

3.4.4 The justification for a primary deficit when r < g

If r < g, government can increase intertemporal utility by way of transfers from the younger to the older generation. Hence, the policy is justified on the grounds of efficiency. Once government initiates such a policy, it has to continue it *ad infinitum*. (It takes resources from the younger generation to give to the older generation, so that those resources must be replaced when the younger generation becomes the older generation in the next period. This can only be done by taking resources from the younger generation of the next period, which then must be replaced when that generation becomes old. Thus, the process has to continue.) To run the policy *ad infinitum* requires that r must never be *expected* (also in the statistical sense) to exceed g. According to mainstream theory, this is a safe presumption to make because it presumes that the (r-g) gap remains stable given the assumption of a long-run equilibrium path.[3]

For the relationship between r and g to be stable requires the actual existence of a long-run equilibrium. This, in turn, requires continuous stability in the trade-off between consumption now and later. Stable preferences and the actual existence of a long-run equilibrium path allow expectations (e.g. expected utility, output, interest rates and the growth rate) to converge and for agents, including government, to act in accordance with those expectations. As section 3.3.1 above demonstrated, mainstream theory assumes that preferences are stable, hence ensuring long-run equilibrium.

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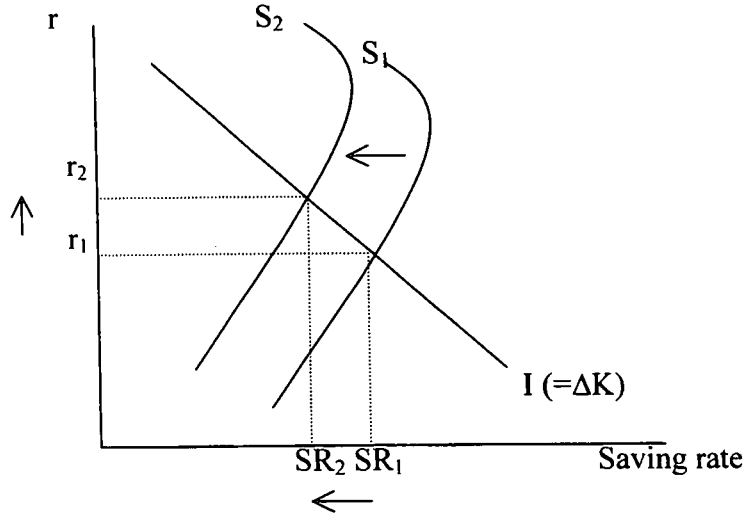
[3] The only exception to this is when there is a statistical probability that r > g in future. Such a probability *may* exist even when the (statistically) expected *negative (r-g) gap* and thus, the expected *savings rate remains unchanged.* The probability that r > g is then a statistical deviation from the expected (r-g) gap. If such a probability exists and government ran a primary deficit before the deviation took place (thus, before r > g), it will have to repay debt in a period when r > g. The existence of this debt then requires government to run a primary surplus. However, the primary surplus will reduce the utility of the generation that pays the tax used to repay debt. Thus, if r < g in *most* but not all future periods, government will increase the intertemporal utility of some at the cost of reducing that of others. As such government will in the period when r > g, violate the Pareto optimum allocation of consumption between the present and the future. Because of this risk it is then not justified to run a primary deficit even in periods when r < g. Note however, that this is a matter of degree. If the probability (risk) that r > g is very small, government may decide that it is worthwhile to run a primary deficit when the (r-g) gap is negative.

If preferences continuously change, there would be little sense in analysing the features of long-run equilibrium. The long-run equilibrium path of the economy would change continuously, with any *particular* equilibrium only existing in a fleeting moment of time. In such a case *dis*equilibrium forces would dominate equilibrium forces; an idea that is anathema to mainstream economics. However, with continuously stable preferences a stable long-run equilibrium actually exists, which means that the structure of the economy is stable. The budget constraint of government is part of that structure. Thus, when preferences are stable the budget constraint is also stable and therefore, represents a given to government. This means that individual preferences determine what levels of government non-interest expenditure and revenue constitute a sustainable fiscal policy. Stability in preferences allows government to justify policy in terms of its impact on utility. Thus, it allows government to implement a transfer policy when $r < g$. Conversely, as section 3.4.5 indicates, it also allows individuals to determine when the policy stance of government is not justified.

3.4.5 Why is an unsustainable fiscal policy not justified?

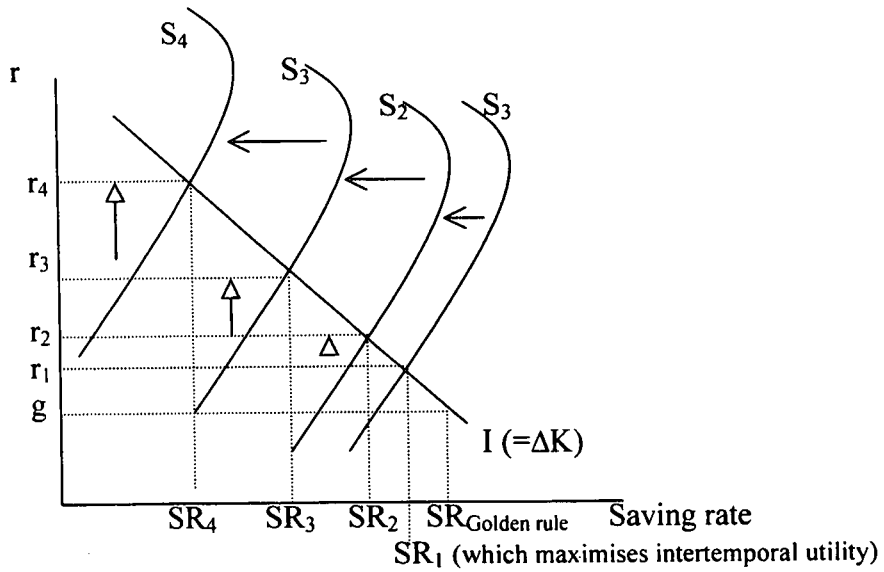
If government runs a primary deficit when $r > g$, the debt/GDP ratio increases. If the saving rate (i.e. the saving/GDP ratio) remains constant, the increase in the debt/GDP ratio causes public debt to increase at a faster rate than saving. According to mainstream theory, saving finances both capital and public debt. Thus, if public debt grows faster than saving, the amount of accumulated past savings taken up by capital grows slower than the economy. Therefore, if fiscal policy is unsustainable, the capital/income ratio decreases. Recalling the discussion on the production function above, a decrease in the capital/income ratio means that the marginal product of capital, and thus, the interest rate, increase. In terms of fig.2 the saving function shifts to the left, from S_1 to S_2, because government absorbs some of the saving – a portion of what society saved government dissaves. This causes the interest rate to increase from r_1 to r_2.

Figure 2



With an unsustainable fiscal policy the increase in the debt/GDP ratio accelerates with time. Thus, the upward pressure by an unsustainable fiscal policy on the interest rate accelerates with time. In terms of fig.3 the saving function shifts to the left continuously and at an accelerating rate, from S_1 to S_2, to S_3, to S_4.

Figure 3



With the continuous larger shifts in the saving function, the interest rate, r and the (r-g) gap increases at an accelerating rate. Given that r > g at the outset of the process, as seen

in the difference between r_1 and g in fig.3, the accelerating increase in the interest rate causes the (r-g) gap to increase at an accelerating rate, from $(r_1 - g)$, to $(r_2 - g)$, to $(r_3 - g)$, to $(r_4 - g)$.

Thus, the economy moves at an accelerating rate away from the golden rule level of capital accumulation ($SR_{Golden\ rule}$). More importantly, the continuation of the primary deficit policy also means a continuous and accelerating reduction in intertemporal utility. Thus, an unsustainable fiscal policy means that government drives a continuously larger wedge between the saving rate society prefers and the actual saving rate following government dissaving. The latter continuously decreases at an accelerating rate. Therefore, in terms of mainstream theory, an unsustainable fiscal policy is *unjustified* as it *increasingly* violates the Pareto optimum allocation of consumption between the present and the future.

3.4.6 A debt-financed transfer: The Ricardian equivalence view

The above discussion will not be complete without considering Ricardian equivalence.[4] Ricardian equivalence maintains that there is no difference whether government uses a tax or debt to finance the transfer. Barro (1989:316-317) argues that the acceptance of the classical life-cycle/permanent income hypothesis implies the acceptance of the Ricardian equivalence theory if the former is specified for an infinite horizon. According to the Ricardian equivalence theory, the intertemporal utility function of individuals is not only limited to the utility they get from their own consumption, but it also includes the utility of all later generations (see equation 3.3 where the utility of future generations is $\Sigma(U_{gn}/(1+r)^n)$). Thus, the individual smoothes his own consumption *and* that of his offspring. This behaviour means the individual has an infinite planning horizon.

$$U_t = C_t + C_{t+1}/(1+r) + \Sigma(U_{gn}/(1+r)^n) \qquad (3.3)$$

[4] For more on Ricardian equivalence see Barro (1974; 1998), Seater (1993), Bernheim and Bagwell (1988), Tobin (1980), Tobin (1998), Tabarrok (1995), Hakes (1996), Easterly and Schmidt-Hebbel (1994), Evans and Karras (1998), Graham and Himarios (1996), Evans (1993), Lord and Rangazas (1993), Eisner (1997), Darby *et al.* (1991), Miller and Roberds (1992), Thorton (1990) and The Economist (1990).

where U_{gn}: Utility of future generations in all future periods, stretching from t+1 to n, where $n \rightarrow \infty$

In a world with Ricardian *equivalence*, the effect of a debt-financed transfer to the elderly is *equivalent* to that of a tax-financed transfer. If a tax is not used to finance the transfer, disposable income is higher with an amount equal to what the tax would have been. Government then borrows the amount of the transfer out of saving. Because this debt implies a future tax liability to either the generation whose disposable income increased *or* their descendants, individuals save the increment in disposable income. As an asset, the increase in saving offsets the future tax liability. If the tax to redeem the debt is not levied before the generation who received the increment in disposable income passes away, they bequest the saved amount to their offspring. The bequest from one generation to the next continues until government levies the tax to redeem the debt. Since the increment in income is saved, the saved amount grows as interest accumulates. However, the debt also grows as interest accumulates. Because individuals save the increment in their income and pay the tax to redeem the debt out of the increase in saving, the use of debt instead of a tax will not affect current or future consumption.

This behaviour of individuals stems, according to Ricardian equivalence theorists, from the recognition that the present value of government bonds equals the present value of future tax liabilities. Thus, government bonds (except those issued to finance investment) do not represent net wealth. Therefore, there is no reason to change consumption patterns since there is no incentive to defer more or less consumption.

When $r > g$ and government repays its debt, Ricardian equivalence eliminates the *additional* negative effect of debt-finance compared to tax-finance (mentioned above). However, when $r < g$ and government repays its debt, Ricardian equivalence eliminates the *additional* positive effect of debt-finance on utility (also mentioned above). Thus, in this case agents will improve their utility by not acting in accordance with Ricardian equivalence. However, since a case where $r < g$ is seen as an anomaly, its importance is limited.

The main difference between the Ricardian model and the non-Ricardian model occurs when r > g and government rolls over all existing loans and finances new transfers and interest payments with debt. In this case Ricardian equivalence ensures that debt-finance does not have any additional effect on consumption and the capital stock beyond that brought about by a tax transfer. If, in the absence of Ricardian equivalence, r > g, mainstream theory argues that the perpetual roll-over of debt ultimately eliminates the saving available after government borrowing (see above). This behaviour continuously reduces the capital/GDP ratio. Ricardian equivalence prevents this.

The rejection of the Ricardian equivalence theory from a mainstream point of view means the acceptance that at least some transitory changes in income do affect consumption. Mainstream economists who reject Ricardian equivalence, but who still accept the life-cycle/permanent income hypothesis, maintain that individuals maximise their utility only over the finite horizon of their lifetime. Thus, individuals view as permanent those transitory changes in income that will only be reversed beyond the finite horizon of their life. Thus, whether debt-finance has any advantage over tax-finance, depends (in mainstream theory) on whether individuals have a finite or infinite planning horizon.

3.5 In-house criticism of the life cycle/permanent income hypothesis

One may mention in passing that some mainstream economists noted that the life cycle/permanent income hypothesis fails to hold up to empirical testing. As noted above, the life-cycle/permanent income hypothesis of consumption is an extension of the mainstream view, first expounded by Fisher, that individuals maximise their intertemporal utility. As such these theories underpin the mainstream view of fiscal sustainability and their failure will put a question mark over the mainstream view of fiscal sustainability. From a mainstream perspective, the failure of the life cycle/permanent income hypothesis means there is more to saving behaviour than just the deferment of consumption and the maximisation of intertemporal utility. In what respect does the life cycle/permanent income hypothesis fail?

The assumption that individuals tend to dissave during retirement proved to be wrong. Several authors (Browning & Lusardi 1996:1820; Hurd 1990: 603; Kotlikoff and Summers 1981; Kotlikoff 1988:48-49; Danziger *et al* 1982/83:210) mention that usually the aged do not dissave their accumulated saving, and may even continue to save after retirement.[5] The authors mention several reasons (Kotlikoff 1988:53-54; Hurd 1990:609). Individuals may want to leave a positive bequest to their children. The motive behind the bequests may, but not necessarily, coincide with a Ricardian-motivated type of bequest, i.e. a bequest that allows children to pay the deferred taxes of their parents. An alternative to the Ricardian type of altruistic bequests are bequests that exist due to imperfect family annuity insurance, provision for large medical costs that never arose, inability to consume all one's resources, payment to children for services provided by the children and uncertainty about one's life expectancy.

In addition to these problems, several authors question the validity of the life cycle and permanent income hypotheses. Flavin (1993:665) concludes that consumption is 'too smooth', implying that consumption does not seem to react fully to changes in permanent income. This view is shared by West (1988: 32) who holds that "...consumption is even less sensitive to news about income than the permanent income model predicts." Campbell (1987:1267) concludes that "...the weakest implications of the PIH [permanent income hypothesis] are satisfied, but overall the PIH can be strongly rejected." Campbell and Deaton (1987:372) also find the permanent income hypothesis lacking. They also observe excess smoothness, and ascribe this to the lag with which consumption adjusts to changes in income.

In addition, Spanos (1989) and Thomas (1989) criticise existing views on the consumption paradox. Spanos argues that the early statistical models were inadequate, mainly because much of the theory that would indicate the inadequacy of these models did not exist at the time (Spanos 1989:158). Stanley (1993/4) argues that insofar as the permanent income hypothesis and the life cycle hypothesis are attempts to resolve the

[5] The literature in support of the view that the aged do not dissave most of their accumulated savings and even continue to save is quite extensive. For an excellent list of references see Kotlikoff (1988).

consumption paradox, they can be ignored. This is because there is no paradox to explain. He agrees with Spanos that the apparent paradox lies in the wrong specification by early researchers of the consumption function. Stanley argues that consumption is best explained as a function of past consumption, with some inertia in the adjustment process. In addition, he argues that consumption is a function of current income. There is no need to filter income to arrive at 'permanent income'. Current income is sufficient to explain changes in consumption (allowing for such changes to take place with a lag).

To summarise, the permanent income/life cycle hypothesis does not present an unambiguous framework in which to cast the saving and dissaving behaviour of economic agents. The following seems to undermine the hypothesis:

- The aged tend not to dissave completely. As chapter 5 indicates, Keynes identified the possibility for such a phenomenon as far back as 1930. Thus, there are other motives for saving than the mere deferment of consumption.
- Consumption seems to react better to changes in current income than the permanent income/life cycle hypothesis would predict – an opinion held by post-Keynesians all along.
- The reaction of consumption to current income takes place with a lag.

The weak empirical support for the life cycle and permanent income hypotheses and thus by implication the mainstream view that individuals maximise their intertemporal utility, indicates the slippery ground on which the mainstream theory on fiscal sustainability stands. It also serves to caution against the unqualified acceptance of the mainstream view by policy-makers and economists.

3.6 *A summary of the mainstream view*

In mainstream theory what constitutes a sustainable fiscal policy depends on the level of saving that maximises the (intertemporal) utility of individuals. Of particular relevance is the maximisation of intertemporal utility through the trade-off between consumption now and later. Individual preferences on when to consume, now or later, determine the level

of saving. *Given* the parameters of the production function and thus, the marginal product of capital that would exist at different levels of capital accumulation (i.e. given the negative sloping investment schedule), the level of saving determines the interest rate. With *given* production and investment functions, low levels of saving mean that $r > g$, whereas high levels of saving mean that $r < g$. An explosion in debt and thus, an unsustainable fiscal policy is possible only if $r > g$.

The relation between r and g determines whether government needs to run a primary surplus or is able to run a primary deficit. Thus, because the real interest rate depends on the level of saving that maximises the intertemporal utility of individuals, the sustainable level of the primary balance depends on utility.

An unsustainable fiscal policy, i.e. a continuously increasing public debt/GDP ratio, crowds out investment because it absorbs an ever-increasing portion of saving. Ultimately this leads to the elimination of the saving pool made available by individuals out of their income in every period, so that the claim government makes on the saving pool is larger than the pool itself. At that point government will not be able to sustain its deficit unless it monetises debt or causes disinvestment by destroying existing capital. The increasing claim made by an unsustainable fiscal policy on the saving pool causes a continuous reduction in the intertemporal utility of individuals.

Changes in intertemporal utility bring growth theory into play. Growth theory describes when it is justified in terms of Pareto optimality theory for government to run a primary deficit. Again, this depends on whether the (r-g) gap is positive or negative. If the gap is positive ($r > g$), a primary deficit reduces intertemporal utility and drives the economy away from the so-called 'golden rule' level of capital accumulation. Thus, a primary deficit is not justified. If the gap is negative ($r < g$), a deficit improves intertemporal utility and drives the economy closer to the 'golden rule' level of capital accumulation. Because the *justification* to run a primary deficit coincides with the *ability* of government to run it, mainstream theorists can argue that a continuously increasing debt/GDP ratio is the result of a government that continuously and increasingly drives a wedge between the

actual and maximum level of intertemporal utility and further away from the 'golden rule' level of capital accumulation. In terms of mainstream theory, such a government increasingly violates the Pareto-optimum outcome of individual decisions and increasingly distorts the allocation of resources while running up the debt/GDP ratio.

Lastly, mainstream theory does not consider either the real interest rate or the real growth rate as amenable to policy intervention to secure fiscal sustainability. The real interest rate cannot be reduced, e.g. through money creation, to allow government to run a primary deficit. The real growth rate, in turn, depends solely on the population growth rate and technological progress. Thus, it is not amenable to policy intervention to increase it. Therefore, if $r > g$, government has no option but to run on average a large enough primary surplus.

* * *

Chapter 2 focuses on the mainstream view of fiscal sustainability, whereas chapter 3 attempts to position the mainstream view on fiscal sustainability within the broader constellation of mainstream theory. Chapters 2 and 3 provide a basis for contrasting the mainstream approach with the sectoral insights discussed in the remainder of the thesis and the subjectivist approach introduced in chapter 5.

* * *

Appendix 3.1 – Equations 3.1 and 3.2

To derive equation 3.1 lets assume that income was Y_t and the transfer G_t in period t. Thus, in period t+1 income equals $(1 + g)Y_t$ and the transfer $(1 + g)G_t$, where g is the growth rate. In the case where government finances the transfer with a tax, the utility generation 1 gains from its total consumption, i.e. in period t+1 and t+2, is measured by equation 3 above. This yields equation 3.1:

$$\begin{aligned} U_{t1} &= C_{t+1} + C_{t+2}/(1 + r) \\ &= a(1 + g)(Y_t - G_t) + ((1 - a)(1 + g)(1 + r)(Y_t - G_t) + (1 + g)^2G_t)/(1 + r) \\ &= (1 + g)Y_t + ((1 + g)(1 + g)/(1 + r))G_t - ((1 + g)(1 + r)/(1 + r))G_t \\ &= Y_{t+1} + ((1 + g)(1 + g)/(1 + r))G_t - ((1 + g)(1 + r)/(1 + r))G_t \end{aligned} \qquad (3.1)$$

where a: The average propensity to consume

Y_t: Income of generation 1 in time t

G_t: The transfer generation 1 pays in time t

r: The discount rate (= the interest rate)

g: The growth rate

and where the second line of equation 3.1 is explained as follows:

- Current consumption, C_{t+1} in equation 1.1, equals $a(1 + g)(Y_t - G_t)$, where disposable income equals $(1 + g)(Y_t - G_t)$.
- Future consumption, C_{t+2}, equals $(1 + r)(1 - a)(1 + g)(Y_t - G_t) + (1 + g)^2G_t)$, where $(1 - a)(1 + g)(Y_t - G_t)$ is the amount individuals saved out of their disposable income when they were young.
- Saving earned interest, so that $(1 - a)(1 + g)(Y_t - G_t)$ is multiplied by $(1 + r)$.
- In addition to the amount saved, individuals also receive a transfer when they are old. The transfer grows at rate g, the same rate as income. Thus, when individuals of generation 1 are old the transfer they receive equals $(1 + g)^2G_t$, which is $(1 + g)$ times larger than the transfer they paid for when they were young.
- When individuals are old they consume both their savings and the transfer they receive. To calculate the present value at time t of consumption during old age, the

amount consumed is discounted at the discount rate, r. Hence consumption during old age, $((1 + r)(1 - a)(1 + g)(Y_t - G_t) + (1 + g)^2G_t)$, is divided by $(1 + r)$.

In the case of a debt-financed transfer, equation 3.2the utility of generation 1 is depicted:

$$\begin{aligned} U_{t1} &= C_{t+1} + C_{t+2}/(1 + r) \\ &= a(Y_{t+1} - (1 + r)G_t) + (((1 - a)(Y_{t+1} - (1 + r)G_t) - (1 + g)G_t)(1 + r) \\ &+ (1 + r)(1 + g)G_t + (1 + g)^2G_t)/(1 + r) \\ &= Y_{t+1} + ((1 + g)^2/(1 + r))G_t - ((1 + r)^2/(1 + r))G_t \end{aligned} \qquad (3.2)$$

where the second line of equation 3.2 is explained as follows:

- In equation 3.2 current consumption, C_{t+1}, equals $a(Y_{t+1} - (1 + r)G_t)$, where $(1 + r)G_t$ is the amount of taxes raised on generation 1 in period t+1 to repay debt and interest to generation 0, the older generation of period t+1.
- Future consumption equals $(((1 - a)(Y_{t+1} - (1 + r)G_t) - (1 + g)G_t)(1 + r) + (1 + g)(1 + r)G_t + (1 + g)^2G_t)$. This amount is discounted by dividing it by $(1 + r)$ to determine its present value in period t+1.
- Part of the future consumption of generation 1 in period t+2 originates in their saving in private sector securities in period t+1. Another part originates in their saving in the form of government bonds in period t+1 which government repays in period t+2. Amount $(1 + g)G_t$ is the amount government borrowed out of the saving of generation 1 in period t+1 and which generation 1, therefore, saves in the form of government bonds. Thus, the total amount individuals saved in the form of private securities equals $((1 - a)(Y_{t+1} - (1 + r)G_t) - (1 + g)G_t)$. The total amount generation 1 saved in period t+1 is $((1 - a)(Y_{t+1} - (1 + r)G_t) - (1 + g)G_t) + (1 + g)G_t$, which equals $(1 - a)(Y_{t+1} - (1 + r)G_t)$. This is multiplied by $(1 + r)$ as saving earns interest, which then yields $(((1 - a)(Y_{t+1} - (1 + r)G_t) - (1 + g)G_t)(1 + r) + (1 + g)(1 + r)G_t$.
- In addition to this generation 1 also receives a transfer payment from government, which in period t+2 equals $(1 + g)^2G_t$, which is $(1 + g)$ times the value of the transfer in period t+1. Generation 1 consumes both the repayment and the transfer.

Chapter 4

Surplus, surplus, who's got the deficit? The general balance framework

In response to increasing pleas to reduce the US federal deficit in the mid-1980s, Eisner (1986:41) asked the question: "Deficit, deficit, who's got the surplus?" He modelled his question after Tobin (1963: 49) who in the 1960s already asked the question: "Deficit, deficit, who's got the deficit?" Both Eisner (1986:41-46) and Tobin (1963:49-55) reminded their readers that a deficit run by government is reflected as a surplus run by the private sector. The reason for this is that the expenditure of one sector represents the receipts of another. To argue that government should run a balanced budget would imply that the private sector should also balance its budget, which means that the private sector in the aggregate cannot save (assuming a closed economy or, if one assumes an open economy, then the foreign sector is included in the private sector, in which case it might be more accurate to talk about the non-governmental sectors instead of the private sector). Both Eisner and Tobin couched their arguments in terms of national accounts data and focused on the flows between the various sectors.

With the increasing focus on fiscal sustainability in the 1980s and 1990s, the question became whether or not these flows are sustainable. Because sustainability focuses on the rate of change in the *stock* of debt relative to the rate of change in income, the debate on fiscal sustainability introduced a stock dimension into the discussion of the financial position of government. Attention turned to the possible determinants of the change in the debt/GDP ratio, which, besides non-interest expenditure and income flows, also includes the interest rate and the economic growth rate. One reason for the shift in focus to the interest rate and the economic growth rate is that the last two decades saw real interest rates internationally soar to levels known before only in times of crises, whereas economic growth, on average, was lower than in the preceding two or three decades (Ciocca & Nardozzi, 1996:3-5). In many countries the real interest rate has exceeded and still exceeds the real economic growth rate by a substantial margin (Fourie & Burger,

2000). This coincided with a substantial and continuous increase in the public debt/GDP ratios as public deficits and debt reached record sizes in countries such as the United States (Morgan, 1995:148), Italy and Belgium during the 1980s and South Africa during the early 1990s, causing alarm amongst economists, politicians and in some cases even the broader public.

However, since the mid- and late 1990s several governments have reversed the upward trend in public debt and deficits, among them the United States and South Africa. During this period the US government turned the federal government deficit into a federal government surplus (Board of Governors 2001:11-13) and ran a primary surplus (which they are still running at the time of writing). As a consequence of this policy reversal, the public debt/GDP ratio in the United States has been decreasing significantly. As mentioned earlier (chapter 1), the federal government debt held by the public as percentage of nominal GDP decreased from approximately 50% in the early 1990s to below 35% in 2001. Also in South Africa government has stabilised the debt/GDP ratio by running a primary surplus. Thus, given that some governments heeded the pleas made in the 1980s and early 1990s to stabilise their debt/GDP ratios by running a primary surplus, the question Eisner asked in 1986 is reversed. It now reads: "Surplus, surplus, who's got the deficit?" At issue here is a *primary* surplus and deficit, and not as in the case of Tobin and Eisner, the current or conventional surpluses and deficits. (However, some links between the current and primary balances of agents are explored below.)

This chapter presents a framework that links the budget constraint of government with those of other economic agents on a macroeconomic level. The framework can be used to track how the effect of changes in the budgets of one group of agents is transmitted to the budgetary position of other agents. The framework is called a *general balance framework* (or *analysis*). Note that it is not a general *equilibrium* model. All the equations included are identities and therefore represent technical rather than behavioural relationships. The chapter postulates some behaviour (that of debtors and creditors), but does not discuss the typical behavioural questions such as whether or not agents

maximise utility or profits. The following two chapters deal with some of these questions. Therefore, the unsustainability discussed in this chapter is still more on technical level than on a behavioural level, i.e. in this chapter unsustainability merely means the debt/GDP ratio is increasing unboundedly and at an accelerating rate.

The general balance framework links (non-interest) surpluses and deficits of the different sectors to one another. Besides establishing explicitly the link between sustainability of government and the financial sustainability or solvency of other sectors in the economy, the chapter further extends the framework to relate fiscal sustainability to the debate on government dissaving. Hemming and Mackenzie (1991:7-8) have already attempted briefly to link the issues of fiscal sustainability and government dissaving. As explained in chapter 3, the reason for considering the link between the two is the close relationship between the two issues.

To create the general balance framework requires the expression of the financial position of all sectors and agents in terms whereby one can determine whether or not they are sustainable and solvent. The sectors chosen for this analysis are all those included in the National Financial Accounts (NFA), i.e. the household sector, the corporate sector, the public sector, the financial sector and the foreign sector. Minsky (1992:4-5) emphasises the importance of focusing on all these sectors. The public sector is defined as the SNA definition of the general government, while the corporate sector includes all incorporated non-financial companies. The financial sector includes all financial institutions and the central bank. The household sector includes among others actual households, non-incorporated businesses such as partnerships and clubs while the foreign sector includes all people and institutions outside the economy and who contributed funds to or borrowed funds from the domestic economy. For each of these sectors of the NFA a budget constraint is derived in terms similar to the budget constraint of government. The NFA is an extension of the National Accounts Framework (Fourie, Falkena & Kok, 1992:23-32; SARB 1999). The broader framework of the NFA is concerned mainly with the

relationship between the *balances* on the various sectoral accounts that make up the NFA.

4.1 Refining the public sector equations

Equation 1 in chapter 2, which serves as a short-run indicator of fiscal policy, does not indicate that government can own securities (Cogan *et al.* 1994:142 & 149). In some countries, such as the US, government runs elaborate social security schemes. Citizens contribute social security taxes to these funds while government pays out the social security benefits. These funds may run surpluses which government must then invest in securities (usually its own securities). Therefore, equation 1 is refined to include government holdings of financial assets, as indicated in equation 1 below (changes to the original equation 1 are shown in bold).

$$\Delta D_{gt}/Y_t - \Delta A_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t - (\mathbf{r_{gAt} - g_t})\mathbf{A_{gt-1}}/Y_t + B_{gt}/Y_t \qquad (1)$$

where D_g and A_g: Respectively, total public debt and financial assets held by the public sector

r_{gAt}: The average real rate of return earned by the public sector

The primary balance of the public sector (equation 2) is not affected. The primary balance (stated with more detail than in chapter 2) is:

$$B_g \equiv I_g + G - T_c - T_w \qquad (2)$$

where I_g: Investment by the public sector

G: Consumption expenditure by the public sector

T_c: Tax revenue collected from corporate income taxation

T_w: Tax revenue collected from wages and salaries

Note, however, that the amount of securities government holds may be negligible compared to its total debt.

4.2 *Financial sustainability of the household sector*

What determines whether or not the financial position of the household sector is sustainable? The household sector comprises various autonomous households. Should a household decide to spend in excess of its income, that household is a deficit unit with debt to its name and interest to pay on that debt. Should a household spend less than its disposable income, it is a surplus unit.

The sustainability of the financial position of households can be depicted in the same manner as that of government. This is done in equation 3, which depicts the sum of the changes in the financial position of households (equation 3 can also be applied to a single household).

$$\Delta D_{ht}/Y_t - \Delta A_{ht}/Y_t \equiv (r_{ht} - g_t)D_{ht-1}/Y_t - (r_{hAt} - g_t)A_{ht-1}/Y_t + B_{ht}/Y_t \qquad (3)$$

where D_h: Total household debt

A_{ht}: Total securities held by households

B_h: Nominal "primary balance" of households, i.e. the difference between the non-interest expenditure and the non-interest income of households

r_{hA}: The average rate of return (dividend and interest rate) received on securities held by households

r_h: The real interest rate paid by the household sector (r_h is the average interest rate on, among others, mortgage bonds and household credit)

The *shaded* area in equation 2 relates to interest flows, whereas the *bold* area indicates the non-interest flows of the household sector. In addition to a change in their *debt* position ($\Delta D_{ht}/Y_t$), households can also have a change in their financial *asset* position ($\Delta A_{ht}/Y_t$).

As a result they also *earn* interest ($(r_{hAt} - g_t)A_{ht-1}/Y_t$) in addition to the interest they *pay* ($(r_{ht} - g_t)D_{ht-1}/Y_t$). This is a true depiction of the financial position of most households because the average household normally has a home loan to repay and simultaneously participates in a saving scheme to provide for retirement and precautionary purposes. The net result represents their accumulated savings. The net position for a single household is usually non-zero because some households are deficit units, particularly young households, whereas others are surplus units, particularly older households, even in retirement (Browning & Lusardi, 1996:1820). Because of the non-zero net position some households receive (pay) more interest than they pay (receive). The net interest they receive (pay) improves (causes a deterioration in) their financial position.

Whereas equation 1 is used to determine public sector sustainability, equation 3 is used to determine whether or not the financial position of the household sector is sustainable, i.e. is the household sector solvent in a technical sense. Unsustainability in a technical sense is an explosive increase in net household debt (debt less financial assets) relative to GDP. It occurs if the real interest rate households pay exceeds the real economic growth rate, while the primary surplus of the household sector is insufficient to cover the excess, after allowing for interest income. The primary balance (B_h) (+ deficit;- surplus) of households is defined as:

$$B_h \equiv (T_w + C) - (W_c + W_g) \qquad (4)$$

where T_w: Personal income tax paid on incomes of households

C: Consumption of households

W_c: Wages and salaries paid by the corporate sector to households

W_g: Wages and salaries paid by the public sector to households

The primary surplus of the household sector is its saving out of wage income, thus, keeping interest income aside and out of the picture.[1]

[1] Thus, to arrive at total household saving, one needs to add saving out of interest income.

4.3 *Financial sustainability of the corporate sector*

Along the same lines as households, companies also borrow and save, earn income and dispose of their income. Non-interest spending by companies takes the form of investment spending on capital goods bought domestically, wages and salaries, and imports of capital goods. The non-interest earnings of companies derive from sales of investment goods to government and other companies, exports and the sale of consumption goods to households and government.

Companies finance themselves, as households do, through credit lines at banks. What distinguishes companies from households is that they issue bonds and shares. Bank credit and bonds are forms of debt on which the company must pay interest, while shares constitute equity on which the company pays dividends. The dividend rate may be higher than the interest rate due to the preferential treatment of the interests of bondholders over equity holders. However, they should be closely and positively correlated.

Companies can also own financial assets. This may, among other things, take the form of bank deposits, the holding of securities of other companies, local and foreign, and commercial credit extended to households to finance their purchase of goods from the company. Companies will earn interest and dividends (expressed in this chapter as a rate of return on financial assets) on these financial assets.

Similar to households, a company is unlikely to attempt to balance its net financial asset position. It usually incurs credit not with the aim of buying securities but to finance its production and distribution operations. Should it borrow funds to purchase securities in another company the other company will normally use the raised funds to finance its operations, so that the net effect over the two companies will still be an increase in debt. Therefore, the financial position of companies is analogous to that of households because companies can earn non-interest income, they have non-interest expenditure, they pay and earn interest and dividends. The change in their net financial position can therefore be depicted in an equation analogous to that of households. This is done in equation 5,

which is applicable to the corporate sector in the aggregate but can also be used to denote the change in the financial position of a single company.

$$\Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t - \Delta A_{ct}/Y_t \equiv (r_{ct} - g_t)D_{ct-1}/Y_t + (d_{dt} - g_t)E_{dt-1}/Y_t - (r_{cAt} - g_t)A_{ct-1}/Y_t + \mathbb{B}_{ct}/Y_t \qquad (5)$$

where D_c and E_d: Respectively total corporate debt and equity of domestic companies

A_c: Financial assets held by the corporate sector

B_c: The nominal "primary balance" of the corporate sector (+ deficit;- surplus), i.e. the difference between their non-interest expenditure and their non-interest income

r_c: The average real interest rate paid by the corporate sector

r_{cAt}: The average real rate of return earned by the corporate sector

d_d: The real dividend rate on domestic shares

The *shaded* area relates to the interest and dividend outflows (r_c and d_d) and inflows (r_{cAt}) of the corporate sector. The *bold* area indicates the *non*-interest flows of the corporate sector. The simplifying assumption is made that all profits are paid out as dividends. This, in effect, means that the dividend rate is equal to the rate of return on equity capital. However, equation 5 looks the same whether or not the company pays out all profits or retains part thereof. The terms $((r_{ct} - g_t)D_{ct-1}/Y_t)$ and $((d_{dt} - g_t)E_{dt-1}/Y_t)$ denote the interest and dividends paid on debt and equity of previous periods. This formulation allows equation 5 to reduce to the standard textbook equation used to value equity and bonds when a perpetual constant stream of income is expected (the variables ΔD_{ct} and ΔE_{dt}, will equal zero when no new investment is undertaken so that no growth (g_t) in corporate income or in the economy is expected).

The primary balance of the corporate sector is defined as:

$$B_c \equiv (W_c + M) + T_c - (I_c + C + C_g + I_g + X) + I_c \qquad (6)$$

where I_c: Investment spending by the corporate sector on domestic investment goods, which also represents sales of investment goods by producers of investment goods

W_c: Wages and salaries paid by the corporate sector

C: Consumption

C_g : Expenditure on consumption goods by the public sector

I_g: Investment by the public sector (assuming government buys the material for public investment from the corporate sector)

M and X: Respectively imports and exports of goods

T_c: Corporate taxes

Note that $(W_c + M) - (I_c + C + G + I_g + X) \equiv$ the *operating profits* of the corporate sector, i.e. profit before the payment of interest and dividends. Thus, equation 6 is the same as equation 7 where P equals the operating profit (– a profit; + a loss).

$$B_c \equiv P + I_c \qquad (7)$$

Thus, the primary surplus of the corporate sector is the difference between the operating profits of the corporate sector and investment. Therefore, it could be interpreted as that part of operating profit not absorbed by investment.

Note further that the analysis does not consider depreciation. Thus, all investment is net investment. The model can be altered to allow for depreciation, but it would only complicate the analysis without adding additional insight. (If it is altered depreciation will be included with W_c and M as expenditure for companies depreciating their capital and with $I_c + C + G + I_g + X$ as income for companies selling the replacement capital

goods. If a company does not replace all its old capital, so that in fact its capital stock decreases, the decrease in capital should be handled as negative investment.)

The comments made with regard to households when comparing them with the public sector also hold for the corporate sector. Should companies be faced with an interest rate exceeding the real economic growth rate and should they not run a primary surplus sufficiently sized to compensate for the excess caused by the real interest rate exceeding the real growth rate (after allowing for interest income), the financial position of the corporate sector will be unsustainable in a technical sense.

4.4 Financial sustainability of the financial sector

What determines the financial sustainability of the financial sector? Financial institutions include banks, pension funds, unit trusts and other institutions. Financial institutions differ from companies and households in one important respect. The predominant activities of companies and households (business, consumption and saving) are reflected in their primary balances, whereas those of the financial sector are reflected in their interest flows. The reason is that financial institutions trade predominantly in financial instruments. As a result financial institutions, unlike companies, households and government, do attempt to balance their financial asset and liability positions. It is therefore possible to assume that their interest income and interest cost will be highly correlated and almost equal, with allowance for the profit margin between the two. This makes possible the simplifying assumption that financial institutions do not have non-interest flows. In reality they do pay salaries and incur other costs. They also charge non-interest fees for services. However, the general balance framework does not lose descriptive and analytical value by abstracting from these costs and incomes. The change in the financial position of the financial sector then is depicted in equation 8. (Equation 8 can also be applied to a single institution.)

$$\Delta D_{bt}/Y_t - {}_t\Delta A_{bt}/Y_t \equiv (r_b - g_t)D_{bt-1}/Y_t - (r_{ba} - g_t)A_{bt-1}/Y_t \qquad (8)$$

where D_b: Debt of the financial sector

A_b: Financial assets of the corporate sector

r_{bt}: The average real interest rate paid by the financial sector

r_{bat}: The average real rate of return earned by the financial sector

Although the financial asset position of the financial sector (and that of a single institution) will probably be balanced, its financial position could be unsustainable. The securities it holds may stem from sectors that become increasingly sensitive to interest rates due to their increasing debt and unsustainable financial positions; thus the financial position of the financial sector will also be unsustainable in a technical sense.

4.5 Financial sustainability of the foreign sector

The position of the foreign sector is measured by the balance of payments. Improvements in the current account of the balance of payments are reflected in either decreases on the capital account of the balance of payments or increases in foreign reserves or both (Fourie 2001:170). The reverse is true for decreases in the current account. The balance of payments (relative to GDP) may therefore be depicted as in equation 9. Equation 9 represents the capital account (shaded area where – net capital inflow; + net capital outflow), the changes in the foreign reserves (bold area where + increase in reserves and – decrease in reserves) and the current account (area in italics where – decrease in the current account; + increase in the current account).

$$\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta \mathbf{R}_{ft}/\mathbf{Y_t} \equiv (r_{ft} - g_t)S_{ft-1}/Y_t + (0 - g_t)R_{ft-1}/Y_t - (r_{fAt} - g_t)A_{ft-1}/Y_t + B_{ft}/Y_t \qquad (9)$$

where $\Delta S_{ft}/Y_t$: Change in the foreign securities financed by domestic funds

$\Delta A_{ft}/Y_t$: Change in the domestic securities financed by foreign funds

ΔR_{ft}: Change in foreign reserves (+ increase in reserves and - decrease in reserves)

B_{ft}: The nominal "primary balance" of the foreign sector = (X - M), where imports are a non-interest income and exports a non-interest expenditure for foreigners.

r_{ft}: The real interest rate paid by foreign sector on debt

r_{fat}: The real interest rate earned by foreign sector on its financial assets

Note that the foreign sector is treated as merely another sector of the economy and not as something outside the economy, so that equation 9 is depicted from the viewpoint of the foreign sector. Thus, interest payments to the foreign sector are depicted as interest income, while a trade account surplus is depicted as a primary deficit. In this way all sectors are treated similarly.

If the foreign sector is in a net debt position to the domestic economy, the interest payments to the domestic economy probably exceed interest receipts. To ensure that its indebtedness towards the domestic economy does not increase, the foreign sector requires a primary surplus. Thus, from the viewpoint of the domestic economy a trade deficit is needed.

4.6 An overall framework – The general balance effect and its impact on the net financial position of agents

This section links the financial positions of various economic agents within one framework. It then considers an aggregate level indicator to measure fiscal and financial sustainability in a technical sense.

4.6.1 The link between financial positions – The general balance effect

How does the sustainability of fiscal policy affect the financial sustainability and solvency of other sectors and agents in the economy? What is required is a framework where the sustainability conditions of all sectors are considered *simultaneously*, i.e. where the

sustainability positions of all the sectors and agents are related to each other in a technical sense. This is done by relating the primary balances of all the sectors. The technical link between the financial positions of economic agents creates the channels through which the behaviour of one agent affects the financial position of others. Thus, the framework created in this section serves as basis for further analysis in later chapters that introduce behavioural elements.

Assume that one sector, e.g. government, runs a primary surplus, is it possible for all agents and sectors to run a primary surplus? The answer is no. When depicting the sustainability position of all the sectors and agents in the economy simultaneously the sum of the primary balances *must* sum to zero, as depicted in equation 10.

$$B_{gt} + B_{ht} + B_{ct} + B_{ft} \equiv 0 \qquad (10)$$

This is so because the total non-interest expenditure (payments) in the economy must equal the total non-interest income (receipts), i.e. every rand spent on a non-interest expenditure *must be* a rand received by someone else (see equations 11 to 13).

$$NIE \equiv (I_g + G + W_g) + (T_w + C) + (I_c + W_c + M + T_c) + X \qquad (11)$$

where NIE ≡ Total non-interest expenditure in economy

$$NII \equiv (T_w + T_c) + (W_c + W_g) + (I_c + C + G + I_g + X) + M \qquad (12)$$

where NII ≡ Total non-interest income in the economy

so that:

$$NIE \equiv NII \qquad (13)$$

Since $B_{gt} + B_{ht} + B_{ct} + B_{ft}$ is the sum of all the "primary balances" and since they have to sum to zero, a surplus run by one sector, e.g. government, must be reflected as a deficit in one or more of the other sectors.

4.6.2 An indicator of overall financial sustainability

An indicator is needed to assess the financial sustainability of all sectors and agents simultaneously. Because aggregate debt in the economy relative to GDP will increase when those with net debt positions run primary deficits, the change in the aggregate debt/GDP ratio becomes an indicator to assess the financial sustainability of all agents *simultaneously*. This section depicts an indicator that can be used to establish the path of the aggregate debt/GDP ratio (or since aggregate debt equals aggregate financial assets, the aggregate financial asset GDP ratio) of the economy.

The analysis uses two groups of agents, i.e. financial asset holders and debtors. These agents can be in any of the NFA sectors. The financial asset holders are those with positive financial-asset-position (positive FAP), and the debtors those with a negative FAP. Thus, the debtors will pay interest while the financial asset holders will receive interest. The assets held by the financial asset holders comprise the debt of debtors.

Equations similar to those depicted above are shown for both groups of agents. In all the equations below there is a term indicating changes in the financial asset position of an agent (left-hand side of the equation), a term relating to interest flows (bold) and a term depicting non-interest flows (italics).

For the debtors:

$$\Delta D_{dt}/Y_t \equiv (\mathbf{r_{dt} - g_t})\mathbf{D_{dt-1}}/Y + \mathit{B_{dt}/Y_t} \qquad (14)$$

where D_d: Total debt of debtors

r_d: The real interest rate paid by debtors

B_d: Nominal 'primary balance' of debtors, i.e. the difference between their non-interest expenditure and their non-interest income.

The position of the financial asset holders is the mirror image of the debtor position:

$$-\Delta A_t/Y_t \equiv -(r_{at} - g_t)A_{t-1}/Y_t + B_{at}/Y_t \qquad (15)$$

where A_t: Total of all financial assets = D_{dt}

r_a: The real interest rate received

B_a: Total nominal 'primary balance' of financial asset holders, i.e. the difference between their non-interest expenditure and their non-interest income.

Assume that debtors run a primary deficit or alternatively a surplus insufficient to prevent their debt/GDP ratio from remaining stable. In addition, agents expect no change in either the interest or growth rate. Thus, the spending and income level of debtors is on an unsustainable path. Consequently, debtors will also face a situation where their FAP will deteriorate unless they can compensate for the excess caused by their real interest rate exceeding the real economic growth rate, i.e. *they require primary surpluses, now or in the future, to be financially sustainable.*

Again note that the sum of the primary balances of debtors and financial asset holders must equal zero (this is equation 10, only with another grouping of economic agents). So:

$$B_{dt} + B_{at} \equiv 0 \qquad (16)$$

Since $B_{dt} + B_{at}$ is the sum of all the primary balances and since they have to sum to zero, a primary deficit (or an insufficient primary surplus) run by debtors must be reflected as a primary surplus (or an insufficient primary deficit) run by financial asset holders.

Equation 17 indicates the extent to which *aggregate* (public plus private) debt/GDP in the economy will be increasing:

$$D_t/Y_t = (D_0/Y_0)e^{((r - g - \alpha(r - g))/(1 + g))t} \qquad (17)$$

where D_t/Y_t: The aggregate debt/GDP ratio in the economy after t periods

D_0/Y_0: The initial debt/GDP ratio

r: Interest rate earned by financial asset holders and paid by debtors and government

α: The ratio of the actual primary balance of financial asset holders (debtors) to the primary deficit (surplus) required to keep their financial asset/GDP ratio (debt/GDP ratio) constant (1 in the case where the actual primary deficit equals the required primary deficit, i.e. $\Delta A_t/Y_t = 0$).

The final aggregate debt level depends on r, g and the extent to which financial asset holders use interest income to acquire financial assets (rather than to finance expenditure). Only in the case where financial asset holders do not wish to increase their financial asset holdings, but only to maintain them, will the term $e^{(r - g - \alpha(r - g))t}$ equal 1 (because $\alpha = 1$) and will $D_t/Y_t = D_0/Y_0$. (They will then have to run primary deficits large enough to neutralise the excess of the interest rate they receive over the real economic growth rate.) If financial asset holders decide to acquire financial assets with the interest they receive, $\alpha < 1$ so that $D_t/Y_t > D_0/Y_0$. Should they also save part of their non-interest income (run a primary surplus), then $\alpha < 0$ so that $D_t/Y_t > D_0/Y_0$ even more than when $0 < \alpha < 1$.

Equation 17 assumes that economic agents run their primary balances as a fixed proportion of the ratio required to prevent an increase in their debt/GDP ratio. However, if financial asset holders decide to rather run primary balances that are fixed as a proportion of income (and not of the required ratio), equation 18 applies. Equation 18 is an adaptation of equation 8.2 in chapter 2. The difference with equation 8.2 is that p is

replaced by the initial aggregate financial asset/GDP ratio (or what is the same thing, the initial aggregate debt/GDP ratio of debtors), denoted by D_0/Y_0. Furthermore, D_t/Y_t stands for the aggregate financial asset/GDP ratio of financial asset holders in period t (or what is the same thing, the aggregate debt/GDP ratio of debtors in period t), whereas q becomes the aggregate primary deficit/GDP ratio financial asset holders run (or what is the same thing, the aggregate primary surplus/GDP ratio debtors must run). Note that the debt/GDP ratio in equation 18 can increase unboundedly only if r > g.[2]

$$D_t / Y_t = q(\frac{1+g}{r-g})(\frac{1+r}{1+g})^t - q(\frac{1+g}{r-g}) + (D_0 / Y_0)(\frac{1+r}{1+g})^t \qquad (18)$$

Equations 17 and 18 indicate that if the aggregate debt/GDP ratio increases and no increase in the real growth rate or decrease in the real interest rate is expected, the financial position of some or all debtors is deteriorating. This also means that the aggregate net financial asset position is increasing. However, since debtors with deteriorating and increasingly fragile financial positions issue these financial assets, the financial position of financial asset holders also deteriorates. Depending on the severity of the increase in the debt of debtors, this could be reflected in bankruptcies of debtors, which serves to purge the excessive debt (but also the associated assets) from the system.

At present the value of equations 17 and 18 rests more in the principle they establish because SNA data on sectoral balance sheets needed to calculate the various sectoral indicators of financial sustainability is not readily available for all sectors at present.

[2] If financial asset holders start out with a primary deficit that is smaller than the required primary deficit, the rate of increase in the aggregate financial asset/GDP ratio is slower in equation 17 than in equation 18. The reason is that in the case of equation 17, as the financial asset/GDP ratio increases, the required primary deficit increases. Because financial asset holders maintain a fixed proportion between the actual and the required primary deficit, the actual primary deficit will increase as a proportion of income and thereby dampen the increase in the financial asset/GDP ratio. This is not the case in equation 18 where the actual primary deficit remains a fixed proportion of GDP. However, should the financial asset holders run primary surpluses when they should run primary deficits to keep their ratios stable, the aggregate debt/GDP ratio increases faster in equation 17 than in equation 18. The two equations yield the same result in the case where financial asset holders run zero primary balances.

Data from the national financial accounts and national accounts refer to the flows between sectors and agents and not to the stocks of equity and debt held by one sector in another. Other indicators of sectoral indebtedness are available, but are not always reconcilable with SNA data. However, the principle established by equations 17 and 18 is that if one observes a general and continuous increase in several aggregated debt/GDP ratios (e.g. like total credit extension to the private sector/GDP ratio or total household debt/GDP ratio), it may be an indication of unsustainability.

4.7 The general balance effect of restoring fiscal sustainability

Given the link between the financial positions of economic agents, the scene is set to consider the impact of a shift to a sustainable fiscal policy on the financial position of non-governmental agents. Whereas government by definition ran a primary deficit or too small a primary surplus when fiscal policy was unsustainable, it will have to switch to a large enough primary surplus if it wants to establish a sustainable fiscal policy. Because the primary balances of all sectors have to sum to zero, a larger primary surplus in the government sector means that one or more of the non-governmental sectors will have to run a larger primary deficit or a smaller primary surplus.

The only agents who can run a primary deficit without their net financial asset position deteriorating (i.e. the *net* debt/GDP ratio does not increase) are net *earners* (as opposed to net payers) of interest income. These are agents with a positive net financial asset position, which means that their financial assets exceed their debt. However, these agents will not necessarily prevent their net financial asset position from increasing, i.e. run a sufficiently large primary deficit. Up to the moment when government decides to pursue fiscal sustainability, financial asset holders financed the increase in the public debt/GDP ratio, so that their financial asset/GDP ratio increased. If government changes its policy to one of fiscal sustainability it does not necessarily imply that financial asset holders will also simultaneously decide to stabilise their financial asset/GDP ratio. Thus, they may continue to grow their financial asset/GDP ratio by running primary surpluses.

If financial asset holders do not run a sufficient primary deficit, it means that net debtors (also then the net payers of interest) run primary deficits. These deficits are financed by the further growth in the financial asset/GDP ratios of financial asset holders. Thus, the debt/GDP ratios of net debtors will deteriorate. Given that their economic position is usually weaker (i.t.o. salaries and employment) than that of financial asset holders, debtors may find it difficult to act differently. Whereas it is easier for financial asset holders to decide not to increase their level of expenditure (particularly if they are used to that level of expenditure) and therefore, allow their financial asset/GDP ratio to grow, debtors may find it difficult to reduce their level of expenditure as it will reduce their living standard.[3] *The implication of this is that if government (or any other sector for that matter), decides to become sustainable by changing to a primary surplus, unsustainability may be shifted to another sector of the economy.*

One can therefore argue that when government decides to establish fiscal sustainability, it shifts the *imbalance* in its financial position to another sector. However, whether or not this shift in imbalance also means that government shifts the *unsustainability* to that sector depends on whether or not the primary surplus of that sector is large enough to absorb the imbalance. If not (as in the case of the debtors above), a *general balance effect* occurs. The general balance effect occurs when net financial asset positions deteriorate because there is a mismatch between the primary balances that are required to prevent a deterioration in these positions and the actual primary balances run by agents.

The above suggests that the focus of mainstream theory on fiscal sustainability is too narrow, as it only considers the effect the establishment of fiscal sustainability will have on the financial position of government. The link between financial positions identified by the general balance framework allows one to make explicit the impact of the switch to a sustainable fiscal policy on the financial position of non-governmental agents and sectors. The possibility that the switch to a sustainable fiscal policy shifts the

[3] This is based on the old analogy that it is easier for a child not to receive sweets, than it is to take it away from him once you have given it to him.

unsustainability to another sector in the economy means that the concept of fiscal sustainability must be broadened to overall, system-wide, multi-sector sustainability. Otherwise government runs the risk of unsustainability merely being 'passed around' between sectors as debtors (including government) attempt to regain sustainability. If this happens, unsustainability may never truly be addressed unless it is flushed out of the system by means of a spate of bankruptcies (see chapter 7 for a detailed discussion of this topic).

4.8 Different dimensions of sustainability

It is now possible to define concisely what is meant by financial and fiscal *un*sustainability in a technical sense. Several dimensions of unsustainability can be defined. The first dimension is in terms of a *single* agent and represents a generalisation of the standard result for government to all sectors. The financial position of an agent with net debt is unsustainable if:

i) the (present and expected) real interest rate paid by that agent exceeds the (present and expected) real economic growth rate, and
ii) that agent does not (and is not expected to) run a primary surplus sufficiently sized to compensate for the excess caused by the real interest rate exceeding the real economic growth rate.

The second dimension is in terms of the entire economy. The result above can be extended to consider the sustainability of all agents *simultaneously*. If $r > g$ (presently and expected) and net debtors run (and are expected to run) primary deficits, causing a deterioration in their net financial asset position, aggregate debt/GDP will increase (cf. equations 17 and 18 above). The aggregate debt/GDP ratio will still increase if one net debtor (e.g. government) restores financial sustainability by running a primary surplus while net financial asset holders keep running primary surpluses. The increase in the aggregate debt/GDP ratio will then indicate that unsustainability was merely shifted to another sector.

A third dimension is an extension of the second to include the net financial asset holders. The increase in the aggregate debt/GDP ratio means that the aggregate financial assets/GDP ratio of agents with a net financial asset position increases, because what is an increasing debt to one agent is an increasing financial asset to another. The financial sustainability of these agents may also be under threat because the interest they earn stem from sectors that become increasingly indebted. This spreads the effect of unsustainability from net debtors to net financial asset holders so that the financial position of the whole economy may become unsustainable.

4.9 The link between the debates on dissaving and sustainability

Chapter 3 demonstrated that the debate on fiscal sustainability is very closely related to the debate on government dissaving – a case of old wine in new bottles. Below the general balance framework is adapted to demonstrate explicitly the link between fiscal sustainability, government dissaving and the solvency of non-governmental agents. As a first step towards this the financial liability side of all sectors is aggregated in equation 19.

$$\Delta D_{ht}/Y_t + \Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t + \Delta D_{gt}/Y_t + \Delta D_{bt}/Y_t + \Delta S_{ft}/Y_t + \Delta R_{ft}/Y_t \equiv \Delta D_t/Y_t + \Delta E_t/Y_t \quad (19)$$

where $\Delta D_t/Y_t + \Delta E_t/Y_t \equiv$ Total liabilities and total equity as proportion of GDP. Domestic securities are financed by domestic and foreign funds and foreign securities are financed by domestic funds.

The same can be done for the financial asset side of the economy:

$$\Delta A_{ht}/Y_t + \Delta A_{ct}/Y_t + \Delta A_{gt}/Y_t + \Delta A_{bt}/Y_t + \Delta A_{ft}/Y_t \equiv \Delta A_t/Y_t \quad (20)$$

where $\Delta A_t/Y_t \equiv$ Total amount of foreign and domestic securities held as proportion of GDP.

so that:

$$\Delta A_t/Y_t \equiv \Delta D_t/Y_t + \Delta E_t/Y_t \qquad (21)$$

Equation 21 means that the total change in financial assets must be equal to the total change in financial liabilities and equity. However, by slightly rearranging equation 21, as is done in equation 22, one can observe that the net financial asset position of the economy as a whole must sum to zero.

$$\Delta A_t/Y_t - (\Delta D_t/Y_t + \Delta E_t/Y_t) \equiv 0 \qquad (22)$$

Equation 22 is transformed into equation 26, which is more familiar to most macroeconomists. This is done by first replacing $\Delta A_t/Y_t$ and $(\Delta D_t/Y_t + \Delta E_t/Y_t)$ in equation 22 with their more elaborate values, depicted on the left hand side of both equations 19 and 20. This is done in equation 23 which after rearranging yields equation 24.

$$\Delta D_{ht}/Y_t + \Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t + \Delta D_{gt}/Y_t + \Delta D_{bt}/Y_t + \Delta S_{ft}/Y_t + \Delta R_{ft}/Y_t - (\Delta A_{ht}/Y_t + \Delta A_{ct}/Y_t + \Delta A_{gt}/Y_t + \Delta A_{bt}/Y_t + \Delta A_{ft}/Y_t) \equiv 0 \qquad (23)$$

$$(\Delta D_{gt}/Y_t - \Delta A_{gt}/Y_t) + [(\Delta D_{ht}/Y_t - \Delta A_{ht}/Y_t) + (\Delta D_{ct}/Y_t + \Delta E_{ct}/Y_t - \Delta A_{ct}/Y_t) + (\Delta D_{bt}/Y_t - \Delta A_{bt}/Y_t)] + (\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t) \equiv 0 \qquad (24)$$

where:

$(\Delta D_{gt}/Y_t - \Delta A_{gt}/Y_t) \equiv$ The Net Financial Asset Position of the Public Sector

$[(\Delta \mathbb{D}_{ht}/Y_t - \Delta A_{ht}/Y_t) + (\Delta \mathbb{D}_{ct}/Y_t + \Delta E_{ct}/Y_t - \Delta A_{ct}/Y_t) + (\Delta \mathbb{D}_{bt}/Y_t - \Delta A_{bt}/Y_t)]$ ≡ The Net Financial Asset Position of the Domestic Private Sector

$(\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t)$ ≡ The Net Financial Asset Position of the Foreign Sector

Upon furhter rearranging equation 24 and dividing it with -1 to yield equation 25, it may be observed that equation 25 is nothing but the familiar national accounts statement which most textbooks depict and which, when expressed as a ratio of GDP, is equation 26.

$$-(\Delta D_{gt}/Y_t - \Delta A_{gt}/Y_t) - [(\Delta \mathbb{D}_{ht}/Y_t - \Delta A_{ht}/Y_t) + (\Delta \mathbb{D}_{ct}/Y_t + \Delta E_{ct}/Y_t - \Delta A_{ct}/Y_t) + (\Delta \mathbb{D}_{bt}/Y_t - \Delta A_{bt}/Y_t)] \equiv (\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t) \quad (25)$$

or which most *textbooks* depict as:

$$(T + Tr_g - G - I_g)/Y_t + (S + \mathbb{T}r_p - \mathbb{I}_p)/Y_t \equiv (X + Tr_f - M)/Y_t \equiv \textit{Net capital flows}/Y_t \quad (26)$$

where T: Total tax revenue

G: Government expenditure on consumption goods and wages

I_g and I_p: Investment by government and the private sector respectively

S: Saving by the private sector

X and M: Exports and imports respectively

Tr_g: Net transfers (primarily in the form of interest payments) received by government from the private and foreign sectors (usually negative (-) because government normally pays more interest than it receives.)

Tr_p: Net transfers (primarily in the form of interest payments) received by the private sector from government and foreign sectors

Tr_f: Net transfers (primarily in the form of interest payments) received by the foreign sector from the private and government sectors

Furthermore: $Tr_g + Tr_p = Tr_f$.

Note that:

$-(\Delta D_{gt}/Y_t - \Delta A_{gt}/Y_t)$ in equation 24 is the same as $(T + Tr_g - G - I_g)/Y_t$ in equation 26;

$-[(\Delta \mathbb{D}_{ht}/Y_t - \Delta A_{ht}/Y_t) + (\Delta \mathbb{D}_{ct}/Y_t + \Delta \mathbb{E}_{ct}/Y_t - \Delta A_{ct}/Y_t) + (\Delta \mathbb{D}_{bt}/Y_t - \Delta A_{bt}/Y_t)]$ is the same as $(S + Tr_p - I_p)/Y_t$ while;

$(\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t)$ is the same as *Net Capital Flows/Y_t* which in turn is the same $(X + Tr_f - M)/Y_t)$.

The issue of fiscal sustainability can now be related to the issue of dissaving by government. To determine what size of the primary (non-interest) current balance should be to prevent an increase in the public debt/GDP ratio, recall equation 1.1 from the previous chapter:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + C_{gt}/Y_t + I_{gt}/Y_t \qquad (1.1)$$

where the current deficit (including interest expenditure) equals:

$r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t =$ current deficit as percentage of GDP

Also recall that if the fixed capital of government expands at the same rate as GDP and government borrows to finance capital expansion, then:

$$\Delta D_{gt}/Y_t \equiv r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t - g_tD_{gt-1}/Y_t + gK_{gt-1}/Y_t$$

$$\Delta D_{gt}/Y_t \equiv r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t \qquad (1.4)$$

Equation 1.4 can now be substituted in equation 25. Also assume for the sake of simplicity that government has no financial assets. After rearrangement the result is:

$$-(r_{gt}D_{gt-1}/Y_t + C_{gt}/Y_t) \equiv [(\Delta D_{ht}/Y_t - \Delta A_{ht}/Y_t) + (\Delta D_{ct}/Y_t + \Delta E_{ct}/Y_t - \Delta A_{ct}/Y_t) + (\Delta D_{bt}/Y_t - \Delta A_{bt}/Y_t)] + (\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t) \quad (27)$$

When the issue of fiscal sustainability is linked to the issue of government dissaving it is possible to *explicitly* consider the impact of an unsustainable fiscal policy on saving, investment and the net financial asset position of economic agents. If government decides to dissave, the left-hand side of equation 27 will become negative, which, in turn, must be reflected in a negative value of one or more of the terms on the right-hand side of equation 27. Because the dissaving is unsustainable, the negative values will increase unboundedly if the dissaving policy is not reversed later on. The terms on the right-hand side of the equation can only become negative if the change in financial assets (the variables denoted by an A) exceeds the change in debt (all the Ds), equity (E), the domestic holding of foreign securities (S) and/or foreign reserves (R). Crowding-out of investment occurs when the dissaving by government causes $\Delta D_{ct}/Y_t + \Delta E_{ct}/Y_t$ in equation 27 to decrease or to turn negative and thereby allow financial assets to expand at a faster rate than debt, equity and reserves. However, $\Delta D_{ct}/Y_t + \Delta E_{ct}/Y_t$ could remain unchanged when government decides to dissave if the debt of other sectors increases at a slower rate than their financial assets. Thus, dissaving need not be synonymous with crowding-out. Nevertheless, dissaving remains fiscally and financially unsustainable as the public debt/GDP ratio and non-governmental financial asset/GDP ratios will tend to increase unboundedly.

4.10 Conclusion

This chapter creates a framework that links the financial positions of economic agents, including that of government. The framework allows one to trace how changes in one

financial position affect other financial positions. This reminds one of the statement by Minsky (1975:118) that "(a)n ultimate reality in a capitalist economy is the set of interrelated balance sheets among the various units." The chapter demonstrates, with the general balance framework, how a move to a sustainable fiscal policy may cause unsustainability in non-governmental financial positions – the shift of imbalance from government to non-governmental agents may also imply a shift of unsustainability from government to non-governmental agents. This unsustainability in the financial position of non-governmental agents is reflected in a continuous and accelerating increase in their debt/GDP ratios that may ultimately culminate in bankruptcy and insolvency.

Even though a move to a sustainable fiscal policy may cause financial unsustainability for non-governmental agents, it is still possible to argue, from a mainstream point of view, that the sectoral effects are short-run and transitory effects and that the economy always returns to a stable equilibrium in the long-run. If they are transitory, sectoral problems do not justify much concern. At the root of this mainstream point of view is the old classical idea that the economic system is inherently stable and that exogenous shocks are to blame for economic instability. Nevertheless, even though shocks may destabilise the economy, the economy will, *ceteris paribus*, always return to a unique, stable long-run equilibrium.

The next chapter argues that because of uncertainty the economy does not display a tendency to return to some unique long-run equilibrium. Thus, the effect of a move to a sustainable fiscal policy, that causes the financial position of non-governmental agents to become unsustainable, will not necessarily be a transitory phenomenon. The chapter also considers how uncertainty and the consequent absence of inherent stability means that the economy may experience instability and a 'shifting' equilibrium that may require government to run a stabilisation policy.

Appendix 4.1 – Deriving the equations

Equation 1 derives from the government budget constraint (Roux, 1993:326-327):

$D_{gt} \equiv i_g D_{gt-1} + D_{gt-1} + B_{gt}$

where: i_g: The nominal interest rate paid by the public sector

Equation 1 differs slightly from the inflationary to the non-inflationary case.

For the inflationary case: $\Delta D_{gt}/Y_t \equiv [(r_{gt} - g_t)/(1 + g_t)]D_{gt-1}/Y_{t-1} + B_{gt}/Y_t$

For the non-inflationary case: $\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t$

The same procedure can be followed in deriving equations 3, 5, 8 and 9. However, equation 8 on the financial sector is a little different. Concerning the financial sector, it is assumed that on the liability side of their balance sheets financial institutions have overnight loans (ONL_t), debt in the form of deposits and other liabilities owed to their clients (D_{bt}), as well as their net profit in the form of net interest income ($i_l L_{t-1} - i_b D_{bt-1} - i_o ONL_t$). On the asset side of their balance sheets they have financial assets in the form of loans and other financial investments (L_t) and reserves (BR_t). The net financial position of the financial institutions (excluding the central bank) is then equal to:

$$ONL_t + D_{bt} - L_t - BR_t \equiv ONL_{t-1} + D_{bt-1} - L_{t-1} - BR_{t-1} + i_b D_{bt-1} + i_o ONL_t - i_l L_{t-1}$$

which (under a non-inflationary assumption), can be transformed to:

$$\Delta ONL_t/Y_t + \Delta D_{bt}/Y_t - L_t/Y_t - \Delta BR_t/Y_t \equiv (r_o - g_t)ONL_{t-1}/Y_t + (r_b - g_t)D_{bt-1}/Y_t - (r_l - g_t)L_{t-1}/Y_t - (0 - g_t)BR_{t-1}/Y_t$$

The financial position of the central bank can be depicted as:

$$\Delta ONL_t/Y_t + \Delta R_{ft}/Y_t \equiv \Delta BR_t/Y_t + (r_o - g_t)ONL_t/Y_t + (0 - g_t)R_{ft-1}/Y_t - (0 - g_t)BR_{t-1}/Y_t$$

The net financial position of the financial sector (including the central bank) is then:

$$\Delta D_{bt}/Y_t - \Delta L_t/Y_t - \Delta R_{ft}/Y_t \equiv (r_b - g_t)D_{bt-1}/Y_t - (r_l - g_t)L_{t-1}/Y_t - (0 - g_t)R_{ft-1}/Y_t$$

Combining the financial assets ($- \Delta L_t/Y_t - \Delta R_{ft}/Y_t$) and the interest earned on those assets ($-(r_l - g_t)L_{t-1}/Y_t - (0 - g_t)R_{ft-1}/Y_t$) gives equation 9 (changes in bold):

$$\Delta D_{bt}/Y_t - \Delta A_{bt}/Y_t \equiv (r_b - g_t)D_{bt-1}/Y_t - (\mathbf{r_{ba} - g_t})A_{bt-1}/Y_t \qquad (8)$$

The difference between the net financial position of financial institutions and that of the sector as a whole stems from the fact that the assets of financial institutions held at the central bank constitutes liabilities to the central bank and *vice versa*. Thus, they cancel out in calculating the net position of the financial sector as a whole. Furthermore, interest paid by banks to the central bank on overnight loans constitutes income to the central bank. Thus, again the two cancel out. The net result is equation 8.

Chapter 5

Fiscal and financial sustainability and the nature of expectations, markets and preferences

The chapter considers the implications of uncertainty and subjective expectations for fiscal sustainability and the financial sustainability of non-government agents. It explores how uncertainty causes expectations to be subjective, which, in turn, may mean that the economy can reach an equilibrium at a level below full-employment. The chapter further explores whether or not the equilibrium that the economy reaches is inherently stable given the existence of uncertainty and subjective expectations. The possible lack of inherent stability has two implications that are relevant to the discussion of fiscal sustainability. First, if the establishment of a sustainable fiscal policy displays a general balance effect causing the financial position of non-governmental agents to become unsustainable (see chapter 4), the effect may not be transitory and may not disappear in the long-run, as mainstream theory would have it. Secondly, a possible lack of inherent stability means that economic instability can be generated from within the economy. The instability may then spill over into the governmental sector to cause fiscal unsustainability. The instability may also generate pressure on government to run a stabilisation policy, which, in effect, is a policy to safeguard the financial sustainability and solvency of non-governmental agents. Thus, in an economy where agents hold subjective preferences and expectations because of uncertainty, the meaning of fiscal and financial sustainability may differ markedly from the mainstream view (set out in chapters 2 and 3). This difference in meaning between the subjectivist and mainstream views also implies that the mainstream rule on fiscal sustainability is too crude. Therefore, with both the current and the next chapter as foundation, the last two chapters seek to refine the rules on fiscal sustainability.

However, what is meant by the term 'subjectivist'? O'Driscoll and Rizzo (1985:1) describe subjectivist as "...the presupposition that the contents of the human mind, and hence decision-making, are not rigidly determined by external events. Subjectivism makes room for the creativity and autonomy of individual choice." O'Driscoll and Rizzo

(1985:22-23) refine their definition further by distinguishing between static and dynamic subjectivism. Static subjectivism refers to the mainstream theory of value where preferences are exogenously given and the mind merely processes information to maximise utility. No choice in the true sense of the word exists. Dynamic subjectivism "...on the other hand, views the mind as an active, creative entity in which decision-making bears no determinate relationship to what went before." The use of the term subjectivist in the context of this chapter conforms closely to that of dynamic subjectivism.

The literature on and approach to subjectivism is complex. The analysis draws heavily on both the Keynesian and Austrian traditions as both are subjectivist in nature. In line with Hicks (1967:203-215), Gilbert (1982:91), Snowden *et al* (1994:351) and O'Driscoll and Rizzo (1985:9) the analysis seeks to integrate the works of Keynes and the Austrians. Haberler (1964:336-338), who considered similarities between Keynes and Hayek, demonstrated that these theories could be used as complements rather than as opposites. Lachmann (1978:15) argues that Keynesians and Austrians have a common methodology in that both deal with purposive action by humans and insist on using radical subjectivism in theory dealing with human action. Notwithstanding the similarities, Lachmann warns that one should be careful about which Keynesianism one talks of. Based on this warning, Torr (1993:403-404) distinguishes between subjectivist and objectivist Keynesians and Austrians. Within the post-Keynesian school the subjectivists built their work primarily on that of Keynes and, to some extent, Kalecki. The objectivists – also known as neo-Ricardians or Sraffians – focus on Ricardo, Marx, Sraffa, Kalecki and rather less on Keynes (see also Torr 1988: chapter 5). Within the Austrian school there are marked differences on subjectivism between Mises, Hayek and Lachmann. Nevertheless, there also are similarities between them, which may be fertile ground for integrating some of their views. Since Lachmann is the most notable exponent of the Austrian view on subjectivist expectations, this chapter draws particularly on his work (and Shackle in so far as he is considered to be an Austrian).

Rothbard (1987:5-6) argues that the origin of subjectivism is found in the writings of continental economists such as Turgot and Cantillon who predate Adam Smith and who trace their roots back to the Scholastics. According to Rothbard, Adam Smith ignored subjectivism, so that his work and that of some later British economists such as Ricardo actually represent a retrogression from the work of these continental writers (Rothbard 1987:6). The re-emergence of the subjectivist tradition predates Keynes and rests in the subjectivist or marginalist revolution of the 1870s. The revolution introduced the concept of 'subjective preferences' and the idea of marginal utility to economics (cf. Lachmann 1982:33). Subjective preferences guide consumers when they buy and producers when they determine the type and quantity of goods they can produce profitably.[1]

In the 1920s and 1930s the subjectivist tradition entered its next phase with the contributions by Knight (1921) and Keynes (1921; 1936; 1937). Knight and Keynes saw the future as inherently uncertain, which led them to emphasise the subjective nature of *expectations*. The notion of subjective expectations is a natural and necessary extension of the notion of subjective and continuously changing preferences. A large part of future preferences are unknown to consumers as the knowledge needed to take those decisions will only become known to them in future. This is especially the case with big item acquisitions in the category of durable and semi-durable goods, for which households usually require more information than when they buy non-durable goods such as food. Preferences change as new knowledge and interpretations of knowledge arise.

Changes in knowledge and interpretations cannot be predicted because, as Popper argues, nothing ever comes off exactly as intended so that all actions have unintended outcomes (Popper 1963:123-125; O'Hear 1980: 141-146). To illustrate this he uses an example of a market where the actions of buyers and sellers change the circumstances in which they took the decision to buy or sell. He calls this the Oedipus effect. Because knowledge cannot be predicted, neither changes in preferences nor changes in the relative demand

[1] Prior to the 1870s economists focused on the accumulation of wealth and not so much on subjective valuations. Hicks (1976:212-216) therefore denoted economics prior to 1870 as plutology (theory on the accumulation of wealth) and after 1870 as catalactics (theory on exchange). The origin of the term 'catalactics' dates back to Whately in 1831 (Mises 1949:3).

for goods can be predicted. Preferences may also change without a change in knowledge, which renders them even more unpredictable. Consequently, producers of particularly durable goods, and to some extent even semi-durable goods, cannot predict the demand for their products with any degree of certainty. Thus, expectations on future profits cannot be based on certain (or even statistically probable) knowledge. This means that both financial and real investors must base their expectations on a subjective evaluation of the future prospects of a company. Hence, the fundamental uncertainty in business and subjectivity of expectations as a natural extension of subjective preferences and the fundamental uncertainty of future preferences. Note that in this chapter the term 'uncertainty' means fundamental uncertainty and must be distinguished from its use in mainstream theory where 'uncertainty' means no more than statistically measurable risk.

The natural extension of the subjectivist concept from preferences to expectations implies that Austrian views on human action and market processes and Keynesian theory on the instability of investment are complementary. Within the Keynesian tradition Shackle did much to ensure consistency and clarity in the Keynesian understanding of the role of subjective expectations. Lachmann did the same for Austrian economics. Because both Lachmann and Shackle were open to the views of subjectivists from other schools, the result is a large measure of similarity in (some) Austrian and post-Keynesian theories on the role of expectations. The similarity is such that Lachmann (1978:15) considered Shackle an Austrian even though Shackle considered himself a Keynesian. The high degree of similarity indicates why this analysis draws on the wider subjectivist tradition and is not limited to any one subjectivist school in particular.

Section 5.1 of this chapter provides an exposition of the basic tenets of a subjectivist view. In particular, it explains the relationship between uncertainty and subjective preferences and expectations. Section 5.2 uses the basic tenets of the subjectivist view to revisit the theory that underpins the mainstream view of fiscal sustainability (presented in chapter 3). Thus, the second section represents a critique of the mainstream view. Section 5.3 considers how uncertainty influences the values of the main variables that enter into the fiscal and financial sustainability equations. Its first subsection considers

the implications of uncertainty for the interest rate. It demonstrates how the interest rate is determined in a speculative market environment where agents hold divergent expectations. The second subsection considers how an interest rate level that is determined in an uncertain environment influences GDP, whereas the third subsection considers the implications for the growth rate.

The fourth section (section 5.4) of this chapter considers uncertainty as an explanation for economic instability. It focuses on the financial instability hypothesis of Minsky. This section also posits the question whether uncertainty renders the economy endemically or just potentially unstable. To consider the question the analysis draws on the views of Kregel and Lewin (the former a post-Keynesian, the latter an Austrian). The last section (section 5.5) considers the rationale for and efficacy of government action to stabilise the economy. It considers to what extent uncertainty and the attitude of economic agents affect the efficacy of a policy to stabilise the economy.

5.1 The relationship between uncertainty and subjective preferences and expectations

In a subjectivist world the future is fundamentally uncertain and preferences and expectations are subjective. This section seeks a proper understanding of the subjective nature of expectations and of the relationship between uncertainty, subjective preferences and expectations. This section first describes the subjectivist view that the future is fundamentally uncertain and unpredictable. It demonstrates that this view can be expressed in different terms even though the central message of the view remains the same. The section then focuses on the relationship between uncertainty and subjective preferences and expectations to distinguish cause and effect between them. Based on this relationship, the section focuses lastly on the nature of expectations.

5.1.1 The subjectivist view on the unpredictability of the future

A subjectivist view rejects the assumption of mainstream theory that the future is certain or, if not, at least statistically predictable (O'Driscoll and Rizzo 1985:3-4; Dow 1993:15; Lachmann 1966:16-17). Thus, a subjectivist view accepts uncertainty as a reality. Uncertainty about the future precludes the charting of a future long-run path of the economy as a whole or of any subset of economic variables, including those pertaining to fiscal and financial sustainability. To quote a much cited paragraph by Keynes (1937:113-114): "By 'uncertain' knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is the prospect of a Victory bond being drawn. Or, again, the expectation of life is only slightly uncertain. The sense in which I am using the term is that in which the prospects of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know." In similar vein Knight (1921:199) argues "It is a world of change in which we live and a world of uncertainty." Like Keynes, Knight clearly distinguishes between uncertainty, which is immeasurable and unknown, and risk, which is measurable and knowable. Simon (March *et al.* 1958:37) makes a similar distinction between risk and uncertainty (see also Lawson 1985; 1988; 1989; Rotheim 1988; 1989/90; Hamouda and Smithin 1988; De Carvalho 1988; Palley 1993).

Like Keynes and Knight, Mises (1949:106; 1957:378-379; 1962:64-66), an Austrian, is sceptical about prediction, including statistical prediction. Unlike Keynes and Knight who view economic prediction as something beyond the realm of probability theory, Mises denotes prediction as a specific type of probability. He distinguishes between class and case probabilities. Class probability (1949:107) is a case where "[w]e know or assume to know, with regard to a problem concerned, everything about the behaviour of a whole class of events or phenomena: but about the actual singular events or phenomena we know nothing but that they are elements of this class." Case probability (1949:110) is

a case where "[w]e know, with regard to a particular event, some of the factors which determine its outcome; but there are other determining factors about which we know nothing." Mises (1949:112) then distinguishes between speculators, gamblers and engineers as different modes to deal with the future. Engineers, like social engineers, act as if the future is certain. Gamblers operate on the principle of class probability, while speculators place bets in cases where case probability applies. Mises clearly distinguishes between a gamble and a bet (1949:115-116). A gamble employs class probabilities about outcomes (e.g. the chance that it will rain is 60%), whereas a bet uses knowledge about a specific outcome (e.g. I bet on horse A because it has a better trainer or bloodline and thus a better chance to win). Mises (1949:113) contends that investment is an example of speculative behaviour where no measurable probability can be attached to any particular outcome. Hence, his conclusion concurs with that of Keynes that the future is unpredictable.

Davidson (1982/83), a post-Keynesian, also argues that the future is unknown. Like Mises, he couches his explanation in statistical terms and uses statistical theory not available in Keynes' time to explain why the future is uncertain. He argues that we live in a world where 'crucial decisions' are made. Crucial decisions (Davidson 1982/83:192-195) change the circumstances in which they are taken. This relates to Popper's Oedipus effect. Davidson argues that "...all important economic decisions where the outcome lies in the future and where circumstances can never be completely replicated over historical time are crucial." In addition to decisions on investment and big item consumption goods, fiscal and monetary policy decisions are also crucial decisions. Crucial decisions give rise to a 'non-ergodic' world. Samuelson (1968:184-186) introduced the term ergodicity to economics. An ergodic world (Davidson 1982/83:185; 1987:148; 1989:477-479; 1991:133; 1998) is a world where statistical space and time averages – the first calculated with cross-section data and the latter with time-series data – are the same over an infinite realisation and converge over a finite realisation. This allows one to estimate the space average with the help of a time average and *vice versa*. However, time and space averages will not coincide in a non-ergodic world where crucial decisions change the circumstances in which they are taken. Thus, a calculated time average cannot be used as

an estimate of a space average. This means time-series data cannot be used to make efficient and unbiased forecasts that are without persistent errors. Therefore, like Keynes, Knight and Mises, Davidson argues that the past is not a reliable guide to the future and, in fact, may even be a misleading guide.

5.1.2 How uncertainty about future preferences causes uncertainty about the profits companies can expect

Ergodicity, and thus, a certain or statistical predictable future, depends on the stability of preferences. Stability and predictability yield sufficient knowledge about the future to enable individuals to maximise their intertemporal utility and companies to undertake investment plans with an objectively determined probability of success. It also allows the economy to converge on a long-run equilibrium path. In a non-ergodic environment one cannot know what the future holds; the future is uncertain. At the basis of uncertainty lies the uncertainty of individuals about their future preferences.

Individuals are uncertain about their future preferences because future preferences depend on knowledge that one can and will obtain only in the future. Mises (1934:39) argues that individuals base their preferences on the relative value they ascribe to goods. A change in the circumstances of an individual will change the relative value he ascribes to goods and therefore, his preferences. In the same vein Lachmann (1986:4, 31) and Shackle (1972:156) argue that in an uncertain world, knowledge changes and becomes available with the passage of time as one moves from the unchangeable and knowable past to the unknowable future. Shackle (1972:231) argues that the "...continuous gaining of knowledge, which is our conscious being, confronts us with *novelty*, with thoughts which transform our picture of the world." In addition, changes in knowledge cannot be predicted (O'Driscoll and Rizzo 1985:25) so that time must pass for knowledge to become available.

Lack of knowledge means individuals do not know what utility to expect from the future consumption of specific goods (Kirzner 1963:82-83). This renders the future relative demand for goods unknown, which, in turn, causes companies to face uncertainty about

their future profits. Companies contribute to the uncertainty through their crucial decisions, which include investment decisions and decisions on new product lines. The actions that stem from these decisions constitute new knowledge to consumers. Only when consumers obtain the new knowledge, can preferences and thus, relative demand change.

Furthermore, even though a company may anticipate a certain reaction, it cannot know how consumers will react to the action it takes. Therefore, companies are, just like individuals, in a position where they have to acquire new knowledge continuously. This knowledge can only become available *after* consumers have adjusted to the actions of companies. Thus, companies have to take decisions at times when they do not posses the new knowledge. This means that companies take decisions in the face of uncertainty. Therefore, economic agents continuously reassess and reformulate their expectations in the light of new knowledge and circumstances (Lachmann 1986:4-5), whereas their actions and reactions generate new knowledge continuously. In this manner the process continues *ad infinitum* and renders uncertainty endogenous (O'Driscoll and Rizzo 1985:73-74).

What complicates the issue is that individuals do not necessarily interpret the same circumstances in the same way. Lachmann (1943:67) argues that experience passes through a filter in the human mind. Thus, what constitutes knowledge to different individuals may differ even if they face the same circumstances. This is a situation of divergent interpretations (Lachmann 1986:56). Hence, different individuals may react differently even though they experience the same circumstances. This allows for endless permutations in the combinations of actions and reactions of economic agents. Moore (1998) likened this situation to a game of chess. One knows what moves each piece on the board is allowed to make. However, since there are about 10^{125} possible moves and combinations of moves in chess, knowledge of what moves each piece is allowed to make does not mean that one can predict in any way the moves and combinations of moves of the various pieces. Thus, even when there are only 32 pieces on the board, with only two minds moving them, the future is unpredictable. How much more will it not be

unpredictable if one operates in a 'board' with millions of pieces, each thinking for him or herself?

5.1.3 Uncertainty and the formation of expectations

Uncertainty is a lack of knowledge about the future environment. Consumers are uncertain about their future preferences and companies about their future profits. Human beings are caught up in a never-ending search for knowledge. To Shackle this is not a burden, but part of the natural state of a human being. In particular, he argues that uncertainty stems from the existence of consciousness itself. "Consciousness is finding out." (Shackle 1975:2) and one cannot 'find out' if one lacks knowledge about the future.

We are, as Shackle (1972:3) puts it, on the "edge of the void of time", meaning that the future does not exist at this moment in time – we move from an unchangeable past to an unknowable future. The latter point seems obvious, but Shackle reasons that its implications are not so obvious. The moment one assumes that a cause has a singular effect or that a cause and effect have a statistical (stochastic) relationship, one believes or assumes that the future already exists.[2] In a world or model ruled by deterministic and statistical laws, history would be "a book already written, whose pages the hand of time is merely *turning*, not composing." (Shackle 1966:72). To counter this opinion, Shackle posits the view that the future is not just unknown at the present, it does not even exist. If it were merely unknown the economic agent would only face *epistemological* uncertainty. The question would then be to find better techniques to predict and expose the future. However, in a world where the future does not exist, the economic agent faces *ontological* uncertainty, meaning that there is nothing to expose, no matter what technique one uses. History must be composed and finding out entails finding out what others composed.

[2] It may also happen that one does not believe in the existence of deterministic or statistical laws, but nevertheless one uses the concept like Lucas (1999:154) as an expository device. However, in one's policy advice, one then needs to act as if the future already exists (see appendix 5.1 for a more complete discussion on the Lucas approach).

Hicks, particularly in some of his later work (1979; 1984), comes close to Shackle when he cautions against the unqualified use of probability calculus in making predictions in social sciences. He argues (Hicks 1979:13; 1984:12-13) that when one determines the relationship between A and B, one must not state it in 'hard determinist' terms or in terms of 'hard causalities', e.g. 'A causes B', but in 'mild determinist or soft causal' terms such as 'A *may* cause B'.

If humans were to act according to determinist or statistical rules, they would not have any choice. Shackle (1975; 1982/3 in reply to Bauser 1982/3) cannot accept this as it would mean humans would have no free will. The presence or absence of free will is key to the type of expectations present in an economy or economic model. Shackle states that in a world ruled by statistical or deterministic rules, choice and decision would be *illusory* (Shackle 1966:73). The word decision would be *empty* of any meaning since the decision-maker will make no judgement in the true sense of the word. Shackle denies that statistical probabilities determine behaviour. Individuals have freedom of will and choice which is by definition unpredictable (Shackle 1972:122,239). Thus, human causality operates through the mind of the agent (Addison, Burton & Torrence 1984:7). Freedom of will does not mean that individuals are free from the laws of nature, e.g. biological laws. The question is rather, as Berlin (2000:19) puts it: "Is his liberty totally exhausted thereby [the existence of natural laws]? Is there not some corner in which he can act as he chooses, and not be determined to choose by antecedent causes?". Shackle (1983:7) answers this question in the affirmative when he states that "...I see *Man* as a 'beginning', a chooser which cannot be fully explained. He is an uncaused cause." Freedom of will makes the future unknown and uncertain (see also O'Driscoll and Rizzo 1985:2). This means that expectations, like the expected return on investment, cannot be generated with the help of a statistical probability calculation.

But if human behaviour is unpredictable, as Shackle argues, how can an economic agent, like government or an investor, form an expectation and decide to act on that expectation? Would an agent not be forced to view *all* outcomes as possible, so that it does not really matter what decision he takes? Would his decision not be *powerless,*

meaning that he cannot influence the outcome whatever his decision (Shackle 1966:74)? This is a charge Selgin (2000: 44-45) levels at both Lachmann and Shackle. Shackle answers this question by arguing that, although the human is really able to choose, a particular action can be followed only by a limited number of events (Shackle 1966:74). Thus, a decision is a "*...choice in the face of bounded uncertainty...*" (Shackle 1966:75). There are "bundles of possibilities" where the possibilities are limited in number (Shackle 1966:75). In addition, a human cannot know all these possibilities – if she can, uncertainty disappears. However, some of them exist in the mind of an individual as a 'possible outcome' (Shackle 1966:78). A 'possible outcome' is a product of the imagination and when linked to a possible action of the agent it is an 'expectation' (Shackle 1966:78; also see Carter *et al.* 1954). The existence of several possible outcomes that are nevertheless limited in number, means that the future is neither certain (in either the deterministic or statistical sense) nor chaotic, but *kaleidic*[3] in nature.

Kaleidicity also means that governments and investors cannot view the effects of their decisions in a mechanistic fashion. A change in the tax rate does not automatically elicit the desired effect in, say, consumption or investment. An investment does not automatically yield a return. Thus, in a kaleidic world it is sensible for economic agents to diversify, *ex ante*, their investments and to obtain, *ex post*, knowledge about the outcome of their decisions.

Knight argues that the discovery of knowledge is not limited only to the present. The individual may also anticipate what knowledge the future may produce. This feature of the individual originates in his consciousness (Knight 1921:200). Life is an internal adaptation to a changing external situation. Knight argues that on the vegetable and thus, unconscious level this adaptation is taking place simultaneously with the external change. However, once a being is conscious, that being may anticipate and expect external changes and may therefore, adapt prior to the changes. Consciousness is therefore a

[3] The picture of a kaleidoscope may change completely and even unpredictably with only a small turn of the kaleidoscope.

precondition for the formation of expectations or, as Knight puts it: "...the rôle of consciousness is to give the organism this 'knowledge' of the future." (Knight 1921:201).

How do we obtain 'knowledge' about the future? According to Knight, we perceive the present world and make inferences from our perceptions towards the future. We then react to our inferences (Knight 1921:201). An inference is an expectation, or as Knight calls it, an estimate. Thus, conscious behaviour is an action designed to change a future situation inferred from a perception of a present situation. This involves one perception and two inferences. One inference is on what the situation will be if one does not act and the other inference is on the situation that will transpire should one decide to act. However, perceptions and inferences may be wrong. This causes dissonance between the expectations and the actual future outcome. Compare this to Lachmann (1943:72-73) who argues that, because experience passes through a filter in the human mind, the interpretation of circumstances individuals make reflect their views on how the world works. This renders expectations subjective and indeterminate. Because the filter may cause different individuals to interpret the same experience differently, expectations may diverge as interpretations diverge. Hence, some expectations, or inferences as Knight called them, are bound to be wrong (Lachmann 1973:39). This view is also related to Popper's Oedipus effect mentioned above, where expectations will never be fully realised.

An important feature of Knightian estimates is that they are not statistical in nature. A Knightian estimate is an inference made where no classification of instances is possible. No statistical probability can be generated since no time-series or cross-section data exists. Knight illustrates his explanation with an example of an investor who has to estimate the return on his investment. However, the instance of this investment is unique because it relates to other variables in a way that is totally different from other instances of investment. Thus, there is no history of past rates of return with which the investor can predict his return (on this issue also see Davidson 1991:135).

Knightian estimates are more common in economic life than is generally accepted by economic theory. Knight (1921:231) argues that uncertainty "...has been neglected in economic theory, and ... we propose to put [it] in its rightful place. As we have repeatedly pointed out, an uncertainty which can by any method be reduced to an objective, quantitatively determinate probability, can be reduced to complete certainty by grouping cases. ... Measurable uncertainties do not introduce into business any uncertainty whatever ... but the present and more important task is to follow out the consequences of that higher form of uncertainty not susceptible to measurement and hence to elimination ... this is *true uncertainty*..."

The expectation of Shackle, which is a product of the imagination, and the expectation of Knight, which is a product of inference and intuitive judgements, are similar. In both cases the human mind, when faced by a shortage of information, plays a significant role to create 'knowledge' to fill in for the missing information. It is not possible to say how this 'knowledge' or expectations come to be. Shackle (1983:6) argues that they are "... *far too elusive and subtle* to find any principles and rules to explain their emergence. They're based on suggestions and you get suggestions from any mortal thing that happens." Nevertheless, expectations are products of the imagination that originate in human subjects. This renders them subjective in nature.

To summarise: Authors like Knight, Shackle and Lachmann argue that the future is uncertain, not only because we do not have the (statistical) tools to eliminate the uncertainty, but because the future does not exist at this point in time – it has to be composed by the actions and decisions of individuals. However, because the future is uncertain, there is no objective basis on which to form expectations. Thus, each individual has to use his imagination to form expectations subjectively on the basis of whatever limited knowledge he or she possesses.

5.2 *The subjectivist view and the theory that underpins the mainstream view of fiscal sustainability*

Using the subjectivist views set out in the previous section, this section revisits the theory that underpins the mainstream view of fiscal sustainability (presented in chapter 3). The section argues that mainstream theory misses some important features of the real world that cannot be ignored when considering fiscal sustainability or the theory that underpins it. Hence, the question: what implication does the subjectivist view set out above hold for the theory that underpins the mainstream view of fiscal sustainability?

To define a steady state model, mainstream theory does not only take preferences (as expressed in the different trade-offs discussed in chapter 3) as given. It also assumes that preferences mostly remain unchanged. Changes that do occur are rare and infrequent and the economy adjusts quickly to a new state of affairs (Lachmann 1986:162). In contrast, the subjectivist view of Keynes allows for the possibility that preferences may change *continuously*.

Because Keynes and mainstream economists differ on the frequency of changes in preferences, they reach completely different conclusion on the impact of such changes on the economy. This is nowhere clearer than in the views of Keynes and mainstream theory regarding the impact of a change in saving and investment. Recall from chapter 3 that the mainstream view on saving largely underpins its view on fiscal sustainability. Therefore, if uncertainty has implications for saving behaviour, it also has implications for fiscal and financial sustainability. Thus, the section represents the external critique of the mainstream theory on saving mentioned in chapter 3.

In mainstream theory, if consumption as a ratio of a given level of income decreases, it means that individuals save more. The change in this ratio may represent a shift of the saving function and not a move along the curve. A higher saving rate *automatically* gives rise to higher investment through the smooth adjustment of the interest rate (the move along the curve subsequent to the shift of the function – see chapter 3). Thus, mainstream theory assumes that a decrease in the consumption/income ratio *automatically* gives rise

to a higher investment/income ratio. Because mainstream theory assumes that the economy always reverts back to its natural rate of employment, the increase in the investment/income ratio that offsets the decrease in the consumption/income rate ensures that aggregate demand (consumption plus investment), and hence income, does not decrease when consumption decreases.

Keynes did not agree with the mainstream view. He argued (1936:210) that "An act of individual saving means – so to speak – a decision not to have dinner to-day. But it does *not* necessitate a decision to have dinner or to buy a pair of boots a week hence or a year hence or to consume any specific thing at any specific date. ... It is not a substitution of future consumption-demand for present consumption-demand, – it is a net diminution of such demand." In other words, a producer of, say, television sets will not interpret a drop in sales as an indication of an increase in the future demand for sets and, therefore, as a justification for an expansion of his production capacity to meet the future demand.

The motive for saving is merely a desire to hold wealth, which represents "...a potentiality of consuming an unspecified article at an unspecified time" (Keynes 1936: 211). This allows individuals to defer consumption because of indecision or a lack of information that makes it impossible to make a trade-off between the different consumption goods. Graaff (1967:103) notes that a lack of information is inescapable. In a system with a perfect pricing mechanism (the mainstream model) the amount people save depends on the amount of goods and services they expect to buy with those savings in the future. This amount either depends on the actual future interest rate, the future general price level or future relative prices.[4] Graaff indicates that savers cannot know these prices as the actual prices that will prevail depend on the saving decisions of other households. He argues that "[n]o one household has any way of knowing what other households intend to do. The market does not provide it with the information it requires to make a rational decision." This means that one household cannot know the current and

[4] If individuals keep their savings in bonds, the expected interest rate determines the future buying power of their savings. If they keep it in money, the general price level determines it and if they keep it in durable commodities, relative prices determine it.

future preferences of other households – they are uncertain – so that individuals cannot maximise their intertemporal utility. This reduces saving to 'potential consumption'.

The way in which Keynes views saving also allows for the possibility that an individual defers consumption because he prefers not to decide what, when and if he is going to consume. Thus, the individual allows for the possibility that his preferences must still be formed or may change or, in fact, may never be formed, so that savings just accumulate. The latter possibility is a view Keynes (1930b:383) held in as early as 1930.

The impossibility of maximising intertemporal utility undermines the mainstream theory on interest rate determination, and therefore, all the theories it underpins, including the theory on fiscal sustainability. The critique levelled by Keynes, Graaff and Shackle at the mainstream view means that the theory that underpins the mainstream view on fiscal sustainability may miss some important features of the real world that cannot be ignored in policy determination. Hence, the next section attempts to rectify this by considering how agents who face uncertainty act in the face of that uncertainty and thereby determine the level of income, the interest rate and the growth rate. These are the main variables that enter into the fiscal and financial sustainability equations. Thus, they determine the parameters of sustainable fiscal and financial behaviour.

5.3 The impact of uncertainty on fiscal and financial sustainability

What is the impact of uncertainty and divergent expectations on fiscal and financial sustainability? By drawing on the first section, the remainder of this chapter considers how the levels of the variables in the fiscal and financial sustainability equations (see chapter 4 for equations) reflect uncertainty and divergent expectations. Subsequent chapters elaborate in more detail.

Consider equation 1 from chapter 2, which measures fiscal sustainability. It contains four variables that determine whether or not fiscal policy is sustainable. These are r, g, Y and B (marked in bold and italics in equation 1). These same variables feature in the

equations that describe the financial sustainability of non-governmental agents (see chapter 4), and therefore, also determine whether or not non-governmental agents are financially sustainable.

$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t$ (1 from chapter 2)

In the equations that describe fiscal and financial sustainability the four variables can be grouped into two categories:

1) The first category comprises those variables (r, Y and g) that are not under the direct control of any agent, including government. This section explains the implications of uncertainty for these variables. To the extent that the presence of divergent expectations and uncertainty influences r, Y and g, it also influences fiscal and financial sustainability.
2) The second category contains the primary balances of agents (B). Because most agents have some control over their non-interest expenditure, all agents, including government, have some direct control over their primary balances. Thus, the primary balance is not as susceptible to changes in expectations as the variables in the first category. However, chapter 6 indicates that there are situations where agents have very little control over their primary balances and where uncertainty and expectations influence the primary balance.

5.3.1 How is the interest rate determined in an uncertain world?

This section shows how the existence of uncertainty influences the nature and functioning of a financial market and, thus, the way the ruling price and quantity are determined. Because the (r-g) gap determines the primary balance that an agent may need to run to maintain fiscal or financial sustainability, the interest rate plays a key role in setting the limits to fiscal or financial sustainability. The discussion draws on the work of Shackle, Lachmann and Keynes (for a discussion of the critique levelled against the views of Keynes, Lachmann and Shackle set out below, see appendix 5.2). Lachmann and

Shackle mostly discussed markets in generic terms (e.g. speculative and non-speculative markets) and mentioned only in passing which specific markets (e.g. financial markets or markets for raw materials) fall within their generic categories. However, this section relates the features of these generic categories specifically to financial markets.

5.3.1.1 Behaviour in the face of uncertainty

This subsection argues that potential future changes in preferences on what to consume immediately (and thus not to buy and hold) cause uncertainty about future prices. These prices include the prices of the financial securities of companies that will sell the consumption goods in future. The uncertainty, in turn, allows speculators to speculate on what future prices will be. Thus, uncertainty gives rise to the speculative motive, i.e. the motive to benefit from expected intertemporal price differences. The speculative motive motivates speculators to buy and hold stock (and thus not to buy and consume). Interspace price differences may also exist at any given time and induce agents to act on them. However, since both prices in an interspace price difference may be known, no uncertainty is involved.[5]

Speculation occurs if the speculator expects the intertemporal price difference minus the carrying cost to exceed or equal the benefit he requires to endure the possibility that his expectation may be disappointed. The carrying cost may include e.g. research cost and cost to buy and maintain a computer that links him to the securities exchange. Thus, stock markets where the supply and demand of stocks determine the price (as opposed to flow markets where the supply and demand of flows determine the price) are speculative markets. The subsection shows why, from a subjectivist point of view, the interest rate is determined in a stock market and not, as mainstream theory maintains, in a flow market.

Equity and bond markets are the most prominent financial markets. Shares have an indefinite life span. Usually bonds too have a very long life span, extending over ten,

[5] In this case the market participant is not really a speculator, but rather an arbitrageur. However, an arbitrageur may also be a speculator if he holds funds in the expectations that arbitrage opportunities may appear in the future.

twenty or even thirty years. The carrying cost of bonds and shares is extremely low. Bonds and shares have few uses other than to store and potentially accumulate value and to earn income (although there is no guarantee they will actually do so). The low carrying cost of bonds and shares and their function to store and accumulate value creates the ideal situation for shares and bonds to be durable assets, i.e. assets on which one can speculate.

The future value of bonds and shares is uncertain because the future profitability of companies is uncertain. Future profitability depends on, among other things, the relative demand for the goods that the company produces. When preferences on what to consume immediately (and thus not to buy and hold) change, the relative demand for products changes. Thus, the future demand for any product that a company produces is uncertain. Naturally this is more serious for some products than for others. For instance, the demand for staple foods such as bread or maize meal is more stable than that for different brands of teenage fashion wear. However, stability in demand even for daily consumables can rarely be ensured. Customers might change their preferences as the circumstances in which they live change. A change in demand elicits a reaction from producers because it is bound to upset their plans. However, producers may also decide to act in the absence of a change in demand – to upset the plans of others, so to speak. This presents customers with new knowledge. As Lachmann (1986:25) puts it: "There can be no unexpected change which does not upset some plan and does not lead to the revision of some expectation." Insofar as preferences are then adjusted and the relative demand for goods changes, the process starts all over again. Hence, the statement by Graaff (1967:104) that no individual investor can estimate his expected return solely on existing market data because the actual return that will realise depends on the investment decisions of other investors. The market mechanism does not provide this information (also see Sen 1968:75-77).

Changes in preferences and the actions of producers cause continuous uncertainty in varying degrees (Keynes 1936:147). Shackle (1982:438) argues that uncertainty causes all markets to be speculative to some degree. The only exceptions that Shackle mentions

are markets for perishable foods or ephemeral entertainment.[6] As soon as wealth is introduced, i.e. something durable, prices become speculative so that today's price depends on what people think the price will be tomorrow. In the absence of durability, one cannot speculate on a good because it either does not exist tomorrow or it is not expected to yield the expected return after payment of carrying cost. Shackle (1972:164) argues that a speculative market is the market Cantillon described, in which the businessman buys at a known price and plans to sell at a price unknown to him at the moment he buys (cf. Cantillon 2000 [1755]: Book 1, Chapter 13). Thus, he exploits the uncertain, unknowable future. Because, according to Shackle, all markets are speculative markets, financial markets are also speculative markets.

Contrary to Shackle's contention that all markets are speculative, Lachmann argues that because different market participants react differently to uncertainty, markets may differ in how they deal with uncertainty. Thus, not all markets are necessarily speculative. Lachmann (1986: chapter 6) distinguishes clearly between speculative and non-speculative markets. Speculative markets are 'flexprice' markets where merchants adjust the price to clear the market at all times (Lachmann 1986:133). Merchants are defined as agents who carry stock and who quote buying and selling prices for the products in which they trade. Thus, they are willing to both buy and sell stock, which means they operate on both the supply and demand side of the market (Lachmann 1986:129). Their profit consists of the margin between the buying and selling prices. Merchants attempt to roll over their stock as fast as possible, because the faster the rollover in stock, the larger their total profit. Lachmann 1986:132) mentions financial markets as important examples of merchant markets. He limits the scope of speculative markets largely to stock (as opposed to flow) markets and does not, with the possible exception of the market for agricultural products, consider the possibility of speculative flow markets.

[6] In exceptional cases, prices must be formed because of the short period before perishable foods expire or because of the pressing need for ephemeral entertainment. The need to form prices in exceptional cases is not a problem because there is definite and simple data on immediate needs, tastes and momentary endowments (Shackle 1972:157-158).

Non-speculative markets are usually fixprice markets, a concept first introduced by Hicks (1965:76-83; 1975:23-30). Producers in these markets usually are firms organised in a bureaucratic fashion, with substantial fixed capital outlays committed to several years of production (Lachmann 1986:134-135). The division of labour in these firms means that price-setting is done by cost accountants, whereas salesmen conclude transactions at the price set by the accountants. The salesman has no or little discretion in the setting of prices. Thus, at the price quoted by the salesman, the potential buyer must either take it or leave it; he cannot negotiate the price. Important examples of non-speculative and fixprice markets are markets for consumption goods and the labour market. In these markets there are no merchants, as defined by Lachmann, who carry stocks. Thus, these markets usually are flow markets.[7]

As mentioned, the merchant attempts to maximise the turnover of his stock. Thus, in the case of a financial market the merchant attempts to maximise the volume of bonds and shares traded. To realise as high a total profit as possible he must actively buy and sell bonds and shares. Stock that is not sold does not realise a profit (Lachmann 1986:133-134). An excess supply or demand means there is idle stock or lost profit opportunities. To realise profit, the merchant adjusts the price to 'get the stock moving'. As a speculator the merchant derives his profit from intertemporal price differences. He takes a long position (buys) when he expects the price to increase and a short position (sells) when he expects the price to decrease.

Because he must hold stock for the period in which he waits for the price to increase, stock-holding is an integral part of the activities of a merchant. The continuous changes of stock-holdings determine the price in merchant markets (Lachmann 1986:135). Prices adjust to equate the supply of stock to the demand for stock. Thus, after the determination of the price and the conclusion of the transaction both parties to the

[7] Speculation may also occur in flow markets, thereby causing temporary economic fluctuations. However, it represents a digression from the present discussion on the determination of the interest rate. Some durable goods, i.e. goods in which one could potentially speculate, are made upon order and therefore, not sold in speculative markets. One reason why some of these goods are not traded in a speculative market is that they are not homogenous and standardised enough to allow a large number of potential users.

transaction hold the amount of stock they desire. The portfolio of each party will be in a stock equilibrium. However, as soon as their expectations change again, the portfolios will be in disequilibrium again, thus, requiring further transactions to re-establish equilibrium.

The question is whether or not speculative activity causes the price of a product like a share or a bond to reflect some underlying and fundamental reality about the product? An underlying and fundamental reality consists of stable long-run behavioural and technical functions such as the utility and production functions described in chapter 3. If everyone knows the fundamental value of a share because they know the underlying reality, no one can profit from speculation against that value. Speculation will only be possible if the share price deviates from its known underlying or fundamental value. Then speculative activity will be stabilising in nature and the stock equilibrium reached will reflect the underlying reality. Chick (1992:181-192) shows that this is the view of some mainstream economists. In financial market analysis this type of view underlies the practice of fundamental analysis. If an underlying reality, consisting of stable long-run behavioural and technical functions, exists the economy and all markets, including financial markets, converge on a stable long-run equilibrium path. Thus, the interest rate will also converge on a long-run equilibrium path. Under such circumstances one can chart a sustainable long-run path for fiscal policy and non-governmental financial positions.

Subjectivists like Lachmann and Shackle reject the notion that prices reflect an underlying reality. Lachmann (1986:126; 137-138) argues that speculation can be both stabilising *and* destabilising, depending on the circumstances. In addition, what some may describe as the 'fundamental' price of an asset (e.g. of a share) only reflects their expectation of what return that asset will yield in the future. In an uncertain world where preferences and hence, the relative demand for products continuously and unpredictably change, there is no fundamental, underlying reality. If there was, then the future already exists and we are not, as Shackle said we are, on the edge of time. Thus, Lachmann and Shackle would deny that it is possible to chart a sustainable long-run path for financial

prices and thus for fiscal and financial positions. This view stands in stark contrast to mainstream theory, presented in chapter 3, which assumes the existence of an underlying reality (even though mainstream economists may see this underlying reality only as a feature of their model and not of reality itself).

The inherent absence of knowledge regarding the future means that a speculator in a financial market has to turn his attention to what other speculators *expect* share and bond prices and interest rates to be. Therefore, price expectations are based on the price expectations of other market participants who act likewise. This is the infinite regress of expectations mentioned by Shackle (1972:230). Keynes (1936:156) likened this infinite regress to a beauty contest where the judges must determine, not who is the most beautiful girl, but whom the other judges will think is the most beautiful girl. The question a judge faces is whom will other judges think will other judges select. Thus, in the context of a financial market, a market participant wants to determine, not what is the right interest rate, but what market participants think market participants in general consider the right interest rate. Thus, a lack of knowledge regarding the future means that the prices of bonds and shares do not reflect an underlying reality, and therefore are speculative in nature.

Because the interest rate is determined in a speculative market where agents have divergent expectations, it becomes impossible to chart the future path of the interest rate. This is compounded by the limited and decreasing power of central banks to influence particularly long-term interest rates (see B.M. Friedman 1999:326 as opposed to Rogers 1986:29-33 and Smithin 1994b:105-112).[8] Hence, it becomes impossible to chart the future path of the (r-g) gap and therefore, of the required primary balance to maintain

[8] Smithin and Rogers argue that by controlling short-term rates, the central bank influences the value of expected short-term rates. Given that the long-term rate is a geometric mean of the short-term rate, it means that the central bank then also controls the long-term rate. However, the relationship between short- and long-term rates may break down. For instance, in the early 1980s when the US Federal Reserve increased short-term rates to combat inflation, long-term rates increased even though the lower future inflation rate expected by the Federal Reserve meant they should have decreased. The breakdown occurs if the expectations of the central bank differ from the average of expectations in financial markets. Benjamin Friedman argues, furthermore, that increasing financial innovation may in future place many financial markets even further beyond the grasp of policy influence.

fiscal and financial sustainability. The best any economic agent, including government, can do to determine whether or not its fiscal or financial position *was* sustainable, is to check regularly on an *ex post* basis whether or not the interest rate it expected turned out to be the actual interest rate. Depending on its expectation regarding the interest rate for the next period, the agent may then need to adjust his primary balance. The frequency and size of the adjustment depend on the difference between the actual and expected interest rate. As unpredictability does not necessarily imply extreme volatility, the required adjustments caused by the difference may not be large. Even if unpredictability does not necessarily imply extreme volatility, does it preclude financial market equilibrium? The next subsection considers this question.

5.3.1.2 Do uncertainty and divergent expectations preclude equilibrium in financial markets?

The absence of an underlying reality consisting of stable long-run behavioural and technical functions that determines the equilibrium level of prices does not mean that no equilibrium is possible in a speculative market like a financial market. However, the equilibrium established in a speculative market is of a different kind. In a mainstream-type economy there is an underlying, fundamental reality in the form of stable long-run behavioural and technical functions. Given enough time everybody will discover the structure so that opinions on what reality is and expectations on what reality will be, unavoidably converges on the right opinions and expectations (Runde 1987:175). Torr (1988:105-106) notes that the use of the term 'expectations' in this context actually is a misnomer because the expectations of agents actually are certain knowledge. To use an example by Knight (1921:212-213; see Mises 1949:109 for a similar example): if one could say that one expects 90% of X is Y, one makes a probability statement. If this is a measurable probability such as the probability that a certain percentage of all newly produced champagne bottles will burst, the loss can be measured and it becomes a cost for which one can budget. There is no uncertainty in this situation, and after allowing for the probable cost of defective bottles, output becomes certain. Given that agents hold more or less certain knowledge about the future means that the equilibrium established in this situation is stable.

In an economy where change is the only certainty and uncertainty about the future pandemic, the type of equilibrium established is considerably different in nature. Because of the absence of an underlying reality, irreconcilable and divergent expectations[9] and opinions characterise such an economy (Lachmann 1977:28; 1969:152; 1971:190-192; Torr 1988:41-44; Runde 1987:162-164,175-180). Both Shackle and Lachmann argue that in speculative markets, like financial markets, expectations are necessarily irreconcilable and not all expectations can be realised. The equilibrium established in a market such as a financial market characterised by divergent expectations is of the bulls-and-bears variety (Keynes 1936:170-172; 1930a:147,250-257). The bulls-and-bears equilibrium is not the result of agents who hold the same view. Quite the contrary, equilibrium exists only when the selling activities of bears (those who expect the price of e.g. a share or bond to fall) precisely offset the buying activities of bulls (those who expect the price of e.g. a share or bond to increase). Opinions and expectations change continuously so that bulls may change into bears and *vice versa* (even on the same day). Hence, a bulls-and-bears equilibrium is very fragile and by nature not lasting.

Should expectations in a bulls-and-bears market converge, for instance if most market participants became bullish, the buying activities of bulls will outstrip the selling activities of bears. Thus, the demand for the product – e.g. securities – increases and the supply decreases. Consequently the price will increase. In the case of a financial market, an increase in the price of securities means that the interest rate decreases. The price continues to increase, so that the interest rate continues to decrease, until enough bulls turn into bears, which again balances the bulls and the bears. It is uncertain how long an equilibrium will exist and whether or not it will be succeeded immediately by another equilibrium. This also means the absence of a stable long-run equilibrium path and the ability to chart a sustainable long-run path for fiscal and financial positions. In the case of fiscal sustainability, a changing and unpredictable interest rate causes the (r-g) gap to change unpredictably.

[9] Although Keynes used the notion of divergent expectations, the term itself originates in Kaldor (1939:24, 28-31) and was later extensively used by Lachmann.

In conclusion, the existence of speculative markets means that the manner of price determination in an economy differs from the way mainstream economists (and new-Ricardians) view the price-setting mechanism. In mainstream models prices result from an equilibrium of the *flow* supply and demand.[10] In a subjectivist world there are speculative markets where prices result from the decisions of bulls and bears to adjust their *stock* supply and demand (see Townshend 1937:159-161). Because the mainstream model excludes the existence of uncertainty from its theory, the mainstream theory (and new-Ricardian theory) does not mention the holding of stock to profit from possible intertemporal price differences. As the following section shows, uncertainty also influences how other prices, particularly on capital goods, are determined. Subjectivist views on the price-setting mechanism, particularly in financial markets and capital goods markets, leads to a view on the determination and stability of the income level that is distinctly different from the mainstream view.

5.3.2 The impact of a subjectively determined interest rate on the level of income

The level of income is the denominator in the debt/GDP ratio. Thus, whatever influences the level of income influences the debt/GDP ratio. This subsection first describes how the interest rate, which because of uncertainty is determined in a bulls-and-bears market, determines the value of income. The subsection concludes with an explanation of how uncertainty and subjective expectations, through their impact on income and the interest rate, affect the fiscal and financial sustainability of economic agents.

Keynes (1936:Chapter 12; 1937) argued that the level of income, depends primarily on investment. Investment depends on (a) whether or not the demand price of capital assets exceeds the supply price and (b) whether or not it is cheaper to create more capital or buy existing capital by taking over an existing firm. This subsection considers these two elements and the relationship between them in the investment decision. This should, in turn, clarify the impact in an uncertain world of the interest rate on the level of income.

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[10] In the new-Ricardian model prices depend on the input-output ratios necessary to produce goods (Sraffa 1960; Harrod 1961; Sraffa 1962; for an introduction to Sraffa, see Sawyer, 1989; for a precursor to the work of Sraffa, see also Von Neumann 1945/6-1946/7 and Champernowne 1945/6-1946/7).

As Keynes (1936: 135-137) and Kalecki (1937: 440-443) demonstrate (see also Davidson 1994:66-69 and Galbraith and Darity 1994:407-408; 413-420), the amount of investment depends on a comparison between the supply and demand price of capital goods. A project can be undertaken if the demand price, which is the discounted value of expected future returns, exceeds or equals the supply price, which is the price to produce a capital good. Subjectivity enters in the setting of both the demand and supply prices. When a potential investor plans to buy a capital good he must form an expectation on the future return of the project. This requires from him to form expectations on future supply and demand conditions of the different goods and factor markets in which he plans to operate.

As an entrepreneur, the investor also determines the rate of return he requires the investment to yield before he bothers to invest. The higher the subjectively perceived uncertainty he faces the higher will be the required rate of return. He uses the required rate of return to discount the expected profit. Thus, subjectivity enters both in the formation of an expectation of the future return and the determination of the required rate of return. Hence, the demand price of a capital good is primarily a subjective phenomenon.

The supply price of capital also has subjective elements. As is the case with the potential buyer of the capital goods, the supplier of capital goods also determines subjectively the rate of return he requires. Insofar as supply and demand conditions allow him, he uses the required rate as a margin of mark-up when he sets the price of the capital goods that he produces. In addition, there is also a subjective element in the wage costs that the producer pays and that enters in his price-setting formula. Shackle (1972:176-177; 1983:5) points out that if the producer plans to pay labour its marginal product, the amount of labour that he employs at a given wage, depends on the expectation that the goods produced by that labour will be sold at the expected price. Thus, the marginal product of labour used to determine the real wage rate is actually the expected marginal product of labour. If the producer unexpectedly sells less, the marginal product of labour is less than expected. In this case the actual real wage paid exceeds the marginal product of labour. Thus, not even the actual costs that the producer of capital goods (or for that

matter any producer) incur and that enters in his price setting formula, are free of subjective elements. Hence, the conclusion that the supply price of capital goods is also subjective in nature.

With both the supply and demand prices of capital goods being subjective in nature, the equilibrium price and amount are subjectively determined. If the demand price exceeds or equals the supply price, investors are willing to invest. However, whether the investor will buy the capital goods from the supplier of new capital goods or from the owners of existing capital goods depends on the second determinant of investment mentioned above.

The second determinant is the comparison between the price of new and the price of existing capital (Keynes 1936:151). If the price of new capital, established through the interaction of the demand and supply prices of capital, falls short of the price of existing capital, physical investment takes place. It is then cheaper to create more capital than to buy existing capital. However, if the opposite applies, it is cheaper to buy the existing capital than to create new capital.

In an economy where by far most of the existing physical capital is held by listed companies, the way to acquire existing capital is to buy the majority of shares of a listed company. To acquire these shares the buyer must pay at least an amount equal to or in excess of the current market valuation of the shares. Thus, to the investor the relevant value of physical capital is expressed in the value of the financial capital of the firm. The value of financial capital depends on subjective expectations of the future income which that capital (both in its physical and financial forms) will yield (cf. Robinson 1978:80-81). Thus, when a potential investor must decide whether or not to create new capital, he has to compare the stock price, established in the bulls-and-bears fashion, with the price of new capital, established through the interaction of the supply and demand prices of new capital. Subjectivity plays a role in the setting of all these prices.

The above implies that economic equilibrium determined by effective demand depends on the bulls-and-bears equilibrium established in financial markets. If the price established in the bulls-and-bears equilibrium exceeds the price of new capital, investment will take place. This continues until the demand for new capital increases to such an extent that the price of new capital equals the bulls-and-bears price of existing capital (a statement which of course only holds true if the bulls-and-bears equilibrium itself remains relatively stable – something that is not guaranteed). However, if the opposite applies, investment does not take place. Given the bulls-and-bears equilibrium, the demand for new capital will decrease until its price equals the bulls-and-bears price. Thus, whether the price of new capital exceeds or falls short of the bulls-and-bears price, it will approach the bulls-and-bears price. Given that the bulls-and-bears price itself is not stationary and more volatile than the price of new capital goods, the price of new capital will trail or chase the bulls-and-bears price, but not necessarily catch it (Kregel 1976:217).

Thus, when the bulls-and-bears price decreases, the price of new capital must follow, and new investment will decrease. Because the bulls-and-bears price and its accompanying interest rate are inversely related, the decrease in investment is associated with an increase in the interest rate. This also means that the rate of return which the potential investor requires on new capital will have to increase to the interest rate (required rate of return) established in the bulls-and-bears financial market. Hence, the interest rate determined in the bulls-and-bears market sets the tone in a monetary (credit using) economy (Rogers 1989: 176-181).

The above also means that the equilibrium level of investment does not necessarily take place at full-employment. Investors will not invest beyond the point where they confidently expect to receive the rate of return they require. The higher the level of uncertainty and the lower the level of confidence that investors hold in their expectations, the higher the rate of return they require. Hence, the less investment and income will be.

The level of investment is prone to change in reaction to changes in expectations. At times the change in expectations may be volatile (Keynes 1936:154). Thus, every time investment adjusts to a new level, the level of economic equilibrium changes. Thus, the economy is characterised by a shifting equilibrium. Because the level of equilibrium established in this fashion depends on investment and because investment is part of aggregate or effective demand, the equilibrium level of income is set by effective demand, which, in turn, is set by investment.

The implication for fiscal and financial sustainability of the above is that the more bearish financial markets become, the higher the interest rate level is. Given the growth rate, this means that the (r-g) gap increases, so that debtors need to run larger primary surpluses and net holders of financial assets can run larger primary deficits. In addition, the more bearish financial markets become, the more downward pressure there is on investment in capital goods. Being part of aggregate demand, lower investment means lower income. A decrease in income increases the debt/GDP ratio of debtors and the financial asset/GDP ratio of financial asset holders.

5.3.3 The determination of the growth rate and the implications of divergent expectations for the growth rate

The growth rate plays a key role in fiscal and financial sustainability. It co-determines the (r-g) gap and therefore, the size of the primary balance, which, in a technical sense, will ensure fiscal and financial sustainability. The growth theory in which the mainstream theory on fiscal sustainability is embedded, assumes that in the long-run the growth rate depends on the population growth rate and technological progress. Both factors are exogenous, and thus, beyond the influence of policy or the impact of other economic variables. In addition, most mainstream economists assume that the effect of technological progress on economic growth is smooth over time. The exception is real business cycle economists who argue that the effect is not smooth and that it forms the basis for business cycles. (Kydland and Prescott 1982; Nelson and Plosser 1982; Long and Plosser 1983; Snowden *et al.* 1994).

There is no consensus in economic literature on the exogenous nature of long-run economic growth. New-growth theories, also called endogenous growth theories, postulate that the formation of human capital influences the growth rate (Romer 1996:95-145) so that higher levels of human capital formation cause a higher growth rate. However, these theories are still within the mainstream stable where preferences are stable, allowing expectations to converge in the long-run. (However, see Palley (1996) who reformulated the endogenous growth theory within a Keynesian framework where aggregate demand sets the tone.)

There are also other, non-mainstream views on what may influence economic growth. According to Kaldor (1957; 1958; 1966; 1972; 1974) and Kaldor and Mirrlees (1962), higher levels of capital/GDP ratios may increase the growth rate. This view relies on the view that the economy is characterised by increasing returns to scale (Kaldor 1966; 1972; 1974). Kaldor (1957; 1958) also defines a technical progress function where an increase in the capital/output ratio is associated, within limits, with an increase in the growth rate. According to the Harrod-Domar model, economic growth can exceed the natural growth rate (equal to the population growth rate) if there is unemployment and if the saving rate supports it. Thirlwall and Gibson (1992:323-336) argue that the equilibrium growth rate depends on exports, cross-border capital flows and the income elasticity of imports. Schumpeter held that in the period following a major technological innovation, economic growth will be high, only to decrease once the diffusion of the new technological knowledge is exhausted. The period over which this takes place may be as long as forty or fifty years (see Freeman and Soete (1997) for work expanding on the ideas of Schumpeter).

The most critical assessment of the mainstream view on economic growth comes from the subjectivist side of the debate, expressed in the views of among others, Lachmann. Lachmann is very sceptical about the degree to which economics can claim to understand the causes of economic growth. He (1966:21-22) states that: "[w]e can certainly identify many constellations of circumstances which have been associated with rapid growth in the past, but we can never say how many of these circumstances were necessary

conditions and how many were not, in the sense that other circumstances might have taken over their rôle. Also we can never be sure that, when we have succeeded in identifying such a favourable constellation of circumstances we have not left out some circumstances which may be more important than some of those we have included. In other words, we can never know that our constellation by itself constitutes a sufficient condition of growth." He then proceeds with what can be interpreted as criticism of the mainstream view that attributes higher economic growth (in excess of the population growth rate) directly to technological progress: "Technological progress has doubtless been one of the major forces of economic progress in the Western world for 2 ½ centuries now. But there has been periods of fairly rapid progress even in countries and during times when technological progress was slow. On the other hand, technological progress did not stop in the great depression of the 1870's and even less in the 1930's, but in these periods it did nothing to promote growth." Thus, the link between technological progress and economic growth is not direct, while there might be other forces that contribute to economic growth beyond those postulated by mainstream theory. Abramovitz (1999:81) holds a similar view, particularly with reference to the current 'information revolution': "We have never understood very well what controls the rate at which technological progress is actually incorporated into production. ... For a while now, this rate has been slower than it had been for a long time, which has given rise to the productivity paradox. Here we have the great computer and information revolution – why hasn't it registered in productivity growth rather than a decline?"

Although Lachmann expressed his view more than 30 years ago, most of the views economists currently hold on the nature and causes of economic growth already existed. The only exception is the mainstream endogenous growth model. Given that endogenous growth theories are open the same critique as the older generation mainstream models were about their assumptions regarding preferences and convergence to long-run steady states, the statement by Lachmann still holds true. The statement by Abramovitz attests to this.

Lachmann (1973:43) also rejects the possibility of long-run equilibrium growth because it would require a world of convergent expectations where expectations all come true and where individual plans are mutually consistent. If the world is characterised by divergent expectations, including expectations about growth prospects, Lachmann argues that the 'inventory of equilibrium tools' will not benefit analysis. This does not mean that there are no equilibrating forces in the economy, rather that most of the time they are overshadowed by disequilibrating forces. These forces originate in unexpected change (1973:43) and the unavoidable and ever-present disappointment of some expectations (1973:39). The inevitability of disappointment rests in the divergent nature of expectations, which itself stems from the uncertainty that characterises the future.

The conclusion that emerges from Lachmann's view is that one cannot determine with a high degree of certainty whether or not the fiscal or financial position of an agent is sustainable *ex ante*. Thus, an assessment that fiscal policy or the financial position of a non-governmental agent is sustainable *ex ante* is merely an expectation that can be disappointed. It is then more sensible to use the short-run equations such as equation 1 above, instead of the long-run dynamic relationships portrayed over an infinite horizon set out in chapter 2. The short-run equations measure the change in the net financial asset/GDP ratios of agents over a finite period. This allows agents to compare the actual and planned change in their financial position when the finite period elapses.

5.4 *Economic stability and the relationship between the short- and the long-run*

This section poses the question whether uncertainty causes the financial positions and the interrelationship between positions to be endemically unstable or potentially unstable. The role of expectations in both the short- and the long-run is relevant.

Economists like the neo-Ricardians (also known as Sraffians) hold that the importance of expectations is limited to the short-run (Eatwell and Milgate 1983:12-14; 126-127). In the long-run the underlying structure of the economy causes the economy to move

towards a long-run equilibrium where there is a uniform rate of profit (Torr 1984:201). Expectations do not play a role in determining this underlying structure so that in the long-run expectations do not play a role in the economy.

Mainstream economists hold a view that is essentially not much different. According to the mainstream view, the economy also moves to a long-run equilibrium that is consistent with the underlying structure of the economy. As in the Ricardian model expectations do not determine this underlying structure. They are rather the product of the underlying structure. As chapter 3 explains, the underlying structure itself depends on the set of individual preferences and technical functions such as production functions. However, the mainstream model differs slightly from the Ricardian model. In the mainstream model expectations, being of the convergent type, ensure that in successive short-run periods behaviour changes to conform to the underlying structure of the economy. This is the case in models that operate on adaptive expectations (for the origin of adaptive expectations, see Cagan 1956). In particular, the disappointment of short-run expectations causes a revision of expectations so that expectations and behaviour conform more closely to the underlying structure of the economy. This ensures that expectations will not be disappointed in the long-run when agents come to know the underlying structure. In the rational expectations version of the mainstream model, expectations ensure that behaviour conforms to the underlying model even in the short-run. (For the origin of the rational expectations concept, see Lucas and Sargent 1981, Muth 1961 and Simon 1959. Also see Shaw 1984. For an application of rational expectations to new-Keynesian theory, see Begg 1982a and 1982b.) Thus, in the mainstream model, the long-run, underlying economic structure influences expectations. However, the opposite does not occur, i.e. short-run expectations never influence the long-run equilibrium.

According to mainstream theory, fiscal sustainability is a long-run issue. It is concerned with whether or not government is able to continue its current structure of expenditure, taxation and deficit financing. Since sustainability deals with the question of growth in debt relative to the growth of GDP, the mainstream theory is closely linked to the issue of

long-run economic growth. Mainstream theory assumes that individual preferences are fixed. This allows the economy to converge on a stable long-run equilibrium growth path. Because nothing inherent in the economy can disturb this equilibrium, it is internally consistent. Disturbances originate from outside the economy.

Keynes and Minsky rejected the mainstream view (Minsky 1975:ix; Ferri and Minsky 1991:8-9). Their view can be described as dialectic since every development in the economy carries with it the seeds of its own destruction. Something is dialectic in nature if it generates its own contradiction or negation, which is then ultimately resolved in a synthesis. Keynes (1937:109-110) argued that the effect of an increase in economic activity on the interest rate level "... is, indeed, a significant element in my theory of why booms carry with them the *seeds of their own destruction.*" [emphasis added]. In presenting his financial instability hypothesis Minsky concurs with Keynes when he argues that "...in truth neither the boom, not the debt deflation, nor stagnation, and certainly not a recovery or full-employment growth can continue indefinitely. *Each state nurtures forces that lead to its own destruction.*" (Minsky 1975:128) [emphasis added]. Minsky argues that over a period of prosperity the economy moves from being stable to being unstable (Minsky 1992:8). He ranks his view with that of Marx, Schumpeter, Kalecki and Keynes (Ferri and Minsky 1991:6; Minsky 1992:1-2;5; Gatti et al. 1994: footnote 18; also compare Minsky with Kalecki 1937 and Keynes 1936:chapter 17). Minsky perceives the capitalist economy as unstable (Hart 1999:3), alternating between boom and bust phases and with no discernible trend over time. Shackle (1972:341-342) agrees with the boom/bust description of the economy.

In describing how an economy moves from stability to instability, Minsky first distinguishes three different agents, namely hedgers, speculators, and Ponzi units (Minsky 1986:335-341; 1982:105-106), the latter named after a man who ran one of the early financial pyramid schemes. Buoyant or bullish expectations during a boom cause agents to incur increasingly more debt relative to their income and moves them from being hedgers to being speculators or even worse, to being Ponzi units. Bear markets cause the bankruptcy and removal of Ponzi units. Their removal causes the proportion in

the economy of hedgers relative to that of Ponzi units to increase. Hedge units are economic agents who can fulfil all their contractual payment obligations with the cash flow they receive. The contractual payment obligations include the payment of both interest and principle (Minsky 1992:7; Kregel 1998:3). The larger the share of equity in the financial capital structure of a unit, the greater the possibility that an agent is a hedge unit. Speculative units, the second type Minsky distinguishes, are agents whose cash flows are of such a nature that in some future periods they may be unable to comply with their obligations (Minsky 1992:7; Kregel 1998:3). Nevertheless, the project may have a positive or zero net present value. This means that the cash flow of the agents will be sufficient over the lifetime of the project to comply with all obligations. Furthermore, speculative units need to roll-over their obligations in periods in which they are unable to comply with their obligations. The third type of unit is Ponzi units (Minsky 1992:7; Kregel 1998:3). These agents do not receive enough cash over the course of their projects to comply with their obligations. Thus, their net present value is negative. These agents will need to borrow into perpetuity if they want to comply with their payment obligations.

The main difference between hedge, speculative and Ponzi units is the degree to which they use leverage. The higher the proportion of debt in a balance sheet, the more exposed an economic agent becomes to events such as changes in aggregate or relative demand that impact on his balance sheet and cash flows. Thus, the increasing use of leverage in recent years made domestic and international financial systems increasingly fragile (Minsky 1996:4). With an increasing use of debt, cash flows in the form of interest payments and loan repayments ultimately are invalidated or lenders fear they will be invalidated if the rate of debt accumulation continues. The latter occurs when the borrower exceeds what the lender considers an acceptably safe debt/equity ratio. The lender may fear that if the current rate of debt accumulation causes the debt/equity ratio to exceed the level deemed acceptable by the lender, the borrower will probably move from being a speculator to being a Ponzi unit.

Unstable preferences lie at the heart of the financial instability hypothesis of Minsky and explain the continuous instability in the capitalist system. In particular, lenders know that a shift in relative demand will affect a company much more if it is highly leveraged. Hence, the increase in the fear of a lender that accompanies an increase in the debt/equity ratio of a borrower. An economy with continuously changing preferences can never converge on a long-term trend. This view causes a major difference of opinion between mainstream (and Ricardian) economists and subjectivist economists. Whereas the disappointment of expectations in the mainstream model ensures that expectations conform more closely to the underlying economic structure, the disappointment of short-run expectations in the subjectivist view may influence the direction in which the economy moves in the long-run.

However, as Hart (1999) points out, there is a difference between an economy that is continuously and endemically unstable and one that is potentially unstable. In the latter case an economy may be relatively stable for long stretches of time. In addition, one should not confuse uncertainty with instability, i.e. an uncertain future for the economy does not mean that the economy is unstable. As Keynes (1973:137) noted in a letter to Robinson: "You must not confuse instability with uncertainty. It is true that the future rates of interest and the future rates of exchange are uncertain, but this does not mean that the present rate of interest or the present rate of exchange is in the technical sense unstable." However, instability may appear from time to time when the destabilising forces in the economy overtake the measures and institutional arrangements that keep the destabilising forces in check. This relates to the three types of equilibrium identified by Kregel (1976:213-217; see also Kregel 1977 for background) in Keynes (1936). These are shifting, stationary and static equilibria. With a static equilibrium (Kregel 1976:214), there can be no disappointment of short-run expectations. Hence, short-run expectations cannot influence long-run expectations. This is rather similar to rational expectations where expectations can, on average, not be disappointed. However, if short-run expectations can be disappointed, agents may consider the disappointment temporary. It then does not affect the state of long-run expectations. Kregel (1976:215) calls this a case of stationary equilibrium. Thus, with stationary and static equilibria long-run expectations

change independently of short-run expectations (and may at times also cause short-run expectations to change significantly).

The possibility of a static or stationary equilibrium means that the economy is not continuously unstable. The existence of customs, institutions and policy intervention may moderate the inherent instability in the capitalist system (Ferri and Minsky 1991: 13). Ferri and Minsky (1991:11) call these structures 'thwarting systems', i.e. they thwart instability. This contrasts very sharply with mainstream theory where discretionary policy intervention is perceived as the main destabilising element in an otherwise stable market system. Lewin (1997) expresses a view similar to that of Minsky. Drawing on Hayek,[11] Lewin (1997:10-11) argues that institutions, customs and habits provide constancy and predictability in what would otherwise be chaos. However, he argues that institutions and habits bring constancy and stability only to parts of the social system. The modicum of stability provided by institutions is necessary to deal with the non-expectable outcomes of productive activity and the appearance of new and better products and production methods. Echoing Lachmann, Lewin (1997:11) argues that "There is no tendency for expectations to cohere in these processes." Lewin (1997:11) synthesises the views of Hayek and Lachmann when he states that "...the social process is composed of equilibrating, disequilibrating and non-equilibrating sub-processes" and "*[p]redictability in one sphere is thus the necessary ingredient for coping with the absence (novelty) in another sphere.*"

However, thwarting systems comprising institutions, habits and customs cannot prevent all instability. If agents view the disappointment of short-run expectations as permanent, this causes a change in long-run expectations. Kregel denotes this as a case of shifting equilibrium. As the next chapter describes, such a shift in long-run expectations may disrupt the financial position of many agents, causing many to become Ponzi units. The process is further aggravated by the inter-relationship of all financial positions. Mainstream and Keynesian theories differ most fundamentally on the possibility of a

[11] See also appendix 5.2 for a discussion on the differences between the subjectivist views of Hayek and Lachmann.

shifting equilibrium. In mainstream theory the long-run equilibrium depends on the set of stable preferences and technical functions such as production functions. These form the underlying structure of the economy to which expectations converge. A shifting equilibrium implies no such underlying structure to which long-run expectations can converge. The absence of an underlying structure means long-run expectations have no point of gravitation (or convergence) and may shift if short-run expectations are disappointed.

5.5 *The rationale for and efficacy of government action to stabilise an unstable economy*

The possibility of a shifting equilibrium means that government may have a role in stabilising expectations and the financial positions of non-governmental agents once a shift in equilibrium has taken place. Minsky (1986:292; 1982:3-13) argues that government deficits and central bank liquidity may, and even did, prevent the recurrence of events of substantial instability such as the Great Depression. The assurance from government that it will maintain the demand for the output from companies may stabilise investment and investor confidence. The mere promise from government may be sufficient to prevent a fall in investor confidence in the first place, implying that it may not even be necessary for government to actually spend more. Hence, Minsky's conclusion that institutions and thwarting systems in the form of deficits, central bank liquidity and policy intervention (in the form of rules that regulate the actions of market participants), reduce uncertainty by reducing the possibility of a crisis. These actions then also render the financial position of economic agents more stable, which in turn enhances the planning abilities of private investors.

A policy to stabilise the economy at a level of full-employment is meant to ensure that individuals have the means to pursue the ends they choose. In so doing government reduces the uncertainty faced by both companies and consumers. According to Lowe (1988:5-6), this type of action ensures true freedom as "...freedom understood as self-determination can exist only where everyone has access to the means on which the

attainment of his or her chief ends depends." This freedom is the rationale that justifies government action to stabilise the economy. However, the question remains whether or not a stabilisation policy by government will be effective.

If uncertainty influences the behaviour of non-governmental agents and causes economic instability, does it also influence how economic agents react to a stabilisation policy and, if so, does it influence the ability of government to counteract the instability? In addition, are the expectations that economic agents form in the face of the uncertainty influenced by their prior attitude towards government and its stabilisation policy?

Contrary to the fiscalist beliefs of the 1950s and 1960s, policy success in the pursuit of stability is not guaranteed. For instance, Lowe (1988:117) and Heilbroner (1999:276-277) mention that during the 1930s the policies of the New Deal failed because businesses curtailed investment in reaction to the expansionary policy of government. The business sector expected that government policy would be inflationary and that government was encroaching on the private domain.[12] It was only during WWII that large deficits, incurred to finance the war effort, helped to ensure full-employment. During the 1950s and 1960s expansionary policies succeeded, because of a change in attitude among the business community that informed their expectations about the outcome of the policy.

Thus, it seems that the attitudes and expectations of non-governmental agents may affect the efficacy of stabilisation policy so that the same policy may succeed in one configuration of attitudes and expectations and fail in another. Lowe (1988:117) argues that "...there is *no strict psychological mechanism* which would make the response of the micro-units to public stimulus easily predictable. A tax reduction may, but need not, raise private spending, nor will a tax increase necessarily curtail it." Thus, whether or not a stabilisation policy will succeed depends largely on the subjectivist evaluation of economic agents, i.e. whether or not they expect policy to be successful.

[12] Despite the fact that the Roosevelt administration expanded government, the administration still emphasised the importance of a balanced budget (Musgrave 1987/88:174).

In the last two decades of the twentieth century there was again scepticism about the stabilising role government can play in the economy. The libertarian views of Friedman (1962) and Hayek (1944), with their emphasis on individual freedom and condemnation of what they view as the encroachment of government on the private sphere, underlie the opinions of both the public and private spheres of society. For instance, Margaret Thatcher (1993:12-13), whose ascendance to power marked the change in public and private attitudes towards the role of government, claims that one of her chief inspirations was the 'Road to Serfdom' by Hayek (1944). She also voiced her strong opposition to Keynesian policy (1993:51; 70; 123; 136).[13] The change of opinion in the public sphere is also apparent from the more liberal and less social-democratic rhetoric and policy statements emanating from traditionally left-of-centre political parties in countries such as the US, UK, Germany and even South Africa. The change of opinion in the private sphere is apparent in the fact that budget deficits and public debt feature as negative factors when international credit agencies such as Standard and Poor's and Moodey evaluate international sovereign risk (Cantor and Packer 1996:39).[14]

Since the early 1980s, as in the 1930s, the private sector *usually* (there are exceptions as noted below) responds negatively towards stabilisation policy in the form of a larger deficit. As President Mitterand learnt in the early 1980s, no single government can go against this tide of opinion (Torr 2000:7). On this Torr (2000:7) notes that "To be the only kid on the block who is running a government deficit which amounts to six per cent of GDP when all the others on the block are sticking to a three per cent rule of thumb is a very different situation from one in which everybody else on the block is also running at six per cent." This means that the functional finance approach of Lerner (see chapter 2) and Vickrey (1996; Arnott 1997: 22-23) where the budget deficit is an instrument in the

[13] This is apparent in her reaction to the statement signed in 1981 by 364 economists, including Lord Kaldor, that protested against her policy (Thatcher 1993:138, 271): "It was signed by no fewer than 364 economists – enough ... to provide me with bad advice for every day of the year except All Fools' Day."

[14] Cantor and Packer (1996:41-42) find no statistically significant relationship between deficits and credit ratings. However, they argue that this does not mean that deficits play no role in the determination of the rating a country receives. It rather means that there are governments who cannot obtain international credit to run a deficit because they have a low credit rating, while others receive a low rating because of large deficits. This introduces a disturbance factor into the regression due to endogeneity between the variables. This renders the budget deficit as an explanation variable of ratings statistically insignificant, but not insignificant in reality.

search for full-employment, may not be as successful as they were in the 1950s and 1960s. Even though there is good theoretical reason to believe that such a functional finance approach may ensure full-employment (Bell 1999; Forstater 2001; 1999a; 1999b), a lack of belief in its potential on the part of non-governmental economic agents suffices to ensure its failure.

The change in attitude in the last two decades of the twentieth century cannot be solely ascribed to a change in ideology. Lowe (1988:42-44,50-51) mentions that the mistakes of public policy-makers in the 1960s and 1970s also undermined their credibility in the eyes of those who wanted to reduce the influence of government. To demonstrate this he uses as example the reluctance of US policy-makers in the 1960s to increase the tax rate after the government increased its expenditure to finance the Vietnam War. This policy mistake laid the foundation for the inflation of the 1970s.[15]

Thus, the public and private attitudes that currently limit the efficacy of stabilisation policy can be ascribed to both a change in ideology and past policy mistakes that have undermined policy credibility. Notwithstanding this, Minsky (1991:11) argues that: "Intervention is ordained if it is believed that a free market resolution of a financial crisis requires doing time in a deep depression." Lowe (1988:126) concurs with Minsky when he states that "...the slogan 'get government off our back' is meant only for prosperous times, as is illustrated by the crises of Lockheed and Chrysler for emergency support, not to mention the hundreds of millions of dollars in outstanding federal loans and guarantees to the business community at large." A more recent example is the US airline industry that will receive a $15 billion bailout from the US government to deal with the expected fall in the future demand for tickets in the wake of the September 2001 terrorist attacks on the New York World Trade Centre (CNN 2001a). In addition, the House of Representatives passed a stimulus package for the US economy of $100 billion to boost

[15] In the ongoing struggle over distribution, policy-makers were reluctant to curb the interests of various interest groups. To Lowe (1988:51) this tendency is not so much the result of an increasingly powerful government encroaching further on individual freedom. Rather, it results from the weakening of the welfare state in the societal struggle between different powerblocks over distribution. The powerblocks include the military-industrial complex, multinational corporations and labour unions. These powerblocks demand increasing freedom to act without the limitations that governments place on them. Lowe (1988:51) compares this situation to the existence of semi-autonomous estates in the middle ages.

consumer and investor confidence in the aftermath of the attacks (CNN 2001b). Thus, there are situations in which private economic agents deem it necessary for government to stabilise the economy (or certain sectors of it that are in financial distress). Nevertheless, the scope for government to implement a successful stabilisation policy is less than in the 1950s and 1960s because of the change in attitude that influences the expectations of agents about the outcome of a stabilisation policy.

5.6 Conclusion

This chapter emphasised the nature of uncertainty and how uncertainty influences the values of the variables that appear in the sustainability equations. The chapter indicated how uncertainty and subjective expectations affect fiscal sustainability and the financial sustainability of non-government agents. The existence of uncertainty means that the economy can reach an equilibrium at a level below full-employment. Because of uncertainty, the equilibrium that the economy reaches is then not necessarily stable. Thus, the chapter argued that the economy is not inherently stable.

This has two implications that should be included in the discussion of fiscal sustainability. First, sectoral effects caused by a move to a sustainable fiscal policy (see chapter 4) may have a long-run impact. Secondly, economic instability can be generated from within the economy. Because uncertainty affects the variables that appear in the sustainability equations, uncertainty may cause both fiscal unsustainability (i.e. of government) and unsustainability in the financial positions of non-governmental agents. If the latter is sufficiently widespread, the economy may be considered unstable and government may face pressure to run a stabilisation policy. The link between uncertainty, sustainability and instability suggests that the relationship between them may be much closer than conventionally thought. The remaining chapters will explore this suggestion. Given that uncertainty influences the variables that appear in the sustainability equations, the next chapter explores how unsustainability, caused by uncertainty, may spread via the linkages between the financial positions of non-governmental agents and thereby cause economic instability.

Appendix 5.1 – The Lucas approach to equilibrium

As stated in footnote 2, it may happen that one does not believe in the existence of deterministic or statistical laws, but nevertheless uses the concept like Lucas (1999:154) as an expository device. However, in one's policy advice one then needs to act as if the future already exists. The question is whether or not this is a valid way of approaching reality. In his exposition of the rational expectations hypothesis, Lucas (1999:154) suggests that equilibrium does not exist in reality. He asserts that "[y]ou can't look out of this window and ask whether New Orleans is in equilibrium. Equilibrium is just a property of the way we look at things, not a property of reality." Equilibrium and rational expectations as a mechanism to ensure equilibrium, is then a tool to determine how the behaviour of agents "...*would have* differed had the agent's environment been altered in some specified way." (Lucas and Sargent 1981:xi-xii). Lucas and Sargent argue further: "Stated so generally, it is clear that some inferences of this type will be impossible to draw. (How would one's life have been different had one married someone else?) The belief in the possibility of a nonexperimental empirical economics is, however, equivalent to the belief that inferences of this kind *can* be made, under *some*, circumstances." Thus, even though Lucas recognises that his method has limits, he believes it is applicable to the economic domain. However, Davidson (1982/83:196) notes that Lucas and Sargent never qualifies the circumstances in which it is applicable, so that adherence to modern neoclassical theory "...is merely a statement of faith." The possibility that preferences may change continuously not only means that long-run equilibrium is absent from the real world. It also undermines the usefulness of the concept as theoretical and mental device to understand and classify real world phenomena. In a non-ergodic environment it becomes impossible to determine how the behaviour of agents "...*would have* differed had the agent's environment been altered in some specified way." Thus, to assume that agents behave in a statistically predictable way becomes an invalid way of approaching reality because it will yield unreliable predictions of the future.

Appendix 5.2 – Critique of the subjectivism of Keynes, Lachmann and Shackle

Appendix 5.2 considers first the critique from the objectivist quarter and secondly critique from the subjectivist quarter levelled at the subjectivist and kaleidic views of Keynes, Lachmann and Shackle. This critique must be considered to determine whether or not it undermines a subjectivist interpretation of fiscal and financial sustainability.

i) Critique of the bulls-and-bears view of price determination in financial markets – the objectivist view

Before one can leave the issue of price determination on securities exchanges, one must consider the critique levelled at the bulls-and-bears equilibrium view. The question is how applicable is the parable of the beauty contest to a world with large institutional investors that do research on the long-term prospects of investments? This is not a new question. Keynes (1936: Chapter 12, esp. 150-151; 154-155) addressed it already in the 1930s. The essence of the critique is that financial markets are dominated today by investors who are not focused on short-term gains, but who are interested in long-term investments. Thus, they do not form their price expectations by gauging the opinions of other market participants on their price expectations. Rather, they take an in-depth look at the fundamental factors that determine the 'true' price of a security. They search constantly for new information not yet reflected in the price of securities and adjust their portfolios to reflect the underlying market situation and risk. These investors conduct in-depth studies into macroeconomic, industry- and company-specific issues related to potential investments. They share with others their views on the 'fundamental' value of shares and bonds. In this way information spreads to less sophisticated market participants. This ensures that financial markets are efficient to some degree (where the degree is described as either efficiency in the strong, semi-strong or weak form). Thus, share and bond prices always reflect the underlying reality relevant to an investment. In such a market, the argument goes, information determines (equilibrium) prices, and bulls-and-bears behaviour is absent or of peripheral importance.

This critique abstracts from the unknowability of the future. It ignores the absence of a solid and complete foundation in facts about the future on which to base expectations. Uncertainty introduces the necessity to speculate about the future, whether it is about the price movement of the share itself or about the movements in the underlying variables that determine the price of the share. In addition, because investors have an array of methods at their disposal to conduct a fundamental analysis, not all investors use the same methods of analysis. Thus, when different investors use different methods they are bound to come up with different conclusions about the fundamental value of securities. In the unlikely event that all investors use the same methods to obtain information, information must still pass through the filter of the mind, as Lachmann argued, so that the same information may lead to different interpretations. The point is that uncertainty, different methods of analysis and different ways of interpreting the same information cause different investors to entertain different expectations. This means that even when investors do conduct fundamental analyses of macroeconomic, industry- and company-specific information, they still have to consult the opinion of other investors on the meaning of information for share prices. It is useless to be the only optimistic investor if the other investors persist in their pessimism (the same is true for being the only pessimistic investors if the other investors persist in their optimism). If you expect that a specific merger will be good for a company whereas everybody else thinks it is bad, the overall pessimism will depress the share price. The price may of course change in your favour again as the mood or interpretation of information changes, but there is no guarantee that the mood will change. Therefore, it may pay to establish what the opinion of others is (Keynes 1936: 154-155).

Even if all analysts conduct fundamental analysis (with their different methods to value the same securities), potential investors still have to factor in the opinions of others to determine in what direction the price of the share is likely to move. The more so since increasing competition causes modern fund managers to become much more focused on short-term gains. This occurs in an environment where the use of leverage increased dramatically since WWII (Minsky 1996:3-4;13; Kaufman 2000:124-125) and causes the profit after the payment of interest to be much more variable. This is further exacerbated

by the pressure on fund managers who outperformed the market in the past, to continue doing so. This may cause these managers to take on increasingly larger risks in their pursuit of high returns, a process which causes fund managers to focus less on their fundamental research and more on market opinion. Bernstein (1998:176-177) argues that this type of behaviour almost guarantees that funds that were the top performers in the recent past will not be the top performers in the immediate future. He demonstrates this with a comparison of the fund return of different funds in the US for two successive five-year periods.

Minsky and Whalen (1996:4) argue that financial markets became much more speculative in the post-WWII period, heralding a stage in the development of capitalism that they denote as 'money-manager capitalism'. Thus, even when fundamental analyses take place, the beauty contest still operates. The presence of beauty contest behaviour may even be stronger than in the past. The reason for this is the combined effect of the increasing use of leverage, the increase in uncertainty that followed financial market liberalisation, the increasing short-term focus of fund managers and the increasing pressure on them to outperform the market in the short-run.

ii) Austrian subjectivists who believe in convergent expectations

Not all subjectivists believe that subjectivism implies divergent expectations and thus, the existence of bulls-and-bears markets. Hayek was one subjectivist who believed there is a tendency towards co-ordination in markets, so that expectations will converge. In their comparison between Hayekian and Keynesian subjectivism, Butos and Koppl (1997:2; 14) group Lachmann and Shackle together with Keynes. According to Hayek (Butos and Koppl 1997: 33), the experience of a human is turned into knowledge by his mental classificatory apparatus (which itself is a product of past experience). Knowledge in this setting is merely a propensity to act and a system of rules of action (Butos and Koppl 1997: 10; 36). Because actions depend completely on the classification of experience, there is no role for the mind to act out of free will. Through a process of natural selection those who act better than others succeed. The successful acts of some market participants

cause their competitors to emulate their behaviour. Thus, competition breeds "commercial traditions of rational procedure" (Butos and Koppl 1997: 35-36). Rationality is not required to make competition work. Rather, the traditions that allow competition cause rational behaviour. In a process of natural selection, the continued success of a tradition, in the form of profits, ensures the survival of a tradition, whereas failure in the form of losses weeds out competitors who follow less successful traditions. The continued success of a rule and its preservation as a tradition or habit ensures co-operation and co-ordination between large numbers of people (Butos and Koppl 1997: 19; 36-37; 40). This process of natural selection suggests an evolutionary process.[16]

Tradition and habits contain expectations (Butos and Koppl 1997: 34). Because the market participant may not know why he pursues a particular tradition, except that it proves successful, he may not even be aware of the expectations included. Hayek is aware that expectations can be either of the divergent or of the convergent type. He is also aware of the consequences of divergent expectations for the actual outcome of plans and states that "...if different people were to base their plans on conflicting expectations, no set of external events could make the execution of all these plans possible. ... This means that the plans of different individuals must in a special sense be compatible if it is to be even conceivable that they should be able to carry all of them out" (Hayek 1937: 3). Hayek goes on to show that equilibrium merely means that the foresight of individuals is correct (Hayek 1937: 5). Because Hayek believes there is a tendency towards co-ordination, there is no reason to suspect that uncertainty about the future will cause disco-ordination (Butos and Koppl 1997: 39). Butos and Koppl (1997: 39-40) claim that expectations have a tendency towards coherence and co-ordination, thus, to converge.

A tendency towards full co-ordination of all plans also implies that the plans of producers co-ordinate with those of labourers to find employment. In such an economy there cannot be involuntary unemployment. Because it will affect the outcome of plans, any action by government will just disturb co-ordination. The convergence of expectations,

[16] However, Boehm and Farmer (1993:420) reject the notion that Hayek was a social Darwinist. On this point Butos and Koppl (1997: 18) mention that the evolutionary process in Hayek is a cultural rather than biological evolution, Lamarckian instead of Darwinian.

the tendency towards co-ordination and the absence of uncertainty preclude the existence of bulls-and-bears markets and thus, unpredictable surges of bearish or bullish sentiment. This, in turn, precludes economic fluctuations caused by a loss of confidence. Thus, there is no sustainable role for government to counter these sentiments simply because they do not exist. In addition, the interest rate will not be determined in a bulls-and-bears stock market, but in a non-speculative flow market.

The evolutionary view of Hayek cannot be reconciled with that of Keynes, Lachmann and Shackle. Even if an evolutionary process attempts to improve the quality of traditions in terms of how they cope with the environment, changing circumstances could prevent tradition from actually doing so. Thus, the evolution does not result in progressively better traditions that approach the set of perfect traditions. The criticism that Davidson (1993:429-430) levels at the Austrian School – that in an Austrian world the market is a Turing machine that ensures the best outcome – seems to apply more specifically to Hayek, rather than to any other Austrian. (However, as this chapter demonstrates in section 5.4, certain aspects of the Hayekian view can be integrated with the Lachmannian view to obtain a view where the economy is not endemically unstable, but potentially unstable.)

In addition, competition does not necessarily mean the compliance with tradition. According to Lachmann (1986:16), periods of emulation and differentiation alternate. Differentiation depends on innovation and thus, the breaking of a tradition. Therefore, the breaking of tradition is as much part of competition as is the emulation of a successful competitor. The expectations of the innovator typically diverge from those of other market participants.

Chapter 6

Economic instability as the spreading of unsustainability among non-governmental agents via the linkages between their financial positions

"An ultimate reality in a capitalist economy is the set of interrelated balance sheets among the various units."
Hyman Minsky (1975:118)

The mainstream view of the economy assumes that the economy has a stable underlying structure. This obviates the need to accord expectations a significant long-run role in the economy. It is then either left out in long-run analysis, as the neo-Ricardians do or, as in mainstream theory, it becomes a mechanism that ensures that in the long-run the behaviour of economic agents accords with the underlying economic structure. In such an economy there may be risk, but no uncertainty. In a subjectivist view there is no assumption that the economy has a stable long-run underlying structure. This view holds that fundamental uncertainty influences the decisions of economic agents, be those agents companies, households, financial institutions, foreigners or government. Expectations on interest rates, the growth rate and the level of GDP then determine *ex ante* what economic agents consider a sustainable financial and fiscal behaviour. Thus, a subjectivist view argues that in a fundamentally uncertain world where agents have divergent and ever-changing expectations, a change in expectations causes a change in what agents consider to be sustainable financial and fiscal behaviour. Therefore, whenever expectations change, behaviour as reflected in the choices on whether or not to invest or to consume may also change. Hence changes in expectations lie at the basis of economic instability and fluctuations.

The title of this thesis suggests a link between fiscal sustainability, economic instability and the solvency of non-governmental agents. This chapter analyses how unsustainability, caused by uncertainty, may spread among non-governmental agents via the linkages that exist between their financial positions and cause economic instability. In particular, the chapter focuses on the financial instability hypothesis of Minsky. The

discussions of both financial sustainability and the financial instability hypothesis concern institutions or agents who consciously or unwittingly violate their budget constraints. By means of the financial instability hypothesis, the chapter links the theory on the formation of expectations with that on economic instability. This provides the subjectivist flavour to the analysis of instability and is possible given the similarity of the views held by Minsky and Shackle (1972:341-342).

The chapter recasts the financial instability hypothesis in terms of the general balance framework. This allows one to consider the financial position of all economic agents simultaneously within a unified framework that makes explicit the linkages between financial positions. Minsky's analysis does not do this,[1] even though he (1992:4-5) emphasised the importance of not limiting the analysis of economic instability to the business sector, but to broaden the analysis to include the household, corporate, financial, public and foreign sectors. The general balance framework, as set out in chapter 4, enables one to include all these sectors. Using the general balance framework, this chapter demonstrates how financial unsustainability spreads from being a localised phenomenon in the financial position of a few non-governmental agents, to other non-governmental agents via the linkages that exist between the financial position of these agents. *Economic instability then becomes the collective term for widespread unsustainability in the financial position of non-governmental agents.*

The use of the general balance framework enables one to describe the general balance effect in action and shows how it influences the severity of financial and economic instability. According to Minsky, economic instability includes short-run economic fluctuations (i.e. business cycles) and longer-run persistent instability or deeper crises. In making this distinction Minsky (Gatti *et al.* 1994:1) elaborates on a distinction by Schumpeter between wavelike and non-oscillatory (i.e. non-wavelike) motions in the

[1] Minsky focuses on the financial position of a single agent – usually a real investor – and how cash flows affect the solvency of that agent. When he relates the financial position of a single agent to that of other agents and the economy on a macro level he mentions but does not discuss multiplier and financial layering effects. His model does not indicate *explicitly* how precisely a change to the financial position of one agent will affect that of other agents. This is a major shortcoming of the financial instability hypothesis, which can be rectified with the use of the general balance framework.

interaction of economic variables over time. Minsky extends this distinction to include a third category of 'incoherent movements'. Incoherence includes situations of runaway inflation and downward spirals. Drawing further on Schumpeter, Minsky (Minsky 1964:354; Gatti *et al.* 1994:1) also associates the fluctuations he analyses with the Juglar cycles of Schumpeter (1939: Chapter 4). Juglar cycles are investment cycles where monetary and financial variables play a crucial role. They are longer than Kitchen cycles that are inventory and investment cycles, but where financial variables do not play a role, and shorter than Kondratiev cycles that depend on technological innovation. To discuss the severity of financial instability and economic fluctuations, the chapter employs Kregel's (1976) distinction between the static, stationary and shifting equilibria used by Keynes in the General Theory (1936).

The analysis contrasts sharply with mainstream theory. Mainstream theorists argue that the general equilibrating nature of the economy would cause economic agents to adjust their actual primary balances in the long-run to match the balance required to prevent a deterioration in their net financial position (i.e. to prevent an unsustainable increase in their assets or liabilities). This will eliminate any possible long-run effects of such imbalances: agents eliminate the imbalances because their expectations adjust in the long-run to reflect the underlying structure of the economy. Thus, in the long-run agents come to know what constitutes sustainable financial behaviour. However, this chapter argues that the general balance effect may have a long-run effect.

Section 6.1 sets out the basic two-sector general balance model with corporate and household sectors and describes the behaviour of agents in this model. Sections 6.2 and 6.3 describe in terms of the general balance framework how a boom phase in the economy sets up the preconditions for the subsequent economic bust phase. (Section 6.2 focuses on companies, section 6.3 focuses on households.) Sections 6.4 and 6.5 analyse the bust phase, with the former focusing on the corporate sector and the latter on the household sector. Sections 6.6 and 6.7 introduce the roles of respectively the financial and foreign sectors during both boom and bust phases. This sets the scene for the introduction of the government sector in chapters 7 and 8.

6.1 The basic model

Recall from chapter 4 that an indicator of the financial sustainability of the corporate sector is contained in equation 1 (which is equation 5 in chapter 4):

$$\Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t - \Delta A_{ct}/Y_t \equiv (r_{ct} - g_t)D_{ct-1}/Y_t + (d_{dt} - g_t)E_{dt-1}/Y_t - (r_{cAt} - g_t)A_{ct-1}/Y_t + B_{ct}/Y_t \quad (1)$$

The primary balance of the corporate sector is defined as:

$$B_c \equiv P_c + I_c \equiv W_c - (I_c + C) + I_c \qquad \text{(so that } P_c \equiv W_c - (I_c + C)\text{)} \quad (2)$$

An indicator of the financial sustainability of the household sector is contained in equation 3 (also equation 3 in chapter 4):

$$\Delta D_{ht}/Y_t - \Delta A_{ht}/Y_t \equiv (r_{ht} - g_t)D_{ht-1}/Y_t - (r_{hAt} - g_t)A_{ht-1}/Y_t + B_{ht}/Y_t \quad (3)$$

The primary balance (B_h) (+ deficit;- surplus) of households is defined as:

$$B_h \equiv C - W_c \quad (4)$$

Because this is a two-sector model:

$$B_c \equiv B_h \text{ (so that } B_c + B_h \equiv 0) \quad (5)$$

Given the two-sector model, equation 5 means that when the corporate sector runs a primary surplus the household sector runs a primary deficit and *vice versa*. The corporate sector runs a primary surplus when the operating profit exceeds investment ($I < -P$) and a primary deficit when investment exceeds the operating profit ($I > -P$). An operating profit

means that P, which equals W_c - (I_c + C) in equation 2, is negative, so that an operating profit of 50 means P = –50 and – P = 50.

Equation 3 for households can be separated into two equations, one for debtors (equation 3.1) and the other for creditors (equations 3.2a and 3.2b). As it does not affect the conclusion, the analysis abstracts from households that are simultaneously debtors and creditors. Equation 3.2b is a more detailed version of equation 3.2a and shows the detail on the type of financial assets held by creditors.

Debtors:

$$\Delta D_{ht}/Y_t \equiv (r_h - g)D_{ht-1}/Y_t + B_{h/debtors,t}/Y_t \qquad (3.1)$$

Creditors:

$$-\Delta A_{ht}/Y_t \equiv -(r_{hAt} - g_t)A_{ht-1}/Y_t + B_{h/creditors,t}/Y_t \qquad (3.2a)$$

or

$$-\Delta A_{Et}/Y_t - \Delta A_{Dt}/Y_t - \Delta A_{ht}/Y_t - \Delta A_{casht} \equiv -(d_E - g)A_{Et-1}/Y_t - (r_D - g)A_{Dt-1}/Y_t - (r_h - g)A_{ht-1}/Y_t + B_{h/creditors,t}/Y_t \qquad (3.2b)$$

where A_E: Equity held by creditors

A_D: Corporate debt held by creditors

A_h: Household debtor credit held by creditors

All the above equations are identities and describe the financial position of sectors. However, they also apply to single agents. The sum of the primary balances in an economy is zero, so that in the two-sector model:

$$B_c + B_{h/creditors} + B_{h/debtors} \equiv 0 \qquad (4a)$$

Since the identities of the general balance framework, set out in chapter 4, define technical and not behavioural relationships, the behaviour of economic agents must be postulated separately. The analysis assumes that companies attempt to maximise profits. The extent to which they succeed is limited by the existence of uncertainty. (Chapter 5 discusses the impact of uncertainty on the decision making of companies.) In addition, the analysis assumes that the relative demand for goods that individuals express depends on their preferences. However, as chapter 5 argues, uncertainty precludes individuals from maximising their intertemporal utility.

In the above framework all companies and the corporate sector in the aggregate are debtors (they sell shares and bonds to finance their activities and they own no securities) whereas households include debtor and creditor households. In the aggregate the household sector is a net creditor. Because both debtors (whether they are households or companies) and creditors face uncertainty, both the buyers (i.e. creditors) and the sellers (i.e. debtors) of financial instruments have to participate in the formation of expectations. Expectations then influence the willingness of debtors to incur debt and that of creditors to buy the securities issued by debtors. Thus, the reaction to uncertainty by both creditors and debtors must be considered when describing the behaviour of households and companies. The reaction is described in terms of equations 1, 3.1 and 3.2b.

Creditors, i.e. those who have a positive net financial asset position, earn interest (the sum of the interest terms in equation 3.2b is negative). Hence, they can afford to run primary deficits (a positive B in equation 3.2b) that will not affect their net financial asset position (so that $-\Delta A_{ht}/Y_t$ remains zero). However, they may decide not to run a large enough primary deficit because they may be confident, as in the Minsky model, that a given higher level of business activity will continue. They may consider financial securities such as bonds, shares and household debt instruments as sound financial investments that will probably yield a sufficient positive and growing return (d_E; r_D; r_h and g in equation 3.2b). Thus, they may be willing to run primary surpluses, or primary deficits small enough for their net financial asset position to improve. This behaviour may continue until creditors realise that the financial position of debtors is fragile, which

then may cause a change in long-run expectations. Fragility means that creditors expect that debtors cannot continue their current behaviour in the short-run. This makes creditors less willing to finance additional debt. This change in long-run expectations relates to the shifting equilibrium of Kregel discussed in the previous chapter.

The position of debtor households is a mirror image of that of creditor households. Because debtor households pay interest they must run a primary surplus to prevent a deterioration in their net financial asset position. However, they may decide not to do so if they are confident that their income will validate higher debt costs. Debtors may continue this behaviour until they realise the fragility of their financial position, which then may change their long-run expectations. This, in turn, influences their willingness to finance consumption with debt and curtail the rate at which consumption expands.

Debtors in the form of companies may increase investment (I_t in equation 2) in the expectation that their operating profit (a negative P_t in equation 2) will increase sufficiently to cover their interest cost (r_d in equation 2) and allow them to pay a dividend rate (d in equation 2) that will not induce a sell-off of shares. Just as households may increasingly finance their expenditure with debt, companies may do so too, causing an increase in their debt/equity ratios. This behaviour may also continue until companies realise the fragility of their financial position, which in turn may change their long-run expectations and hence, their willingness to incur debt. The discussion below maintains that the willingness to incur debt influences investment and thus, income. This refers yet again to the shifting equilibrium of Kregel.

6.2 *The corporate sector in the boom phase: the preconditions for the emergence of financial vulnerability, unsustainability and insolvency*

The previous section explored the possible behaviour of both creditors and debtors in the face of uncertainty. This section focuses on the impact of this behaviour during the boom phase on the financial position and sustainability of the corporate sector – in particular,

on interest and non-interest expenditure and income and, subsequently, on the net financial asset position of the corporate sector.

During the boom investors probably are confident about the growth prospects of income. Because investment and consumption increase, growth in demand is strong. As the boom progresses, the realisation of expectations reinforces the confidence of investors. Since companies are confident about their income prospects they may increasingly finance expansions of their capital stock with debt, increasing their leverage or debt/equity ratio. Kaufman (2000:348) shows how the debt/GDP ratios in the US increased from 1984 to 1990 and again since the mid-1990s. Both these periods coincided with an economic boom phase. With higher leverage shareholders would benefit from an unexpected windfall in corporate income. Despite the benefits from leverage, a higher debt/equity position means that shareholders are also more exposed to adverse movements in the operating profit of the company. However, since shareholders are also more confident about the income prospects of companies, they may be willing to accept the possibility of an adverse movement in operating profit in return for the prospect of windfall income.

A larger debt/equity ratio causes interest payments to make a larger claim on the operating profits of companies. Provided that the interest rate, economic growth rate and level of expected income remains stable, an increase in interest payments and debt does not mean that the financial position of companies is unsustainable. Companies with a higher debt/equity ratio remain financially sustainable because the debt-plus-equity/GDP ratio[2] remains stable throughout the boom phase. Only the composition of financial capital has changed, i.e. the proportion of debt relative to equity increases. In addition,

[2] Instead of GDP one could use the income (or expenditure) of an individual company or of the entire sector as denominator of the ratio. However, the general balance framework expresses the financial position of all economic agents within an economy so that the use of GDP makes it easier to compare the financial positions of agents in different sectors. One can use GDP instead of individual company or sectoral income because the latter two cannot change permanently at a rate that is either higher or lower than the economic growth rate. A precedent for this is found in corporate finance literature where the equations used for the valuation of equity, bonds or assets use the expected economic growth rate as a proxy for the expected growth rate of a company. The same argument holds for the use of GDP instead of the individual or sectoral income in the debt ratios of other sectors.

the composition would change only for as long as companies have not reached a desired new ratio.

However, with an increase in individual corporate debt/equity ratios (and thus, in the aggregate ratio as well) the financial position of companies can now more easily become unsustainable and lead to insolvency. Because interest has a first claim on operating profit, a permanent decrease in operating profit is fully reflected in a lower after-interest-profit and thus in a lower value of equity (given the discount and retention rates). If the after-interest-profit is already small due to a large claim of interest on operating profit, the value of equity will be much more sensitive to a given change in operating profit. Also, the higher the level of leverage the higher the chances that the decrease in equity value will wipe out the entire equity base of the company. (Companies then become the Ponzi units descried by Minsky – see previous chapter). With a decrease in income they would become insolvent and go bankrupt. Hence the conclusion, which corresponds with that of Minsky, that an increase in the debt/equity ratios means that the companies are increasingly exposed to the possibility of financial unsustainability and insolvency.

Because the value of equity becomes more sensitive to permanent changes in income, it is unlikely that companies would want a continuous increase in their debt/equity ratios. They would rather impose an upper limit on their debt/equity ratio. However, even before they reach that level, creditors may lose confidence in the ability of companies to continue to service their interest and dividend commitments. As a result both companies and creditors may rein in the rate of growth of corporate debt. This loss of confidence in the ability of companies to service their commitments stems from a loss of confidence regarding future income and profit expectations. If the increase in debt/GDP ratios is a general phenomenon in an economy, as it is during the boom, an economy becomes more vulnerable and exposed to a fall in confidence as the boom progresses. Thus, the debt/equity ratio *does* matter, not only to shareholders, but also to the company and the economy.[3]

[3] The Miller-Modigliani theory argues that the composition of the debt/equity ratio does not matter to companies because the composition does not influence the cost of capital. However, it argues that the ratio is important to shareholders because higher levels of leverage amplify the effect on the value of equity of a

The following illustration in terms of equation 1 describes how the debt/equity ratio can increase even while the debt-plus-equity/GDP ratio remains unchanged. It illustrates the growth in the debt/equity ratio and the growth in the interest payments in periods t and t+1. At time t-1, t and t+1, the corporate sector has the characteristics set out in table 1 (period t-1 is merely shown to demonstrate the change that took place in period t).

Table 1

	t-1	t	t+1
Economic growth rate and rate of growth in corporate income		5%	5%
Income (ℝ) (= GDP)	95.24	100	105
Non-interest expenditure (ℝ)	66.67	70	73.5
Operating profit (ℝ)	28.57	30	31.5
Dividend and interest rate	10%	10%	10%
Debt + equity (ℝ) **Debt/equity ratio**	150+150 1:1	165+150 1.1:1	180.75+150 1.205:1
Debt + equity/income ratio	3.15:1	3.15:1	3.15:1
Debt/income ratio	1.575:1	1.65:1	1.72:1
Equity/income ratio	1.575:1	1.5:1	1.428:1
%ΔDebt/income ratio		4.8%	4.2%
%ΔEquity/income ratio		– 4.8%	– 4.8%
Total asset/income ratio	3.15:1	3.15:1	3.15:1

If the corporate sector wants to grow at 5% in period t (implying that the economy also grows at 5%), it will have to invest 15 so that the capital stock increases by 5%. If the financial investors in the corporate sector require a 10% return on their investment of previous periods, the operating profit has to increase by 5% to 30. This is possible if income and non-interest expenditure also grows at 5%, income from 95.24 to 100 and expenditure from 66.67 to 70. Suppose that investors want to finance investment solely

permanent change in profit. Nevertheless, the theory remains a partial theory because it does not consider the impact on the value of equity of adverse macroeconomic changes.

with debt. When these values are placed in equation 1 below, it yields a zero change in the equity-plus-debt/GDP ratio. That is because debt-plus-equity increases at the same rate as income. However, the debt/GDP (where income = GDP) and equity/GDP ratios do not remain stable. The debt/GDP ratio increases in both periods, although the rate of increase is falling. It will approach the capital asset/GDP ratio, so that the rate of increase in debt will tend to approximately equalise the rate of increase in capital. The equity/GDP ratio decreases and will continue to decrease (in the example at a rate of 4.8% of the equity/GDP ratio). Although dividends in absolute terms do not decrease, dividends as a percentage of income becomes smaller, while that of interest cost becomes larger.

Period t:

$$\Delta E_t/Y_t + \Delta D_t/Y_t \equiv (0.1 - 0.05)150/100 + (0.1 - 0.05)150/100$$
$$- 30/105 + 15/100 \qquad (1)$$
$$\equiv 0$$

Period t+1

$$\Delta E_{t+1}/Y_{t+1} + \Delta D_{t+1}/Y_{t+1} \equiv (0.1 - 0.05)150/105 + (0.1 - 0.05)165/105$$
$$- 31.5/105 + 15.75/105 \qquad (1)$$
$$\equiv 0$$

To recapitulate: the increasing confidence of companies during a boom may cause them to increase their debt/equity ratios. This does not cause their financial position to be unsustainable as their debt-plus-equity/GDP ratio may remain stable throughout the boom phase. However, the larger interest claim of debt on operating profits means that the financial position of companies is more fragile and exposed to the possibility of financial unsustainability and insolvency.

If large enough the increase in the debt/equity ratio itself may create doubt about the solvency and sustainability of the financial positions of companies so that the increase in the ratio during the boom sets up the preconditions for financial vulnerability, unsustainability and insolvency. The increase in the debt/equity ratio may create a loss of

confidence in long-run expectations and cause market sentiment to turn bearish even though short-run expectations may still be realised. As the level of confidence in income and growth prospects falls, it inhibits investment, which dampens aggregate demand, economic growth and income. Once this occurs, the financial position of highly indebted companies may become unsustainable and the bust phase sets in. This is examined in more detail in section 6.4 below.

6.3 *Households in the boom phase: further preconditions for the emergence of financial vulnerability, unsustainability and insolvency*

Individuals must be the ultimate holders and buyers of equity and bonds even though firms do hold securities of other firms. If company A holds securities of company B, it must finance this holding through the issue of debt or equity. However, individuals are agents whose net worth does not belong to someone else.

Debtor households may decide to increase their debt/GDP ratios[4] if the economic boom confirms their confidence regarding their expected income. In addition, the boom may also confirm the confidence of creditor households, which may cause them to extend more credit, so that their financial asset/GDP ratio increases. Since the additional debt taken up by households and the credit extended to households cancel out, there is no increase in the *aggregate* debt-minus-financial-asset/GDP ratio of the household sector. Thus, debtor and creditor households must be considered separately to determine their degree of financial vulnerability.

It is unlikely that debtor households plan to increase their debt/GDP ratio unboundedly. Just as companies plan to stabilise their debt/equity ratios after a period of increase, debtor households may plan to stabilise their debt/GDP ratios after a period of increase. Nevertheless, as long as the household debt/GDP ratio increases, it causes the interest payments of debtor households relative to their income to increase. Because they may

[4] For the use of GDP instead of individual household income, see footnote 3.

feel more confident about their expected income, they may be confident about their ability to pay the interest on the higher debt.

In the two-sector model creditor households are financial investors (as opposed to real investors) who lend to both debtor households and companies (i.e. they buy the shares, bonds and other debt instruments issued by households and companies). In the expanded model they lend to all sectors. Their portfolios consist of shares, bonds and cash. (The cash is probably deposited at a bank. Thus, it is a liability of the financial sector.) If, during the boom, financial investors become increasingly confident about the ability of companies to generate growth and debtor households to repay their debt, they may increasingly substitute bonds and equity for cash, i.e. lend more to companies and households. Companies, in turn, use the cash they raised by issuing bonds and shares to finance their investment. (For the sake of simplicity, it is assumed that companies have no use for holding cash. Since the cash cannot disappear from the economic system – it only circulates – it again enters the portfolios of households. For more detail on how the behaviour of creditors influences the money supply, see section 6.6 below.)

Creditors are agents who earn interest (as opposed to debtors who pay it), and, therefore, are in a position to run primary deficits (i.e. their non-interest expenditure exceeds their non-interest income) without causing a deterioration of their net financial asset position. However, they may decide otherwise during the boom. They may decide to run a relatively small primary deficit or a primary surplus, causing their net financial asset position to improve even more. As a result their financial asset/GDP ratio may improve during the boom. This represents the mirror image of the position of debtors.

To demonstrate the likely behaviour of debtors and creditors, consider the following example that uses equations 3.1 and 3.2b. The example is an extension of the example on the corporate sector used above. The dividends and interest paid by the corporate sector are earned by the household sector. (It is assumed for the sake of simplicity that no money is held.) Because the sum of the primary balances equals zero, the primary surplus of the corporate sector equals the primary deficit of the household sector. The

primary deficit may be shared between debtor and creditor households because debtors want to increase their debt while creditors want to run a primary deficit that is smaller than the one they can afford (so their net financial asset position improves). As a result, there may be a mismatch between the actual and required primary balances of households, which may cause a general balance effect within the household sector which, in turn, results in an increase in the household debt/GDP and household financial asset/GDP ratios (see chapter 4 on the general balance effect). For the purposes of the exposition, assume that the primary deficit of creditors is 10 in period t, which is smaller than the 15 that would have prevented the financial asset/GDP from increasing. Thus, their net financial asset position will still improve. This also implies that the primary deficit of debtors in period t equals 5. The same ratio of division between creditors and debtors applies to the primary deficit in period t+1. Equation 3.1 depicts the net financial position of debtors for periods t and t+1:

Period t:

$$\Delta D_{HHt}/Y_t \equiv 0 + 5/100 \equiv 0.05 \qquad (3.1)$$

Period t+1:

$$\Delta D_{HHt+1}/Y_{t+1} \equiv (0.1 - 0.05)5/105 + 5.25/105 \equiv 0.0524 \qquad (3.1)$$

Equation 3.2b depicts the net financial position of creditors for periods t and t+1:

Period t:

$$-\Delta A_{Et}/Y_t - \Delta A_{Dt}/Y_t - \Delta A_{HHt}/Y_t - \Delta A_{casht} \equiv -(0.1 - 0.05)150/100 - (0.1 - 0.05)150/100 + 10/100 \equiv -0.05 \qquad (3.2b)$$

Period t+1:

$$-\Delta A_{Et}/Y_t - \Delta A_{Dt}/Y_t - \Delta A_{HHt}/Y_t - \Delta A_{casht} \equiv -(0.1 - 0.05)150/105 - (0.1 - 0.05)165/105$$

$$-(0.1-0.05)5/105+10.5/105 \qquad (3.2b)$$
$$\equiv -0.0524$$

The example clearly indicates that the debt/GDP ratio of debtors increased, whereas the financial asset/GDP ratio of creditors improved by equal amounts. The increase in the debt of the household sector equals the increase in its financial assets so that the net financial position of the sector remains unchanged. However, with an increase in their debt/GDP ratio, the financial position of debtors has become more vulnerable. The risk of financial unsustainability and insolvency has increased. The primary reason for this is that, given the interest rate, an increase in debt means that the claim of interest payments on income increases. Unless debtor households can cut back sufficiently on their non-interest expenditure, a decrease in income expected to be permanent implies that households have to borrow to pay interest. If their ability to cut back on non-interest expenditure is limited – it entails a cutback in what is considered basic living expenses – bankruptcy and insolvency set in. (Households then also become Ponzi units, just like companies.) Thus, given a limited ability to cut back on non-interest expenditure the financial position of individuals can more easily become unsustainable with an increase in their debt/GDP ratio. A decrease in income considered by households to be permanent may result from companies who retrench part of their labour force once they lose confidence in their profit expectations. In this way a loss in confidence in the corporate sector spills over into the household sector.

To recapitulate: As is the case with companies, households may also increase their indebtedness during an economic boom. The counterpart of this increase in debt is an increase in the financial asset position of creditor households. The increase in the debt of debtor households increases the interest claim on their incomes and increases their exposure to the possibility of financial unsustainability and insolvency. As is the case with companies, the increase in debt/income ratios may be the preconditions for creditors to lose confidence in the ability of households to service their debt and interest payments.

6.4 *The economic downturn: The contagion of unsustainability and insolvency in the corporate sector*

During the boom phase the debt/equity ratios of companies may increase due to buoyant expectations. However, as section 6.2 argues, the increase in debt/equity ratios leaves companies more exposed to the possibility of financial unsustainability. How does this possibility become a reality? Can companies and households not stabilise their debt/equity and debt/income ratios at the higher levels and then maintain those ratios indefinitely? After all, companies and debtor households usually incur debt only to the extent that they seemingly can afford it. At first sight the increase in income that occurred during the boom validates the higher interest costs incurred during the boom. Therefore, as debtors seem able to service their debt, it also seems that creditors do not stand to lose anything. However, a boom phase is followed by a bust phase characterised by losses. The question is how does this bust phase unfold and what determines its severity.

Minsky stated that the economic boom comes to an end when economic agents consider themselves too buoyant about the expected economic growth rate and level of income, i.e. they turn bearish. This bearish sentiment may emerge when creditors recognise the financial fragility of companies due to the continuous increase in debt/equity ratios during the preceding boom and realise that the economic growth rate may falter under the fragility. Therefore, even before the downturn affects economic variables such as investment and growth, creditors may consider debt/equity ratios excessive. The lack of confidence in short-run expectations about growth and income then also causes a lack of confidence in the long-run expectations about these variables. The discussion below indicates, that the lack of confidence usually causes debt/equity ratios to increase further from levels that may already be considered excessive and renders the financial position of companies and financial asset holders even more fragile than before the lack of confidence set in.[5]

[5] Dow (1993:62,72) argues that as the boom progresses the price of non-reproducible (and, one may add, difficult-to-produce) goods such as land, antiques and gold increases relative to that of reproducible goods. Increasingly creditors divert their investments towards the acquisition of non-reproducible goods as a result

What complicates the analysis of an economic downturn is that the disappointment of short-run expectations does not necessarily cause financial and real investors to lose confidence in their long-run expectations. Section 6.4.1 explores this possibility, which falls in the stationary equilibrium category of Kregel. Sections 6.4.2 to 6.4.3 then explore the impact of a loss in confidence in long-run expectations and the subsequent reduction in investment.

6.4.1 A temporary fall in profit – the stationary equilibrium case

When financial investors view the change in consumption and investment as temporary, it neither affects the net financial asset position of companies, nor changes long-run expectations. Thus, this falls under the heading of a stationary equilibrium, also associated with the Kitchen cycles of Schumpeter. It can explain actual cases where short-run expectations are disappointed but where the disappointment does not influence long-run expectations. As Kregel (1976:224) argues, a fall of 5% in the demand for electricity in one quarter will not necessarily cause a revision of long-run expectations on required future capacity and, hence, not cause investment to fall.

How does a temporary decrease in the operating profit of a company affect its financial health as measured by its debt/equity ratio and therefore its ability to maintain its level of investment? With a lower operating profit, less profit is available for distribution to bond- and shareholders. However, the amount of interest is fixed – it represents a contractual liability. Thus, only the dividends that the company can distribute decrease. Since financial investors view the decrease in profit as temporary, they will not sell equity. Thus, the price of equity does not decrease, meaning the debt/equity ratio of the company is not affected. If financial and real investors expect the change to be

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of the relative price increase in these goods and away from reproducible goods. Thus, to free up resources to speculate in non-reproducible goods, financial investors will toughen the conditions on which they extend credit and buy the shares of companies that produce reproducible goods. Hence, producers of reproducible goods find it more difficult to finance their physical investments, which in turn, may cause them to become bearish about their ability to service their debt and equity commitments. Investment is bound to decrease once expectations turn bearish or confidence about buoyant expectations is lost.

temporary, only the dividend rate (d_{dt}) in equation 1 decreases. However, it is expected to increase again once producers overcome the bottlenecks and difficulties.

6.4.2 The spreading of imbalances as a first-round impact of an autonomous decline in investment – the shifting equilibrium case

Should financial investors view the fall in consumption and investment as permanent, it will affect the financial position of companies. The change in short-run expectations and circumstances causes a change in long-run expectations and is, therefore, classified as a shifting equilibrium. When a company adjusts its expectations downward or loses confidence in its expectations, it will refrain from investment (because it is not expected to yield the necessary operating profit in the long-run to pay interest and the dividends required by shareholders). Thus, the investment term in equation 2 decreases (or increases at a lower rate). In terms of equation 2 the primary balance of the corporate *sector* is not affected because companies purchase capital goods from other companies (investment is both added and subtracted from the corporate sector primary balance). However, the operating profit of the producers of capital goods is affected.[6]

To describe the first round effect of a reduction in investment, equation 2 is split up into an equation for producers of consumption goods on the one hand (equation 2.1) and for producers of capital goods on the other (equation 2.2). The split helps to circumvent partially the problem that investment is both added and subtracted from the primary balance of the corporate sector.

$$B_{cc} \equiv P_{cc} + I_{cc} \equiv W_c - C + I_{cc} \qquad (2.1)$$

where I_{cc}: The investment by consumption goods producers

W_c: The wage bill paid by consumption goods producers

[6] The impact of the change in operating profits on the financial position of companies depends on whether or not financial investors share the depressed expectations and lack of confidence of companies. If they do, they will value the equity of a company downward. If not, they may perceive the change in investment as only temporary, relegating this to a case of stationary equilibrium described in section 6.4.1. For a shifting equilibrium to occur, financial investors must become bearish.

P_{cc}: The operating profit of consumption goods producers

B_{cc}: The primary balance of consumption goods producers

C_c: Total consumption

$$B_{cl} \equiv P_{cl} + I_{cl} \equiv W_l - I_c + I_{cl} \qquad (2.2)$$

where I_{cl}: The investment by capital goods producers

I_c: Total investment by the corporate sector

W_l: The wage bill paid by capital goods producers

P_{cl}: The operating profit of capital goods producers

B_{cl}: The primary balance of capital goods producers

A fall in investment causes a decrease in the sales of companies that sell capital goods. If these companies do not decrease their wage cost, their operating profits decrease so that they have less operating profit to distribute to bond- and shareholders. Since debt cannot decrease in value – it is a contractual agreement – the reduction in operating profits will cause a once-off downward valuation of equity. The larger the initial debt/equity ratio, the larger the downward valuation of shares. The lower operating profit of capital goods producers creates an imbalance between the primary surplus (and operating profit) which these producers run and the primary surplus (and operating profit) which their creditors *require* them to run. This imbalance increases the possibility that unsustainability may set in.

The lower dividend and interest income that creditor households receive due to the decrease in dividend payments means that their consumption may have to decrease to prevent a deterioration in their net financial asset position. This affects the sales and profits of the consumption goods industry, thus creating an imbalance between the primary surplus (and operating profit) which these companies run and the primary surplus (and operating profit) which their creditors *require* them to run. This imbalance increases the possibility that unsustainability may also appear in the financial position of consumption goods producers.

If the producers of capital goods do reduce their wage bill[7] in line with the decrease in their sales revenue, they will moderate the impact of the reduction in corporate investment on their operating profits. However, the reduction in the wage bill may cause a further reduction in consumption, so that the sales of the producers of consumption goods decrease even further. Thus, the reduction in profits is shifted from the capital goods industry to the consumption goods industry (Kalecki 1939:24-30; 1971:96-97).[8] This shifts the imbalance in financial positions from the producers of capital goods to the producers of consumption goods, which implies that the latter now do not have sufficient operating profit to pay interest cost and the dividends required by creditors. The presence of imbalances may become widespread depending on the degree of success with which individual producers of capital goods shift their imbalances. The next subsection examines whether or not these imbalances will cause the financial position of companies to become unsustainable.

Furthermore, any attempt by the producers of consumption goods to decrease their wage bill in line with the reduction in their sales income to restore their profit may be self-defeating as it may cause a further fall in their sales. Nevertheless, a reduction in the wage bill may occur because individual producers may hope that even though on the aggregate level a fall in wage bill may cause a fall in sales, it may not be the case on the individual company level. Thus, some companies may be able to reduce wage cost without experiencing a fall in sales. However, in the aggregate this cannot happen so that the lower operating profits of consumption goods producers cause their debt/equity ratios to increase, thus increasing the possibility that their financial positions may become unsustainable.

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[7] This probably occurs as a result of the retrenchment of staff as companies usually do not reduce nominal wages.

[8] Note that the reduction in the wage bill discussed in this section does not yet form part of an attempt by companies to improve the productivity of their labour (this is discussed in subsection 6.4.3). It is merely a case of retrenchment of staff that became redundant following a fall in sales and business activity.

Equation 6 represents the downward valuation of equity faced by both the producers of investment and consumption goods due to the passing of imbalances via the linkages between financial positions:

$$\Delta PV = (P2_t - r_L D_t)/d - (P1_t - r_L D_t)/d \qquad (6)$$

where ΔPV: Change in the present value of equity

d: The discount rate

P1: The operating profit expected for period t before the adjustment of expectations

P2: The operating profit expected for period t after the adjustment of expectations

D: Debt

r: The interest rate

Substituting equation 6 into equation 7 below yields the change in the debt-plus-equity/GDP ratio:

$$\begin{aligned}\Delta E_t/(Y_t - \Delta Y_t) + \Delta D_t/(Y_t - \Delta Y_t) \equiv\ & (d_{required} - g)E_{t-1}/(Y_t - \Delta Y_t) \\ & + (1 + d_{required})\Delta PV_t/(Y_t - \Delta Y_t) \\ & + (r_d - g)D_{t-1}/(Y_t - \Delta Y_t) \\ & + P_t/(Y_t - \Delta Y_t) \qquad (7)\end{aligned}$$

where ΔPV_t: The change in the present value of equity due to a decrease in the expected future stream of income

$(Y_t - \Delta Y_t)$: Income after the decrease in income resulting from the adjustment in expectations and the reduction in consumption and investment

$d_{required}$: The required rate of return on equity

Because the downward valuation only takes place in the value of equity, the debt/equity ratio increases. The debt/equity ratio remains at this higher level unless companies take steps to reduce it. Should a company attempt to sell more consumption goods in this

environment, it will face difficulties because of the reduction in the wage bill and income from profits, whereas a company that attempts to sell more capital goods faces difficulties because of the reduction in investment.

Furthermore, the reduction in investment and the wage bill may cause a reduction in the economic growth rate, while the interest rate and required dividend rate may increase if creditors experience more uncertainty. A higher interest and required dividend rate and a lower growth rate cause the (r-g) and (d-g) gaps in equation 1 to increase and thus requires companies to run larger primary surpluses. Because debt remains stable, the failure of companies to run the necessary and larger primary surpluses would cause a decrease in the value of equity (see appendix 6.1 for an equation showing the impact of a change in the interest rate on the value of equity). The increase in these gaps may therefore cause the financial position of companies to deteriorate further and faster.

In conclusion, note that the spread of imbalances starts when uncertainty and a loss of confidence causes investment to fall. It then spreads as companies reduce their wage bill in line with the fall in their sales. Because the debt/equity ratios exceed the highest ratio that creditors tolerate, there is a need to reduce them. The next subsection considers unsustainability caused by the attempt of companies to reduce their ratios.

6.4.3 The second round: Spreading unsustainability as a result of the amplifying effect of an autonomous decline in investment

We now turn to a key element of the analysis to describe how attempts by companies to expunge the imbalances from their financial position may in fact render their financial positions *unsustainable* and cause the unsustainability to spread. These attempts amplify and aggravate the initial effect of the decline in investment.

The previous section indicates that a fall in investment may cause an increase in the debt/equity ratio. In addition, investment may not resume unless companies reduce their debt/equity ratios because creditors may be unwilling to finance any further investment

through debt creation.[9] To decrease the debt/equity ratio, companies may reduce investment further to free up retained earnings to retire debt.[10] One of the main consequences of the adjustment process is that investment is further reduced (from its already lower levels) to finance the restructuring of the debt/equity structure.

Furthermore, companies may also reduce their wage bills in an attempt to improve their profitability. As explained above, a reduction in the wage bill may cause a contraction in consumption and income. The further reduction in investment and the wage bill amplifies the initial effect of a reduction in investment and introduces further rounds of contraction that enlarges the imbalances that already exists in the financial position of companies. This continuous weakening of the financial position of companies will register as continuous increases in their debt/equity ratios and is the corporate version of financial unsustainability. Because the unsustainability propagates itself through further rounds of investment contraction that may spread imbalances throughout the economy, the unsustainability also spreads throughout the economy via the linkages between the financial position of economic agents.

The further rounds of contraction may place the economy on a downward spiral, which can only cease once debt/equity ratios reach levels that financial investors tolerate. However, it is not likely that the ratios will stabilise as long as companies attempt to stabilise them through cutbacks in investment, as each further cutback in investment causes these ratios to move further into intolerable territory. Via the linkages between the financial positions of non-governmental agents the amplification may cause a secondary depression or recession (depending on its severity).

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[9] Individual creditors can, of course, finance new debt and then sell existing debt instruments in their portfolio so that the total amount of debt instruments in their portfolios does not increase. They can also reduce their own (homemade) leverage. However, this cannot be done for creditors as a group; someone must face the additional risk and uncertainty.

[10] Companies may also raise new equity to repay debt or, what comes down to the same thing, offer bondholders to substitute equity for debt in a debt-equity swap. However, in these cases bondholders must be willing – which they probably will not be – to exchange the right to receive interest for the mere possibility of receiving a dividend, while current shareholders must be willing to accept a dilution of their control over the firm, something which they may not be willing to do either.

An avenue left open to stabilise the debt/equity ratios of the corporate sector as a whole (and for companies on average) is to declare those companies whose debt/equity ratios move to infinity (as their equity gets wiped out) insolvent. These agents are the Ponzi units of Minsky. Bankruptcy and insolvency remove the companies with excessive debt/equity ratios from the corporate sector. After the removal, the average debt/equity ratio of all companies taken together looks better than before bankruptcy and insolvency set in. This change may improve sentiment and cause a resumption of investment. However, the price that had to be paid is large-scale bankruptcy and insolvency. Bankruptcy and insolvency are then the result of unsustainability that spreads via the linkages that exist between the financial positions of non-governmental agents.

A further option that particularly mainstream economists favour is an improvement in productivity that allows companies to produce the same amount of consumption and investment goods (C and I in equation 2) but to reduce the wage bill (W in equation 2a), so that operating profits, P_c, increase. In effect this means a reduction in the real wage.

$$P_c \equiv (W_c + M) + T_c - (I_c + C_W + C_A + C_g + I_g + X) \qquad (2a)$$

where C_W: Consumption by consumers who earn only wage income

C_A: Consumption by consumers who earn interest and dividend income

Through equations 6 and 7 the equity of a company would be revalued upward because of the higher profitability. The higher profitability would eliminate the imbalance that exists between the primary surplus (and operating profit) which companies run and the primary surplus (and operating profit) which creditors require companies to run.

However, Keynes was sceptical about the ability of the corporate sector to reduce the real wage rate when it wanted to improve its profitability. Lowe (1988:97-103) provides a clear exposition of the Keynesian view. He indicates that the reduction in the wage bill and the subsequent reduction in the consumption of wage earners necessitate an increase in the consumption of creditor households if total sales are not to decrease. To view this

in terms of equation 2a, note that the improvement of productivity implies that output (and sales) increases relative to a given wage cost (in nominal and real terms) or that wage cost decreases relative to a given output. Thus, if an increase in the consumption by creditors (C_A in equation 2a), who earn profits in the form of interest and dividend income, accompanies an attempt to improve productivity, their increased consumption will offset the fall in consumption by wage earners (C_W in equation 2a). Only with this offset could the attempt to improve productivity and profitability possibly succeed, because only then can output sold increase relative to wage cost (or does wage cost decrease in relation to output sold).

However, because of the uncertainty involved, Lowe is sceptical about the possibility that the consumption of creditors will increase. The uncertainty for creditors lies in the timing of their consumption relative to the receipt of dividends and interest. Kalecki (1939:25) mentioned that workers spend what they receive, whereas the owners of capital receive what they as owners spend.[11] This means that creditors must spend (consume and invest) in anticipation of a higher profit in order to receive that higher profit, otherwise their higher dividends and interest income will also not materialise. However, if shareholders are not confident about the ability of companies to improve their profitability by improving productivity, they may not increase their consumption in anticipation of higher profit. As a result profits will not improve.

It can be argued that the more productivity has to increase, the more likely it is that creditors will be sceptical and will not spend more in anticipation of higher profits. Their failure to spend means that the total sales income of companies may indeed be lower because there is no increase in the consumption of creditors to offset the decrease in the consumption of wage earners. Thus, if creditors fail to spend, companies will not succeed in their attempt to increase productivity and to reduce the real wage. Through the amplifying effects the financial unsustainability of non-governmental agents then spreads throughout the economy as the imbalances in corporate financial positions become

[11] "Therefore, the capitalists as a class determine by their expenditure their profits (in a one-to-one relation) and in consequence the aggregate production." (Kalecki 1939:25)(Parentheses added).

increasingly larger. As the unsustainability spreads, it turns financial healthy agents into Ponzi units. Hence, the rather gloomy prospect that if it is left to itself the only way to rid the economic system of excessive debt is by a wave of bankruptcies that eliminate the Ponzi units from the economy.

However, if the required adjustment in productivity is relatively small and not that difficult to make, creditors may be optimistic about future profit and may spend in anticipation of the higher profits. Their higher consumption causes a higher profit so that companies are able to restore their financial health themselves and ward off Ponzi status. This, in turn, prevents a downward spiral. In effect, companies are able to expunge the imbalances in their financial position by adjusting their productivity.

The above implies that this chapter can refine the shifting equilibrium of Kregel to distinguish between a *reversible* and an *irreversible* shift of the equilibrium. Thus, in the case of a reversible shift of the equilibrium, companies can restore confidence and reverse the spreading of financial unsustainability, thereby countering economic instability.[12] However, in the case of an irreversible shift of the equilibrium where companies significantly exceed the debt/equity ratio creditors allow and where the required adjustment is larger, companies may be unable to reverse the financial unsustainability and economic instability. Thus, an irreversible shift of the equilibrium occurs when imbalances in the financial position of a few non-governmental agents spread via the linkages that exist between the financial positions of economic agents and become increasingly larger so that the financial positions of companies become unsustainable. In addition, it could be said that unsustainability spreads via the linkages between financial positions because the cutbacks in investment or wage bills affect the sales of other companies.

[12] A reversible shift of the equilibrium differs from a stationary equilibrium. In the case of the latter, actual sales and profits may temporarily deviate from their expected long-run values without influencing the long-run expectations. In the case of a reversible shifting equilibrium the actual drop in sales and profits causes long-run expectations to turn sour. However, the weakening in profits elicits a reaction from companies to make the necessary adjustments to restore profitability. This reaction and the confidence of companies that they can be successful in making the adjustments, cause expectations to improve.

By using the framework set out by Kregel, the above analysis represents a version of the corridor effect described by Leijonhufvud (1973:103-130).[13] As long as a stationary equilibrium and a reversible shift of the equilibrium applies the economy operates within a safe corridor. The boundaries of this corridor are set by the ability of companies to make adjustments in their balance sheets in response to adverse movements in their profitability without causing a downward spiral. When the required adjustment is small the economy probably will remain within the corridor. However, once companies cannot make adjustments without setting in motion a downward spiral, i.e. a case of a irreversible shift of the equilibrium, the economy has moved outside the safe corridor.

6.5 *The household sector: The relative position of debtor and creditor households*

In addition to the corporate sector, the general balance framework includes the household sector. Since in the two-sector model the household sector is just the mirror image of the corporate sector, there is no need to repeat the above analysis for the household sector. Therefore, this section only considers some issues pertaining specifically to the household sector not included in the above analysis.

As with companies, creditors may lose confidence in the ability of debtor households to service their debt commitments in future. The loss of confidence may spill over from the corporate sector when financial investors become bearish about the ability of companies to service their debt in future. However, the loss of confidence may also emerge in the household sector. Section 6.2 noted that the debt/GDP ratio of debtor households may increase during the boom. Even if households still honour their debt and interest commitments, the rate of increase in debt may cause creditors to become bearish about the ability of households to honour their commitments in future. In particular, this occurs if households are likely to exceed the debt/GDP ratio that creditors tolerate. The loss of

[13] The original version by Leijonhufvud is a Walrasian model where the auctioneer is absent so that transactions can take place at false prices. Leijonhufvud himself (1973:127) suggested a possible link between his corridor effect and Minsky's financial instability hypothesis.

confidence by creditors causes them to require a higher interest rate on the loans they have extended to debtors.

Debtors:

$$\Delta D_{ht}/Y_t \equiv (r_{ht} - g_t)D_{ht-1}/Y_t + B_{dht}/Y_t \qquad (3.1)$$

Creditors:

$$-\Delta A_{ht}/Y_t \equiv -(r_{hAt} - g_t)A_{ht-1}/Y_t + B_{cht}/Y_t \qquad (3.2a)$$

If interest rates increase due to a decrease in confidence, the interest terms in equations 3.1 and 3.2a increase. Because the (r-g) terms in these equations increase there is upward pressure on the debt/GDP and financial asset/GDP ratios, which may create a general balance effect as described in chapter 4. Thus, if debtor households are not able to reduce their expenditure to increase their primary surplus, they may face bankruptcy once creditors are not willing to extend more credit to them and call up their loans.

6.6 *The role of the financial sector*

So far this analysis was limited to a two-sector model comprising a corporate sector and a household sector. In what follows the financial sector is added first, followed by the foreign sector. The next chapter sees the addition of the government sector to complete the model.

In the same way as companies, financial institutions may wish to expand their activities during an economic boom. For the financial sector this expansion of activities takes the form of an expansion of credit. Their ability to expand their activities depends on the existence of free reserves and the endogeneity of the money supply. Even if the central bank imposes cash reserve requirements to control the money supply, the cash reserve requirements do not place a limit on the ability of banks to expand credit if banks have free reserves (FBR in equations 12, 13 and 14 below) and if the money supply is, at least, partially endogenous (see appendix 4.1 for the derivation of these equations).

The net financial position of financial institutions (excluding the central bank):

$$ONL_t + D_{bt} - L_t - RBR_t - FBR_t \equiv ONL_{t-1} + D_{bt-1} - L_{t-1} - RBR_{t-1} - FBR_{t-1} + i_bD_{bt-1} + i_oONL_t - i_lL_{t-1} \quad (12)$$

which (under a non-inflationary assumption) can be transformed to:

$$\Delta ONL_t/Y_t + \Delta D_{bt}/Y_t - L_t/Y_t - \Delta RBR_t/Y_t - \Delta FBR_t/Y_t \equiv (r_o - g_t)ONL_{t-1}/Y_t + (r_b - g_t)D_{bt-1}/Y_t - (r_l - g_t)L_{t-1}/Y_t - (0 - g_t)RBR_{t-1}/Y_t - (0 - g_t)FBR_{t-1}/Y_t \quad (13)$$

The financial position of the central bank is:

$$\Delta ONL_t/Y_t + \Delta R_{ft}/Y_t \equiv \Delta FBR_t/Y_t + \Delta RBR_t/Y_t + (r_o - g_t)ONL_t/Y_t + (0 - g_t)R_{ft-1}/Y_t - (0 - g_t)FBR_{t-1}/Y_t - (0 - g_t)RBR_{t-1}/Y_t \quad (14)$$

The free reserves of banks fulfil the same role as the cash held by creditors. If banks share the same perceptions as creditors, they will, similarly, be willing to substitute loans (L in equations 12 and 13) for their free cash reserves (FBR in equations 12, 13 and 14).

As credit increases, deposits (D in equations 12 and 13) also increase. The increase in deposits means that the money supply increases. The required reserves (RBR in equations 12, 13 and 14) increase in response to the increase in the money supply. If the increase in required reserves is offset by the decrease in free reserves, banks do not need to incur further overnight loans. This prevents an increase in their interest costs.

In addition to the use of free reserves, the money supply can increase endogenously. Banks can enlarge their loan book (L in equations 12 and 13), whereby deposits (D in equations 12 and 13) increase. By making use of overnight loans (ONL in equations 12, 13 and 14), banks borrow from the central bank the additional cash reserves they require (RBR in equations 12, 13 and 14).

During an economic downturn, banks may call up loans as the debt/equity ratios of companies exceed the limit tolerated by the banks. The contraction in loans may cause a contraction in deposits so that the money supply decreases. In addition, due to the drop of confidence in their expectations, financial investors may want to substitute cash for bonds and equity, so that the demand for money increases. Furthermore, the money supply may not increase endogenously, because banks may also want to substitute cash holdings for loans and do not want to supply the cash that financial investors demand. The combined effect of the decrease in the money supply and the increase in the money demand may cause interest rates to increase unless the central bank accommodates this extra demand for money (which it may not want to do if it considers the accumulation of debt excessive). A higher interest rate places downward pressure on the value of equity, which, in turn, puts upward pressure on corporate debt/equity ratios, so that these ratios deteriorate.

This means that the financial sector may also contribute to the spreading of unsustainability among financial positions during an economic downturn. It may also be the original source of a downturn if banks or the central bank consider debt/equity and household debt/income ratios too excessive and impose stricter credit and interest rate conditions, thus initiating the spreading of unsustainability through the economy.

6.7 The role of the foreign sector

Can the existence of an open economy not alleviate the pressure on the financial position of domestic sectors once expectations and confidence in expectations falter? Is it not possible for companies to finance themselves with foreign capital, and thus, extend the boom phase, or at least prevent an economic downturn? This section shows that this is not possible, particularly if foreign and domestic financial investors and companies share the same expectations and hold the same degree of confidence in their expectations. Thus, the foreign sector plays a role similar to that of creditor households. Through portfolio flows it reacts to an autonomous decline in domestic investment in a similar

fashion as domestic financial investors. However, the same is true of the reaction of domestic financial investors who hold securities in foreign companies that invest less.

In terms of equation 9 of chapter 4 and renumbered here as equation 15, the reactions by both domestic financial investors who invest abroad and foreign investors who invest in the domestic economy are reflected in decreases in S_{ft}/Y_t and A_{ft}/Y_t. The decreases occur via a downward revaluation (by way of equation 6a above) in terms S_{ft-1}/Y_t and A_{ft-1}/Y_t in equation 15.[14] Whether $\Delta S_{ft}/Y_t$ exceeds $\Delta A_{ft}/Y_t$, or falls short of it, depends on:

- the initial value of S_f/Y relative to A_f/Y (i.e. whether the capital account was initially in a surplus or deficit),
- the relative shares of equity in respectively S_{ft-1}/Y_{t-1} and A_{ft-1}/Y_{t-1},
- the change in the value of the foreign and domestic equity.

$$\Delta S_{ft}/Y_t - \Delta A_{ft}/Y_t + \Delta R_{ft}/Y_t \equiv (r_{ft} - g_t)S_{ft-1}/Y_t + (0 - g_t)R_{ft-1}/Y_t - (r_{fAt} - g_t)A_{ft-1}/Y_t + B_{ft}/Y_t \quad (15)$$

A few points are relevant to this discussion. First, if foreign financial investors share the same downward adjustment in expectations and lack of confidence as domestic financial investors, the value of equity is valued downward similarly, no matter who holds the securities. Thus, whether foreign or domestic funds were used to finance debt and equity, the debt/equity valuation of companies will increase just as much. If the debt/equity ratios of domestic companies exceed the limit that foreign investors tolerate, foreign investors also require adjustments. Failing to do so may also result in bankruptcy and insolvency. The downward spiral on which such requirements place the economy may cause a run on the capital account of the balance of payments till such time as the debt/equity ratios fall within the boundaries that foreign financial investors tolerate.

Secondly, insofar as the foreign sector is involved in direct investment, it may be subject to the same faltering expectations and lack of confidence as domestic investors. Thus,

[14] In SA changes in S_{ft-1}/Y_t and A_{ft-1}/Y_t are not shown in the actual current account. The balance of payments does not record revaluation of securities held across borders where such securities are not actually sold. However, the revaluation is included in the foreign debt position of the country.

foreign direct investors may cause a fall in autonomous investment in the domestic economy.

Thirdly, a loss of confidence that causes a sell-off of equity and capital flight causes a floating exchange rate to weaken. This, in turn, causes the domestic value of foreign denominated debt to increase (e.g. in the case of a depreciating rand, the rand value of dollar denominated debt increases). Thus, debt/equity ratios may deteriorate further. The Asian crisis provides an excellent example of this phenomenon (Kregel 1998).

Fourthly, the foreign exchange market, like all financial markets, is a speculative market (see previous chapter). Just as a share price embodies the (divergent) expectations and reflects the confidence of shareholders in a company, an exchange rate embodies the (divergent) expectations and reflects the confidence of financial investors in an economy. Therefore, as with the prices of other financial instruments, an exchange rate is subject to the bulls-and-bears behaviour of financial investors. Thus, a bearish sentiment in the foreign exchange market is also associated with the expectation that financial positions will deteriorate, like a bearish sentiment in other financial markets. In both cases prices may fall.

Lastly, a drop in autonomous investment in foreign economies may cause a drop in exports from the domestic economy. If these foreign companies do not decrease their wage bill, only the exports of investment goods are affected. However, if companies in foreign economies also decrease their wage bill, the exports of both investment and consumption goods may be affected. The result of the reduction in exports is a decline in the profits of domestic companies. This has much the same effect on the profits of the corporate sector as a reduction in investment.[15]

[15] However, where investment was added and subtracted from the primary balance of the corporate sector, the net change is zero, while a reduction in exports causes the primary surplus of the corporate sector to deteriorate. Exports are just subtracted, so that with a decrease in exports both the operating profit and the primary surplus of the corporate sector decrease.

If creditor households perceive the decline in exports as permanent, the reduction in profits may cause a reduction in the value of equity and hence, an increase in the debt/equity ratio. This is a shifting equilibrium, where the equilibrium in the domestic economy adjusts to the shift in equilibrium in the foreign economy. However, if the reduction is perceived as temporary, the debt/equity ratio is not affected and creditor households will view the lower dividend rate as temporary. This occurs with a stationary equilibrium. Therefore, the question is whether or not the drop in exports depresses long-run expectations and the confidence that financial investors hold in these long-run expectations.

If the same waves of bearishness and bullishness affect both domestic and foreign investors, the domestic and foreign effects occur simultaneously. Thus, both domestic and foreign investors react in the same manner. This is increasingly likely in an increasingly globalised international economy. Therefore, the reaction of both domestic and foreign investors has nothing to do with the openness of the economy, but with the fact that domestic and foreign investors increasingly share the same views. Thus, even if an economy is relatively closed, domestic and foreign investors may still react in the same manner. In addition, the distinction between foreign and domestic investors is becoming less clear with the emergence of truly international financial investors and multinational corporations. Thus, it becomes increasingly senseless to distinguish between the behaviour of foreign and domestic investors. Therefore in conclusion, the foreign sector does not create an escape hatch; in fact, it can magnify the domestic process and be the cause of a domestic economic crisis.

6.8 Conclusion

Using the general balance framework, this chapter has shown how financial unsustainability, caused by uncertainty, is prone to spread among non-governmental agents and its effect amplified and aggravated via the linkages that exist between their financial positions. Economic instability then becomes the collective term for the system-wide unsustainability in the financial positions of non-governmental agents. In addition,

because of the uncertain environment in which agents operate, unsustainability may be a recurring phenomenon.

The ability of agents to restore financial sustainability and, therefore, economic stability depends on how large the adjustment is that they need to make to their profit positions. If the adjustment is small, companies may be able to make the adjustment (i.e. it is a reversible shift of the equilibrium). However, if the adjustment is large, companies may not be able to make the necessary adjustment to their profit positions on their own (i.e. it is an irreversible shift of the equilibrium), so that there may be a role for a stabilisation policy by government to help them adjust. The next two chapters indicate that the distinction between an irreversible and a reversible shift of the equilibrium has significant implications for the rules on fiscal sustainability. In addition, because of the link between the financial position of government and those of non-governmental agents, fiscal sustainability is inextricably enmeshed with issues pertaining to the financial sustainability of non-governmental agents and therefore to economic stability. The next two chapters also consider this enmeshment because it also influences the rules on fiscal sustainability.

Appendix 6.1 – The impact of uncertainty on investment: An increase in the interest rate in the case of a shifting equilibrium

This appendix considers the role that the interest rate can play in rendering the financial position of economic agents more fragile. A decrease in expected income and a loss of confidence about expected profits may spur creditors to demand a higher rate of return on their investment. As the previous chapter argued, the price of new capital goods and the expected rate of return on investment must trail the price and interest rate established in the bulls-and-bears market. If creditors experience more uncertainty – i.e. they lose confidence in their expectations – it may cause the interest rate established on the bulls-and-bears market to increase (given that the money supply remains constant). Investment will decrease because the price of new capital – established through the interaction of the supply and demand prices of new capital – has to trail the bulls-and-bears price.

A higher interest rate has several implications for companies. A higher interest rate means that interest costs lay a larger claim to corporate income. In addition, the required rate of return on equity also may increase when the interest rate increases (the opportunity cost to hold equity increases if the interest rate on bonds increases). An increase in the required rate of return on equity means that the rate at which future dividend income is discounted increases. This is aggravated if the economic growth rate also decreases, so that future dividend income is expected to grow at a lower rate. In terms of equation 1, a higher interest rate and required dividend rate means that the (r-g) and (d-g) for companies increase. Thus, the primary surplus required to prevent a deterioration in corporate financial positions (as manifested in the debt-plus-equity/GDP ratio) increases. A higher discount rate and a larger claim of interest payments on income means shares are valued downward. The change in the value of shares is measured by equation 6a, which is an amended version of equation 6. Note that depressed expectations may cause the expected operating profit to decrease as well.

$$\Delta PV = (P2_t - r2_L D_t)/d2 - (P1_t - r1_L D_t)/d1 \qquad (6a)$$

where d1: The discount rate before the change in the interest rate

d2: The discount rate after the change in the interest rate

P1: The operating profit expected for period t before the increase in the interest rate

P2: The operating profit expected for period t after the increase in the interest rate

D: Debt

r1: The interest rate before the increase

r2: The interest rate after the increase

With an increase in the interest rate and the discount rate and a decrease in the expected operating profit (causing P2 to be lower than P1), the change in the present value of shares is negative. Substituting equation 6a into equation 7 yields the change in the debt/equity ratio. Note that the change brought about by an increase in the interest rate is additional to the change brought about by the decrease in investment, which is captured in the reduction of P. This is also in addition to the effect of a reduction in the economic growth rate.

Thus, to summarise, an increase in the debt/equity ratio of companies may result from a decrease in investment and the growth rate and an increase in the interest rate. In turn, these variables change because of a change in long-run expectations.

Chapter 7

Establishing fiscal sustainability amidst uncertainty, economic instability and general balance effects: Towards more sophisticated policy rules

The mainstream prescription for attaining fiscal sustainability is unambiguous: government should run a large enough primary surplus (see chapters 2 and 3). However, the difficulties experienced by several governments in their attempt to maintain or restore fiscal sustainability indicate that it is not always as simple as that. Several factors seem to affect the ease with which a government can run a sustainable fiscal policy. These factors include the general balance effect discussed in chapter 4, the uncertainty and subjectivist expectations considered in chapter 5, and the spreading of financial unsustainability and economic instability in non-governmental sectors considered in chapter 6. This chapter considers how these factors influence the validity and application of the mainstream rule on how to maintain a sustainable fiscal policy. It serves as a basis for developing a menu of rules, in the concluding chapter, that embeds the quest for fiscal sustainability in a broader policy context that recognises the inescapable enmeshment of fiscal sustainability with other policy objectives including, in particular, a stabilisation policy.

One of the central insights of chapters 5 and 6 is that significant cyclical instability and downturns remain likely, because of fundamental uncertainty. This implies the likelihood of recurring pressure on governments to run stimulating deficit policies. Given a sustainable fiscal policy and a non-increasing debt/GDP ratio before the downturn, a stabilisation policy that uses the deficit as a policy instrument will cause the debt/GDP ratio to increase. This is an exogenous policy dependent but cycle-related potential cause of fiscal unsustainability. The inherent instability of the economy and the use of deficits to counter it may cause government to repeatedly find itself in a position where it is outside the 'rules' of sustainability and where it eventually has to consider re-establishing fiscal sustainability. Government will then also have to consider the possibility that a

policy to restore fiscal sustainability may cause instability and unsustainability in the financial position of non-governmental agents.

Both this chapter and the next chapter argue that stabilisation policy and policy aimed at restoring and maintaining fiscal sustainability are so enmeshed that it is impossible to separate the two into two neat policy compartments or to abstain from the one while pursuing the other. Instead of being two separate policies, they represent two dimensions of the same (fiscal) policy. If one considers economic instability as the collective term for the widespread unsustainability in the financial position of non-governmental agents (see chapter 6), it becomes apparent that this enmeshment is also a feature of the problems addressed by stabilisation policy and by policy aimed at restoring fiscal sustainability. *Thus, stabilisation policy instils economic stability by instilling sustainability into the financial position of non-governmental agents.* Because the stabilisation policy uses the expenditure and revenue components of the primary balance of government, the policy influences the sustainability of fiscal policy, and because re-establishing fiscal sustainability later on uses these same components, it may influence the stability of the economy and even cause economic instability. *Hence, stabilisation policy and policy aimed at restoring and maintaining fiscal sustainability are two sides of the same coin: each rand that flows into or out of government has both a stabilisation and a fiscal sustainability dimension.*

In addition to an exogenous cause, there is a potential endogenous, cycle-related cause of fiscal unsustainability. Using the general balance framework, chapter 6 indicated how unsustainability in the private sector spreads via the linkages between budgetary positions to produce economic instability. However, since the financial positions of government and non-governmental agents are linked, the unsustainability may also spread to government if the deficit increases endogenously because of weaker economic conditions, thereby causing the fiscal position of government to deteriorate and eventually become unsustainable.

The exogenous and endogenous causes of fiscal unsustainability imply that the enmeshment of unsustainability and instability exists on two levels. On the one level, the problem of widespread unsustainability in the financial position of non-governmental agents is classified as economic instability. This is the result of the spread of unsustainability from a few non-governmental agents to the vast majority of non-governmental agents in the economy. This widespread unsustainability (instability) may endogenously cause fiscal policy to become unsustainable as the unsustainability in the financial position of non-governmental agents spills over into the financial position of government. On the second level, which is the policy level, a stabilisation policy causes fiscal policy to become unsustainable and prevents the unsustainability in the financial position of non-governmental agents to spread further. However, the need to re-establish fiscal sustainability later on, when government pulls back the stabilisation policy, has the potential of shifting the unsustainability back to non-governmental agents (unless, as the discussion below demonstrates, certain conditions are met). The potential shifting back of unsustainability means that government may also be a cause of economic instability.

Nevertheless, economic instability is not the only factor that may cause fiscal unsustainability. It was mentioned in chapter 2 that in South Africa there is pressure on government to expand its social expenditure. Other developing countries have experienced similar pressure, many of them yielding to the pressure. Among the developed countries, several of them have experienced significant fiscal pressure due to the escalation of costs associated with entitlement and social welfare programs and low economic growth. As many developed and developing countries have experienced significant increases in their debt/GDP ratios due to these socio-political reasons, they also have to consider the impact of establishing a sustainable fiscal policy on the financial position of non-governmental agents. As is the case with the cycle-related increases in the debt/GDP ratio, government will have to consider the possibility, raised in chapter 4, that when it shifts the imbalance in its financial position to the other sectors to establish fiscal sustainability it may shift unsustainability to the other sectors.

A further reason for unsustainability is when government increases expenditure to cope with the effects of a natural or man-made disaster. It must then also restore fiscal sustainability once the crisis has passed. The question is whether or not the establishment of fiscal sustainability in this case poses the same difficulties as in the case of cycle-related unsustainability or unsustainability due to socio-political pressure.

Chapter 7 approaches the above cyclical and socio-political causes of fiscal unsustainability in six sections. Section 7.1 sets out two reference scenarios against which to compare the scenarios set out in sections 7.2 to 7.4. The first reference scenario is a description of the economy if no downturn takes place and the second scenario represents the economy if a downturn does take place, but government does not react to it. The scenarios are stated in terms of the general balance framework to demonstrate the interaction between different sectors of the economy.

Following the exposition of the reference scenarios, section 7.2 demonstrates the direct sectoral impact of re-establishing fiscal sustainability if unsustainability was endogenously caused by the spread of instability/unsustainability from non-governmental sectors to government – a typical cyclical downturn. Because re-establishing fiscal sustainability at the time when fiscal policy becomes unsustainable may entail a shift of unsustainability from government to non-governmental sectors, the section considers whether government may have to first stabilise the economy before attempting to restore fiscal sustainability.

Section 7.3 demonstrates the impact of a stabilisation policy on the sustainability of fiscal policy, whereas section 7.4 considers how the impact of subsequently establishing a sustainable fiscal policy is influenced by whether or not non-governmental agents met the precondition necessary for the success of the *stabilisation* policy. The penultimate section (section 7.5) of the chapter considers the establishment of fiscal sustainability when the unsustainability was caused by non-cyclical, socio-political pressure. The section also considers the ease with which fiscal sustainability can be attained given the cyclical position of the economy. The last section of the chapter (section 7.6) describes very

briefly the re-establishment of fiscal sustainability when unsustainability was caused by the reaction of government to a shock like a natural or man-made disaster.

7.1 The reference scenarios

The scenarios are stated in terms of the general balance framework to demonstrate the interaction between different sectors of the economy. To this end, the general balance framework comprises three sectors: a government sector, a corporate sector and a household sector. In these scenarios the household sector is assumed to have no debt and to own all the securities (in the form of equity and debt) issued by companies and government. The corporate and government sectors own no financial assets.

7.1.1 The economy in the absence of a recession – the steady debt/GDP scenario

Both this section and the next section create reference scenarios against which to compare the results of sections 7.2, 7.3 and 7.4. In the economy described in this section all financial (including debt) positions are and remain stable and sustainable as the economy grows at a steady state 5%: there is no increase in the indebtedness of either the corporate or the government sector. There also is no increase or decrease in the financial asset position of the household sector. Suppose the real interest rate is 10% and the same interest rate (and growth rate) applies to all economic agents. Furthermore, the total wage bill, consumption and investment also increase by 5% (thus, the composition of GDP and GDE remains unchanged).

Assume that public debt equals 50 in period t-1, while GDP in period t equals 210 (as against 200 in period t-1). To run a sustainable fiscal policy government in period t runs a primary balance (surplus) of –2.5 (note: – in the case of a surplus; + in the case of a deficit): that is the primary surplus needed to offset the upward pressure of the $(r_{gt} - g_t)D_{gt-1}$ term (which equals 2.5) on the debt/GDP ratio in equation 1:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t \qquad (1)$$
$$\equiv (0.1 - 0.05)50/210 - 2.5/210$$
$$\equiv 0$$

This also means that government runs a conventional deficit of 2.5 (i.e. interest cost of 5 plus a primary surplus of – 2.5 (where (-) is a surplus and (+) a deficit)). Hence, there is no increase in the debt/GDP ratio of government: nominal GDP grows by 5% (= 10) and nominal debt grows by 5% (= 2.5).

As far as the corporate sector is concerned, assume that in period t-1 the corporate sector has debt of 200 and equity of 300. In period t the corporate sector issues new bonds to the value of 10 (so that debt grows by 5%) and equity of 15 (so that equity grows by 5%) to finance investment of 25 (so that total capital grows by 5%), i.e. the capital stock, like the economy, grows by 5%. In a steady state the operating profit of the corporate sector must be large enough for companies to pay both interest and dividends. Because the interest and dividend rate equals 10%, an operating profit of –50 in equation 2 (– when a profit; + when a loss) will allow companies to pay the 20 in interest (10% of 200) and the 30 in dividends (10% of 300) required by creditors (the –50 in operating profits thus covers the combined interest and dividend cost of 50). Then the impact on the debt and equity position of the corporate sector is:

$$\Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t \equiv (r_{ct} - g_t)D_{ct-1}/Y_t + (d_{dt} - g_t)E_{dt-1}/Y_t + B_{ct}/Y_t \qquad (2)$$
$$\equiv (0.1 - 0.05)200/210 + (0.1 - 0.05)300/210 - 50/210 + 25/210$$
$$\equiv 0$$

The position of the household sector is (and must be because of the linkages between sectoral balances) just the combined mirror image of the government and corporate sectors: a primary balance (a deficit in this case) of 27.5. Thus for the household sector:

$$
\begin{aligned}
-\Delta A_{ht}/Y_t &\equiv -(r_{hAt} - g_t)A_{ht-1}/Y_t + B_{ht}/Y_t \qquad (3)\\
&\equiv -(0.1 - 0.05)200/210\\
&\quad -(0.1 - 0.05)300/210\\
&\quad -(0.1 - 0.05)50/210\\
&\quad +27.5/210\\
&\equiv 0
\end{aligned}
$$

To recapitulate: in this 5% steady growth and debt reference scenario the government debt/GDP ratio, the net financial asset/GDP ratio of households and the debt-plus-equity/GDP as well as debt/equity ratios of the corporate sector are steady. This means that government debt, corporate debt and equity and household financial assets all grow at the 5% at which the economy grows, thereby leaving the ratios unaltered. Lastly, note that the primary balances of all three sectors sum to zero ($0 \equiv -25 - 2.5 + 27.5$), as they always must do in terms of the general balance identity.

7.1.2 A severe recession without any contra-cyclical policy – the deteriorating debt/GDP scenario

The second reference scenario portrays an economy where a severe recession takes place, but government takes no policy steps to stabilise the economy. Assume first that in this scenario, as in the first reference scenario, the debt/equity ratio in period t-1 is 2:3 (i.e. 200 debt and 300 equity). Furthermore, assume that in the second reference scenario expectations turn sour and companies expect zero economic growth (and thus, no growth in their sales). Expectations turn sour when creditors (and companies themselves) recognise the financial fragility of the corporate sector due to the continuous increase in debt/equity ratios during the preceding boom and fear that this fragility will endanger the growth potential of companies and the economy. Therefore, companies have to reduce

their debt/equity ratios before confidence is restored. Thus, assume that creditors consider the 2:3 debt/equity ratio as too high.

With an expected zero economic growth companies will also not expand their capital. The corporate sector will refrain from investment.[1] Because of the drop in investment, the capital stock of companies does not grow by the five percent of subsection 7.1.1. In the extreme case, considered here, investment falls to zero. In less extreme cases investment would be lower but still positive. In this example companies also refrain from hiring the extra labour necessitated by an increase in investment, simply because there is no new investment. Thus, total wages do not increase either. With no expected improvement in either wages or profits, consumption, which is dependent on wages and profits, does not increase. Therefore, because investment is assumed to fall in the period when the recession strikes, the GDP shows a once-off fall in level because of the fall in investment in that period (investment is part of GDP) and is then not expected to grow after the reduction (the economic growth rate is expected to be zero).

Suppose that government decides not to prop up the profit position of companies via adjustments in taxes or government expenditure. In times of recession the primary deficit of government may increase as the economic weakness causes entitlement expenditure to increase and tax revenue to fall. However, assume for the sake of simplicity that this does not happen. Thus, the primary balance of government does not change so that the conventional deficit is at 2.5 as in the first reference scenario (see equation 1). Then the impact on the debt/GDP ratio of the once-off fall in the level of GDP and the zero economic growth rate is:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/(Y_t - \Delta Y_t) + B_{gt}/(Y_t - \Delta Y_t) \qquad (1)$$
$$\equiv (0.1 - 0)50/(210 - 25) - 2.5/(210 - 25)$$
$$\equiv 0.0135$$

[1] Note that the analysis does not consider depreciation. Thus all investment is net investment. The model can be altered to allow for depreciation, but it would only complicate the analysis without adding additional insight. See chapter 4 for more detail.

Even though government does not change its primary balance, the public debt/GDP ratio increases because of the once-off decrease in the level of income (i.e. GDP, the denominator in all the terms of equation 1) and the zero expected economic growth rate that causes the $(r_{gt} - g_t)D_{gt-1}$ term in equation 1 to exceed the primary surplus. (Debt will grow even more if the primary balance increases due to an increase in entitlement expenditure or a reduction in taxation.) If this policy stance is continued, fiscal policy becomes unsustainable. This is an endogenous, cycle-related increase in the debt/GDP ratio.

Because of the assumption that companies do not invest, investment in period t is 25 lower than it would have been had the economy continued to grow at five percent, as in the first reference scenario. Thus, the income of companies selling investment goods is 25 lower than in subsection 7.1.1, which, in addition, means that for period t the operating profit of the corporate sector is – 25 instead of the – 50 it would have been, had the first scenario prevailed (–50 plus the drop of + 25 because of the lower sales of investment goods).[2] The decrease in operating profits reduces the value of equity. The change brought about by the decrease in operating profit in the value of equity is:

$$\Delta PV = (P2_t - r_L D_t)/d - (P1_t - r_L D_t)/d \qquad (4)$$
$$= (25 - 20)/0.1 - (50 - 20)/0.1$$
$$= 5/0.1 - 30/0.1$$
$$= -250$$

The reason for the decrease in the value of equity is that the operating profit, – 25 in the example, is insufficient to pay both interest and the required dividend, totalling 50 in the example. Because interest is a contractual charge and, therefore, has a first claim on the operating profit prior to dividends, the corporate sector is not able to pay the required dividend. In some cases companies may not even have enough operating profit to pay

[2] Note that this analysis abstracts from the secondary effects that a contraction in investment may cause (see chapter 6, section 6.4.3). Thus, it does not include the retrenchment of labour in reaction to a fall in profits. The reason for this is that section 7.3 will explore how to prevent a secondary effect by focusing on preventing the initial effect.

interest. Substituting equation 4 into equation 5 below yields the decrease in the debt-plus-equity/GDP ratio to the sector:

$$\begin{aligned}\Delta E_t/(Y_t - \Delta Y_t) + \Delta D_t/(Y_t - \Delta Y_t) \equiv\ & (d_{required} - g)E_{t-1}/(Y_t - \Delta Y_t) \\ & + (1 + d_{required})\Delta PV_t/(Y_t - \Delta Y_t) \\ & + (r_d - g)D_{t-1}/(Y_t - \Delta Y_t) \\ & + P_t/(Y_t - \Delta Y_t) \qquad (5) \\ \equiv\ & (0.1 - 0)300/(210 - 25) \\ & - (1 + 0.1)250/(210 - 25) \\ & +(0.1 - 0)200/(210 - 25) \\ & -25/(210 - 25) \\ \equiv\ & -1.35\end{aligned}$$

Since debt cannot decrease in value – it is a contractual agreement – a decrease in the debt-plus-equity/GDP ratio means that only the value of equity can decrease. Thus, the debt/equity ratio increases. The value of equity decreases by 250 (as calculated by equation 4), from the 300 it was assumed to be, to 50, so that the debt/equity ratio increases from the 2:3 (the ratio of 200 debt to 300 equity) it was assumed to be, to 4:1 (200 debt to 50 equity). The debt/equity ratio will not decrease later on unless companies take steps to reduce it. However, if companies need to take these steps, they may trigger the secondary effects, the irreversible shift in equilibrium discussed in chapter 6, that causes the economic downturn to worsen.

Being the mirror image of the government and corporate sectors, the household sector is also affected. The reduction in the value of equity means that the holding of equity in private portfolios relative to the debt instruments of other sectors owned by households has decreased. The positive value with which the financial asset/GDP ratio of the household sector changes, indicates a *reduction* in the holding of financial assets and more specifically of equity (recall that financial assets and an increase in financial assets have a negative sign, so that a positive sign means a reduction in the financial asset/GDP ratio). This implies a weakening in the financial position of the household sector that is

just the mirror image of the weakening that took place in other financial positions. Thus, for the household sector:

$$
\begin{aligned}
-\Delta A_{ht}/Y_t &\equiv -(r_{hAt} - g_t)A_{ht-1}/Y_t + B_{ht}/Y_t \qquad (3)\\
&\equiv -(0.1 - 0)300/(210 - 25)\\
&\quad + (1 + 0.1)250/(210 - 25)\\
&\quad - (0.1 - 0)200/(210 - 25)\\
&\quad - (0.1 - 0)50/(210 - 25)\\
&\quad + 27.5/(210 - 25)\\
&\equiv +1.338
\end{aligned}
$$

The primary balances sum to zero ($0 \equiv -25 - 2.5 + 27.5$) because of the general balance identity.

To summarise: When expectations turn sour, investment is likely to fall, causing the debt/equity ratio of companies to increase. The fall in investment also causes a once-off fall in the level of GDP and, furthermore, causes the economic growth rate to decline (to zero in the above scenario). This, in turn, causes fiscal policy to become unsustainable endogenously. In addition, the decline in the value of equity causes the net financial asset position of (creditor) households to deteriorate.

7.2 Re-establishing fiscal sustainability if unsustainability has been caused endogenously

If unsustainability and imbalances in financial positions spread through non-governmental sectors via the link between financial positions, it will in all likelihood also affect the financial position of government. The fall in income and the growth rate (depicted in the second reference scenario above) together with a possible fall in revenue collections and an increase in government expenditure, may put upward pressure on the deficit and debt/GDP ratio. Government faces the question, addressed in this section, whether or not it should follow the mainstream prescription and increase its primary

surplus to prevent an increase in the debt/GDP ratio and to restore fiscal policy to a sustainable path. If it does, equation 1 below describes the required financial position of government:

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t \qquad (1)$$
$$\equiv (0.1 - 0)50/(210 - 25) - 5/(210 - 25)$$
$$\equiv 0$$

Compared with the second reference scenario where government ran a primary surplus of –2.5, it now has to run a primary surplus of –5 to prevent an increase in the public debt/GDP ratio.[3] The primary surplus of –5 is necessary to offset the upward pressure of 5 that the $(r_{gt} - g_t)D_{gt-1}$ term places on the debt/GDP ratio.

However, the larger primary surplus has the potential of *further destabilising* the financial position of non-governmental agents. Because the sum of all primary balances must add to zero, the larger primary surplus of government means that one or more of the non-governmental sectors must run a larger primary deficit (or smaller primary surplus). Assume that in this scenario the corporate sector absorbs the larger primary surplus of government by running a smaller primary surplus. This means that its operating profit decreases.

The decrease in the primary surplus of the corporate sector is additional to the decrease that took place in the second reference scenario (due to the decrease in investment and GDP) and that constitutes the reason why there was upward pressure on the public debt/GDP ratio in the first place. The decrease in operating profit resulting from the initial instability *and* the subsequent increase in the primary surplus of government brings about a change in the value of equity equal to:

[3] Assume that government attains the higher primary surplus by increasing taxes so that GDP remains stable at least in the first round of the multiplier.

$$\Delta PV = (P2_t - r_L D_t)/d - (P1_t - r_L D_t)/d \qquad (4)$$
$$= (22.5 - 20)/0.1 - (50 - 20)/0.1$$
$$= +2.5/0.1 - 30/0.1$$
$$= -275$$

Note that this decrease in the value of equity exceeds the decrease of the second reference example by –25. This is due to the increase in the primary surplus of government. Substituting equation 4 into equation 5 below yields the decrease in the debt-plus-equity/GDP ratio:

$$\begin{aligned}\Delta E_t/(Y_t - \Delta Y_t) + \Delta D_t/(Y_t - \Delta Y_t) \equiv\ & (d_{required} - g)E_{t-1}/(Y_t - \Delta Y_t) \\ & + (1 + d_{required})\Delta PV_t/(Y_t - \Delta Y_t) \\ & + (r_d - g)D_{t-1}/(Y_t - \Delta Y_t) \\ & + P_t/(Y_t - \Delta Y_t) \qquad (5) \\ \equiv\ & (0.1 - 0)300/(210 - 25) \\ & - (1 + 0.1)275/(210 - 25) \\ & +(0.1 - 0)200/(210 - 25) \\ & -22.5/(210 - 25) \\ \equiv\ & -1.49\end{aligned}$$

Note that the decrease in the debt-plus-equity/GDP ratio of the corporate sector exceeds the decrease of –1.35 that would take place if government did not attempt to stabilise its debt/GDP ratio when faced by a recession (the second reference scenario).

The household sector, as owners of all financial assets in these scenarios, is merely the combined mirror image of the government and corporate sectors. This is also reflected in the primary balances of the three sectors that sum to zero ($0 \equiv -22.5 - 5 + 27.5$). Thus, for the household sector:

$$
\begin{aligned}
-\Delta A_{ht}/Y_t &\equiv -(r_{hAt} - g_t)A_{ht-1}/Y_t + B_{ht}/Y_t \qquad (3)\\
&\equiv -(0.1 - 0)300/(210 - 25)\\
&\quad + (1 + 0.1)275/(210 - 25)\\
&\quad - (0.1 - 0)200/(210 - 25)\\
&\quad - (0.1 - 0)50/(210 - 25)\\
&\quad + 27.5/(210 - 25)\\
&\equiv +1.49
\end{aligned}
$$

Compared to the increase of 1.338 in the second reference scenario (which represents a drop in the value of their financial asset/GDP ratio), the increase of 1.49 in this scenario indicates that the financial position of households deteriorates more than in the second scenario because the value of their financial asset/GDP ratios falls further. The seriousness of this fall depends on whether or not companies can make the necessary adjustments in their financial position, which in turn, will determine whether or not the financial position of households will improve.

Given this possible adverse impact of government on non-governmental financial positions, the question is whether or not government should indeed restore fiscal sustainability when economic instability strikes. What are its options to restore fiscal sustainability? The first option is for government to restore fiscal sustainability only if its impact will not push corporate debt/equity ratios significantly beyond the point that creditors tolerate. Non-governmental agents may then be able to absorb the impact of the re-establishment of fiscal sustainability and make the necessary adjustments in their financial positions, discussed in chapter 6, without causing further instability. Thus, government will be able to shift the *imbalance* in its financial position to non-governmental agents without also shifting the *unsustainability* to them.

However, if the shift of the imbalance pushes corporate debt/equity ratios far beyond the ratios that creditors tolerate, government may actually contribute to further economic instability. As a second option, government may then have to consider running a

stimulating stabilisation policy before restoring fiscal sustainability. This requires an increase in the deficit and hence, an increase in the debt/GDP ratio.

7.3 *The need for a stabilisation policy and the impact of the policy on fiscal sustainability*

The need for a stabilisation policy in recessionary conditions arises when there is an irreversible shift of equilibrium that causes a large and permanent decline in profit which, in turn, causes the debt/equity ratios of the corporate sector to increase far beyond the level that creditors tolerate. The shift in equilibrium is due to creditors who recognise the financial fragility of companies – because of the continuous increase in debt/equity ratios during the preceding boom – that threatens economic growth. Because of the large adjustment companies need to make, creditors may have little confidence in the ability of companies to improve their profitability. This lack of confidence may set off the amplifying effects, discussed in chapter 6, that cause the spread of unsustainability (via the linkages between financial positions). A stabilisation policy is needed to prevent this.[4] A stabilisation policy is not needed in the case of a stationary equilibrium or a reversible shift of equilibrium, because there is no threat of amplifying effects.

If government increases the deficit (higher expenditure and/or lower taxes) to stabilise the economy during a downturn,[5] the larger deficit props up the profits of companies and may prevent a deterioration in the debt/equity ratio of companies. However, any increase in the primary deficit (or reduction in the primary surplus) to stabilise the economy will

[4] In addition to fiscal policy, government may also use monetary policy to stabilise the economy. However, the study of monetary policy as stabilisation policy falls outside the scope of this thesis.

[5] Note that the focus is on the impact of government on the growth rate and not so much its impact on the level of GDP. Standard textbook models such as the IS-LM models focus on the impact of government policy on the level of GDP. This focus remains even in the IS-MP model of Romer (2000; 1999), which is a modern version of the original IS-LM model by Hicks (1937). In the Keynesian and Minskian set-up instability in the economy originates in the instability of investment, including net investment. Net investment represents an addition to the capital stock. However, the capital stock cannot grow indefinitely without contributing to an expanding GDP. Thus, net investment usually takes place only in an economy that grows. Therefore, in a Keynesian or Minskian model that focuses on the instability of investment, the concern is the instability in the growth rate of income and not so much the instability of income itself.

cause fiscal policy to become unsustainable,[6] assuming that government ran a sustainable fiscal policy prior to the downturn (i.e. the debt/GDP ratio would have remained unchanged). Compared with the first scenario (subsection 7.1.1 above) where government would run a primary surplus of 2.5 in the case of no recession, it increases its non-interest expenditure or reduces its tax revenue in this scenario by an amount of 25, which equals the amount with which private investment decreased. This change in government expenditure and revenue offsets the downward pressure of the reduction of investment on the operating profits of companies. Therefore, in this fourth scenario where government attempts to stabilise the economy, it runs a primary deficit of 22.5 during the recession (that is, the initial primary surplus of –2.5 plus the increase in expenditure or reduction in taxation of 25):

$$\Delta D_{gt}/Y_t \equiv (r_{gt} - g_t)D_{gt-1}/Y_t + B_{gt}/Y_t \qquad (1)$$

$$\equiv (0.1 - 0.05)50/210 + 22.5/210$$

$$\equiv 0.119$$

Because government runs the primary surplus when the real interest rate exceeds the real growth rate, the debt/GDP ratio of government increases (i.e. both $(r_{gt} - g_t)D_{gt-1}/Y_t$ and B_{gt}/Y_t in equation 1 are positive). In the example it increases from 0.25 to 0.369 (debt of 77.5 divided by GDP of 210). Furthermore, because of the increase in the primary deficit, the conventional deficit of government increases to 27.5 (that is, the 22.5 of the primary deficit plus the 5 of the interest (=10% on 50 debt) that government pays). Thus, government borrows 25 more than it would have borrowed if there was no recession (the first reference scenario where the conventional deficit equals 2.5) and if it did not react to the recession (the second reference scenario). The primary deficit ensures that the corporate sector earns 25 more income. This increases the operating profit of the

[6] The statement that fiscal policy becomes unsustainable does not mean that the public debt/GDP ratio is excessive in the short-run or during the period when the stabilisation policy is in place. It merely means that the levels of government expenditure and revenue during the period when the stabilisation policy is implemented, is such that if these levels remain as such indefinitely (or over an extended period of time), the debt/GDP ratio of government will tend to explode and, therefore, become excessive.

corporate sector by 25 (from 25 in the second reference scenario to 50). The increase in operating profit, in turn, allows companies to pay the 20 in interest and the 30 in dividends mentioned in the two reference scenarios (subsections 7.1.1 and 7.1.2). Thus, companies can pay the dividend rate required by creditors, which in turn prevents the downward valuation of shares, an increase in the debt/equity ratio and a reduction in the debt-plus-equity/GDP ratio[7]:

$$\begin{aligned}\Delta D_{ct}/Y_t + \Delta E_{dt}/Y_t \equiv\ & (r_{ct} - g_t)D_{ct-1}/Y_t \\ & + (d_{dt} - g_t)E_{dt-1}/Y_t \\ & + B_{ct}/Y_t \qquad (2)\\ \equiv\ & (0.1 - 0.05)250/210 + (0.1 - 0.05)250/210 \\ & - 50/210 \\ \equiv\ & 0\end{aligned}$$

The above means that the imbalance in the corporate sector is shifted to the government sector. This shift renders the financial position of the corporate sector sustainable and that of government unsustainable, as can be seen in the stabilisation of the debt/equity ratio of the corporate sector and the increase in the public debt/GDP ratio. Thus, the stabilisation policy is characterised by a shifting of unsustainability, an indication of the enmeshed nature of sustainability and economic stability aspects.

Because fiscal policy is unsustainable, government cannot prevent a deterioration in the financial position of companies indefinitely – government will have to shift the imbalance back to the corporate sector at some later date when it reduces the deficit and re-establishes fiscal sustainability. In addition, once government restores fiscal sustainability, it has to reduce the ratio to its pre-recession level – it will not suffice to

[7] The temporary stabilisation of the economy is necessary if economic agents want to make the adjustments necessary for the stabilisation policy to succeed. Therefore, this section assumes that government is able to stabilise at least temporarily the financial position of agents. However, government may not succeed even to temporarily stabilise the profits of companies. Hicks (1975:18-19) argues that "[i]t would indeed seem to be quite difficult, if the shortage of materials is at all widespread, for the 'Keynesian' expansion to get started, except on a very limited scale". He (1975:23-28) shows that for fiscal policy to be successful, there must be ample surplus stocks of material in fixprice markets.

merely stabilise the debt/GDP ratio at the higher level to which it increased during the recession. This means that the primary surplus will have to increase with more than the amount by which it decreased when government first implemented the stabilisation policy. If government does not reduce the debt/GDP ratio, there is nothing to offset the increases that occur every time there is a recession. After a few recessions the ratio may exceed the level that creditors are willing to finance, hence restricting the room for government to use stabilisation policy. One way to reduce the ratio is if economic growth is strong in the aftermath of a recession. The ratio can then decrease endogenously, without an explicit policy decision. However, unless the growth rate is higher than the pre-recessionary rate, the only way, *ceteris paribus*, to restore fiscal sustainability is a relatively large change in the primary surplus that exceeds the amount by which it decreased when government implemented the stabilisation policy.

7.4 *Re-establishing fiscal sustainability if unsustainability has been caused by a stabilisation policy*

The danger exists that when government shifts the imbalance back it may also shift the unsustainability back, particularly if confidence has not been restored, so that investment still does not take place. This means that companies have to address the underlying problem that caused the loss of confidence and the drop in investment that threatened their financial position in the first place. Thus, they must use the window of time that government buys for them with the stabilisation policy, to reduce the 2:3 debt/equity ratio (deemed too high by creditors in the second scenario). If they succeed, government can shift the *imbalance* back to the corporate sector without also shifting the *unsustainability* back. However, if they fail, companies will return to the dismal position they were in just after the downturn set in and prior to the initiation of the stabilisation policy. To consider the need for companies to reduce their debt/equity ratios, this section extends the scenario sketched in the previous section.

Assume that in the aftermath of a stabilisation policy government wants to reduce the public debt/GDP ratio to its pre-recession level by reducing non-interest expenditure

and/or by increasing its tax revenue. Assume further that the post-recession growth rate is 5%, whereas the real interest rate is 10%. To reduce the ratio, the primary surplus must exceed the primary surplus needed to just stabilise the debt/GDP ratio at the post-recessionary level. Whereas the primary surplus would equal – 3.875 in period t+1 if government just wants to stabilise the debt/GDP ratio at its post-recessionary level, it now has to equal – 30.125 in period t+1 to reduce it to its pre-recessionary level:

$$\Delta D_{gt+1}/Y_{t+1} \equiv (r_{gt+1} - g_{t+1})D_{gt}/Y_{t+1} + B_{gt+1}/Y_{t+1} \qquad (1)$$
$$\equiv (0.1 - 0.05)77.5/220.5 - 30.125/220.5$$
$$\equiv -0.119$$

The difference between – 3.875 and – 30.125 is 26.25. For government to just stabilise the debt/GDP ratio by running a primary surplus of – 3.875, it would already have to reduce expenditure or increase taxation (as it goes from a stimulating to a neutral policy). Thus, to reduce the debt/GDP ratio to its pre-recession level requires a further cut in expenditure or increase in taxation to increase the primary surplus to – 30.125.

The combined effect of the move first to a neutral policy and then to a larger primary surplus to reduce the debt/GDP ratio, constitutes the imbalance that government shifts to the corporate sector. The question is whether or not this shift of imbalance to the corporate sector also shifts the unsustainability back to the corporate sector. The answer depends on whether or not companies can improve their profitability. Increased profitability creates a buffer to absorb the shift of the imbalance from government. If companies want to improve their profitability, they have to restructure their capital and production processes to increase the productivity of both capital and labour. Lachmann (1956:125) argues that the restructuring of capital and production processes (which he termed as 'capital regrouping') is the "...necessary corrective for the maladjustment..." caused by booms. Higher productivity restores the confidence of creditors so that they will allow companies to resume investment, whereas higher profitability allows for the upward valuation of equity and, thus, for the reduction of debt/equity ratios. In brief, the following occurs:

1) If confidence is restored, companies can resume investment. Thus, government is no longer required to prop up the profits of companies (recall that initially, when the reduction in investment caused profits to fall, government increased government expenditure and reduced taxation to prop up the profits of companies). The resumption of investment can then offset the decrease in government expenditure or increase in taxation when government moves from a stimulating to a neutral policy stance.

2) If companies restructure their capital and improve the productivity of labour so that the wage bill decreases by 26.25, the operating profit of companies can increase by 26.25. This increase in operating profit offsets the decrease in operating profit that occurs due to the larger primary surplus (where the larger primary surplus equals –30.125, which is 26.25 larger than the primary surplus needed to just stabilise the public debt/GDP ratio) that government has to run to reduce the public debt/GDP ratio.

3) Once government has reduced the debt/GDP ratio to its pre-recession level, it can reduce its primary surplus. Thus, government can increase expenditure or reduce taxation up to the level where the primary surplus is just enough to keep the debt/GDP ratio stable at its pre-recession level. This improves the profitability of companies. As there is nothing to offset the higher profitability, there may be an upward valuation of equity. The upward valuation of equity decreases the debt/equity ratio (of 2:3) of the corporate sector. This fall in the ratio is essential to restore confidence (recall that the recession started when creditors deemed the debt/equity ratio of 2:3 too high). Investment will only resume if confidence is restored, which in turn depends on the restructuring of capital and the improvement of labour productivity.

If companies do not make the necessary adjustments, the real wage and the wage bill will not decrease and investment will not resume. Thus, there will be nothing to offset the effect of the larger primary surplus that government runs to restore fiscal sustainability. In addition, with no resumption of investment, no adjustments to productivity and no

further propping up of profits by government, operating profits will not cover the required dividend and interest payments. This shortfall of profits may cause an increase in the debt/equity ratio of companies and a resumption of the instability that plagued the economy before the implementation of the stabilisation policy.

The above indicates that fiscal policy can only buy time for the corporate sector to make the necessary adjustments. However, it is up to the corporate sector to make the adjustments in productivity. In the absence of the stabilisation policy, they may lack the time to make the adjustments due to the threat of bankruptcy and insolvency. This lack of time may be particularly acute when the required adjustment is large. The implementation of a stabilising fiscal policy may ward off insolvency and a downward valuation of equity, causing shareholders to be more confident in the ability of companies to improve productivity. This view concurs with that of Keynes who stated that "I see the problem of recovery in the following light: How soon will normal business enterprise come to the rescue? On what scale, by which expedients, and for how long is abnormal government expenditure advisable in the meantime?" (Heilbroner 1999:279). Elaborating on this statement by Keynes, Heilbroner (1999:279) makes the following comment: "Note 'abnormal.' Keynes did not see the government program as a permanent interference with the course of business. He saw it as lending a helping hand to a system that had slipped and was struggling to regain its balance." Thus, stabilisation policy does not only entail the propping up of profits and aggregate demand, it also entails an adjustment process by companies during the time government buys them, so that they can regain their balance.

However, Lachmann (1956:123) argues that the maintenance of effective demand and profit positions through a stabilisation policy, reduces the incentive to the corporate sector to make the necessary changes. Thus, a stabilisation policy may create a type of moral hazard problem. Therefore, because the deficit policy reduces the incentive to restructure capital, Lachmann (1956:125-126) argues that a deficit policy must be combined with pressure and incentives from government so that companies make the necessary adjustments.

7.5 *Establishing fiscal sustainability if unsustainability has been caused by socio-political pressure*

In the last two decades of the twentieth century responsibility for fiscal unsustainability and the increasing public debt/GDP ratios have been ascribed to high levels and rates of growth of public expenditure (Masson and Mussa 1995:2, 5-18). Other reasons, noted in chapter 2, include the high level of real interest rates, low economic growth and anticipated inflation that exceeded actual inflation. Masson and Mussa (1995:2, 5-18) argue that in developed countries the high level and growth of public expenditure can be ascribed largely to the escalation in the costs associated with entitlement and social welfare programmes.

Although developing countries such as South Africa do not have such elaborate social welfare structures as developed countries, they also experience upward pressure on government expenditure. Countries such as South Africa face a 'twin sustainability' predicament (Fourie and Burger 2001:13) because of the tension between the requirements of maintaining fiscal sustainability and the claims that a policy of sustainable development may make on the public purse. Developing countries that spent more on social development and basic service delivery, to the detriment of fiscal sustainability, may experience upward pressure on their public debt/GDP ratios.

Thus, both developed and developing countries may have to consider the impact of establishing fiscal sustainability on the financial position of non-governmental agents where such fiscal unsustainability resulted from socio-political pressure. The first and second subsections examine how socio-political pressure may cause fiscal policy in respectively developed and developing countries to become unsustainable. These sections also examine the possible consequences of establishing fiscal sustainability. The third subsection considers how governments in both developed and developing countries can establish fiscal sustainability without simultaneously shifting the unsustainability to non-governmental agents when unsustainability was caused by socio-political pressure. This section also considers the timing and cyclical dimension of establishing a sustainable fiscal policy.

7.5.1 Socio-political pressure and fiscal sustainability in developed countries

Due to the slowdown in economic growth in the early 1980s, several developed countries had to spend more on unemployment benefits. The escalation in the cost of medical treatment combined with the subsidised health care services also contributed to an increase in government expenditure. However, the biggest threat to the health of public sector finance is still looming (Masson and Mussa 1995:9-11). Falling population growth rates mean that the ratio of those who contribute to pension funds to those who are entitled to a pension decreases (i.e. the dependency ratio increases). Most of these schemes are organised on a pay-as-you-go basis, which means that the present working generation pays for the pensions of the presently retired. The increase in the dependency ratio is expected to become a problem in the second decade of the twenty-first century when the so-called baby-boom generation retires.

Because these entitlements represent a commitment from government that is almost as binding as the repayment of interest and debt, they represent something akin to a liability. Masson and Mussa (1995:21-26) show that the present value of these liabilities far exceeds the present value of the future payroll taxes that some of these governments can realistically expect to collect. Thus, unless legislation is adjusted to drastically reduce the entitlements, the governments of several developed countries will experience significant upward pressure on their public debt/GDP ratios, rendering fiscal policy unsustainable.

A change in legislation, now or in fifteen to twenty years' time when the entitlements come due, will result in a general balance effect. By changing the law now, government, in effect, defaults on a liability. Households lose a financial asset in the form of the present value of the entitlement, while they must now themselves provide for their retirement by running larger primary surpluses (or smaller primary deficits) to rebuild their financial asset/GDP ratio – while still having to pay for the pensions of those retired at present. This may destabilise the financial position of the contributing households. If government changes the law at that late stage to reduce entitlements, this will likewise affect the sustainability of the financial position of those who lose the entitlement. Should

these governments decide to pay the entitlements even though they are unable to collect the necessary taxes to pay for the entitlements, they will have to borrow significantly. This will put pressure on the debt/GDP ratios and cause fiscal policy to become unsustainable. The size of the primary surpluses that governments will have to run to then prevent any further increases in their debt/GDP ratios is significant. The move to such a large primary surplus may potentially cause significant economic instability.

The above implies that whether the governments in developed countries change the law on entitlements now, later or not at all, the financial position of the household sector will be affected and may potentially become unsustainable, thereby causing instability. By simply arguing that the governments in developed countries must establish a sustainable fiscal policy now by reducing the entitlements individuals will receive, avoids the question of the impact of such a policy change on the financial position of non-governmental agents (not only of individuals, but also of the companies who sell goods and services to individuals). The question that needs to be addressed is whether there is an escape route that will prevent a shift of unsustainability to non-governmental agents, while allowing fiscal policy to regain sustainability. Once again the question is whether or not it is possible for government to shift the imbalance without also shifting the unsustainability. This question is addressed below, following a discussion of the developing countries' case.

7.5.2 Socio-political pressure and fiscal sustainability in developing countries

Developing countries have also experienced a slowdown in economic growth since the 1980s, which, together with socio-political pressure to expand social expenditure, placed upward pressure on their public debt/GDP ratios. In addition, Gordon (1997:6-8, 13) notes that in several African countries the expansion of public sector employment is a major reason for the unsustainable increase in government expenditure. However, it is no simple task to reduce public sector employment as it is one of only a few reliable sources of employment.

To restore fiscal sustainability, these governments will have to run larger primary surpluses that must be reflected as larger primary deficits of non-governmental agents. However, many non-governmental agents in developing countries are too poor to run either a primary surplus or a deficit (i.e. they spend whatever they earn, no more and no less). Poverty may prevent them from saving so that they cannot run a primary surplus where their non-interest income exceeds their non-interest expenditure. Neither may they possess enough financial or physical assets to serve as collateral for debt, so that these households cannot run primary deficits either.[8] Therefore, if government reduces income grants or other subsidies to establish a sustainable fiscal policy, the poor households have no choice but to reduce their expenditure in line with the decrease in income. This means that the larger primary surplus of government cannot be reflected as a larger primary deficit in the low-income household group. Thus, the middle- and high-income household group must run the larger primary deficit, or the corporate sector must run a smaller primary surplus (or larger primary deficit)[9] that may result from the lower expenditure by poor households. The lower expenditure may disrupt sales and employment by firms, resulting in bankruptcies, especially among the many small-, medium- and micro-enterprise companies that serve the low-income group.

Furthermore, the lower expenditure and disruption of sales may spread unsustainability and cause economic instability. In many developing countries where political structures are young and still fragile, such instability could even cause political instability, so that establishing fiscal sustainability is not politically sustainable. Thus, again, policy-makers will have to consider the broader, sectoral impact of establishing fiscal sustainability.

One could argue along mainstream lines that the 'excessive' government expenditure on social services and civil service employment artificially raises living standards. Establishing a sustainable fiscal policy then implies establishing a sustainable living

[8] Semi-formal and informal debt agreements (with micro-lenders and so-called 'loan sharks') can be concluded, but usually only for short periods as the interest rates on these loans are usually extremely high.
[9] This is assuming it is a closed economy. In an open economy, the larger primary surplus of government can also be reflected as a larger primary deficit (or smaller primary surplus) of the foreign sector, i.e. in a larger surplus of exports over imports. Thus, the foreign sector has to buy more or sell less to the country to prevent a continuous and accelerating increase in the country's indebtedness to the foreign sector.

standard. However, in countries where poverty is widespread, this view is of little consolation and avoids the question of how a government can establish a sustainable fiscal policy without disrupting non-governmental financial positions. This question is explored in the next section.

7.5.3 How to establish a sustainable fiscal policy without shifting the unsustainability

When socio-political pressure causes fiscal unsustainability, the question facing policy-makers is whether or not there is an escape route that will allow government to restore fiscal sustainability without disrupting non-governmental financial positions. More specifically, how and when can government shift the imbalance in its financial position to non-governmental agents without also shifting the unsustainability?

Although the fiscal unsustainability discussed in this section does not originate in a stabilisation policy, in the case where unsustainability stems from socio-political pressure, companies must also restructure their capital and improve labour productivity to prevent unsustainability from shifting to them and other non-governmental agents.

Higher labour productivity means less labour is used per unit of output.[10] Thus, for companies a lower labour cost (per unit of output) can offset the 'cost' of higher taxes (or loss of sales to government) that may flow from government steps to attain fiscal sustainability.[11] This means that government may be able to collect the necessary taxes to continue running the entitlement and social development programmes. However, if the entitlements are reduced, the benefits of higher labour productivity can be passed on to labour in the form of additional income with which they can create an asset that will yield an income to replace the entitlement. In the case of the poor, the additional income can replace the subsidy by government.

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[10] This does not necessarily imply higher unemployment, as higher productivity could also mean producing more with the same amount of labour.

[11] If the tax is levied on households instead of companies, companies can pass the benefit of the higher productivity of labour to labour itself by paying them a higher wage, so that the after-tax wage remains the same. A similar argument can be made for lower transfers to households.

However, if agents fail to improve productivity, the establishment of fiscal sustainability may shift the unsustainability to non-governmental sectors. Whereas the finger is usually pointed at government as the one who has to adjust its financial position to avert unsustainability, the private sector is the one who will face unsustainability if it also does not make the necessary adjustments before government restores fiscal sustainability. Therefore, *restoring fiscal sustainability requires adjustments from both government and non-governmental agents* to prevent a shift of unsustainability, together with the shift of imbalance, to non-governmental agents. However, unlike a recession there is no pressure on non-governmental agents to make adjustments prior to the establishment of fiscal sustainability, as they do not face imminent bankruptcy. Thus, government has to implement an incentive scheme to encourage them to adjust.

Policy-makers also need to know when is the best time to establish fiscal sustainability. Compared to cyclically-caused unsustainability, government has more options regarding when to restore fiscal sustainability if unsustainability was caused by socio-political pressure. In the case of a stabilisation policy (section 7.2 – 7.4 above), the only options government has with regard to timing is whether to restore fiscal sustainability immediately after the unsustainability was caused endogenously or to first run a stabilisation policy and thereafter restore fiscal sustainability. However, in the case of unsustainability caused by socio-political pressure, the unsustainability is not that directly linked to a particular up- and downswing (except, perhaps, for unemployment compensation that increases during recessions). There may also be no need to reduce the debt/GDP ratio to any particular level before the next downswing (as may be the case when government restores fiscal sustainability in the aftermath of a stabilisation policy).[12] Thus, government can temporarily delay the establishment of fiscal sustainability if the timing of such a step is not right. The right timing may minimise the impact of establishing fiscal sustainability and even ensure its success.

[12] The exception to this is if the debt/GDP ratio already exceeds the ratio that creditors tolerate so that they are not willing to buy further issues of government stock or would only buy them at interest rates that government cannot afford.

Even though establishing fiscal sustainability when unsustainability was caused by socio-political pressure is not directly linked to a particular up- and downswing, the timing does have a strong cyclical dimension. The possibility that government may shift unsustainability to non-governmental agents when it establishes a sustainable fiscal policy may be greater during a recession than during a boom phase. Thus, it may be prudent policy to restore fiscal sustainability during a boom phase. The economic growth rate – therefore, also the rate at which tax income grows – is higher during a boom phase, so that the (r – g) gap is smaller (given the interest rate). Thus, the primary surplus required to keep the public debt/GDP ratio stable or to reduce it is smaller during the boom phase. This means that the primary deficit that non-governmental agents must run is also smaller (recall that the sum of all primary balances in the economy must sum to zero). Thus, it is easier to establish fiscal sustainability when the economy is in a boom phase.

If government reduces the debt/GDP ratio gradually so as not to shift too much of the imbalance in its financial position to non-governmental agents all at once, it can also limit the reductions in the ratio to economic boom phases and, thus, not reduce the ratio during recessions. The motive for this is the smaller (r – g) gap during boom phases (given the interest rate) and the contractionary and adverse general balance effects of reducing the debt/GDP ratio during economic downturns. In this way steps to restore fiscal sustainability take the form of an anti-cyclical policy.

Notwithstanding the above, a word of caution is also necessary. The adjustment that non-governmental agents need to make prior to the establishment of fiscal sustainability may be too large relative to what is technologically feasible. Therefore, the adjustments may only partially offset the impact of establishing fiscal sustainability. Nevertheless, any degree of offset is better than none at all. There is also the danger that the threat of fiscal unsustainability caused by social welfare and social development programmes, and the fear of possible repercussions that the establishment of a sustainable fiscal policy sometime in future may entail, may cause grave uncertainty. The uncertainty, in turn,

may cause non-governmental agents to doubt their ability to improve productivity and profitability, which in turn, may prevent them from making the adjustments.

In conclusion, a consideration of sectoral effects, uncertainty, timing and the possible steps to offset the negative impact of establishing fiscal sustainability on the financial position of non-governmental agents, indicates that establishing a sustainable fiscal policy entails much more than adjusting the budgetary aggregates of government.

7.6 *Establishing fiscal sustainability if unsustainability has been caused by a shock*

Fiscal policy may also become unsustainable if government increases expenditure and the deficit to cope with the effects of a natural or man-made disaster – assuming that it ran a sustainable fiscal policy prior to the shock. The question facing government is whether or not the establishment of fiscal sustainability in the aftermath of a shock creates the same difficulties as in the case of cycle-related unsustainability and unsustainability due to socio-political pressure. The answer depends on whether or not the shock causes expectations to turn bearish. If it does, the loss of confidence that accompanies bearish sentiments will cause this case to reduce to one of economic instability. Then the above discussion on economic instability applies.

However, if the shock does not cause expectations to turn bearish, the re-establishment of fiscal sustainability will not necessarily cause a shift of unsustainability to non-governmental agents. The reason for this is that in the period that government reduces its deficit, the reduction in expenditure or the increase in taxation to restore fiscal sustainability may be offset by increased expenditure on the part of non-governmental agents to rebuild whatever was damaged in the disaster. Both the expenditure (and deficit) incurred by government to cope with the disaster and the cost incurred by non-governmental agents to rebuild whatever was destroyed in the disaster, is of a temporary nature, and may therefore, not have lasting effects on the financial position of non-governmental agents. Adjustments to reduce debt/equity ratios are not necessary as there

is no drop in confidence. Thus, investment can continue or, if the disaster interrupted it, investment can resume.

7.7 Conclusion

This chapter considered the establishment of fiscal sustainability amid conditions of economic instability, when government may need to stabilise the economy, and socio-political pressure to maintain or even increase expenditure on entitlements, social welfare and social development. In particular the chapter considered the establishment of a sustainable fiscal policy in four contexts:

- Restoring fiscal sustainability if the cause of unsustainability was cycle-related and endogenous.
- Restoring fiscal sustainability if the cause of unsustainability was cycle-related but exogenously caused by explicit anti-recession policy.
- Establishing fiscal sustainability if the cause of unsustainability was non-cyclical and socio-political in nature.
- Establishing fiscal sustainability if the cause of unsustainability was non-cyclical and caused by a shock.

In all these cases it was argued that to just consider what adjustment is needed in the levels of government revenue and expenditure to restore fiscal sustainability, is too narrow. A broader focus is necessary because establishing fiscal sustainability may also shift the unsustainability onto non-governmental agents. Such a shift may cause economic instability and uncertainty. Thus, policy should also consider the impact of establishing fiscal sustainability on the financial position of non-governmental agents and on uncertainty. The chapter demonstrated how considerations relating to economic instability and socio-political pressure are relevant to government's decisions on when and whether it should increase its primary surplus to establish fiscal sustainability.

Lastly, the chapter argued that establishing fiscal sustainability when unsustainability was caused by cycle-related, exogenous factors and socio-political pressure, should coincide

with micro-level adjustments in the corporate sector to ensure that establishing fiscal sustainability does not shift the unsustainability to non-governmental agents.

Together with the preceding chapters, this chapter sets the scene for the concluding chapter which specifies how the subjectivist insights and insights drawn from using the general balance framework can be used to improve the rules on how to run a sustainable fiscal policy.

Chapter 8
Conclusion

The increase in public debt/GDP ratios in the 1980s and 1990s caused issues relating to public debt and fiscal sustainability to resurface. Given that fiscal policy was deemed unsustainable in so many countries, mainstream theory shifted its focus to the question of how governments can restore fiscal sustainability. Mainstream theory concluded unambiguously that if fiscal policy is unsustainable, it is because government, on average, runs a primary deficit (or too small a primary surplus). Thus, if government wants to reestablish fiscal sustainability, it should, on average, run a large enough primary surplus via appropriate reductions in government expenditure and/or increases in taxes.

This prescription is so simple that from a mainstream point of view it is hard to fathom why governments have difficulty in establishing a sustainable fiscal policy or why there could be any dispute on the rule. However, policy-makers in several developed and developing countries found that the establishment of fiscal sustainability is not always as simple as that. Even though it is permissible, in the mainstream view, for government to temporarily increase its debt/GDP ratio (i.e. it must run the large enough primary surplus only *on average*), mainstream theory is not in favour of an active stabilisation policy as this would endanger fiscal sustainability. It also insists that social welfare and development programmes should be cut back if it endangers fiscal sustainability. However, for a government not to run stabilisation policies and to cut back on social welfare and development programmes is not that simple, especially if the electorate demands these policies and benefits. Thus, although the mainstream prescription for fiscal sustainability is simple, it may also be simplistic.

The thesis argues that the mainstream view on fiscal sustainability is too narrow in several respects. First, it does not consider the sectoral impact of establishing fiscal sustainability, whatever the cause of the fiscal unsustainability. Secondly, it also does not consider the role of subjective expectations and uncertainty that may cause economic instability and may necessitate the use of a stabilisation policy. Thirdly, because the econ-

omy is not inherently stable the sectoral impact of establishing fiscal sustainability may not be transitory. Therefore, mainstream theory does not consider that steps to restore fiscal sustainability may themselves strengthen, weaken or cause cyclical disturbances (and/or uncertainty) in the economy. Thus, the mainstream view does not consider how government should maintain a sustainable fiscal policy if instability is present, tenacious and recurring. Fourthly, the mainstream view does not consider the impact of establishing fiscal sustainability amidst sectoral effects, uncertainty and in an economy that is not inherently stable, if unsustainability was caused by large expenditures on entitlements, social welfare and development programmes. The same holds for unsustainability caused by disturbances from outside the economic sphere, e.g. political, military or natural disasters.

Given these limitations of the mainstream view and following the exposition and analysis of various cases in chapter 7, this concluding chapter embeds the quest for fiscal sustainability within a broader policy context. More specifically, this chapter sets out a menu of new, more refined, rules for the successful return to a sustainable fiscal policy. The rules take into account sectoral effects, uncertainty, instability, cycles and the danger of fiscal policy actually *causing* instability, and distinguish according to whether unsustainability was caused by cycle-related factors, socio-political pressure or non-economic disturbances such as shocks. These new rules force policy-makers to recognise properly the inescapable enmeshment of fiscal sustainability with policy objectives relating to economic stabilisation.

8.1 The theoretical foundation of the rules

To develop the rules the thesis makes use of the general balance framework, developed in chapter 4, as a key to unlocking the sectoral effects and the effects of uncertainty and instability. Chapter 4 pointed out that merely running a primary surplus to restore fiscal sustainability may not ensure the disappearance of unsustainability from the economy, i.e. system-wide sustainability is not necessarily achieved. Government may just shift the unsustainability to the non-governmental sectors of the economy. The unsustainability in

the financial positions of non-governmental agents, particularly those of debtors, may cause wide-scale bankruptcies and instability. Thus, system-wide unsustainability is associated with debt/GDP and financial asset/GDP ratios that show a tendency to increase unboundedly.

However, unsustainability and the accompanying instability (and bankruptcies) in the financial position of non-governmental agents may also originate from within the ranks of the non-governmental agents. Chapters 5 and 6 pointed out that, given fundamental uncertainty and subjective expectations, economic instability and tenacious recessions that defy the attempts of non-governmental agents to counter them, are recurring phenomena – the economic system is not inherently stable. Economic agents operate in an uncertain world where investment decisions are based on subjective expectations about an uncertain future. Being subjective, these expectations can quickly be altered, causing a change in interest rates, investment and income (chapter 5). Whereas the initial change in expectations may cause imbalances in the financial position of a few economic agents and cause their financial position to become unsustainable, the unsustainability may quickly spread to other agents through the linkages that exist between the financial position of economic agents, i.e. the general balance effect (chapter 6). As it spreads it causes the economy to become unstable. Because economic instability and tenacious recessions are recurring phenomena, a government may time and again find itself in a position where it may have to stabilise the economy. It is apt, using the general balance framework, to define economic instability as a collective term for recurrent and widespread unsustainability in the financial position of non-governmental agents.

Thus, a stabilisation policy is no less concerned with unsustainability than is a policy aimed at restoring fiscal sustainability. The difference between a stabilisation policy and a policy aimed at restoring fiscal sustainability then merely is whose sustainability is at issue: that of government or that of non-governmental agents? In addition, government uses the same policy instruments, in the form of changes in government expenditure and revenue, to influence the sustainability of both its own financial position and that of non-governmental agents (stabilisation steps). Moreover, a decision on the sustainability of

fiscal policy is, with or without the conscious recognition of policy-makers, also a decision on economic stabilisation (and *vice versa*), as the instruments government uses simultaneously influence the financial position of both government and non-governmental agents. The rules on fiscal sustainability must take this into account.

8.2 A menu of rules for a sustainable fiscal policy

The mainstream rule for fiscal sustainability is simple: government should, on average, run a sufficiently large primary surplus. However, the mainstream rule is too crude and its mathematical simplicity is dangerously misleading. The rule requires refinement to take account of sectoral shifts, uncertainty, instability, the implementation and reversal of stabilisation policy, the effects of socio-political pressure and unforeseen external changes. By ignoring the implications of uncertainty and subjective expectations and, thus, intrinsic instability, the rote application of the mainstream sustainability rule is, ironically, doomed to cause and/or aggravate instability and increase the urgency of stabilisation policy steps (and, in all likelihood, require stronger steps than would have been necessary had these implications been incorporated from the beginning). Hence, this section sets out a menu of rules that takes these issues into account.

8.2.1 The menu of rules if the cause of unsustainability is cycle-related

An activist stabilisation policy places the public debt/GDP ratio on an unsustainable path[1] because government may have to run a primary deficit (as part of its stabilisation policy), at a time when the real interest rate exceeds the real economic growth rate. Therefore, fiscal rules must establish how fiscal policy can successfully return to a sustainable path without it leading to unsustainability in the financial position of non-governmental agents and thereby undoing the effects of the stabilisation policy. In addition, chapter 7 argued that if government wants to use a stabilisation policy again in future, then the shift to a sustainable fiscal policy in the aftermath of a stabilisation policy requires that the debt/GDP ratio must return to its pre-crisis level. Strong economic growth is one way to

[1] Thus, if it continues on this path indefinitely, the debt/GDP ratio will explode.

reduce the ratio. (To obtain a high growth rate, companies need to make adjustments similar to those discussed under point 2 immediately below.) However, unless the growth rate is higher than the pre-recessionary rate, the only way, *ceteris paribus*, to restore fiscal sustainability is for government to increase the primary surplus with more than the amount by which it decreased the surplus when it implemented the stabilisation policy.

Chapter 7 devised the following rules to restore fiscal sustainability if the cause of the unsustainability is cycle-related and if economic growth is not strong enough to reduce the debt/GDP ratio after the economy moves out of the downturn:

1. If the cause of the fiscal unsustainability is endogenous and cycle-related and if the instability that causes it is small (classified as a stationary equilibrium or a reversible shift of equilibrium) government can apply the mainstream rule to restore fiscal sustainability. A return to a sustainable fiscal policy will not cause the debt/equity ratio of companies to deteriorate too far beyond the ratio that creditors tolerate. Hence, no stabilisation policy is needed.

2. If the cause of the fiscal unsustainability is endogenous and cycle-related and the instability that causes it is classified as an irreversible shift of equilibrium, government should attempt to stabilise the economy *before* restoring fiscal sustainability (i.e. first move further away from the fiscal sustainability rule). If government were to immediately and rapidly move to a sustainable fiscal policy (by increasing taxes and reducing expenditure), government may cause instability to spread further – establishing fiscal sustainability may aggravate the unsustainability of non-governmental agents.

   Stabilisation policy is necessary because non-governmental agents are not able to make the adjustments needed to improve their financial position rapidly enough. As long as the stabilisation policy is in place it renders the financial positions of non-governmental agents temporarily sustainable, giving agents time to adjust and improve their financial positions. Once non-governmental agents have made the adjustments, government can shift the imbalance in its financial position back to non-

governmental agents without also shifting back the unsustainability. The debt/equity ratios of companies will not deteriorate beyond the ratio that creditors tolerate.

In the absence of the stabilisation policy, companies will lack the time to make the necessary adjustments to reduce their debt/equity ratios to acceptable levels, because the adjustments are so large that creditors lack confidence in the ability of companies to make them. Hence, creditors will file for the bankruptcy of these companies.

However, electing to run a stabilisation policy is not necessarily preferable, as it will not necessarily be successful:

2.1 If private agents can adjust their financial situation and restructure business activities during a period of fiscal stimulation, government can first implement a stabilisation policy and then establish a sustainable fiscal policy later on. When government later on restores fiscal sustainability, it does so via a normal primary balance adjustment (i.e. increasing taxes and decreasing non-interest expenditure).

2.2 If agents do not or cannot adjust, the implementation of a stabilisation policy is futile – the establishment of fiscal sustainability at a later stage (when government reverses the stimulation steps) will unavoidably shift unsustainability to non-governmental agents who cannot absorb the impact. The stabilisation policy merely postpones the inevitable. Government should rather immediately apply the mainstream rule to prevent a continuous and accelerating increase in its debt/GDP ratio. It will have to run a large enough primary surplus even though this step may shift the unsustainability to non-governmental agents and cause their financial position to deteriorate further. This deterioration continues until the excessive debt is flushed out of the system via the aforementioned bankruptcies. Since non-governmental agents cannot or will not make the necessary adjustments to their financial positions, the economy will not automatically stabilise at pre-crisis levels of economic activity.

2.3 The intermediate case occurs if agents are only able to make a partial adjustment, or only some agents are able to make the full adjustments in their financial position. This means only partial absorption of the impact of steps to establish a sustainable fiscal policy. Thus, establishing fiscal sustainability may shift unsustainability to non-governmental agents, but the shift will be smaller than in the case where agents cannot make any adjustment. Whether or not to stabilise the economy then depends on how much unsustainability will be shifted should government first implement a stabilisation policy and then restore fiscal sustainability compared to when it immediately establishes fiscal sustainability. This depends on the size of the adjustment agents can make. The larger the adjustment they can make, the smaller the shift of unsustainability will be and the more sense it makes first to implement a stabilisation policy.

A note of caution about these rules is necessary. Government may not *ex ante* be fully informed about the ability and willingness of agents to make the necessary adjustments. Government also operates in an uncertain environment. It may therefore find that, even though it expected, *ex ante*, agents to make the necessary adjustments, *ex post* it seems they could not or would not make them. (Reasons why they could not or would not make them include a lack of confidence by agents in their ability to make adjustments, technological constraints and a moral hazard problem if agents expect government to always 'bail them out' through stimulatory fiscal policy or direct support to selected companies.) Government will then have no option but to establish fiscal sustainability in the aftermath of a failed stabilisation policy even though it may shift unsustainability to non-governmental agents. In addition, the possibility that government may be mistaken in its expectation that a policy may not work also warns against a rash conclusion *ex ante* by policy-makers that a stabilisation policy will not be successful. Policy-makers should guard against an ideological predisposition against stabilisation policies in general. Just as a negative attitude among non-governmental agents may cause them to expect a stabilisation policy to fail, such an attitude among policy-makers may cause government not to implement a stabilisation policy when it does have the potential to be successful.

The discussion highlights some aspects of the anatomy of a successful stabilisation policy:

1. A stabilisation policy must have a microeconomic component because the deficit policy by government must be accompanied by micro-adjustment of non-governmental financial positions if the policy is to succeed. These adjustments include the improvement of labour productivity and the restructuring of capital. The micro-level adjustment is necessary to ensure that when government ultimately has to establish fiscal sustainability and shift the imbalance back to non-governmental agents, these agents are able to absorb the shift of the imbalance.

2. The microeconomic dimension, as set out in the general balance framework, highlights the fact that a stabilisation policy only creates a window of opportunity for agents to make the necessary adjustments. Through the deficit government in effect 'buys' time for companies, propping up profits to prevent and postpone the potential fatal deterioration in their debt/equity ratios. It is then up to companies to reduce their debt/equity ratios and improve their profitability. Stabilisation policy itself is a necessary but not sufficient condition for re-establishing economic stability.

3. However, Lachmann also highlighted the danger that the implementation of a stabilisation policy and the propping up of profits may reduce the incentives for companies to make the necessary micro-adjustments. This is a moral hazard problem.[2] To avoid it, a stabilisation policy may have to be accompanied by a set of micro-economic incentives and mechanisms that encourage companies to make the necessary adjustments. Thus, more complex policy packages, where microeconomic incentive programmes form part and parcel of macroeconomic stabilisation policies, are required.

The above demonstrates that a stabilisation policy can be effective while still allowing government to return to a sustainable fiscal policy *if* subjectivist (and general balance) insights are fully incorporated. Stabilisation policy and fiscal sustainability are inexorably

[2] If government supports a selected group of companies (e.g. the airline industry in the US) the moral hazard is more significant than when government props up profits through augmenting aggregate demand because in the former case the 'bailed out' company is more certain of the flow of funds from government.

linked: one cannot talk about restoring sustainability without mentioning stabilisation policy, and vice versa.

8.2.2 The menu of rules if the cause of the unsustainability is socio-political in nature or a shock

Economic instability is not the only reason why fiscal unsustainability may occur. It may also result from the implementation of entitlement programmes, large social welfare programmes or because of high social development expenditure. Another cause of fiscal unsustainability is natural or man-made disasters. The discussion in chapter 7 suggests the following rules to restore fiscal sustainability in these cases:

1. If non-governmental agents can make adjustments to their financial positions and business activities similar to those they must make with the implementation of a stabilisation policy, it may render the social welfare and development programmes sustainable, which, in turn, implies that government does not need to reduce entitlements and benefits. In addition, unlike what it must do in the aftermath of a stabilisation policy, government does not need to *reduce* the debt/GDP ratio when it establishes fiscal sustainability (except when the public debt/GDP ratio is considered excessive by creditors). It only needs to *stabilise* the ratio. Thus, once non-governmental agents have made the necessary adjustments, government can establish fiscal sustainability without shifting unsustainability to non-governmental agents.

   However, unlike the case of a cyclical downturn where agents face imminent bankruptcy, in this case there is no pressure on non-governmental agents to make the necessary adjustments, as they do not face imminent bankruptcy. They may not see the need to adjust until such time as government establishes a sustainable fiscal policy that destabilises non-governmental financial positions. The absence of pressure highlights the need for an incentive scheme that encourages companies to make the necessary adjustments before government establishes fiscal sustainability.

Should government decide to reduce entitlements and benefits in any case, the adjustment by non-governmental agents will place them in a position to earn a higher income that will offset the loss of the transfer and of the asset destroyed by the scrapping of the entitlement. The asset is the discounted value of future benefits.

2. If agents do not or cannot make the necessary adjustments, government has little choice but to reduce its expenditure on the entitlement and social welfare and development programmes if it wants to establish a sustainable fiscal policy. Agents may not make the necessary adjustments if they doubt their own ability to do so or are uncertain about the consequences of an unsustainable fiscal policy or fear the negative impact of government's steps to establish fiscal sustainability on their financial position. This again highlights the importance of expectations. Agents may also have a negative attitude towards a micro-level policy and perceive it as 'interference' by government. In this case, establishing fiscal sustainability may shift the unsustainability to non-governmental agents, so that establishing fiscal sustainability becomes the potential *cause* of economic instability.

   It may also happen that the adjustments agents have to make are too large relative to what is technologically feasible given the period within which companies have to make the adjustments. In this case, too, government has little choice but to reduce its expenditure to establish fiscal sustainability, causing unsustainability to shift to non-governmental agents.

3. Lastly, if the cause of fiscal unsustainability is a shock and government decides to restore fiscal sustainability, non-governmental agents may offset the impact of the reduction in government expenditure on their financial position by increasing their expenditure to repair whatever was damaged in the disaster. The reduction in government expenditure to restore fiscal sustainability will then only shift the imbalance and not unsustainability to non-governmental agents. However, should such a disaster also cause a bearish sentiment where creditors and companies consider the debt/equity ratios of companies too high, this case reduces to a case of economic instability.

With regard to the timing of the establishment of fiscal sustainability (both when agents can and cannot make the necessary adjustments), it is easier for government to establish fiscal sustainability if the economy is in a boom phase rather than in a downturn. During a boom phase the economic growth rate is higher, which, *ceteris paribus*, means that the (r-g) gap is smaller, so that the required primary surplus that government has to run to ensure that the debt/GDP remains constant, is smaller. Thus, the primary deficit that non-governmental agents have to run is smaller (because the sum of all primary balances has to sum to zero), so that the impact on their financial position is smaller. Therefore, unlike the cyclical case, government can temporarily postpone the establishment of fiscal sustainability until the best time to do so. Compared with the cyclical case, government has an extra degree of freedom regarding the timing of the establishment of fiscal sustainability. In addition, government can first stabilise and then reduce the debt/GDP ratio during economic boom times while not reducing it during recessions. Establishing fiscal sustainability then takes the form of an anti-cyclical policy.

8.3 Some final thoughts

Both where unsustainability is cycle-related and where it is due to socio-political or other pressure the *basic* rule on how to establish a sustainable fiscal policy remains the same as in the mainstream model: government has to run a large enough primary surplus. However, by explicitly considering issues related to economic instability, socio-political pressure, expectations and uncertainty, the basic rule is refined to establish *how* and *when* it is to be applied so that it minimises damage to non-governmental financial positions.

Thus, the thesis is not about relaxing the mainstream rule, but about making it more sophisticated and sensitive to uncertainty, expectations, instability/cyclicality, and sectoral balance effects. By taking account of these issues, the mainstream rule is refined into a menu of rules. Although the thesis argues that the rules should not be rigid, it also does not propose pure discretion. Rather, it proposes a framework for the sophisticated, non-mechanical and more effective, less damaging application of the mainstream rule – essentially a normative approach to the implementation of the rule. However, it is ironic

that the success and sustainability of the mainstream/classical sustainability rule can be improved by acknowledging and incorporating non-classical, subjectivist and sectoral balance insights.

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Abstract

In several countries the public debt/GDP ratio showed the largest ever peacetime increase during the last 20 years of the twentieth century. According to numerous analysts, the continuous and increasing accumulation of debt has rendered fiscal policy unsustainable in many countries. Towards the latter half of the 1990s several countries initiated steps to check the increase in their public debt/GDP ratio and in so doing establish fiscal sustainability.

The mainstream rule on how to re-establish fiscal sustainability is unambiguous: government should, on average, run a sufficiently sized primary surplus (i.e. non-interest revenue less non-interest expenditure). However, policy-makers in several countries have found that the establishment of fiscal sustainability is not always so straightforward. The 'general balance framework' is developed in the thesis to obtain a tool with which to examine why it is not straightforward.

Using this framework, the thesis points out that merely running a primary surplus to restore fiscal sustainability may not ensure the disappearance of unsustainability from the economy. Government may just shift the unsustainability to the non-governmental sectors of the economy, which, in turn, may cause wide-scale insolvency and instability.

However, unsustainability and the accompanying instability and insolvency in the financial position of non-governmental agents may also originate from within the ranks of the non-governmental agents. The thesis points out that, given fundamental uncertainty and subjective expectations, economic instability and tenacious recessions that defy the attempts of non-governmental agents to counter them, are recurring phenomena – the economic system is not inherently stable. Economic agents operate in an uncertain world where investment decisions are based on subjective expectations about an uncertain future. Being subjective, these expectations can quickly be altered, causing a change in interest rates, investment and income. Whereas the initial change in expectations may cause imbalances in the financial position of a few economic agents

and cause their financial position to become unsustainable, the unsustainability may quickly spread to other agents through the linkages that exist between the financial position of economic agents. As it spreads it causes the economy to become unstable. Because economic instability and tenacious recessions are recurring phenomena, a government may time and again find itself in a position where it may have to stabilise the economy. It is possible, using the general balance framework, to define economic instability as a collective term for recurrent and widespread unsustainability in the financial position of non-governmental agents.

Thus, a stabilisation policy is no less concerned with unsustainability than is a policy aimed at restoring fiscal sustainability. The difference between a stabilisation policy and a policy aimed at restoring fiscal sustainability then merely is whose sustainability is at issue: that of government or that of non-governmental agents? In addition, government uses the same policy instruments, in the form of changes in government expenditure and revenue, to influence the sustainability of both its own financial position and that of non-governmental agents (stabilisation steps). Moreover, a decision on the sustainability of fiscal policy is also a decision on economic stabilisation (and *vice versa*), as the instruments government uses simultaneously influence the financial position of both government and non-governmental agents.

The thesis is not about relaxing the mainstream rule, but about making it more sophisticated and sensitive to uncertainty, expectations, instability/cyclicality, and sectoral balance effects. By taking account of these issues, the mainstream rule is refined into a menu of rules. Although the thesis argues that the rules should not be rigid, it also does not propose pure discretion – rather, it proposes a framework for the sophisticated, non-mechanical and more effective, less damaging application of the mainstream rule – essentially a normative approach to the implementation of the rule.

Opsomming

In verskeie lande het die staatskuld/BBP verhouding die grootste vredestydse styging ooit gedurende die laaste 20 jaar van die twintigste eeu getoon. Volgens verskeie analiste het die voortdurende en toenemende akkumulasie van skuld, fiskale beleid in verskeie lande onvolhoubaar gemaak. Gedurende die laaste helfte van die 1990s het verskeie lande stappe geïnisieer om die styging in die staatskuld/BBP verhouding in bedwang te bring en sodoende fiskale volhoubaarheid te vestig.

Die hoofstroomreël om fiskale volhoubaarheid te herstel is ondubbelsinnig: die regering moet, gemiddeld, 'n groot genoeg primêre surplus (d.w.s. nie-rente inkomste minus nie-rente uitgawes) handhaaf. Beleidmakers in verskeie lande het egter gevind dat die herstel van fiskale volhoubaarheid nie so eenvoudig is nie. Die 'algemene balansraamwerk' word in die tesis ontwikkel om 'n instrument te verkry waarmee ondersoek ingestel word oor waarom dit nie so eenvoudig is nie.

Met die gebruik van hierdie raamwerk, dui die tesis aan dat deur bloot 'n primêre surplus te handhaaf om fiskale volhoubaarheid te vestig, nie noodwendig sal verseker dat nie-volhoubaarheid uit die ekonomiese stelsel sal verdwyn nie. Die regering mag bloot net die nie-volhoubaarheid na nie-regeringsektore van die ekonomie skuif, wat, op sy beurt, wydverspreide insolvensie en onstabiliteit mag veroorsaak.

Nie-volhoubaarheid en die meegaande onstabiliteit en insolvensie in die finansiële posisie van nie-regeringsagente mag sy oorsprong in die geledere van nie-regeringsagente hê. Die tesis dui aan dat, gegewe fundamentele onsekerheid en subjektiewe verwagtinge, ekonomiese onstabiliteit en hardnekkige ressesies wat die pogings van nie-regeringsagente om hulle teen te werk weerstaan, herhalende verskynsels is – die ekonomiese stelsel is nie inherent stabiel nie. Ekonomiese agente opereer in 'n onseker wêreld waar investeringsbesluite op subjektiewe verwagtinge rakende die toekoms gebaseer is. Synde subjektief, kan hierdie verwagtinge vinnig verander word, wat weer 'n verandering in rentekoerse, investering en inkomste veroorsaak. Waar die inisiële

verandering in verwagtinge wanbalanse in die finansiële posisie van 'n paar ekonomiese agente mag veroorsaak en veroorsaak dat hulle finansiële posisie nie-volhoubaar word, kan die nie-volhoubaarheid vinnig versprei na ander agente deur die koppelings wat tussen die finasiële posisie van ekonomiese agente bestaan. Soos dit versprei, veroorsaak dit dat die ekonomie onstabiel word. Omdat ekonomiese onstabiliteit en harnekkige ressesies herhalende verskynsels is, mag 'n regering hom slag op keer in 'n posisie bevind waar hy die ekonomie moet stabiliseer. Dit is moontlik, deur die gebruik van die algemene balansraamwerk, om ekonomiese onstabiliteit te definieer as die versamelnaam vir die herhalende en wydverspreide nie-volhoubaarheid in die finansiële posisie van nie-regeringsagente.

Gevolglik is 'n stabilisasie beleid nie minder gemoeid met volhoubaarheid as 'n beleid gerig of fiskale volhoubaarheid. Die verskil tussen 'n stabilisasiebeleid en 'n beleid gerig op fiskale volhoubaarheid is bloot net wie se volhoubaarheid ter sprake is: die van die regering of die van nie-regeringsagente? Verder gebruik die regering dieselfde instrumente, in die vorm van veranderings in regeringsuitgawes en –inkomste, om beide sy eie finansiële posisie en die van nie-regeringsagente te beïnvloed (stabilisasiestappe). Daarby is 'n besluit rakende die volhoubaarheid van fiskale beleid ook 'n besluit oor ekonomiese stabiliteit (en *vice versa*), omrede die instrumente wat die regering gebruik gelyktydig die finansiële posisie van beide die regering en nie-regeringsagente beïnvloed.

Die tesis gaan nie oor die verslapping van die hoofstroomreël nie, maar maak dit meer gesofistikeerd en sensitief vir onsekerheid, verwagtinge, onstabiliteit/siklisiteit, en sektorale balanseffekte. Deur hierdie kwessies in ag te neem word die hoofstroomreël verfyn tot 'n spyskaart van reëls. Alhoewel die tesis aanvoer dat die reëls nie rigied moet wees nie, stel dit ook nie suiwer diskresie voor nie – dit stel eerder 'n raamwerk vir die gesofistikeerde, nie-meganiese en meer effektiewe, minder skadelike toepassing van die hoofstroomreël voor – essensieel 'n normatiewe benadering tot die implementering van die reël.