

The five tests framework

EMU study



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*This study has been prepared by HM Treasury to
inform the assessment of the five economic tests*

This is one of a set of detailed studies accompanying HM Treasury's assessment of the five economic tests. The tests provide the framework for analysing the UK Government's decision on membership of Economic and Monetary Union (EMU). The studies have been undertaken and commissioned by the Treasury.

These studies and the five economic tests assessment are available on the Treasury website at:

www.hm-treasury.gov.uk

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EXECUTIVE SUMMARY

1 This study describes the framework for assessing whether membership of Economic and Monetary Union (EMU) is in the UK's national economic interest. It outlines the main issues that are examined in the assessment and the approach taken in coming to a decision. It can therefore be seen as a guide to the assessment and the accompanying EMU studies.

2 The study begins by setting out the context and approach to and the rationale for the five tests framework. It then considers the framework in more detail, describing how it enables appraisal of the options, costs and benefits, and uncertainties of EMU; how the five tests are grounded in optimal currency area (OCA) theory but, in recognising the theory's limitations, embody a more dynamic forward-looking analysis; how other countries have assessed membership of EMU; and how together this ensures a comprehensive and rigorous approach to the EMU assessment.

Government policy on EMU

3 The Government's policy on EMU is set within its central economic objective:

"To build a stronger, more enterprising economy and a fairer society, extending economic opportunity and supporting those most in need to ensure that rising national prosperity is shared by all."

4 Because of the importance of decisions on interest rates, exchange rates and economic policies to growth and stability, the EMU decision is central to the long-term success of the UK economy. As the Chancellor of the Exchequer has stressed, the decision on the euro *"is perhaps the biggest peacetime economic decision we as a nation have to make"*.

5 Because the EMU decision is irreversible, it is materially different from any previous exchange rate decisions taken by the UK Government. But the approach to the EMU decision has drawn on the lessons of the past. Because of the great importance of the decision, the Government considers that it is vital that it should be made on as robust a basis as possible, meaning:

- a **comprehensive and rigorous** assessment of all the evidence and issues;
- full reflection of the potential **costs, benefits and risks** of the various options; and
- that, for the Government to decide to recommend UK membership of EMU, it must be in the national economic interest. That is why the case for entry must be **clear and unambiguous**.

6 The Government has been clear since 1997 that the decision on whether to recommend UK membership of EMU must be based on a more wide-ranging and long-term economic assessment than embodied in the EC Treaty convergence criteria. This is necessary because of the distinctive nature of the UK economy – a large economy in the EU with a global outlook – and its history of economic instability. History also shows sustained periods of clear divergence between the UK and the euro area. This makes a comprehensive assessment of the economic case for joining EMU, as provided by the five tests, particularly important for the UK.

Five tests framework and approach

7 The five tests define whether a clear and unambiguous case for entry can be made. They are:

- Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?
- If problems emerge is there sufficient flexibility to deal with them?
- Would joining EMU create better conditions for firms making long-term decisions to invest in Britain?
- What impact would entry into EMU have on the competitive position of the UK's financial services industry, particularly the City's wholesale markets?
- In summary, will joining EMU promote higher growth, stability and a lasting increase in jobs?

8 The convergence and flexibility tests are principally focused on the potential costs of EMU. Together they determine whether **sustainable and durable convergence** has been achieved. Sustainable and durable convergence is the key precondition for successful membership of EMU. It ensures that the costs of adjustment within the single currency are kept to a minimum.

9 But just as there are certain constraints inside EMU, there are potential gains from the removal of a barrier to trade – separate currencies – across a large and stable economic area. The EU is already developing a single market in which barriers to movements in goods, services and capital are removed. The removal of the exchange rate barrier through the creation of the euro complements this. The investment, financial services and growth, stability and employment tests together help assess these potential benefits.

10 The assessment brings together each test to reach a conclusion on whether joining EMU would be in the UK's national economic interest. The evaluation of the case for membership takes into account the dimension, timing and certainty of the effects on the economy, in particular the need to:

- **establish the counterfactual** – the Government has consistently committed itself to the principle of membership of a successful EMU as part of its wider commitment to, and engagement with, the EU. The key counterfactual considered in the assessment is one where the UK is outside EMU but remains a strong and constructive member of the EU, committed to the success of EMU and of an enlarged EU;
- **identify the costs and benefits** – the dynamic, long-term, nature of the decision makes evaluation and estimation of the costs and benefits complex. Some of the costs and benefits can be thought of in terms of their effects on output, either on the growth rate or level of potential output, or on the size of deviations from potential;

- **adjust for risk and uncertainty** – there are four main areas of uncertainty; over the nature of future shocks; over the development of economic structures; over policies; and over the level of the sustainable exchange rate. Use of evidence from the euro area to date, and from other monetary unions, can help to reduce this uncertainty; and
- **adjust for differences in timing for costs and benefits** – quantification of costs and benefits requires clarity on the time scale over which they can be expected to occur and consideration of how present versus future costs and benefits should be evaluated.

The five tests and the economic literature **I1** The five tests take **optimal currency area (OCA) theory** as their starting point. The original OCA literature stressed strongly the need to examine whether economies are sufficiently integrated (the convergence test) and whether factors of production are sufficiently mobile (the flexibility test).

I2 However, traditional OCA theory is insufficient to encompass all of the issues relevant to the decision on whether to join EMU, so the five tests also consider a number of extensions to the original literature, in particular: an analysis of adjustment through prices; a recognition of the importance of capital markets; a focus on structural changes; and an assessment of the role of policy frameworks.

I3 A key issue outlined in the economic literature is the **role of shocks**. A country that is likely to suffer from frequent asymmetric shocks, i.e. shocks that affect one country more than others, may be ill advised to join a monetary union, because it is insufficiently converged. The assessment contains a full analysis of the types of shocks that are most relevant.

Other assessments **I4** As with the UK approach, assessments of EMU by other countries and the European Commission generally take OCA theory as their starting point. For example, they often look at the degree of flexibility, especially in labour markets and in fiscal policy, and at the likelihood of asymmetric shocks. Also like the UK, the other assessments typically take the national economic interest, in terms of growth, stability and employment, as the bottom line in their analytical frameworks.

I5 The insights and approaches of these assessments can help to inform the UK's decision, providing a useful crosscheck to the assessment. However, important caveats should be borne in mind, reflecting the fact that the assessments were carried out by different countries, at different times, in different situations, by different bodies, with different remits, and the assessments typically used different counterfactuals.

The framework for the five tests **I6** The principal aim is to ensure that the assessment, and the preliminary and technical analysis which informs it, fully address these issues. A complementary aim is to ensure that the assessment informs an open, transparent and wider debate on UK membership of EMU.

I7 The Government has set exacting requirements for the assessment to ensure that it provides a sound basis for a decision of this magnitude. It is a decision that will have long-term implications for the UK economy and the Government's economic policies. The Government will only make a decision to recommend joining EMU if the case is clear and unambiguous. The five tests define whether such a case can be made.

INTRODUCTION

I.1 This study provides a guide to the UK Government's five economic tests for entry into Economic and Monetary Union (EMU). It sets out the context and rationale for the five tests and why they provide the right framework for assessing whether membership of EMU is in the UK's national economic interest.

I.2 The study comprises seven sections. Sections 2 and 3 explain the context and rationale for the five tests framework and the approach taken:

- **Section 2** puts the Government's policy on EMU membership into its long-term context. It sets out how the EMU decision must be judged in terms of the contribution to the Government's central economic objective. It also explains why the long-term implications of the EMU decision require that the benefits are clear and unambiguous; and
- **Section 3** explains the rationale for the five tests and how they provide a basis for the assessment of whether EMU membership is in the UK's national economic interest.

I.3 The subsequent four sections describe the five tests framework in greater detail, in terms of analysing the costs and benefits of membership, the existing economic literature (both theoretical and applied) and why the approach taken must be comprehensive and rigorous:

- **Section 4** considers how the five tests framework enables an analysis of the options and the costs, benefits, uncertainties and risks associated with them;
- **Section 5** relates the five tests to the extensive academic literature on EMU and membership of a single currency and explains how the five tests encompass the important extensions to the original literature on optimal currency areas;
- **Section 6** examines applied analyses, focusing on the assessments of the important economic questions relevant to membership of EMU produced by other countries and the European Commission; and
- **Section 7** sets out the comprehensive and rigorous approach to the five tests. It describes the preliminary and technical work and the Treasury's assessment in more detail.

I.4 In addition there are two annexes. **Annex A** sets out the theoretical foundations to the analysis in the five tests assessment. **Annex B** discusses the nature and impact of economic shocks, which are an important factor in the assessment of the likely impact of EMU on the UK economy.

2

GOVERNMENT POLICY ON EMU

Objectives and strategy 2.1 Government policy on EMU was originally set out by the Chancellor of the Exchequer in his statement to Parliament in October 1997.¹ It is updated in the Government statement and decision on EMU membership, based on HM Treasury's assessment of the five economic tests.

2.2 The Government's central economic objective is:

“to build a stronger, more enterprising economy and a fairer society, extending economic opportunity and supporting those most in need to ensure that rising national prosperity is shared by all”.

2.3 The Government's decision on UK membership of the single currency must be considered in the context of this objective.

A long-term, principled approach

Key principles 2.4 The Government's policy towards EMU membership is founded on the following key principles:

- a successful single currency within a single European market would in principle be of **benefit** to Europe and to the UK;
- the **constitutional** issue is a factor in the UK's decision but it is not an overriding one, so long as membership is in the national interest, the case is clear and unambiguous, and there is popular consent;
- the basis for the decision as to whether there is a **clear and unambiguous** economic case for membership is the Treasury's comprehensive and rigorous assessment of the five economic tests; and
- whenever the decision to enter is taken by the Government, it should be put to a **referendum** of the British people.

Introducing the five tests 2.5 The five economic tests define whether a clear and unambiguous case for UK membership of EMU can be made and they must be met before any decision to join can be taken. The tests were set out in full in the Treasury's first assessment of the five tests (HM Treasury, 1997) which accompanied the Chancellor's statement to Parliament in October 1997. The five economic tests are as follows:

- Are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?
- If problems emerge is there sufficient flexibility to deal with them?
- Would joining EMU create better conditions for firms making long-term decisions to invest in Britain?
- What impact would entry into EMU have on the competitive position of the UK's financial services industry, particularly the City's wholesale markets?
- In summary, will joining EMU promote higher growth, stability and a lasting increase in jobs?

¹ Statement on Economic and Monetary Union by the Chancellor of the Exchequer, 27 October 1997. Available on the HM Treasury website at www.hm-treasury.gov.uk.

The implications of EMU **2.6** The key implications of a decision to join EMU are set out in Box 2.1. The EMU decision is as important for the long-term success of the UK economy as it is for the immediate future. EMU membership would mean significant changes to the operation of UK macroeconomic policy. The performance of the UK economy following the introduction of the Government's monetary and fiscal policy frameworks since 1997 shows how stability has provided a foundation for a long-term improvement in the UK's economic performance.² This demonstrates why the Government's decision on EMU focuses on the long-term implications for the UK economy.

2.7 A long-term approach is necessary because of the distinctive nature of the UK economy – a large economy in the EU with a global outlook – and the stop-go nature of the UK's economic history. This explains why the decision on whether to recommend UK membership of EMU must be based on a more wide-ranging economic assessment than embodied in the EC Treaty convergence criteria (see Box 3.2 in Section 3).

Why EMU matters **2.8** In his June 2002 Mansion House speech, the Chancellor of the Exchequer stressed that:³

“Our decision on the euro is of immense, historic importance to the long-term future of our economy and our country as a whole. It is perhaps the biggest peacetime economic decision we as a nation have to make.”

Learning from the past **2.9** Because the decision on EMU is irreversible, it is materially different from any previous exchange rate decision taken by the UK Government. EMU is a permanent monetary union, rather than a fixed or semi-fixed exchange rate regime, and so does not suffer from the pressures that can undermine fixed exchange rate systems if market participants come to believe that the fixed exchange rate is no longer sustainable. This was the case during sterling's membership of the Exchange Rate Mechanism (ERM) in 1992.

2.10 Nevertheless, the Government's approach to the five economic tests – as in other aspects of its management of the economy since 1997 – is based on learning the lessons of the past, which means it is crucial to ensure that:⁴

- economics, not politics is the deciding factor on the timing and manner of the decision;
- the decision is taken from a position of economic strength rather than being forced from weakness. Such a position of strength has been established by the macroeconomic framework implemented since 1997 and reforms to raise productivity and employment (see Box 2.2);
- the decision is based on a proper assessment of the long-run economic case; and
- the economic consequences of a decision to join, including any short-term transitional issues, are fully analysed and understood.

² See HM Treasury (2002a).

³ Mansion House Speech, 26 June 2002, HM Treasury press notice 62/02, available at www.hm-treasury.gov.uk.

⁴ See Balls (2002)

Box 2.1: The implications of EMU membership

The 12 Member States of the European Union^a which have joined the EMU have replaced their national currencies with the euro. The key implications for the countries of the euro area are:

- nominal exchange rates between these countries are fixed irrevocably at the entry rate;
- there is a single short-term interest rate which is set for the euro area as a whole by the European Central Bank (ECB); and
- fiscal policy remains the responsibility of Member States, subject to a requirement to avoid excessive deficits and comply fully with the terms of the Stability and Growth Pact (SGP).

If the UK were to join EMU then the key implications would be:

- sterling would be replaced by the euro as the UK's national currency. The UK would no longer have a floating nominal exchange rate with other members of the euro area. The level of the euro would determine the UK's exchange rate with non-euro area countries, which would continue to move;
- official short-term interest rates would be the same in the UK as in the euro area and set by the ECB; and
- the UK Government and Parliament would remain responsible for UK fiscal policy, subject to the full terms of the SGP for EMU members.

Adoption of the euro as the UK's national currency would therefore entail important economic and institutional changes, both in terms of the frameworks for the operation of monetary and fiscal policy and the coordination of economic policies more generally. This is discussed in detail in the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

It is also important to emphasise that EMU is not static. Sweden will have a referendum on EMU membership in September 2003 and the imminent enlargement of the EU will increase by ten the number of prospective members of EMU.

The E in EMU

EMU stands for **Economic and Monetary Union**.^b Many of the potential benefits associated with a common currency depend on well-functioning and integrated product, labour and capital markets. The EU Single Market Programme has been a key driver towards delivering a more dynamic and open Europe and is further advanced by the ten-year European economic reform strategy launched at the Lisbon European Council in 2000.^c

^a The current 12 members of the euro area are: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Eleven members joined on 1 January 1999 while Greece joined on 1 January 2001.

^b The importance of the economic dimension was highlighted by the European Commission (1990).

^c See HM Treasury (2003b).

A robust decision 2.11 In practice, if the Government is to recommend membership of EMU, it must be in the national economic interest. This requires that:

- first, the case for entry must be **clear and unambiguous** and fully reflect the potential **costs and benefits and uncertainties and risks** of membership, as well as the option of staying out over different time scales; and
- second, the decision must be underpinned by a **comprehensive and rigorous** assessment of the evidence and issues.

Box 2.2: Establishing a position of strength

Since 1997, the Government has taken tough decisions and introduced wide-ranging reforms to deliver high and stable levels of growth and employment, establishing a platform of economic stability based on low inflation and sound public finances:

- the macroeconomic framework is designed to **maintain long-term economic stability**. Large and unpredictable fluctuations in output, employment and inflation impose significant economic and social costs and hold back the economy's long-term growth potential. Stability helps businesses, individuals and the Government to plan effectively for the long term, improving the quantity and quality of long-term investment in physical and human capital and helping to raise levels of productivity;
- **raising the UK's sustainable rate of productivity growth** is a key route to higher prosperity and living standards and advances the Government's objectives to tackle poverty and improve public services. The Government is taking steps to ensure faster UK productivity growth, closing the productivity gap which exists between the UK and other advanced industrial economies; and
- the Government's long-term goal is to sustain a **higher proportion of people in work** than ever before by the end of the decade. Economic strength depends on the number of people in work and their productivity. For the majority of individuals and their families, employment is also the single most effective means of avoiding poverty, both now and in the future. The Government's goal is to ensure that employment opportunity is extended to all groups and every area of the country.

The relevant timeframe 2.12 The analysis in the assessment and the accompanying EMU studies is framed over different periods of time. The following reference points are used throughout:

- **short term:** the period of time over which prices and quantities of goods produced can be adjusted but capacities are essentially fixed. It is most relevant to the current cyclical conjuncture of the UK economy and how monetary policy impacts upon it;
- **medium term:** the period of time over which fiscal policy is typically framed. Capacities will be adjusting over this time frame and the exchange rate will move to a level consistent with sustained internal and external economic balance. It is most relevant to the analysis of whether the prospects for UK economic stability, growth and employment can be enhanced in EMU and how the impact of the transition to EMU membership would affect this; and

- **long term:** the period of time over which all inputs to production can be varied, ensuring that capacity adjustment is complete. It is most relevant to analysis of the Government's overall objectives for economic growth, stability and jobs.

2.13 A thorough assessment of the potential implications of EMU membership in the short, medium and long term enables a complete picture to be built up. This is important – past experience of the UK and other countries shows that decisions taken for the short term can have effects over much longer time horizons, with sustained effects on the economy as a result.⁵ Such decisions might require offsetting policy changes which run counter to the Government's long-term economic objectives.

A clear and unambiguous case

2.14 Requiring the case to be clear and unambiguous sets a demanding standard for UK membership of EMU. The Government believes that to aim lower would fail to take full account of the particular nature and policy history of the UK economy, the irreversible nature of the decision and the constitutional issues which it raises. As the Chancellor said in his 2002 Mansion House speech:

“The case for the five economic tests is not just that we must avoid the economic policy mistakes of the past but, when the decision is not just momentous but irreversible, affecting every industry and all people, that the national economic interest – full employment, high and sustainable levels of investment and growth, long-term prosperity – is, and should be seen to be, the decisive factor.”

A comprehensive and rigorous assessment

2.15 This is why the Government attaches so much importance to a robust, comprehensive and rigorous five tests assessment. Anything less puts at risk achievement of the Government's long-term economic objectives, potentially damaging the UK national economic interest.

⁵ If these effects persist and lead to a prolonged adjustment, there is the possibility that the eventual equilibrium position itself may vary.

3.1 This section explains the five economic tests in more detail. As the Chancellor made clear in his 2002 Mansion House speech “...being serious about the economics of the euro means being serious about the five tests”.¹

Consistent with Government objectives

3.2 The starting point is the Treasury’s approach to analysing the UK economy (see Box 3.1). While recognising that there is no trade-off between output and inflation in the very long run, the approach emphasises the importance of stability in the short, medium and long term and the role of the short-term interest rate and the nominal exchange rate in the assignment of policies. These are the key option variables in the EMU decision.

The five tests: the underlying framework

The difficulty of analysing EMU

3.3 While the Treasury’s approach to analysing the economy is widely accepted (subject to differences of view about the degree of flexibility of prices), analysing the issue of UK membership of EMU is more challenging. There is no single unified conceptual or theoretical framework to apply to either the operation of a monetary union or the decision to join one.²

3.4 It is, however, generally recognised that membership of EMU carries potential costs and benefits, or pros and cons as David Currie described them in his 1997 publication for HM Treasury (Currie, 1997). This is the basic insight of optimal currency area (OCA) theory – see Mundell (1961) – which provides the theoretical starting point for the five tests approach.³

3.5 OCA theory highlights the significance of unanticipated economic disturbances or shocks (including their transmission and the adjustment to them) and the relationship between the degree of economic integration and the likely costs and benefits that might be expected from a single currency.

3.6 However, the original OCA theory is highly stylised. For example, it assumes that prices and wages are rigid, even in the long term. It focuses more on the costs of membership, with the benefits largely taken as given. And both the costs and benefits are assessed in a static environment. The original theory can be developed to examine the likelihood of different types of shock and the adjustment mechanisms available to respond to them.

More emphasis on dynamics and the future

3.7 The five tests framework is designed to overcome these limitations by adopting a more forward-looking approach. It also encompasses the range of approaches taken by different countries and institutions to addressing the question of membership of a monetary union (as discussed in Section 6). This helps assess the costs and benefits, not just in terms of theory but also as they apply in practice to the UK.

¹ In a paper for the Treasury Select Committee in September 2002, the Treasury set out in more detail why each of the tests are important and why they provide the right framework for assessing the national economic interest. See *Paper for the Treasury Committee on the Treasury’s Approach to the Preliminary and Technical Work*, 6 September 2002. Available at www.hm-treasury.gov.uk.

² This is not a new insight – see, for example, the European Commission (1990).

³ See Section 5 for a detailed discussion of OCA theory and the five tests framework.

Box 3.1: The Treasury's approach to analysing the UK economy

The Treasury's analysis of the UK economy assumes:

- prices and wages are not fully flexible in the short run, but are flexible in the long run;
- this stickiness of prices – known as nominal rigidity – means that nominal variables like the exchange rate and interest rates can have an impact on real economy variables like output and employment over the short and medium term, which are the time horizons relevant for decisions on monetary and fiscal policies;
- moreover, nominal rigidities can interact with real rigidities, prolonging the period that the economy is out of equilibrium and potentially affecting the equilibrium itself – an effect known as hysteresis;
- the aim of economic policy is to stabilise fluctuations in output and inflation so that the economy remains close to trend while pursuing policies to raise the trend rate of growth itself;
- within this, *macroeconomic policy* is principally directed towards delivering economic stability as the essential foundation for delivering an improved real economic performance. Monetary policy is directed to the achievement of the Government's inflation target. The primary role of fiscal policy is to deliver sound public finances. But fiscal policy also has an important secondary role to support monetary policy in achieving economic stability;
- *microeconomic policies* are focused on raising the trend rate of productivity growth and the sustainable rate of employment; and
- the nominal exchange rate is not a policy target – as it was, for example, during the UK's membership of the ERM. Rather it should be seen as the outcome of other policy choices. The real exchange rate – the nominal exchange rate adjusted for differences in inflation between the UK and other countries – is an important measure of competitiveness and is an indicator of the sustainability of convergence.

Annex A outlines key insights from economic theory that have informed the Treasury's analysis of the EMU decision.

3.8 This extended framework highlights longer-term dynamic factors, both in terms of price adjustment mechanisms and also potentially self-reinforcing mechanisms for integration through product and capital markets that may result from EMU membership. The latter is known as *ex post* or *endogenous convergence*, i.e. convergence which continues after entry. This contrasts with *ex ante convergence* or convergence prior to entry.⁴ In addition, issues such as the choice and credibility of macroeconomic policy regimes are now rightly given greater emphasis in economic theory and analysis.

⁴ Frankel and Rose (1997) were the first to use this terminology, which brings out the time dimension to the choice to be made. *Ex ante* convergence is the position that the UK is in now and is the position current EMU members were in until they joined. In a subsequent article (Frankel and Rose, 1998), they coined the word 'endogeneity' to describe the self-reinforcing nature of these processes.

Potential costs 3.9 The first two of the five economic tests, relating to convergence and flexibility, address the demands which would be placed on the UK economy by EMU membership. The costs relate to the loss of monetary policy as a domestic instrument to achieve stability and the loss of the potential adjustment mechanism of the nominal exchange rate to help maintain stability. The means of minimising these costs is through convergence in economic performance – so that interest rates set for the single currency area as a whole are appropriate for individual members – and through having the flexibility to adjust to divergence and to change. These issues have their origins in OCA theory:

- the **convergence** test assesses the degree of compatibility in economic cycles and structures and the implications for the incidence and transmission of both common and country-specific shocks; and
- the **flexibility** test assesses whether there is sufficient potential for the economy to adjust in response to shocks in the absence of an independent monetary policy and without the nominal exchange rate to act as an adjustment mechanism.

3.10 Convergence must be shown to be *settled* on the basis of an analysis of past history and current conditions, not just at a point in time. Convergence must also be *sustainable* to ensure the economy can withstand changes or developments which, while uncertain, will inevitably occur in the future.

3.11 Flexibility is about the resilience of the economy; its ability to respond to change quickly and at minimum cost in terms of disruption. So the level of flexibility determines the durability of convergence.

3.12 Together the assessment of the convergence and flexibility tests determines whether **sustainable and durable convergence** has been achieved. The 1997 assessment concluded:

“...we need to demonstrate sustainable and durable convergence before we can be sure that British membership of EMU would be good for growth and jobs. Joining before such convergence is secured would risk harming both”. (HM Treasury, 1997, page 8.)

3.13 Sustainable and durable convergence is the key precondition for successful membership of EMU,⁵ to ensure that the potentially significant gains from further integration can be realised. It is therefore important to analyse existing monetary unions to gauge the extent of compatibility and sufficiency that is needed. Economic cycles and structures within a monetary union will never be perfectly compatible, as the long history of the US and UK show, and as the emerging evidence from the euro area demonstrates. But as the evidence also indicates, and as recognised throughout the EU, to make a sustained success of EMU requires a **high degree of flexibility**.

Potential benefits 3.14 Even in a world of increasingly free trade between countries, separate currencies remain a barrier. The euro removes this barrier across an economic area the size of the US and complements the EU Single Market Programme in goods, services and capital.

⁵ The 1997 assessment described sustainable and durable convergence as the “touchstone”.

3.15 The third, fourth and fifth economic tests – investment, financial services, and growth, stability and jobs – together help assess the potential benefits of EMU membership:

- the **investment** test focuses on investment as one of the key drivers of UK productivity, growth and long-term economic performance;
- the **financial services** test concentrates on this key sector for the UK economy where the advent of the euro is having the earliest impact and where the impact promises to be significant in the medium term; and
- the final test, the **growth, stability and employment** test, considers the overall impact for the Government's central economic objective.

Assessing the case for membership

3.16 On the basis of the assessment of the five economic tests, the Government has to decide whether to recommend joining EMU.

3.17 The potential costs and benefits have to be assessed for each option and must take account of:

- **uncertainties:** the requirement that the case be clear and unambiguous means that uncertainties such as those relating to the sustainable level of the sterling-euro exchange rate must be fully analysed and their implications understood;
- **the time frame:** as noted earlier, assessing the potential costs and benefits of membership must fully consider the short, medium and long-term implications; and
- **the importance of longer-term dynamic mechanisms and of the future path of the economy:** again, as already noted, a particular issue highlighted by many is the possibility of convergence after entry, i.e. endogenous convergence. This contrasts with convergence prior to entry.⁶

Risks and opportunities

3.18 If a decision to join EMU was taken now, on the current degree of sustainable and durable convergence, this would clearly rule out joining at a later date when the position might be different. This underlines the emphasis on the case for joining being clear and unambiguous. As well as focusing on the risks, the assessment also highlights the potential missed opportunities from a decision not to join, reflecting the fact that EMU is dynamic and evolving, both in terms of its operation and the potential benefits it offers.

Wider policy implications

3.19 Whatever the outcome of the EMU decision, because of the Government's policy on EMU there will be wider economic policy implications:

- if a decision is taken not to join at the present time, then additional policy action might be required to encourage a greater degree of convergence and flexibility to deliver sustainable convergence in the future; while
- if a decision is taken to join, then additional policy action might be required to minimise the risks associated with membership – for example, a more active fiscal policy to compensate for the loss of interest rate setting as a domestic policy tool and the nominal exchange rate as an adjustment mechanism. Fiscal policy issues are discussed in detail in the EMU study by HM Treasury *Fiscal stabilisation and EMU*.

⁶ This distinction is emphasised by Professor Peter Kenen in his contribution to the EMU study *Submissions on EMU from leading academics*.

Key economic issues 3.20 Overall, the five tests focus on the following key economic questions:

On sustainable and durable convergence:

- How important is the degree of cyclical convergence and the transition to EMU?
- Which economic structures, for example the housing market, business sectors and trade, matter in determining the incidence and transmission of shocks?
- How adaptable is the economy to shocks and what are the costs of adjustment entailed?
- What particular types of flexibility (labour mobility or flexibility in prices and wages) does EMU put a particular premium on?
- What is the role of the real exchange rate both in relation to entry and as an adjustment mechanism?
- How far is there an enhanced role for fiscal and structural policies within EMU?

On the potential benefits:

- What is the time profile and scale of the potential benefits of membership for both businesses and consumers?
- How important is the robustness of the macroeconomic framework and governance arrangements?
- What dynamics are at work both in terms of adjustment and integration and how might these change in the future because of both changes to existing trends (endogenous convergence) and exogenous changes (for example, enlargement of the EU)?

3.21 As the IMF has concluded, the five economic tests are:

“...broadly consistent with the economic considerations that would be important for the decision to join a monetary union.” (IMF, 2001, page 22.)⁷

The Treaty convergence criteria 3.22 The Government believes that the convergence criteria included in the EC Treaty (European Commission, 1999), and set out in Box 3.2, are a key economic input into the process at EU level whereby the European Council decides whether countries have met the “*necessary conditions*” to join EMU.⁸ But the focus of the EC Treaty convergence criteria is on the relative short-term cyclical position of the economy and the public finances: they are effectively entry criteria. In terms of their relation to the five economic tests, the Treaty convergence criteria are embodied in the analysis of the degree of cyclical convergence, as part of the convergence test.

⁷ The IMF have more recently noted that “*The five economic tests ... remain appropriate for evaluating the economic considerations relevant to this decision*” (IMF, 2003).

⁸ In the UK’s case because of the UK specific protocol in the Treaty – the UK ‘opt-out’ – the EU process only begins after a decision to join is taken first by the Government then by Parliament and then by the people of the UK in a referendum. By contrast, among EU members all the existing EMU members had a legal obligation to join EMU at some point, having signed the Maastricht Treaty. Denmark also has an opt-out from the Treaty commitment to EMU, whereas Sweden has been judged by the European Council not to meet the necessary conditions for membership.

Box 3.2: The EC Treaty convergence criteria

The European Council decides whether the “*necessary conditions*” for EMU entry have been met on the basis of progress against the EC Treaty convergence criteria:

- the achievement of *price stability* – a low rate of inflation close to the best performing states (defined as being within 1½ per cent of the average of the three lowest);
- *sustainability of the government financial position* – the government should not run a financial deficit greater than 3 per cent of GDP, and gross general government debt should be less than 60 per cent of GDP;
- *exchange rate stability* – apparent by the observance of the normal fluctuation margins provided by the Exchange Rate Mechanism, for at least two years; and
- *durability of convergence* – convergence of long-term interest rates (defined as being within 2 per cent of the average long-term interest rate of the three lowest inflation states).

3.23 The Government has been clear since 1997 that the decision on whether to recommend UK membership of EMU must be based on a more wide-ranging and long-term economic assessment than embodied in the EC Treaty convergence criteria. This is necessary because of the distinctive nature of the UK economy – a large economy in the EU with a global outlook – and its history of economic instability. History also shows sustained periods of clear divergence between the UK and the euro area. This makes a comprehensive assessment of the economic case for joining EMU, as provided by the five tests, particularly important for the UK.

3.24 In his 1997 statement, the Chancellor stressed the importance of the UK having a “*genuine option*” to join EMU in the future. Aside from the legal position,⁹ to have a genuine option:

- the UK has to have made the **practical preparations** necessary for potential membership. In his October 1997 statement, the Chancellor made clear that the UK had not at the time made the practical preparations necessary;¹⁰ and
- there must be a **choice in economic terms**. The reforms to the UK’s macroeconomic policy framework since 1997 – including the granting of operational independence to the Bank of England and the introduction of strict fiscal rules and a Code for Fiscal Stability – offer the UK a credible future outside the single currency until any decision is taken to join. This provides a platform of stability and a position of strength from which to make the decision on UK membership of EMU.

⁹ The UK specific protocol to the Treaty means that the UK also has an option to exercise in the legal sense.

¹⁰ For progress since 1997, see successive HM Treasury reports on euro preparations and the third outline National Changeover Plan (HM Treasury, 2003a).

4

THE FIVE TESTS: COSTS AND BENEFITS

4.1 The costs, benefits, uncertainties, risks and timing issues associated with EMU membership highlight the importance of undertaking a full and comprehensive assessment of the options. This section considers how the five tests framework makes this possible, both for the option of joining EMU and the option of staying outside EMU.

4.2 Each of the five tests addresses key economic and policy issues relevant to EMU and they are brought together in the assessment to reach a conclusion as to whether it is in the UK's national interest to join EMU. As this study has already made clear, the implications of joining EMU are far reaching. There are implications for different variables (for example, output, prices and employment) there are different dimensions (for example, there are implications for both the level and the volatility of output and employment) and there are differences in terms of both timing and the certainty of particular outcomes.

Developing the options

4.3 Most discussion of the EMU decision to date has concentrated on describing what the effect might be on the UK of joining EMU. But this is only part of a proper assessment. It is important to consider not only what the impact might be if the UK were to join EMU but also what would happen if the UK were not to join at the present time.

4.4 A description and assessment of the options – the ‘counterfactuals’ – is central to ensuring that there is a *genuine* option to join EMU. Because a number of potential counterfactuals to joining could be considered, it is important to focus the analysis on the most likely real world cases.

4.5 The Government has consistently committed itself to the principle of membership of a successful EMU as part of its wider commitment to, and engagement with, the EU. EMU is not static and the same is true of the EU. Enlargement in 2004 will result in a major change to the EU and Box 4.1 summarises its implications for EMU. Enlargement is factored into the assessment of the five economic tests, which is based on a forward-looking assessment of the issues.

Real world counterfactual: a full member of the EU, outside EMU

4.6 The key counterfactual considered in the assessment is one where the UK is outside EMU but remains a strong and constructive member of the EU, committed to the success of EMU and of an enlarged EU.

Box 4.1: Enlargement and EMU

The 10 accession countries^a are obliged to adopt the euro as soon as they meet the EC Treaty convergence criteria. In the medium term this means that several of them will be members of EMU. A forward-looking analysis of how EMU will operate therefore has to consider that the euro area could have at least 22 members within a decade. This has many implications for how EMU will operate, for instance:

- the ECB will need to consider economic developments in the additional countries – any one state will have even less impact on the common monetary policy of the euro area than it does at present;
- divergence of growth rates could increase as the accession countries catch up with the EU average. As a result, inflation differentials could also rise;
- the ECB's operating procedures will change, as was recognised by the Nice Treaty. The ECB has proposed a system of rotating votes at the Governing Council, meaning that there would be no more than 21 voting members at any time; and
- the implementation of the Stability and Growth Pact (SGP) will need to recognise the special role of public investment, reflecting the public infrastructure requirements of many of the accession countries. The accession countries also typically have lower debt levels than existing EU Member States.

A number of these issues are discussed in the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

In the short to medium term, enlargement will probably have a greater impact on the operating procedures of EMU, including the ECB and the SGP, than on the overall economic performance of the euro area. In 2001, the combined GDP of the accession countries was less than 8 per cent of that of the euro area. However, assuming that they will grow faster than the existing members as productivity catches up, their relative weight can be expected to increase over time.

^a The 10 accession countries are Cyprus the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

4.7 The UK would retain the option of joining EMU, providing that it met the EC Treaty's convergence criteria outlined in Section 3. The UK would remain inside the Single Market and follow economic policies consistent with its ongoing EU commitments, for example to the SGP. This is a key element in the need for a 'genuine' option.

Evidence from existing monetary unions

4.8 The assessment also looks closely at existing monetary unions, in particular:

- evidence on the performance of the **US** as a long-standing monetary union of similar size to the euro area. This is the subject of detailed analysis in the EMU study by HM Treasury *The United States as a monetary union*;
- analysis of the **UK** as a single currency area, smaller in scale but nevertheless relevant – particularly on issues relating to adjustment; and
- detailed evidence drawn from the **euro area**. This is a key extension to the evidence base compared with the 1997 assessment. There are now several years' of experience to learn from and draw on to inform the assessment.

A successful EMU 4.9 The Government has consistently stressed that it wants EMU to be successful irrespective of whether or not the UK decides to join. This is a key element of having a real option. The starting point for the Government's approach is that EMU has strong potential to be successful over time. Success can be gauged in different ways:¹

- in terms of the **technical changeover operation** of EMU – whether the changeover process was smooth and cost effective, allowing resources to be best targeted. The Treasury's sixth report on euro preparations and the third outline National Changeover Plan (HM Treasury, 2002c and 2003a) describe the key features of the changeover to the euro in the current euro area and the lessons that can be drawn. They conclude that the changeover to the euro was broadly smooth in all 12 euro area countries;
- in terms of the **performance of the member economies** – looking at, for example, the evidence of and scope for stronger potential growth and greater resilience to shocks;² and
- in terms of the EMU institutions which make up the macroeconomic and microeconomic policy frameworks – the '**governance**' of EMU.³ The governance of EMU is vital to its success and will have bearing on the context in which the UK economy operates, whether inside or outside of EMU. The framework consists of a set of institutions with functions and particular practices, the key ones being the ECB setting monetary policy; the SGP which provides the framework for fiscal policy in EMU; and the Eurogroup and the Broad Economic Policy Guidelines which provide the framework within which the coordination of different elements of macroeconomic and microeconomic policies are considered. The UK Government supports the essentially intergovernmental nature and balance of responsibilities in the existing policy framework.

4.10 The evaluation of the potential success of EMU, now and in the future, is a particular focus of the fifth test on growth, stability and employment. This test also examines at governance issues in some detail. A key element of this is an analysis of the robustness of the UK and euro area macroeconomic policy frameworks. This is the focus of the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

What the option of EMU does not imply 4.11 It is important to be clear about exactly what the option of joining EMU does and does not entail. Box 2.1 in Section 2 has already described the implications of a decision to join EMU. Box 4.2 complements this by summarising some important elements of EU policy where the policy position is clear and essentially independent of the decision of whether to participate in EMU. As such, these aspects are not considered to be part of the option of joining EMU assessed within the five tests framework.

¹ A wider range of criteria consistent with these are discussed in House of Lords Select Committee on the European Union (2000, page 7).

² For progress on economic reform in Europe see HM Treasury (2002a, 2002d and 2003b).

³ Jacquet and Pisani-Ferry (2001) distinguish this concept from that of Economic Government which implies a more formal institutional structure which is potentially less inter-governmental in nature.

Box 4.2: What EMU is not

It is often claimed that EMU must inevitably lead to fiscal federalism or harmonisation of tax policy and social legislation. While EMU membership could have some indirect effect on these issues, in either direction, there is no necessary link. There is no provision for such developments in the EC Treaty. A fuller discussion of the issues is included in the assessment of the growth, stability and jobs test.

Fiscal federalism: growth in the EU budget is constrained by the Financial Perspective ceilings decided periodically by the European Council, by Treaty rules limiting the increase in the main categories of expenditure and by the Own Resources Decision which limits total EC revenues (and therefore expenditure) to 1.24 per cent of Community Gross National Income. These measures are all independent of EMU membership. Like many other countries, the UK takes a prudent approach to the EU budget and sees no rationale for increasing it, either in general or in response to any EMU-related demands. The “no-bail out” clause in the EC Treaty protects individual Member States from assuming the debts of others.^a The US has a different approach reflecting its very different political structure and evolution of institutions.^b

Tax harmonisation: while some argue that EMU membership would promote tax harmonisation across the EU, this is not the case. The UK Government believes that fair tax competition, coupled with effective action to combat harmful tax competition, is key to promoting the competitiveness of the EU while allowing governments to respond to national preferences. The history of the US shows that monetary unions can be successful while enjoying a wide diversity of tax rates. Any move towards tax harmonisation would need the unanimous support of all EU Member States. The UK, like other countries, has made clear its strong opposition to tax harmonisation.

Structural reforms: nor does EMU entail a further centralisation of legislative measures on structural reform and labour markets. At the Lisbon European Council in March 2000, the Heads of Government or State gave new impetus to the “open method of coordination”. This means that individual Member States commit to achieving common goals but have the freedom to design national policies in pursuit of those goals. At the EU level, Member States are able to learn from each others’ experiences and to identify which policies work well and which do not, through a process of peer review. This approach is increasingly being used to develop European economic policy, although in some areas – such as the Single Market – further progress may require the more traditional approach of centralised directives.

^a Article 103(1) of the Treaty.

^b The EMU study by HM Treasury *The United States as a monetary union* contains a detailed exposition. For a summary see Currie (1997). In any case, the EMU study *The United States as a monetary union* makes clear that the degree of economic stabilisation provided by national fiscal policy systems in the EU, without fiscal federalism, already at least matches that found in the US. In his contribution to the EMU study *Submissions on EMU from leading academics*, Antonio Fatás argues that “the implementation costs [of a European fiscal federation] are too large to compensate for the small potential benefits”.

Costs and benefits

4.12 The Government has repeatedly stressed that EMU membership could entail significant benefits. The October 1997 statement stated that:

“The potential benefits for Britain of a successful single currency are obvious: in terms of trade, transparency of costs and currency stability”.

4.13 The evaluation of the potential costs and benefits must reflect the risks associated with them. For example, being part of a single currency area is likely to yield a clear benefit in increased trade over time and a more efficient allocation of production for its members.⁴ On the other hand, surrendering an independent monetary policy is a clear potential cost to joining the single currency, the risks of which will be reduced if sustainable convergence has been achieved.

Estimating costs and benefits 4.14 The basic issues relating to the costs and benefits are quite simple in principle, but evaluating and estimating them is complex, with difficult issues relating to their timing, size and distribution, and the importance of avoiding double-counting.

Timing 4.15 In terms of timing it is necessary to consider:

- the **immediate** effects on entry. For instance, the **one-off costs of changeover** and the ongoing benefits in terms of **savings in transaction costs** and the elimination of exchange rate risk. Attempts have been made at quantification, but with wide margins of error on both;
- the **short to medium-term economic impacts**, both in terms of the benefits from **increased trade and investment** and the economic costs from **adjusting** to entry and then stabilising the economy having joined. These effects are potentially much more significant, but even more difficult to quantify; and
- the potential **long-term effects** on the supply side of the economy and on competition.

4.16 Detailed modelling and analysis of the dynamic cost issues is included in the EMU studies *Modelling shocks and adjustment mechanisms in EMU* and *Modelling the transition to EMU*. This analysis is important for the assessment of the convergence test, the flexibility test and the growth, stability and jobs test.

Size 4.17 Gains could arise from enhanced market efficiency and competition and the ability to reap internal and external economies of scale. The size of these benefits would depend on the extent of the UK's integration into the euro area market. It is important to examine this factor in a forward-looking way as the degree of integration could change as a result of EMU membership. A number of the EMU studies consider the magnitude of the potential costs and benefits of EMU, for example:

- *EMU and trade* establishes a range of estimates for the potential effect of membership on UK trade and output;
- *Prices and EMU* considers the issues from the perspective of the consumer, particularly the potential impact on price differentials;
- *EMU and business sectors* sets out a framework for examining the benefits and impacts on business in the short, medium and long term; and
- *The United States as a monetary union* assesses, in largely qualitative terms, the costs and benefits for the US of having the dollar as a single currency.

⁴ This is examined in detail in the EMU study *EMU and trade*.

Distribution of gains and losses 4.18 The distribution of gains and losses is also important. While the assumption is that gains may accrue to the euro area as a whole, they will not necessarily flow to particular regions or members, including to the UK, if it became a member. These distributional issues were a particular focus of the European Commission (1990), reflecting the fact that it was concerned with the introduction of a single currency across a large and economically varied region. The emphasis in the assessment on the sustainability of convergence addresses this point. Without it, the UK would not be able to share in the potential gains of membership. The issue is also examined more widely in the fifth test on growth, stability and jobs, which considers the potential regional and sectoral impacts, drawing on the EMU study by HM Treasury *EMU and business sectors* as well distributional issues at the individual and household level.

The Government's central economic objective 4.19 Given the Government's central economic objective, the starting point for framing the analysis of costs and benefits is the effect on potential GDP. Many of the benefits of EMU could raise the economy's potential level of output. Many of the costs of EMU arise from greater deviations of output around this potential level. While this approach has limitations, it helps to emphasise the importance of sustainable convergence to the decision on EMU membership – if sustainable and durable convergence is attained, costs will be minimised and it will be more possible to realise the benefits.

Risks and uncertainty

4.20 The costs and benefits of the options cannot be considered in isolation from the risks and uncertainty surrounding them. The assessment must take into account uncertainty, particularly over the following:

- the future development of **shocks**. The conventional assumption and the methodological basis for the EMU study *Modelling shocks and adjustment mechanisms in EMU* is that the future will resemble the past in terms of the shocks which will arise.⁵ From the UK perspective, it is important whether the past evolution of shocks is likely to be repeated in the future, particularly those originating in macroeconomic policy areas. In light of the significance of the German reunification shock, it is also highly relevant in looking at the euro area;
- the future trends in countries' economic **structures**. In particular, whether they will become more or less alike over time simply through the dynamic process of integration that EMU might enhance;
- the future development of **policies** in the UK, the euro area, the EU and elsewhere. For example, it is important to consider how the UK's position in the EU could be affected by a decision not to join EMU. Another uncertainty concerns the future development of macroeconomic frameworks within the euro area. This is a focus of the EMU study by HM Treasury *Policy frameworks in the UK and EMU*; and

⁵ Stochastic simulation analysis is an econometric technique which uses shock distribution data from the past as input into a specified model of the economy. The model will generate results for output and inflation volatility if a given set of historical shocks were to be repeated in the future, and these volatilities can be compared for different model assumptions and specifications. NIESR and the Liverpool Group are the principal exponents of this approach, which they have both recently applied to the question of UK entry into EMU.

- finally, the sustainable sterling-euro **exchange rate**. This is an important variable in any decision to join EMU. This has historically been quite volatile in nominal terms and difficult to predict. Given the UK's trade and investment patterns, the evolution in the euro effective exchange rate, particularly the euro-US dollar rate, is also relevant.

Risk and uncertainty are inevitable... **4.21** Layard *et al.* (2002) stress that each of the options carry risks and require policy choices at both the macroeconomic and microeconomic levels, while other assessments⁶ emphasise the importance of reform of EU economies and institutions in reducing the risks. This again illustrates the importance of a dynamic, forward-looking approach.

...but learning could help to reduce them **4.22** Uncertainty surrounding some of these parameters can be reduced over time through learning about actual performance. The assessment and the EMU studies draw extensively on the evidence from the operation of EMU to date, as well as the experience of other monetary unions.

The Lucas Critique **4.23** On the other hand, the change that EMU membership would imply could change private sector behaviour, so that current economic relationships are not relevant to what would occur following EMU entry – the ‘Lucas Critique’ (Lucas, 1976).⁷ Taken to its limit, this could imply that there is no way of knowing how the economy would function following a decision to join EMU. However, this would be taking the critique too far, it seems likely that a focus on longer-term features such as structural convergence are less likely to be influenced by particular policy choices.

4.24 The Lucas Critique does not render economic policy analysis invalid. It does, however, underline the need for caution when assessing whether outcomes reflect transient features that could change in the event of EMU entry or longer-lasting elements. This is a key focus of the long-term analysis that the five tests framework permits.

Insurance against risk **4.25** These observations about risk and uncertainty suggest that attitudes to risk are an important part of the economic analysis. Indeed, Mélitz (1996) concludes that “*Insurance [against risk] is what the economic case against EMU is all about*”. Several of the EMU studies inform the assessment by examining how the Government could insure against increased risk, either through improved functioning of market adjustment mechanisms in the absence of an independent monetary policy or through, for example, more active use of fiscal policy for economic stabilisation.

Issues of timing

4.26 The **time dimension** is also central to the discussion of options. A decision to join EMU is irrevocable and many of the potential benefits will arise only in the medium to long term. Some of the potential costs, particularly of transition, are up front and easier to gauge, if not necessarily to quantify. Making explicit allowance for the differential timing of costs and benefits enables these factors to be taken into account.

⁶ Bush (2001) and OEF (2002).

⁷ Escolano (2000), page 85, makes this point clear.

Five timing comparisons 4.27 The importance of timing can be illustrated in several ways:

- **the short term versus the long term.** Future costs and benefits need to be discounted to reflect society's time-preference rate – other things equal, net benefits today are preferable to net benefits tomorrow;
- **dynamic versus static effects.** Dynamic effects imply a long-lasting process of change in the functioning of the economy, with accumulating costs and/or benefits. OCA theory underplays this dynamic element through time. Even focusing on counterfactuals does not ensure sufficient consideration of this element. Hence the emphasis throughout on endogenous convergence (convergence after membership) alongside analysis of the importance of *ex ante* convergence (convergence prior to membership);
- **ongoing versus one-off costs and benefits.** For example, the elimination of transaction costs that EMU implies provides ongoing benefits, while the costs of changeover are only incurred once;
- **steady state benefits versus disequilibrium costs.** Many of the potential benefits of EMU can be thought of in terms of changes to the economy's steady state, while the costs can be seen as relating to the process of adjustment to this steady state; and
- **delaying a decision to join versus immediate entry.** In October 1997 the Government concluded that, on the basis of the five tests assessment, there was a clear value in the option of delay.

4.28 These distinctions mean that careful attention needs to be paid to the question of *when* benefits and costs can be expected to occur. The dynamic dimension of the decision, involving many unknowns, also shows the need for a wide-ranging assessment, using both quantitative and qualitative evidence.

Conclusion

4.29 This section has made clear the necessity of ensuring that realistic options exist, with a full appraisal of their benefits, costs, risks, uncertainties and timing. A recurring issue is the need for a dynamic approach, looking at – among other things – how the 'regime change' of EMU would affect the UK were it to join. Section 5 extends OCA theory to embody the forward-looking approach to the five tests framework.

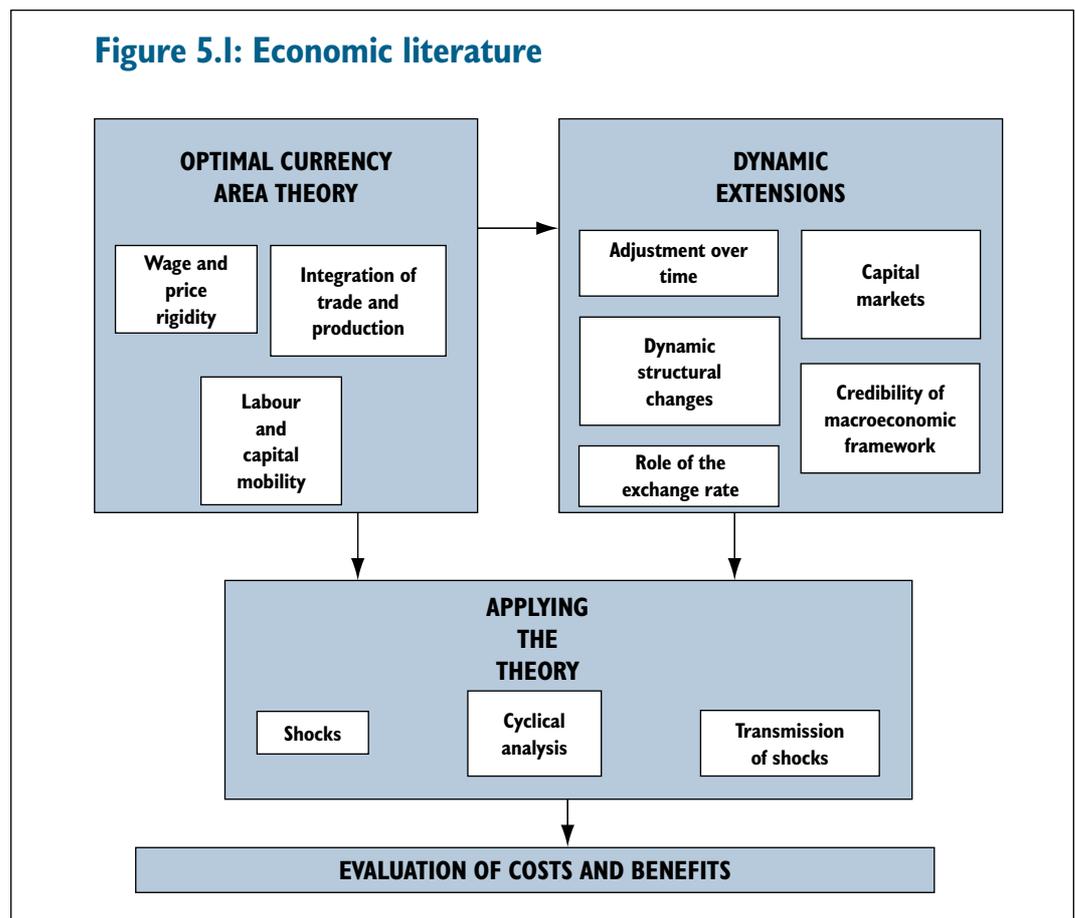
5

THE FIVE TESTS AND THE ECONOMIC LITERATURE

5.1 This section describes how the framework for the five economic tests is grounded in the economic literature on currency areas. Thorough research into the relevant literature has been a key element of the economic analysis and is crucial in ensuring a comprehensive and rigorous approach.¹

5.2 The five tests framework takes optimal currency area (OCA) theory as the conceptual starting point for the economic analysis. However, as already explained, the scope of traditional OCA theory is insufficient to encompass all of the issues relevant to the decision on whether to join EMU. So the five tests framework considers a number of extensions to the original literature, as illustrated in Figure 5.1.

5.3 The dynamic extensions include a fuller analysis of adjustment through price changes, recognition of the importance of capital markets, a focus on dynamic structural changes and assessment of the role of policy frameworks. This means that the framework can be applied to real world cases in order to produce an evaluation of the costs and benefits of EMU.



¹ This section provides an overview of the literature. More detail of this field is cited and reviewed in the EMU studies which accompany the assessment.

Optimal currency area theory

A useful starting point ... **5.4** The OCA literature provides a useful starting point for considering the UK's potential membership of the single currency.² The basic insight of this literature is that two countries will benefit from sharing a common currency if the microeconomic benefits of lower transaction costs and exchange rate risk and greater price transparency exceed the macroeconomic costs of adjusting to country-specific (asymmetric) shocks in the absence of the ability to set national interest rates or the possibility for the nominal exchange rate to adjust.

... for assessing suitability for joining a single currency **5.5** Kawai (1987) and Tavlas (1993) summarise eight characteristics, drawn from the OCA literature, as relevant indicators of how well countries or regions are suited to having a single currency. Countries or regions are well suited to having a single currency:

- where there is a high degree of **price and wage flexibility**. Perfect price and wage flexibility would ensure that markets cleared fully, leaving no role for the exchange rate in the adjustment process or for monetary policy. In other words, the choice of monetary policy or exchange rate regime would have no bearing on the real economy;
- the higher the degree of **labour and capital mobility** between the countries. Labour and capital mobility provide a substitute for exchange rate flexibility and wage and price flexibility in promoting adjustment. Meade (1957) and Scitovsky (1958) focused on labour mobility, reflecting the assumption that prices and wages were fixed and the fact that there were many controls on international capital movements at the time;
- the higher the degree of **financial market integration**.³ Ingram (1962) noted that a high degree of financial integration financed inter-regional payments imbalances.⁴ Capital flows cannot sustain an inter-regional deficit indefinitely, but can provide time in which real adjustment can occur (for example, from price-wage changes). Financial integration can also strengthen long-term adjustment processes through wealth effects;⁵
- the more **open the economies** are to each other. McKinnon (1963) showed that if foreign trade represents a large proportion of the goods produced and consumed then exchange rate changes have a large effect on the general price level and on real competitiveness. Where this is the case, then price stability is best achieved by maintaining a fixed exchange rate;
- the greater the **variety of goods and services** produced. Kenen (1969) argued that more diversified economies are better candidates for monetary union as diversification provides some insulation against changes in the demand for individual products, preventing the need for frequent changes in the terms of trade via the exchange rate;

²The theory of optimal currency areas originated with Mundell (1961). The relevance (at least from the perspective of modern macroeconomic policymaking) has recently been queried by Barrell (2002) and Buiter (1999a). But most studies continue to take the theory as a basic reference point. Artis (2000) and Escolano (2000) are examples.

³ Or related to the second point, this can be thought of as a high degree of capital mobility.

⁴ He observed this in the US and between the US and Puerto Rico.

⁵ The surplus region accumulates net claims which leads to higher expenditure while the deficit region decumulates claims leading to lower expenditure (Kawai, 1987).

- the greater the degree of **similarity in production structures**. Countries with similar production structures will tend to experience similar shocks. In these circumstances, the appropriate monetary policy response for the monetary union will also be an appropriate response for each of its regions;
- the greater the **similarity of inflation rates**. Flemming (1971) argued that when inflation rates are similar, payments imbalances between different regions of the monetary union are more likely to be minimised than if they are divergent. But in the long run, a monetary union will in itself constrain inflation rates to be similar across its regions;⁶ and
- the greater the **degree of fiscal integration**. Kenen (1969) argued that the greater this is, the easier it is to smooth out diverse shocks through fiscal transfers. Such fiscal flexibility may involve the operation of the automatic stabilisers or discretionary action. The literature generally assumes that fiscal integration is at the level of the monetary union, although experience of existing monetary unions shows that there is considerable scope for fiscal action at a lower level of aggregation.⁷

Viability and optimality 5.6 A successful monetary union does not require that the constituent countries score highly on all these measures. Good performance on one measure may compensate for a poor performance on another. For example, a high degree of wage flexibility reduces the need for labour mobility as an adjustment mechanism. The need for fiscal integration is also reduced if regional fiscal authorities have scope for conducting their own fiscal stabilisation policies. These considerations point to the importance of the viability or successful working of a monetary union, as opposed to the notion of optimality highlighted in the original expositions of the theory.

The costs of multiple currencies 5.7 These criteria do not explicitly mention benefits. Mundell (1961) argued that if only the stabilisation argument were considered in isolation then that necessarily led to the view that it was preferable to have many different currencies. This would include different currencies for different areas of the UK. But this would ignore the costs associated with having many currencies. These costs were well appreciated by 19th century economists who were concerned more about the valuation and money changing costs of having many currencies than the possible stabilisation benefits. Mundell notes that they generally favoured a world currency and quotes Mill (1848):

“...So much of barbarism, however, still remains in the transactions of most civilised nations, that almost all independent countries choose to assert their nationality by having, to their own inconvenience and that of their neighbours, a peculiar currency of their own”.

⁶ A caveat to this statement reflects the Balassa-Samuelson effect, which means that countries with faster productivity growth will experience higher equilibrium inflation rates – see, for example, ECB (1999). In the short run, inflation rates could differ considerably given the role of inflation as an important adjustment mechanism.

⁷ At a national level in EMU within the framework of the Stability and Growth Pact, which is analysed in the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

5.8 For Mundell, the most important benefit a country may derive from participation in a single currency is that the usefulness of money is enhanced. If there are too many different currencies, money would lose its usefulness as a unit of account and a medium of exchange and people might just as well barter.⁸ Mundell identifies two other constraints on the number of different currencies:

- markets for foreign exchange must not be so thin that a single speculator can affect the market price; and
- the argument for a stabilisation role for flexible exchange rates depends on the idea that people will not accept changes in real incomes arising from a reduction in nominal wages but they will accept lower real incomes if they arise from a change in the exchange rate (i.e. due to higher import prices).⁹ The smaller the currency area, the larger the share of imports in total consumption, and the less likely this assumption is to be valid.¹⁰

Key insight of OCA theory

5.9 A fundamental and valuable insight of the OCA literature is that the net benefits of joining a monetary union will be directly correlated with the degree of economic integration. The more integrated economies are, the higher will be the benefits and the lower the costs. If markets for outputs, factors of production and financial assets were all fully integrated and all prices and wages were fully flexible then the optimum currency area would be the whole world.¹¹ The benefits are higher because a larger share of output and expenditure is affected, while costs are lower because with a higher level of integration shocks to one country will spread more quickly to other economies in the currency area, for example through trade and investment flows.¹² Relatedly, the higher the degree of integration, the more difficult it is actually to operate an independent monetary policy, as spillover effects are larger.

Extensions of the OCA approach

5.10 Traditional OCA theory is insufficient to encompass all of the issues relevant to the decision on whether to join EMU. In particular, the focus is primarily on the channels for costs of adjustment, rather than on the benefits. In his contribution to the EMU study *Submissions on EMU from leading academics*, Peter Kenen notes how original OCA theory dealt only with simple currency unions but does not provide a “*comprehensive framework for assessing the benefits and costs of a currency union*”. In particular, he points out that OCA theory did not say much about the microeconomic gains brought about by fixing exchange rates.

5.11 Kenen highlights the fact that OCA theory pays insufficient attention to key considerations such as: the effects of a fully fledged monetary union on capital markets and capital movements, the prominent role that monetary policy plays in a currency union and how the single currency itself might affect the degree to which EMU members satisfy the OCA criteria.

⁸ “Money is a social contrivance which simplifies economic calculation and accounting, economizes on transactions, and promotes the integration of markets ... The usefulness of money generally rises with size of the domain over which it is used” – Kawai (1987).

⁹ As argued by Keynes (1936), page 14.

¹⁰ Though the lack of a stabilisation role for the exchange rate in this case does not mean that independent control over interest rates could not be valuable. The ability to set interest rates lower than those of Germany may have been the key factor behind the UK’s economic recovery after leaving the ERM in 1992, rather than the devaluation of the exchange rate.

¹¹ Kawai (1987), page 742. Nearly 40 years on from his original contribution, Mundell has made a similar suggestion – see Mundell (1997). Two caveats to this conclusion should be made: first, DeLong and Summers (1986) note that active (and, presumably, independent) monetary policy could be useful in preventing large swings in inflation and real interest rates; and second, separate currencies could still be desirable if different areas have different preferences over equilibrium inflation rates.

¹² Unsurprisingly the issue is somewhat more complex than this broad generalisation, as discussed in the convergence test.

5.12 With this in mind, and building on the original theory, the five tests framework provides a dynamic extension to the OCA approach in order to assess the costs and benefits of EMU. It:¹³

- emphasises adjustment through prices, with an associated focus on the distinction between real and nominal rigidities;
- recognises the importance of capital markets as an adjustment mechanism, as an area in which there are substantial potential benefits of monetary union and as a determinant of short-term exchange rate movements, with possible destabilising effects;
- focuses on dynamic structural changes, incorporating the lessons learnt from the Lucas Critique (paragraph 4.23); and
- emphasises the role of policy frameworks.

Adjustment through prices, not factors of production

5.13 The early OCA literature focused heavily on factor mobility as an adjustment mechanism, especially geographic labour mobility. This is symptomatic of the fact that prices and wages were generally assumed to be fixed.¹⁴ The idea that geographic labour mobility might be a substitute for the loss of an independent monetary policy and the nominal exchange rate has been questioned by Bean (1992) and Buiters (1995) among others. Their doubts focus on whether geographic labour mobility, even in the US, is of a high enough frequency and is sufficiently reversible in nature to act as an effective adjustment mechanism in this context. The EMU study *EMU and labour market flexibility* discusses geographic labour mobility in more detail.

Real and nominal rigidities and flexibility

5.14 The OCA literature has been criticised for failing to consider price adjustment in sufficient detail; in particular to distinguish consistently between nominal rigidities (the tendency for money wages and prices to take time to adjust fully to changed circumstances), which are typically short term, and longer-term real rigidities or structural relative distortions.¹⁵ For example, the early literature assumed that a nominal exchange rate depreciation is equivalent to a real exchange rate depreciation, not only in the short term when nominal rigidities are present but also in the longer term. It therefore has a sustained impact on real variables such as output and employment. The discussion in Section 2 made clear that this is not the conventional assumption and it is unlikely to be a good description of how the economy actually behaves.

5.15 The failure to draw a clear distinction between the nominal and the real exchange rate may exaggerate the effectiveness of the exchange rate as an instrument because where real (as opposed to nominal) rigidities are present, a nominal exchange rate adjustment will not be sustained as prices and wages adjust, eroding the real impact of the exchange rate movement.¹⁶ Further, as already highlighted, within a currency union differential wage and price adjustments mean that the real exchange rate can still adjust – if one country sustains a higher inflation rate than another its real exchange rate will appreciate.

¹³ The first three of these are also outlined in Escolano (2000), page 76. The fourth is prominent in, for example, Artis (2000).

¹⁴ Although they are identified as one of the key adjustment factors in Tavlas's (1993) review, the original literature acknowledged the issue.

¹⁵ Buiters (1997, 1999b and 1999c).

¹⁶ Currie (1997) argues that in some circumstances wages and prices respond quickly. The evidence on this is discussed in the EMU study by HM Treasury *The exchange rate and macroeconomic adjustment*.

5.16 In the light of this, the flexibility test and the EMU study *EMU and labour market flexibility* focus on adjustment at the frequency of the economic cycle, which is the time frame relevant to compensate for the loss of independent monetary policy, and make a careful distinction between the types of flexibility that are relevant to the EMU decision (and the adjustment it implies) and broader notions of flexibility, and how they can interact.

Capital markets 5.17 A second extension, which goes beyond the earlier recognition of the role of financial market integration, is the emphasis on capital markets. Buitter (1999b) argues that the OCA literature ignores the effect of capital market integration, mobility and capital account openness. This is particularly relevant for the EU which is experiencing rapid integration in financial markets, reinforcing more global trends. This has three important effects, considered in detail in the EMU studies and the assessment:

- it permits greater risk sharing which helps to smooth income, even when there are asymmetric shocks;¹⁷
- it is another avenue through which benefits could emerge because of the elimination of transaction costs. EMU could lead to lower financial market transaction costs if it promotes financial integration in the euro area, with the potential for economies of scale and increased competition in the retail and investment banking sectors;¹⁸ and
- it could mean that an independent currency is a source of shocks rather than a means of adjusting to them.

The role of the exchange rate 5.18 Buitter (1999a) argues that, with free international capital mobility, short-term capital movements are more important than trade in determining exchange rate movements, at least in the short run. This could turn an independent currency from a shock absorber into a source of destabilising shocks to the real exchange rate and the economy as a whole. If this is the case, then a country does not face a significant loss in giving up its independent currency and the optimum currency area could seem to be the world.¹⁹

5.19 For this reason, Vaubel's (1976, 1978) argument that the extent of countries' need for real exchange rate changes could serve as a measure of whether countries should form a monetary union, has been questioned. In any case, commentators have pointed out that real exchange rates, unlike nominal ones, are not fixed in a monetary union and greater flexibility of wages and prices will increase the flexibility of the real exchange rate.

5.20 The real exchange rate has a key role in the five tests framework as an indicator of the competitiveness of the economy, the sustainability of convergence and a pointer to the long-term equilibrium of the economy. The question of the adjustment role of the exchange rate in is the subject of the EMU study by HM Treasury *The exchange rate and macroeconomic adjustment*.

¹⁷ In the US, risk sharing mechanisms may be very important in providing insurance against such shocks, as discussed in the EMU study by HM Treasury *The United States as a monetary union*.

¹⁸ See the EMU study by HM Treasury *EMU and the cost of capital*.

¹⁹ Buitter argues that some degree of political integration is required for a common currency, so a single world currency would not yet be appropriate.

Dynamic structural changes **5.21** OCA theory is typically formulated under strong assumptions of exogeneity of behavioural parameters which, in reality, can be expected to change as a reaction to policies and the institutional environment, including the EMU decision. A third key extension involves a recognition that existing relationships may not continue to hold following a large regime change such as EMU; agents' behaviour may react to the new situation in various ways. The analysis of these endogenous convergence mechanisms is a key feature of the convergence test.

5.22 For instance, the likelihood of asymmetric shocks might change as a result of having a common monetary policy and, in the longer term, as a result of increased trade and integration of production structures and investment, as well as through the financial channels already mentioned. Some economists place significant emphasis on these mechanisms for dynamic change in structures, which are a key driver of endogenous convergence.²⁰

5.23 In his contribution to the EMU study *Submissions on EMU from leading academics*, Robert Mundell notes that EMU could lead to a number of dynamic structural changes. In particular, he states that the trade boosting effects of the single currency could be substantial and that monetary integration could lead to a high degree of synchronisation of the business cycle among EMU members.²¹

5.24 Such dynamic structural changes are not just relevant to the convergence test. For example, some have argued that the loss of one adjustment mechanism – an independent monetary policy – could stimulate adjustment through other channels, such as labour markets.²² This issue is examined in the EMU study *EMU and labour market flexibility*. In theory, EMU membership could also affect the UK's influence in shaping debate over, for example, structural reforms, thus resulting in further dynamic changes across the EU. This is an important part of the growth, stability and jobs test.

Policy frameworks **5.25** A fourth extension relates to the fact that, for some of the original members of EMU, one of the prime motivations for joining was to enhance the credibility of the monetary policy framework, reducing instability, risk premia and the equilibrium inflation rate.²³ This is evident in the stress on the benefits of price stability in European Commission (1990) and is also an important facet of Sweden's 1996 assessment of EMU. If EMU were to lead to gains in monetary policy credibility, that could more than offset the impact of the loss of an independent monetary policy.

5.26 However, as Escolano (2000) points out, these gains are not necessarily associated with joining the euro; rather they are related to the good conduct of monetary policy. The reforms to the UK's monetary policy framework in 1997 were made to achieve just this.²⁴ The same argument can be applied to the framework for fiscal policy and how the two interact as part of overall policy coordination. The credibility of policy frameworks and their effectiveness as adjustment mechanisms also develops through time, indicating an important dynamic dimension to the analysis here. These issues are a key feature of the assessment and the subject of the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

²⁰ See Frankel and Rose (1998). Indeed this insight was not lost in the early literature. Scitovsky (1958) favoured a common currency in Western Europe because it would induce greater capital mobility.

²¹ On the other hand, some analysts, for example Krugman (1993) have suggested that EMU could encourage less not more convergence.

²² As argued by Calmfors and Johansson (2002).

²³ Currie (1997) argued that this was a potentially important benefit for the UK along with Ireland, Italy, Portugal and Spain.

²⁴ Artis (2000), page 78 provides a concise summary of this issue.

Applying the theory

5.27 In applying OCA theory and its extensions to empirical analysis of the suitability of actual economies to join single currencies, four approaches can be identified:

- first, a concentration on shocks and their transmission, and the cyclical patterns that result;
- second, analysis of the instruments available to adjust to shocks;
- third, analysis of the dynamic factors involved in monetary union decisions; and
- fourth, recognition of the importance of policy choices, both in terms of policy frameworks and the microeconomic policy changes that could be enacted to aid adjustment.

5.28 The first two of these approaches are most closely related to the original OCA theory, the other two based more around its extensions. The third approach should be seen as a way of thinking about the option of monetary union in all its facets, rather than a separate way of conducting analysis.

Shocks and their transmission

5.29 In applying OCA theory to shocks, three broad analytical approaches can be identified which investigate the issues from three different but closely interrelated perspectives:

- first, the type and incidence of **shocks** generated by the structural and institutional characteristics of economies, which are a key driver of the degree of sustainable convergence between economies – see Box 5.1. Bayoumi and Eichengreen's (1993) seminal contribution has generated a substantial literature focused on identifying shocks within overall economic performance. But as already stressed, it is important to focus on what shocks are likely to hit in practice;
- the **transmission mechanism** of shocks, again through the structural and institutional characteristics of particular economies, with a specific focus on the monetary transmission mechanism both for interest rates and exchange rates. Researchers including Kieler and Saarenheimo (1998) compare economic structures which could lead to asymmetric transmission mechanisms across countries; a different approach, for example Smets (1995), is to use econometric models to compare the strength of transmission mechanisms at an aggregate level; and
- the **cyclical patterns** which are observed as a result of the interaction of shocks and their transmission can be analysed. For example, as Artis and Zhang (1997) studied the correlations between key aggregates to investigate how closely cycles move together. Many studies have compared correlations between EMU countries with correlations between US states, as a benchmark for a viable currency area. Cluster analysis has also been used to assess cyclical synchronicity among a group of countries using a wider variety of macroeconomic variables. These issues are discussed further in the EMU study by Professor Michael Artis *Analysis of European and UK business cycles and shocks*.

Box 5.1: The role of shocks

A key consideration for the assessment, which motivates both the convergence and flexibility tests, is the role of unanticipated economic disturbances or shocks, and whether countries have the necessary flexibility to adjust to them given the loss of monetary independence and the nominal exchange rate as adjustment mechanisms within a monetary union. Failure to adjust means that economies do not quickly return to a position of equilibrium following an economic disturbance; thus, in the case of a negative shock, giving rise to costs in terms of lost output and lower employment.^a

Shocks are the main origin of the “*problems*” referred to in the language of the flexibility test. They can be temporary or permanent, on the demand or supply side, and sector, region or country specific. Annex B includes a full typology of shocks. Typically, permanent shocks are supply-side related (for example, an increase in the economy’s productive capacity due to technological change) whereas temporary shocks usually occur on the demand side (for example, a fall in export demand due to slow world growth).

Shocks which affect countries or regions in a different manner are known as **asymmetric shocks**. They can be shocks that affect mainly or only certain countries or regions (for example, the collapse of the USSR had a particular effect on the Scandinavian countries) or they can be the result of common exogenous shocks which have asymmetric effects due to different national economic structures and institutions. Policy-induced asymmetric ‘shocks’ can also occur, due to governments having different political preferences or policy instruments (Ireland’s recent strong growth can be seen as a positive asymmetric shock resulting from policy changes). As already noted, the nominal exchange rate could also be a source of shocks.

In the last 30 years, the world economy has experienced a number of common shocks. For example, there have been supply shocks such as the oil price increases of 1973, 1979 and 1990 and the ICT boom of the 1990s; and demand shocks such as the increase in G7 interest rates in order to reduce inflation in the early 1980s. While the shocks have been common, their effects have differed between countries depending upon their economic structures and policies. This shows the importance of flexibility in permitting optimal responses to those shocks that occur.

Asymmetric shocks might be thought to be of most relevance to the EMU decision, but in practice the full range of shocks needs to be considered along with their importance. This is ultimately an empirical issue. The October 1997 five tests assessment concluded that the UK has been particularly prone to asymmetric shocks compared to its EU partners, reflecting long-standing differences in economic policies and the structures and institutions which had evolved. This had led to divergent cyclical trends. The EMU study *Analysis of European and UK business cycles and shocks* by Professor Michael Artis terms this the UK ‘idiosyncrasy’, consistent with previous studies which have typically placed the UK in the ‘periphery’ rather than the ‘core’. That said, the most significant asymmetric shock of the recent past was the reunification of Germany in 1990, which has had sustained implications for economic performance since.

^a If there is path dependence, perhaps because of hysteresis effects, there could be a new equilibrium position, with lower levels of employment.

5.30 Analysis of shocks, their transmission and the cyclical outcomes which emerge are the key elements in the framework of the convergence test and of the approach taken in the EMU study *Analysis of European and UK business cycles and shocks*. A number of the other EMU studies look in more detail at particular issues relevant to the incidence and transmission of shocks and the cyclical trends that result. For instance, the EMU study by HM Treasury *Housing, consumption and EMU* focuses on how the housing market affects the transmission of shocks, particularly via consumption.

Adjustment to shocks **5.31** The second key focus of original OCA theory was on the flexibility available to adjust to shocks. Early writers tended to concentrate on mobility of factors of production, particularly of labour, but later authors have identified other methods of adjustment, such as through price changes. The literature has also emphasised the importance of a close analysis of what monetary policy and an independent exchange rate can and cannot do in aiding adjustment.

5.32 In applying the theory, four main adjustment mechanisms are relevant:

- **price adjustment** – flexibility of wages and prices. Monetary policy would be impotent in a world where prices were perfectly flexible; consequently greater price and wage flexibility reduces the costs of joining a monetary union. The European Commission (1990) notes that price flexibility is most related to the nominal exchange rate as both a prices and the nominal exchange rate influence the real exchange rate. In practice this means that inflation may be part of the optimal adjustment process in an overheating economy;
- **supply or quantity adjustment** – factor mobility, including capital or labour mobility. Mundell (1961) stressed that optimal currency areas could be defined by their degree of labour and capital mobility. Subsequently, much has been made of empirical findings in Blanchard and Katz (1992) that labour mobility plays an important role in adjustment in the US;
- **demand adjustment** – consumers and firms may adjust their spending in response to a shock. Or policymakers may use fiscal or monetary policy to aid adjustment; and
- **risk sharing** – the smoothing of consumption by sharing risk across borders. Research has shown that risk sharing between regions shares a significant amount of shocks in the US – see Sørensen and Yosha (1998) and Méltitz and Zumer (2000).

5.33 Adjustment to shocks is the main focus of the flexibility test and is examined in detail in the EMU studies related to that test. These include the EMU studies *Modelling shocks and adjustment mechanisms in EMU* and *The exchange rate and macroeconomic adjustment*.

Dynamic factors **5.34** In terms of ensuring that analysis of monetary unions fully considers the dynamic aspects of a decision, there is an emphasis on the effects of the regime change of monetary union on private sector behaviour. This is a prominent focus of the claims of Rose (2000) that monetary union could greatly increase the volume of trade. These issues are covered in depth in the convergence test and the EMU study by HM Treasury *EMU and trade*.

5.35 The dynamic factors which the extensions to OCA theory have stressed infuse the assessment as a whole. For example, the EMU study *Modelling shocks and adjustment mechanisms in EMU* models how the UK economy could adjust if it were to join EMU.

Policy variables 5.36 In applying theoretical literature on the credibility of policy frameworks, based on the seminal work of Kydland and Prescott (1977), a key consideration is awareness of the incentives of policymakers – do they have the right objective function to make difficult short-term decisions if needed for long-term stability? And do they have sufficient flexibility to aid economic stabilisation in the short run? These questions are considered in the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

5.37 Another way in which assessment of the policy variables available is important is in the consideration of what instruments policymakers could utilise in order to make a monetary union a success – it can thus be seen as a variant of the dynamic analysis discussed above. This is considered through the assessment and is a particular focus of the EMU study by HM Treasury *Fiscal stabilisation and EMU*.

Conclusions

5.38 This section has discussed OCA theory and its dynamic extensions. Section 6 goes on to describe how other countries have used this as a starting point for their own assessments of EMU membership. Drawing on these two sections, Section 7 considers OCA theory in relation to ensuring a comprehensive and rigorous approach to the five economic tests.

6

ASSESSMENTS OF EMU BY OTHER COUNTRIES AND THE EUROPEAN COMMISSION

6.1 This section examines how other countries and the European Commission have approached the economic issues relevant to membership of EMU. It considers the assessments of the following countries, as described in Box 6.1:

- Denmark (2000);
- Finland (1997);
- Hungary (2002);
- Ireland (1996);
- Sweden (1996 and 2002); and
- the European Commission (1990).

6.2 The assessments were carried out at different times and in different situations. This, combined with different assumptions about the options faced and the detail of the counterfactual, resulted in a variety of frameworks, approaches and final assessments. With this in mind, the particular points raised in the assessments are not examined in detail. Rather, the focus of this section is on the insights that the different approaches provide for the UK assessment of EMU membership and the implications for the five tests framework.

Context

6.3 While the frameworks in the studies all emerge from OCA theory and its extensions, they were all tailored to the particular circumstances faced at the time. Unsurprisingly, none is directly analogous to the UK's circumstances. But by considering the similarities and differences between the frameworks, it is possible to gain a fuller understanding of the key issues pertinent to the UK's decision on EMU.

6.4 Five main factors help to explain why the frameworks differ across the assessments:

- **country:** the issues that are important to relatively small economies may be different from those faced by larger countries. Moreover, the question of whether a monetary union should be created in a region is different from the question of whether a particular country should join an existing monetary union. This distinction can explain many of the differences between the approach of the European Commission and that of the individual countries;
- **timing:** the assessments were made at different times, such that the evidence base and knowledge of the institutional set up of EMU differed. The analysis by the European Commission was made at a time when the institutional features of the single currency were still to be decided. At the time of the original assessment by Sweden and that of Ireland, it was still unclear how many countries would be members of EMU. The assessments by Sweden in 2002 and by Denmark and Hungary were able to draw on the functioning of EMU and experiences of participating countries. For the UK, this is also an important addition to the evidence base compared with the 1997 assessment;

Box 6.1: Other assessments of EMU

Denmark and the Euro (April, 2000)^a was written by a team in the Danish Ministry of Economic Affairs and published in the run-up to the referendum on EMU entry held on 28 September 2000. The report's principal aim was to examine the economic arguments for and against EMU membership for Denmark. It was based on shorter reports that the Ministry published in 1998 and 1999.

Finland and EMU (April, 1997)^b was written by an expert working group commissioned by Prime Minister Paavo Lipponen in November 1996 to consider the significance of EMU for the Finnish economy. The group's members were prominent Finnish economists and the group was chaired by Jukka Pekkarinen.

Adopting the euro in Hungary: expected costs, benefits and timing (2002)^c was written by a team of economists based in the National Bank of Hungary and edited by two bank employees – Attila Csajbók and Ágnes Csermely. Its remit was to analyse the likely impact of EMU membership on Hungary, and to consider when Hungary should join.

Economic Implications for Ireland of EMU (1996)^d was prepared by a range of economic experts, most from the Economic and Social Research Institute (ESRI) of Ireland. It was edited by Terry Baker, John Fitz Gerald and Patrick Honohan, all from the ESRI. Its remit, from Ireland's Department of Finance, was "to carry out an in-depth study of the likely economic implications of EMU for Ireland with particular reference to employment..."

EMU: A Swedish Perspective (November, 1996)^e was written by the Swedish Government Commission on the EMU, appointed in October 1995 to analyse the consequences of the monetary union and of Swedish participation in it. Lars Calmfors chaired the Government Commission, which consisted of prominent Swedish economists and political scientists.

Stabilisation Policy in the Monetary Union (March, 2002)^f was written by the Government Commission on Stabilisation Policy for Full Employment in the Event of Swedish Membership in the Monetary Union, which was established in December 2000 to examine how to conduct stabilisation policy after EMU entry. This Commission was chaired by Ambassador Bengt Johansson, and its members were prominent economists including Lars Calmfors.

One Market, One Money (1990)^g was written by a team in the **European Commission's** Directorate-General for Economic and Financial Affairs, directed by Michael Emerson. Its aim was to assess the economic costs and benefits of the establishment of a single currency in the European Union. The analysis built on work on the gains available from completing the single market in goods and services (European Commission, 1988).

^a Economics Ministry and Finance Ministry of Denmark (2000).

^b Prime Minister's Office of Finland (1997).

^c Csajbók and Csermely (2002).

^d Baker *et al.* (1996).

^e Calmfors *et al.* (1996).

^f Government Commission on Stabilisation Policy for Full Employment in the Event of Swedish Membership in the Monetary Union (2002).

^g European Commission (1990).

- **context:** some of the issues covered in these assessments reflect questions of topical concern in the countries involved. For example, the Danish assessment discusses the external value of the euro in some detail – a major issue in Denmark at the time, after the euro had depreciated considerably. Sweden (2002) concentrates on the need for fiscal stabilisation in EMU, following trade union calls for mechanisms to aid adjustment in the monetary union;
- **assessing body:** the different approaches partly reflect differences in the body commissioned to write the assessment. For example, Sweden (1996), written by a group of academic economists and political scientists, takes a more theoretical and academic approach than does the Danish assessment which was written by a team of economists within the Economics Ministry; and
- **remit:** the authors of these assessments were given different remits. For example, the authors of the assessments by Ireland, Finland and Sweden (2002) were not asked to conclude on whether EMU membership would benefit the country, but only on what issues would arise should the country join. The authors of Sweden (1996) were asked to assess the EMU project as a whole, as well as Swedish membership of it. Some of the groups were asked to pay special attention to certain issues and areas; Finland, for example, focused on the production structure, the labour market, public finances and economic policy.

Counterfactuals

6.5 Knowledge of the situation to which potential membership of EMU is being compared is critical to understanding the decisions reached by other assessments, the framework adopted and the analysis carried out. Section 4 of this study sets out how the UK's assessment is predicated on the principal alternative being a continuation of the present macroeconomic policy regime, with a floating exchange rate and monetary policy aimed at an inflation target. In this scenario the UK would remain a full and committed member of the EU and of the Single Market.

6.6 The assessments by Finland, Hungary and Sweden (2002) do not make explicit comparisons with a counterfactual. However, the Hungarian assessment looks closely at the experiences of similar euro area economies in terms of GDP per capita and absolute size in order to provide a benchmark, while the Finnish assessment considers briefly what might occur in a floating exchange rate regime or if Finland joined the ERM2.

Different exchange rate counterfactuals

6.7 The other assessments contain explicit counterfactuals, with the main difference between them being whether the comparison is to a fixed or floating exchange rate regime. This is an important distinction. Economic convergence is not necessary for floating rates, but it is required for a fixed exchange rate regime to work just as it is needed for a monetary union. Therefore, the question of convergence has in some sense already been answered when drawing comparison with a fixed exchange rate regime.

6.8 From this perspective, Sweden (1996) is the closest analogue to the UK's framework for analysis. It compares EMU membership with a floating exchange rate regime, in which the Swedish *Riksbank* would target domestic inflation. The Danish, European Commission and Irish assessments make comparisons to a fixed exchange rate regime. The Danish assessment was made after Denmark had joined the ERM2 and the European Commission assessment was written after the ERM had been in operation (albeit with occasional revaluations) for over a decade.

Different members of EMU **6.9** The Irish assessment and, to a lesser extent Sweden (1996), states that the question of which other countries are members of EMU is very important to their analysis of whether to join or not, with the question of UK membership being particularly important. The Irish assessment considers that the economic benefits of EMU would be much greater should the UK join, as the UK is a key trading partner, while Sweden (1996) believes that the political costs of non-membership would not be too prohibitive so long as the UK and Denmark stay out. This is not an issue that arises in the UK framework.

Key features of other assessments

6.10 These differences have important implications for the approach taken in the assessments. Nevertheless, similarities remain. The assessments typically take the OCA literature as their starting points, but note its limitations, particularly its concentration on factor mobility as an adjustment mechanism. There are eight key recurring issues:

- the prevalence of asymmetric shocks;
- the degree of flexibility;
- the size of microeconomic gains, from greater efficiency and trade and from reduced uncertainty;
- the credibility of the policy framework;
- sectoral and regional analyses;
- political issues;
- the transition to EMU; and
- the final impact on growth, employment and stability.

Prevalence of asymmetric shocks **6.11** The question of asymmetric shocks is emphasised by Sweden (1996). Two reports submitted to the Government Commission examined this issue, containing new research measuring the extent of convergence. The assessment asks whether the EU has a ‘core’ and a ‘periphery’ and, if so, to which group Sweden belongs.

6.12 The Hungarian and Finnish assessments also see convergence as important. The Finnish assessment devotes a chapter to the question of asymmetric shocks and notes that *“[a]symmetry’ in shocks affecting an economy ... results in a problem for the country involved: the single monetary policy permits a response to shocks common to the whole monetary union ... but it is of no help in stabilizing the impact of problems experienced by individual countries”*.

6.13 In measuring convergence, the assessments typically analyse shocks and cyclical patterns, while noting that these are to some extent misleading because of the influence of policy in causing such fluctuations and shocks. The Hungarian assessment contains the most in-depth analysis of structural convergence, comparing the sectoral composition of the Hungarian economy to that of other countries.

6.14 As already noted, the question of asymmetric shocks is less of an issue if the control scenario is a fixed exchange rate regime since the extent of convergence required is fairly similar in both cases. Hence this is looked at only briefly in the Danish assessment. In the European Commission and Irish assessments, greater convergence is considered likely to increase the potential economic benefits of joining, but a lack of convergence is not considered in terms of costs through a greater likelihood of asymmetric shocks.

- Degree of flexibility...** **6.15** All of the assessments see flexibility as an important factor in making a monetary union a success. The Danish assessment states that “*for a well-functioning EMU it is vital that the markets have sufficient flexibility*”, and a chapter of the European Commission’s assessment looks at how economies could adjust without the nominal exchange rate. Sweden (2002) focuses on how Sweden could have enough flexibility to function well within EMU.
- 6.16** The main focus is on flexibility in labour markets and in fiscal policy. Sweden (1996) and Finland both have chapters on each of these subjects. The value of product and capital market adjustment is not examined in as much depth.
- ...in the labour market...** **6.17** The assessments examine labour market flexibility by studying the various possible adjustment mechanisms. For example, Sweden (1996) assesses wage flexibility by looking at both institutional features (for example, the extent of multi-annual wage contracts and the level of coordination of wage bargaining) and an econometric analysis of sacrifice ratios.¹ It also looks at labour mobility (measured by the proportion of foreign citizens in selected countries) and at policies that could aid flexibility in this field, such as active labour market policies.
- ...and fiscal policy** **6.18** In discussing fiscal policy as an adjustment mechanism, three main questions are considered:
- how effective could current fiscal policy be in smoothing output? The Hungarian assessment, for example, compares the size of the automatic stabilisers in Hungary to those in other countries;
 - what changes could be made to the fiscal policy regime in order to increase the stabilisation provided? This is a key focus of Sweden (2002), which recommends a large increase in fiscal stabilisation through tax and spending changes; and
 - would the Stability and Growth Pact limit the use of fiscal policy in adjusting to shocks?
- Microeconomic gains** **6.19** A number of the assessments attempt to measure the microeconomic benefits that EMU could provide. For example, the Danish, Finnish and Irish assessments consider the likely gains to investment from lower real interest rates resulting from more efficient capital markets. Unsurprisingly, though, they differ in their findings, in part reflecting differences in their counterfactuals and in the timing of the assessments as well as methodological differences. There is a particular focus on the effect of EMU on foreign direct investment, especially in the Danish assessment.
- 6.20** Reflecting the recent growth in the academic literature on trade and monetary unions, the Hungarian assessment stresses the trade impact of EMU. It uses a gravity model based on the work of Andrew Rose to quantify the likely size of the effects on the Hungarian economy.
- 6.21** In terms of EMU’s effects on uncertainty, Sweden (1996) attempts to assess the effects of exchange rate volatility (and misalignment) on investment, using historical data of exchange rate movements, while accepting that the amplitude of past movements may partly have reflected unstable policy frameworks – a problem that is less likely to arise in future.

¹ The change in output or employment that is needed to produce a 1 percentage point change in the inflation rate. The EMU study by HM Treasury *EMU and labour market flexibility* contains a more detailed discussion of sacrifice ratios.

- Credibility of the policy framework** **6.22** Some assessments see potential gains from EMU coming from increased credibility of monetary policy. For instance, Sweden (1996) and the Finnish assessment argue that EMU membership could reduce risk premia and inflation volatility, stimulating investment. The European Commission's analysis, written before the agreement of EMU's institutional arrangements, looks at how a system of price stability could be ensured. It concludes that credibility requires central bank independence and a mandate for price stability.
- Sectoral and regional analysis** **6.23** The European Commission's assessment contains a detailed analysis of how EMU could affect its component nations, reflecting the fact that *"concern with the distribution of benefits (and losses) from economic integration has been expressed at every stage of development of the [European Community]"*. The Irish assessment uses econometric work to provide a breakdown of how EMU membership could be expected to affect various important sectors of the Irish economy such as manufacturing, agriculture and financial services.
- Political issues** **6.24** Some of the assessments cover the question of the political costs and benefits of joining EMU, mainly resulting from membership of Eurogroup. For example, the assessments by Denmark and Sweden (1996) argue that such gains could be considerable if many other countries were to join EMU.
- Transition** **6.25** In some assessments, issues arising in the transition to EMU are also considered. For example, the European Commission's work contains a chapter discussing how an effective transition could be achieved. The Hungarian assessment looks closely at the likely adjustment costs involved in meeting the convergence criteria for adopting the euro.
- Final impact on growth, employment and stability** **6.26** The final impact of EMU on employment, growth and stability is an underlying criterion in all of the assessments. In reaching an overall judgement, the gains – such as from greater efficiency and increased investment – are typically weighed in the balance against costs resulting from the loss of an independent monetary policy as an adjustment mechanism. However, the assessments agree that a precise quantification of all of the effects is not possible. The Hungarian assessment, for example, quantifies some effects, such as EMU's impact on transaction costs, but notes that other important factors are not quantifiable.

Implications for the five tests assessment

- Same theory...** **6.27** The assessments covered in this section are based around the same core of economic theory which stresses the importance of convergence and of possessing different adjustment mechanisms within a monetary union, and sees a single currency as potentially providing benefits by removing transaction costs and reducing uncertainty.
- ...but different frameworks** **6.28** However, there is considerable variation in frameworks around this core reflecting the different circumstances in which the assessments were written. For example, some put less stress on convergence because their benchmarks are fixed exchange rate regimes; while others, such as Sweden (2002) and the Finnish assessment, emphasise the need for fiscal policy as an adjustment mechanism, reflecting those countries' experiences of asymmetric shocks and their belief that current adjustment mechanisms may not be enough to counteract such shocks.

Sweden and the European Commission most relevant **6.29** Because of the clear differences in the circumstances in which the assessments were produced, and the generally different counterfactuals, the read across to the UK's position is somewhat limited. The first Swedish study is perhaps the most closely-related overall, since its counterfactual and remit were similar. The second Swedish study, which assesses the importance of fiscal stabilisation, is also relevant to the UK, particularly to the EMU study *Fiscal stabilisation and EMU*. The UK's work is also similar to the work of the European Commission in some respects, such as the use of comparisons with other monetary unions, though the area-wide focus of *One Market, One Money* and its different counterfactual gives it a very different slant overall.

General similarities **6.30** The assessments have a number of more general similarities to the UK's approach. All of the assessments see flexibility, both through market adjustment mechanisms and fiscal policy, as important. Convergence is also examined, particularly in the first Swedish study where the benchmark is a floating exchange rate system. The effect of EMU on investment is considered by most of the assessments, typically in a discussion of the efficiency gains resulting from monetary union. There are no precise analogues to the UK financial services test, although Ireland conducts a sectoral analysis of the effects of EMU and the European Commission considers the effects of EMU on financial services in detail. As with the UK's assessment, the final impact on employment and growth typically provides the bottom line for judgement.

New insights **6.31** Careful analysis of these assessments has been an important part of the Treasury's preliminary and technical work leading to the five tests assessment. Such analysis provides a useful indication of the considerations relevant to other countries' assessments, acting as a helpful cross check and in some cases offering new insights for the Treasury's approach.

The firmest possible foundation

7.1 The Chancellor set out in the June 2002 Mansion House speech his intention to:

“...ensure that the assessment will be the most robust, rigorous and comprehensive work the Treasury has ever done”.

7.2 Given the analytical difficulty of the issues which are relevant to the EMU decision and the fact that the benefits of EMU might accrue over a long time period, the five tests assessment provides a comprehensive and rigorous approach that allows a long-term, dynamic analysis. The approach is consistent with the importance that the Government attaches to evidence-based policymaking.

7.3 The large number of factors to be considered means that the assessment is wide-ranging. In particular, it is underpinned by quantitative and qualitative analyses of the likely costs and benefits of EMU membership.

The preliminary and technical work

7.4 The preliminary and technical analysis leading up to the assessment has been extensive. The IMF Executive Board has welcomed this approach (IMF, 2003), which was described in the Chancellor's 2001 Mansion House speech and the paper for the Treasury Select Committee on the Treasury's approach to the preliminary and technical work.¹

Expert input

7.5 Experts from outside the Treasury, including many academics, have assisted the Treasury with the preliminary and technical work. Experts in economic modelling techniques have produced four of the EMU studies, containing new work in key areas analysing:

- the extent of **cyclical convergence** between the UK and the euro area;²
- the long-term **equilibrium exchange rate** between sterling and the euro;³ and
- the potential macroeconomic implications for the UK economy, in terms of both the **transition** to EMU and, over time, the **adjustment** required as a member of EMU.⁴

¹ Paper for the Treasury Committee on the Treasury's Approach to the Preliminary and Technical Work, 6 September 2002.

² The EMU study *Analysis of European business cycles and shocks* by Professor Michael Artis of the European University Institute.

³ The EMU study *Estimates of equilibrium exchange rates for sterling against the euro* by Professor Simon Wren-Lewis of Exeter University.

⁴ The EMU studies *Modelling the transition to EMU* and *Modelling shocks and adjustment mechanisms in EMU* by Dr Peter Westaway.

7.6 Academics and experts from outside the Treasury have also assisted with the preliminary and technical work in other ways:

- advising, in a consultancy capacity, on the Treasury’s EMU studies;
- providing new insights on previous academic work, as collected together in the EMU study *Submissions on EMU from leading academics*; and
- more generally, as in other areas of Treasury work, engaging in internal seminars and dialogue with Treasury officials.

EMU studies 7.7 The **EMU studies** published alongside and intrinsic to the assessment are listed in Table 7.1. They are mainly stand alone documents which review previous academic analysis, update it with more recent data and include new analysis where appropriate. They employ the latest empirical and econometric techniques to support the analysis and arguments contained in the assessment itself and, as a result, are often quite technical in nature. While each study primarily relates to one of the economic tests, they are also relevant to, and inform, other parts of the assessment, as indicated in the table.

Table 7.1: How the EMU studies inform the five tests assessment

EMU study	Convergence	Flexibility	Investment	Financial services	Growth, stability and employment
The five tests framework					
Analysis of European and UK business cycles and shocks					
Estimates of equilibrium exchange rates for sterling against the euro					
The exchange rate and macroeconomic adjustment					
Modelling the transition to EMU					
Modelling shocks and adjustment mechanisms in EMU					
Housing, consumption and EMU					
EMU and the monetary transmission mechanism					
EMU and labour market flexibility					
EMU and business sectors					
EMU and the cost of capital					
The location of financial activity and the euro					
EMU and trade					
Prices and EMU					
The United States as a monetary union					
Fiscal stabilisation and EMU					
Policy frameworks in the UK and EMU					
Submissions on EMU from leading academics					

The Treasury assessment

7.8 As in 1997, the **assessment** itself is the work of the Treasury. It reflects the analytical findings of the more technical EMU studies as clearly as possible, but is designed so that it can be read independently of them. The principal aim has been to assess all the issues, hence fulfilling the Government’s objectives of robustness, rigour and comprehensiveness.

7.9 In parallel, the assessment seeks to inform the wider debate on UK membership of EMU. As the Chancellor stressed in his 2002 Mansion House speech:

“...when the assessment is complete the detailed supporting studies will be published alongside, all to be subject to intensive public scrutiny and debate. Such openness and transparency will be in marked contrast to the past history of policy making”.

Structure 7.10 With these two aims in mind, each chapter of the assessment covers one of the **five economic tests**. The convergence (Chapter 1) and flexibility (Chapter 2) tests encompass the main concerns of the OCA literature. The tests on investment (Chapter 3), financial services (Chapter 4) and growth, stability and employment (Chapter 5) consider the likely impact of the single currency on the performance of the economy and assess the extent to which the potential benefits of EMU can be realised.

The convergence test 7.11 The convergence test concerns the degree of macroeconomic convergence and its sustainability, directly addressing the issue of whether a single interest rate can be suitable for all members of a currency union over time. It asks: **“are business cycles and economic structures compatible so that we and others could live comfortably with euro interest rates on a permanent basis?”**

7.12 Membership of EMU requires having a fixed nominal exchange rate with the euro area and a common monetary policy (a single interest rate across all members of the euro area). The convergence test is therefore important in assessing whether UK economic stability would be maintained if the UK were to join EMU. The test is designed to assess the likelihood and importance of differences between the interest rate suitable for the euro area and what would be appropriate if monetary policy were set only in relation to UK conditions, as well as issues relating to the exchange rate.

7.13 The test assesses whether convergence is settled and sustainable – and is therefore closely related to the central insight of the OCA literature that prospective candidates for a monetary union should be well integrated. The evidence base, as befits the definition of settled and sustainable convergence, is drawn from several EMU studies that cover:

- short-term cyclical indicators, such as the relative magnitude and synchronicity of UK and euro area business cycles and issues related to the transition to EMU, should the UK decide to join;
- medium-term analysis of structural factors in the UK and the euro area and what they imply for different shocks and their impact, with a particular focus on the housing market and its impact on consumption and the overall transmission mechanism of monetary policy; and
- long-term analysis, which considers whether membership of a single currency might make business cycles more similar and how powerful such endogenous convergence effects might be.

7.14 The approach is therefore not just an historical one but also encompasses a forward-looking and dynamic analysis assessing the costs that might arise in the future if convergence (or flexibility) is not sufficient and the potential benefits if convergence increases through time.

7.15 The convergence test also examines the role played by the exchange rate in the transition to entry and the sustainability of convergence thereafter. The analysis is informed by four EMU studies which between them provide estimates of the equilibrium exchange rate for sterling against the euro and contain a full exposition of how the exchange rate facilitates macroeconomic adjustment and how this works in practice.

The flexibility test **7.16** The flexibility test is concerned with adjustment following an economic shock. It asks: “if problems emerge is there sufficient flexibility to deal with them?”

7.17 Even with a high degree of convergence, economies will continue to be affected differently by shocks and changes to the economic environment. The flexibility test is concerned with whether there is sufficient flexibility in the UK and the euro area so that the effects of shocks do not persist. Together the assessment of the convergence and flexibility tests determines whether sustainable and durable convergence has been achieved. A high degree of sustainable and durable convergence is a key precondition for successful UK membership of EMU, to ensure the potential gains of further integration between countries which trade significantly with each other can be realised.

7.18 The flexibility test includes an analysis of asymmetric shocks, i.e. shocks that are specific to one economy, and the differential transmission of common shocks, i.e. where economies are less converged. The flexibility test also involves an assessment of the relative speed and strength of the adjustment and stabilisation mechanisms available inside EMU and how they might compensate for the loss of an independent monetary policy and the nominal sterling-euro exchange rate.

7.19 To examine whether there is sufficient flexibility to cope with the constraints of EMU membership, the test uses a variety of tools to build a complete and coherent picture of flexibility through:

- a qualitative microeconomic analysis of labour, product and capital market flexibility, set within a new framework developed for the assessment. The framework considers the ways in which markets adjust, the institutional factors that influence adjustment and how this is reflected in performance outcomes;
- examination of how existing monetary unions, such as the US, adjust in practice as well as the experiences of existing EMU members;
- analysis of the extent to which fiscal policy might compensate for the loss of an independent monetary policy; and
- a quantitative macroeconomic assessment of adjustment to shocks inside and outside EMU, based on a model that closely mirrors the key features of the UK and euro area economies and the interactions between the two.

The investment test **7.20** The investment test asks: “would joining EMU create better conditions for firms making long-term decisions to invest in Britain?”

7.21 It provides a criterion on which to judge whether membership of the single currency would be in the UK’s national economic interest. As a driver of productivity growth and overall economic performance, investment is a key outcome measure and it is therefore important that EMU membership would support the Government’s policy of encouraging investment.

7.22 The investment test is divided into two main sections:

- the analytical framework used in the test identifies the key drivers of **business investment** and assesses how they would be affected by the EMU decision. One of the main drivers is the cost of capital and an EMU study sets out how EMU has affected the cost of capital for firms in euro area countries and how the cost of capital might be affected were the UK to join the single currency; and
- although conceptually a component of business investment, the test contains a thorough discussion of **foreign direct investment** (FDI) and how this might be influenced by specific factors such as the removal of nominal exchange rate volatility and transaction costs in EMU.

7.23 The test also draws on a study that assesses the impact of the elimination of exchange rate volatility and foreign exchange transaction costs on firms' behaviour in different sectors of the UK economy. This study examines the extent to which a decision to join EMU might cause firms to relocate or to change their scale of operations and whether there is any evidence of such changes already occurring in the euro area.

The financial services test **7.24** The UK has a significant comparative advantage in wholesale financial services and, on most measures, the City is – by some distance – the pre-eminent financial centre in Europe. The financial services test asks: “**what impact would entry into EMU have on the competitive position of the UK's financial services industry, particularly the City's wholesale markets?**”

7.25 Given the importance of the financial sector to the UK in terms of both employment and invisible earnings, it is vital that the decision on whether to join the single currency does not damage the sector's competitiveness. The Treasury's assessment of the five economic tests in 1997 concluded that EMU offers benefits to the UK financial sector irrespective of whether the UK is a member, but that the UK will be able to appropriate these gains more easily from inside the single currency. The financial services test revisits this conclusion.

7.26 The test examines the impact of EMU on the factors that have combined to ensure the UK is an attractive location for financial services activity, such as the tax and regulatory environment, a large pool of skilled labour and the UK's large and liquid capital markets. The analysis draws on an EMU study which examines the drivers of the location of activity in the financial services sector and the changes that have taken place since the start of EMU.

The growth, stability and employment test **7.27** The growth, stability and employment test analyses the potential benefits of EMU for the UK economy and makes an assessment of how far the single currency is itself a success. It asks: “**in summary, will EMU promote higher growth, stability and a lasting increase in jobs?**”

7.28 The tests assesses whether EMU membership would contribute to the Government's central economic objective of high and stable levels of growth and employment and improve the longer-term performance of the UK economy. The test considers a comprehensive range of issues concerning the long-term implications of the UK being inside or outside of the single currency, namely:

- EMU's direct impact on the UK's productivity, resulting from increased trade and competition and long-term changes to the UK's industrial structure;
- the indirect effects of the single currency on productivity and employment through its potential catalytic effect on economic reform across the EU;
- how EMU could affect both the equilibrium level of employment in the UK and its volatility over the economic cycle;
- whether the euro area's macroeconomic policy framework is conducive to long-term macroeconomic stability and encourages effective policy coordination. This involves analysis of the situation now and consideration of how the framework might evolve;
- the implications of the single currency and the European Convention for economic governance in the EU, including for taxation and social policy; and
- whether the potential benefits of EMU could be realised by all regions of the UK.

7.29 The test draws on EMU studies relevant to this and the other tests, in particular covering: the likely impact of EMU on UK trade with the euro area and the rest of the world; the impact of EMU on prices; the experience of the US as a monetary union; and the robustness of the arrangements for delivering macroeconomic stability.

Steps to the comprehensive and rigorous approach

7.30 There are several steps involved in moving from the preliminary and technical work to the assessment to ensure a **comprehensive and rigorous** approach to the five economic tests:

- develop an **analytical and methodological framework** which encompasses the key issues identified and their importance for each test. Although the basic analysis is an economic one, the framework covers relevant elements of geographical, industrial and sectoral analysis as well as historical and institutional analysis where appropriate;
- analyse and review **existing studies, literature and models** across the relevant issues;
- gather the relevant **data** and apply them to models in order to test key hypotheses and address key issues;
- produce **EMU studies** which present the detailed analysis and findings on key issues and which are published alongside the assessment; and
- produce the **five tests assessment** which brings together all the models, evidence, analysis and findings. The assessment forms the basis for the Government's decision on UK membership of EMU.

7.31 Box 7.1 takes analysis of the real exchange rate as an example of how this comprehensive and rigorous approach is applied in practice.

The five tests and OCA theory

7.32 The five tests comfortably encompass the main insights from the original OCA literature, how monetary unions are analysed in practice and how the original literature has been extended to take account of more dynamic issues relating to adjustment, integration and the credibility of the macroeconomic framework. Table 7.2 summarises how the five tests relate to the OCA literature and its extensions.

7.33 The comprehensive and rigorous approach therefore precludes attaching too much weight to the issues raised in the original OCA literature or similarly to attaching too much weight to more recent analysis that emphasises the dynamic nature of the EMU decision.

7.34 The assessment and EMU studies examine the issues from as many perspectives as possible to provide quantitative estimates or, where this is not possible, qualitative evidence from which clear conclusions can be drawn. There is clarity and transparency in terms of the assumptions, models and methodologies used and how they relate to the results obtained.

Conclusion

7.35 The Government has set exacting requirements for the assessment to ensure that it provides a sound basis for a decision of this magnitude. It is a decision that will have long-term implications for the UK economy and the Government's economic policies.

7.36 The Government will only make a decision to recommend joining EMU if the case is clear and unambiguous. The five tests define whether such a case can be made.

Box 7.1: An example of the comprehensive and rigorous approach

Analysis of the real exchange rate provides a good example of what the five-stage comprehensive and rigorous analytical approach means in practice and how this complements the long-term focus of the assessment.

Stage 1 has involved establishing the role of the real exchange rate in the overall five tests analytical framework. As the earlier discussion has indicated, the sterling-euro real exchange rate has an important role:

- as an indicator of competitiveness of the UK economy and of sustainability of convergence with the euro area, both in the short and medium term;
- as an important adjustment mechanism. It is a key means by which, via changes in prices (and the nominal exchange rate outside of EMU), the impact of shocks on output can be dampened; and
- the long-run equilibrium value of the real exchange rate is an important concept for gauging the degree of adjustment required both before and after entry and the effect on the economy into the medium term.

Stage 2 involved reviewing and analysing existing models of the equilibrium sterling-euro exchange rate over different time frames and the different estimates produced.

Stage 3 involved testing existing models with the latest data. The conclusions of this work were that neither the estimates nor the models from which they were derived were able to reflect and explain the UK's more recent trade and exchange rate performance, an understanding of which is a vital part of the evidence base for the assessment.

Stage 4 involved bringing this work together in the EMU study *Estimates of equilibrium exchange rates for sterling against the euro*, produced by a leading expert in the field, Professor Simon Wren-Lewis. Given the limitations identified in previous work, the focal point of this study is an updated range of estimates of the long-run equilibrium exchange rate between sterling and the euro, and their sensitivity to different assumptions. It has also informed other studies which consider related issues, in particular the transition to EMU and the role of the exchange rate and macroeconomic adjustment.

Stage 5 involved reflecting and weighing this analysis in the Treasury's assessment of the five economic tests – in particular, its relevance to the short-run convergence position, its sustainability into the medium term and what is required for the long run. This important work informs the assessment of all the tests, but particularly the convergence test, the flexibility test and the growth, stability and jobs test.

Table 7.2: The five tests and how they relate to the OCA literature and its extensions

	Convergence	Flexibility	Investment	Financial services	Growth, stability and employment
Wage and price flexibility		■			
Factor mobility		■			
Financial integration	■	■	■	■	
Openness	■				■
Production structures	■				
Inflation	■	■			■
Fiscal integration		■			■
Micro-efficiency benefits			■	■	■
Shocks	■	■			■
Transmission	■				■
Cycles	■				■
Real exchange rate	■	■	■		■
Adjustment over time	■	■			■
Capital markets		■	■	■	
Dynamic structural changes	■				■
Credibility of macroeconomic framework	■		■		■

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A

ANNEX A: THEORETICAL ASPECTS OF THE ANALYSIS

A1 This annex outlines key insights from economic theory that have informed the Treasury's analysis of the EMU decision. It first considers three variables that affect overall economic outcomes – interest rates, the exchange rate and fiscal policy. It then looks at two important macroeconomic outcomes – employment and productivity.

A2 The analysis in the five tests assessment and the EMU studies is based on standard economic theory. Output is determined by the use of labour, capital and technology. Employment is determined by the interaction of labour demand and supply. In general, prices move to balance supply and demand in the markets for goods, labour and capital. However, in some markets, prices may not adjust instantly (for example, because of costs associated with changing prices). It may therefore take time for prices to adjust fully to a change in the balance of supply and demand. In such circumstances, there could be an imbalance between aggregate supply and aggregate demand, leading to rising inflation (with excess demand) or falling inflation and employment (with excess supply). But prices will usually adjust eventually to the new market conditions.

Interest rates

A3 The Monetary Policy Committee (MPC) of the Bank of England sets the short-term interest rate at which the Bank of England deals with the money markets. This is a key determinant of the overall level of aggregate demand in the economy, influencing demand through a number of channels.¹ The effects of an interest rate change can vary in both speed and size, depending on the context in which it occurs, especially on the strength of consumer and business confidence. Also, for consumer and business decision-making, it is the real interest rate (that is, the nominal interest rate adjusted for expected inflation), that is key: official interest rates of 5 per cent may be considered high when inflation is zero, but low when inflation is 10 per cent a year.

A4 If the UK were to remain outside EMU, UK interest rates would continue to be set by the MPC. The level of UK interest rates primarily affects demand and inflation in the UK both directly and indirectly through its effect of the exchange rate.

A5 If the UK were to join EMU, UK short-term interest rates would be the same as euro area short-term interest rates and would be set by the European Central Bank (ECB). The objective of the ECB is broadly similar to that of the Bank of England, namely to ensure price stability within the currency area.

¹ See the EMU study *EMU and the monetary transmission mechanism*.

A6 The key difference is that while the primary effect of the Bank of England's decision is on demand in the UK, the ECB's decision affects demand across the whole of the euro area. In conditions where the UK position is broadly similar to that of the euro area as a whole, the policy response of the ECB would be broadly similar to that of the Bank of England. However, circumstances could arise in which UK conditions, considered in isolation, might warrant a different interest rate response from that in the rest of the euro area.

A7 Other adjustment mechanisms within a monetary union could compensate for the loss of an independent interest rate. An important part of the five tests assessment is consideration of how the UK economy would be affected if UK interest rates were set by the ECB in response to euro area conditions rather than by the MPC in response to UK conditions. This is a major consideration of the convergence test (which assesses the likelihood of major divergences between conditions in the UK and the euro area), and the flexibility test (which assesses the extent to which other adjustment mechanisms would be likely to compensate for the loss of an independent monetary policy were the UK to join EMU).

Nominal and real exchange rates

A8 The exchange rate is the price of one currency in terms of another. It therefore affects the price of goods and services produced in one currency area and sold in another. Such transactions are usually determined in the home currency of one of the contracting parties, though this is not true for all goods (for example, oil is typically priced in US dollars regardless of the contracting countries). Movements in the exchange rate will therefore affect the domestic currency price of the buyer, the seller or both. They entail changes in relative prices which may alter patterns of supply and demand (see Box A1).

A9 The nominal exchange rate gives the domestic currency price at which a unit of foreign currency can be bought. The real exchange rate reflects the purchasing power of that currency, since it is adjusted for inflation. Movements in the real exchange rate reflect not only movements in the nominal exchange rate but also differences in the rates of inflation in the two currency areas.

A10 For example, assume that inflation is zero in currency area A, but 100 per cent in currency area B (implying that prices double every year). A's nominal exchange rate must rise by 100 per cent in order to preserve an unchanged real exchange rate. Conversely, if it were possible to fix the nominal exchange rate in these circumstances, then B's real exchange rate would rise by 100 per cent and B's producers would find themselves being priced out of both international and domestic markets.

A11 In practice, it would not be possible to sustain a fixed nominal exchange rate if inflation differentials were this large. But it helps to illustrate that a fixed nominal exchange rate does not imply a fixed real exchange rate. More fundamentally, inflation differentials may substitute for nominal exchange rate movements in bringing about the real exchange rate changes needed to ensure that aggregate supply equates to aggregate demand. This is the key role played by the exchange rate.

Box A1: Effect of exchange rate changes

Assume that two firms are producing similar products. The production of one firm is solely in the UK, while the other is located in the euro area. The exchange rate is initially 1.6 €/£. Both firms sell their products for €16 in the euro area and for £10 in the UK.

Now assume that the exchange rate changes to 1.5 €/£, representing a depreciation of sterling.

The UK firm could continue to charge euro area consumers €16, which now gives the firm higher sterling revenues. Alternatively, the firm could try to win market share in the euro area by reducing the euro-denominated price of its product, while maintaining or increasing sterling revenues.

For the euro area firm, maintaining its sterling price would enable it to maintain its share of the UK market, but at the cost of lower euro-denominated revenues. Alternatively, aiming to restore revenues would entail raising its sterling price at the cost of a reduced market share.

The decisions of individual producers will depend on the price sensitivity of their particular products, as well as the costs of building up market share. Depending on these factors, and the response of their competitors, both firms may be able to absorb some of the exchange rate change in profit margins and some in the price they charge in their respective foreign markets. But the net effect of a sterling depreciation is to favour UK producers, and hence increase aggregate demand for UK products, at the expense of euro area producers.

Whether these effects are sustainable depends also on aggregate supply conditions in both markets. If the boost to UK aggregate demand exceeds UK aggregate supply capacity, then it will boost UK inflation. A rise in UK inflation is equivalent to a rise in the real exchange rate, tending to offset the effects of the initial nominal exchange rate depreciation. Similarly if the depreciation were to result in deficient demand for euro area production, then euro area inflation would tend to fall, which again would erode the real exchange rate depreciation arising from the initial nominal depreciation.

A12 An important implication is that inflation is unlikely to be the same in all parts of a monetary union at any one point in time. Regions of the monetary union that are experiencing strong demand for their products will tend to experience higher inflation than in the rest of the currency union, and regions experiencing low demand will tend to experience lower inflation than elsewhere. These differences will be most evident in goods and services that are not easily traded between regions. Small inflation differentials may be sustainable in a fixed exchange rate system if there are differences in the trend rate of productivity growth between regions.

A13 If the UK were to remain outside EMU, then its nominal exchange rate against the euro would remain free to fluctuate. If the UK were to join EMU, nominal exchange rate movements against the rest of the euro area would be eliminated. Of course, EMU membership would not eliminate all nominal exchange rate risk. The euro floats against other currencies, including the US dollar and the Japanese yen. Hence producers competing in markets outside the euro area or against producers from outside the euro area would still need to manage currency risk. It is theoretically possible that nominal exchange rate volatility against the US dollar and other non-euro currencies would be greater if the UK were inside the euro area than if it remained outside.

AI4 The effects of fixing the sterling-euro exchange rate are examined in greater detail in the assessment of the five tests, as well as in the EMU studies *Estimates of equilibrium exchange rates for sterling against the euro* and *The exchange rate and macroeconomic adjustment*. The question of whether it would be sensible to lock the exchange rate at or close to current market rates is addressed in the convergence test. The role of the nominal exchange rate as an adjustment mechanism has implications for both the convergence and flexibility tests. The exchange rate regime may also affect investment, firm location and production decisions, which are considered in more detail in the investment, financial services and growth, stability and employment tests.

Fiscal policy

AI5 As a major agent in the economy, the Government's taxation and spending decisions can influence aggregate demand, potentially supporting monetary policy in stabilising the economy. For instance, a tax cut can usually be expected to stimulate demand by increasing taxpayers' spending power. The overall impact of fiscal policy on the economy will vary according to the instrument used, the current economic situation and whether firms and households expect the change to be temporary or permanent. The role of fiscal policy in stabilisation is discussed in detail in the EMU study by HM Treasury *Fiscal stabilisation and EMU* and in the flexibility test.

AI6 Were the UK to join EMU, a more active fiscal policy could potentially compensate for the loss of an independent monetary policy. Indeed, in the standard Mundell-Fleming model, fiscal policy is likely to be a more potent instrument for demand management than monetary policy under fixed exchange rates. The model indicates that monetary policy is more effective than fiscal policy under floating exchange rates.

Automatic/ discretionary

AI7 Conceptually, it is helpful to distinguish between automatic and discretionary changes to the fiscal stance. The automatic stabilisers play a role in stabilising the level of aggregate demand without any active decision by the fiscal authorities. For example, the income tax take as a share of GDP tends to rise when aggregate demand is strong (since more people are in work, there are more overtime and bonus payments, and the marginal tax rate exceeds the average tax rate). Unemployment payments also act as an automatic stabiliser since they support incomes when unemployment rises. Discretionary changes require an active decision to change the fiscal stance. For example, the Government may decide to reduce a particular tax rate during a downturn or to reduce expenditure in a period of strong growth.

AI8 While the Government's fiscal decisions can affect aggregate demand, it is critical that it remains able to fulfil its obligations without harming intergenerational equity or introducing a risk of a debt financing crisis. For this reason, both the UK fiscal rules and the EU's Stability and Growth Pact are designed to ensure that fiscal policies remain sustainable in the medium to long term. This is discussed in the EMU study by HM Treasury *Policy frameworks in the UK and EMU*.

Unemployment

AI9 There are two dimensions to the labour market: first, whether it is able to respond quickly to economic shocks such that the effects are temporary and short-lived, and second, whether the labour market is structurally sound with high employment and low unemployment across the economic cycle. These two dimensions are related in the sense that factor adjustment tends to imply lower structural unemployment.

AI20 The structural component of unemployment is largely determined by microeconomic influences on labour supply and demand, such as how employment regulations affect the

hiring decisions of firms, the influence that tax and benefit systems have on the decisions of firms to offer employment and of households to supply their labour, the incentives that individuals have to acquire the skills needed by firms and the incentives that firms have to offer training.

A21 These structural influences on unemployment are largely independent of aggregate demand in the economy. However, as set out in the EMU study *EMU and labour market flexibility*, overall economic volatility can also have some effect on the structural rate of unemployment. For instance, if the labour market is slow to adjust then what are initially cyclical increases in unemployment can become embodied into more long-standing changes (an effect known as hysteresis).

A22 The cyclical component of unemployment is determined by the size of the output gap – defined as the difference between actual output and potential output, or in other words the difference between actual aggregate demand and the aggregate supply capacity of the economy. Box A2 discusses the different approaches that can be used for estimating potential output and hence the output gap. The configuration of interest rates and the exchange rate influences the level of aggregate demand, and as a result affects the size of the output gap and the level of cyclical unemployment.

A23 The objective of both the MPC and the European Central Bank is to achieve price stability, broadly defined. In the medium term, this can only be achieved by keeping the aggregate level of demand close to the aggregate supply capacity of the economy, since persistent differences between aggregate demand and aggregate supply would either result in increasing inflation (if demand were too high) or falling inflation (if demand were too low). Hence, in meeting a price stability objective, the monetary authorities should ensure that cyclical unemployment is zero, over the course of the economic cycle.²

A24 There could be some difference in the short term between what would occur in or out of EMU, since the MPC's monetary stance will be determined by its assessment of UK inflation prospects, whereas the ECB's stance will be determined by inflation prospects across the euro area as a whole. The ECB's stance will, therefore, be less responsive to specific UK conditions. The effects of this on the UK economy will depend on the extent to which other mechanisms can compensate for the loss of an independent monetary policy. The convergence, flexibility and growth, stability and jobs tests contain a more detailed analysis of these mechanisms.

² Alesina et al. (2001) describe inflation targeting as an 'employment-friendly strategy'.

Box A2: Measuring the output gap

Several methods can be used to estimate potential output and thus the output gap. They range from statistical methods which identify trend output,^a involving little or no economic theory, to those where economic theory has more influence:

- a simple time trend, based on the assumption that trend growth is constant;
- statistical filters such as the Hodrick-Prescott (HP) filter or the Baxter-King Band-Pass (BP) filter.^b These allow trend growth to vary over time; and
- a production function approach.

The HP filter estimates a trend path, subject to a smoothness constraint. The greater the degree of smoothness imposed, the closer the trend path will be to a linear trend. Despite its relative simplicity and ease of use, the HP filter has a number of limitations, such as failing to account for structural breaks in trends and the need for judgement over the choice of the smoothness constraint.^c

The production function approach represents a natural response to the problems of purely statistical methods by allowing economic theory to help to identify potential output. This method relates the level of output to the level of technology and the inputs that are used to produce it (i.e. labour and capital). It is widely used by international organisations including the European Commission, the OECD and the IMF. However, there are a number of practical implementation problems. Assumptions need to be made about the form of the production function and the underlying determinants (potential employment and potential capital) are unobservable and have to be estimated.

The Treasury approach to estimating trend growth represents a practical solution to the problems of the other methods. A wider range of information than output alone is used; on-trend points are identified by assessing key economic indicators. Trend growth is then assumed to be constant between the on-trend points. Projections of trend growth looking forward are built up from the analysis of the components – labour productivity, average hours worked, the employment rate and the population of working age.

^a While similar, the concepts of potential and trend growth are not exactly the same. Potential output measures the maximum obtainable output if all factors are fully utilised, whereas trend output measures the level of output obtained if all factors are utilised at average or long-run levels.

^b For more detail of how these filters are constructed and applied see the EMU study *An analysis of European and UK business cycles and shocks* by Professor Michael Artis.

^c The smoothness constraint value should reflect the relative variance of demand to supply shocks hitting the economy (the greater the variance of supply shocks, the weaker the smoothness constraint imposed, as supply shocks are more likely to have persistent effects on output), but in practice most studies use the values set in the original study, 199 for annual data and 1,600 for quarterly data, though there is no guarantee that this produces valid results.

Productivity, growth and stability

A25 Productivity growth is of key importance in meeting the Government's central economic objective of high and stable levels of growth and employment. The productivity of labour and capital, along with the level of their utilisation, determines the country's wealth. Faster productivity growth means faster growth in economic output, other things equal. The Government has initiated a wide-ranging programme of microeconomic reforms to address historic weaknesses in the five key drivers of productivity performance:³

- strengthening the **competition** regime to encourage firms to innovate, minimise costs and deliver better quality goods and services to customers;

³ These are detailed in HM Treasury (2000). Their relevance for the European Union is outlined in HM Treasury (2002b, 2003).

- promoting **enterprise** to help new and established businesses to start up, develop and grow;
- supporting **science and innovation**, to utilise the potential of new technologies and to develop more efficient ways of working;
- improving **skills**, through better education for young people and greater training opportunities for those already in the workforce; and
- encouraging **investment** to improve the stock of physical capital in all sectors and industries.

A26 In tandem with these microeconomic reforms, it is vital to maintain macroeconomic stability which provides a foundation upon which high levels of growth and employment can be delivered. A more stable macroeconomic environment enables firms and individuals to plan with confidence. Consequently investment, innovation and enterprise will tend to be higher in a more stable environment, leading to higher levels of productivity and more rapid output growth over the longer term. The UK's post-War economic history clearly demonstrates the negative long-run impact of excess volatility of inflation and output. This underlines the critical importance of continued macroeconomic stability to the UK's decision on EMU.

A27 EMU membership could potentially have an impact on all of these factors. The assessment of the five economic tests, especially the growth, stability and jobs test, considers the issues in depth.

B

ANNEX B: TYPOLOGY OF SHOCKS

B1 An analysis of unanticipated economic disturbances or shocks is of vital importance for the EMU decision. This annex provides a fuller typology of different types of shock, setting out the key shocks which are relevant. Box B1 describes the ‘textbook treatment’ of shocks in terms of a simple aggregate supply and aggregate demand model.

Several distinctions **B2** The starting point is to consider economies being hit by a range of shocks, for example, oil price shocks and changes in consumer confidence and tastes. Some of these shocks are short-lived while others have a lasting impact. The degree of persistence depends not only on the nature of the shock but also the policy responses and the market adjustment mechanisms to the shocks. The economics literature highlights several distinctions:

- demand and supply shocks;
- permanent and temporary shocks;
- goods market and financial market shocks; and
- symmetric and asymmetric shocks.

Demand and supply, permanent and temporary **B3** Demand and supply shocks can be distinguished according to their impact on prices and output. A demand shock, such as a change in tastes, has the effect of changing prices and output in the same direction, so a positive demand shock leads to higher prices and higher output. A supply shock, such as a crop failure, has the effect of moving prices and output in opposite directions. With a crop failure, the price goes up but output goes down. Sometimes the literature assumes that demand shocks can only be temporary, although this can be misleading.

B4 The distinction between demand and supply shocks is important because monetary policy is most suited to offsetting demand shocks. Potentially, it can also play some short-term role in smoothing the impact of a supply shock,¹ but output can only be maintained at its potential level at the cost of volatility in the price level, i.e. temporarily higher or lower inflation. In the longer term, output cannot be held above or below its potential level without inflation increasing or decreasing. So being inside or outside EMU should have few implications for the UK’s ability to cope with shocks that permanently change potential output.

The role of the exchange rate **B5** The exchange rate may be a useful adjustment mechanism when domestic wages and prices move sluggishly and a country needs to change its terms of trade, for example if there is a change in tastes away from the sort of exports it produces. But the exchange rate does not have a role to play when relative prices need to change, as is the case for a typical supply shock. It is also less useful when wages and prices adjust quickly, as a change in the nominal exchange rate will only have a very short-lived effect on the real exchange rate. This can be seen in the contrast between the UK’s experiences following devaluations in the late 1960s and the early 1990s. In the first period, demand was strong and output near capacity. The change in the nominal exchange rate quickly led to wage and price adjustment. In the latter case, output was well below trend and wage moderation continued despite the devaluation, permitting a strong recovery.²

¹ Bayoumi and Eichengreen (1993) argue that an “*independent economic policy response*” is more compelling for supply shocks than for demand shocks because they may “*require more painful adjustment*”.

² Méltiz (1996) argues that a similar pattern was repeated in all of the countries that devalued in 1992-93.

B6 Another distinction is within the set of demand shocks, between goods market ('IS') shocks and financial market ('LM') shocks. If asymmetric shocks are from financial markets and the degree of international capital mobility is very high, a fixed exchange rate may deliver the best policy response.³ This is discussed in Box B1.

Box B1: A textbook treatment of demand and supply shocks^a

The different impact of demand and supply shocks can be illustrated using a textbook aggregate supply and demand diagram. Figure 1 shows the aggregate demand curve (AD), and the aggregate supply curves in the short run (SRAS) and the long run (LRAS). In the short-run, prices are 'sticky' – due to inertia in setting prices (and wages), prices adjust only slowly. The simplest assumption would be that there is no price adjustment, in which case the SRAS curve would be horizontal. This assumption might be suitable for the very short term, say a few months, but some price adjustment would be expected to occur quite quickly and certainly within a year. So Figure 1 presents the SRAS curve as upward sloping.^b In the long run, prices are fully flexible and so the long-run aggregate supply curve is shown as vertical. That is, the level of prices does not affect the level of output.

A key issue is how long it takes for the economy to get to the long-run position. If the adjustment is rapid, prices are highly flexible and the deviation of output from equilibrium will be relatively short, even without policy changes.^c If price adjustment is slow, however, the gradual adjustment of prices will imply an extended period where actual output deviates from its potential level unless policy can assist to help move output back to its potential level.

Demand shock

Consider first the case of a demand shock, such as might be caused by an exogenous increase in consumer confidence. The demand shock causes a shift in the aggregate demand curve from AD_1 to AD_2 . The price level rises above its expected level and output rises above its long-run potential level with the economy moving along the short-run aggregate supply curve from A to B. In time, however, the expected price level would increase, gradually shifting the aggregate supply curve up from $SRAS_1$ until it reaches $SRAS_2$. As the economy moves from B to C, prices rise further and output returns to its potential level, shown as Y^* , and given by the long-run aggregate supply curve. In the long run, the impact of the demand shock is higher prices with output remaining at its potential level.^d

^a For example, as in Begg *et al.* (1994) or Mankiw (1992).

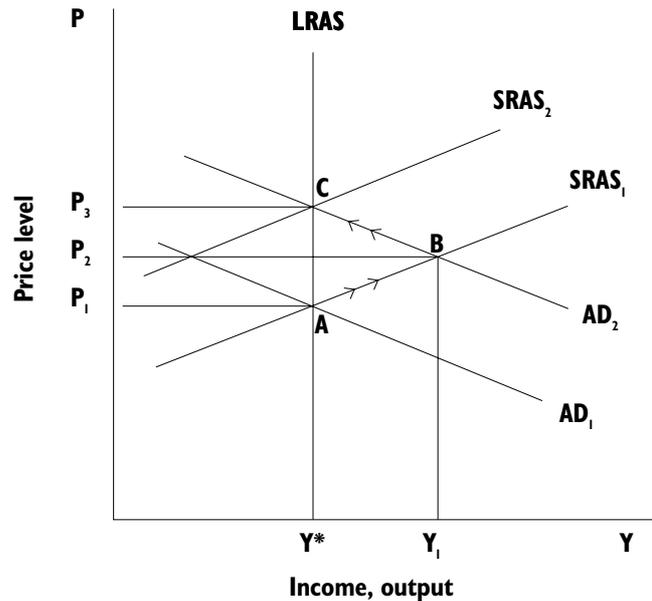
^b More formally, the short-run aggregate supply curve can be written as $Y = Y^* + \alpha (P - P_e)$, where Y is actual output, Y^* is potential output (or the natural rate of output), P is the price level and P_e is the expected price level. If the price level exceeds the expected price level then output is above the potential or natural rate. Essentially the SRAS curve is therefore the same as the Phillips curve (for a further discussion see Mankiw (1992) pp 287- 321).

^c Though Keynes (1936) makes clear that in certain circumstances high price flexibility could be insufficient to stabilise output, and could even be counterproductive.

^d This simple textbook treatment ignores the possibility, discussed above, that short-run volatility in output and employment could affect the equilibrium position.

³ Buiter (1997).

Figure 1

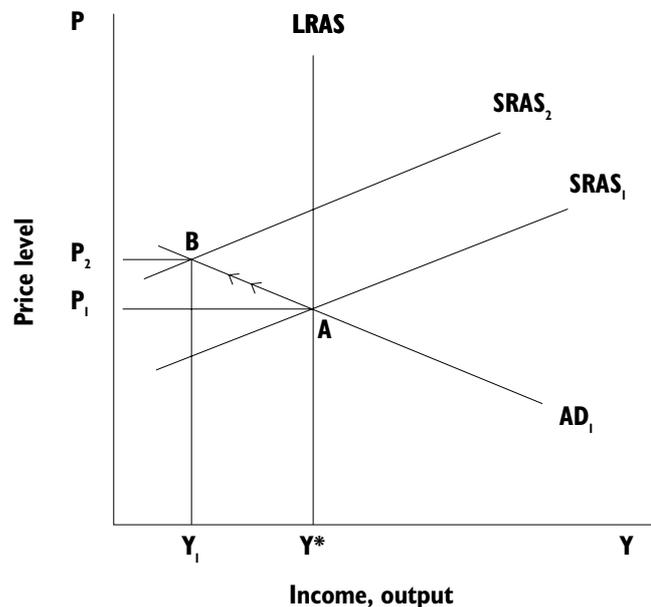


If prices were flexible, the economy would reach point C very quickly and output would not deviate from its potential level for long. When prices and wages adjust quite slowly, monetary policy can be used to reduce the deviation of actual output from potential. By raising interest rates, the central bank can restrain aggregate demand and prevent any increase in the price level or output. This keeps the economy close to point A.

Supply shock

In the case of a supply shock, such as a rise in oil prices, the short-run aggregate supply curve shifts up from $SRAS_1$ to $SRAS_2$. In the short-run, the effect of higher oil prices more than outweighs the reduction in other prices in the aggregate price level, and aggregate prices rise. If (nominal) aggregate demand is held constant, the economy will move from A to B, with prices rising and output falling. In time, the fact that output is below its potential level, Y^* , will depress other prices and wages. As prices fall the economy will return to point A.

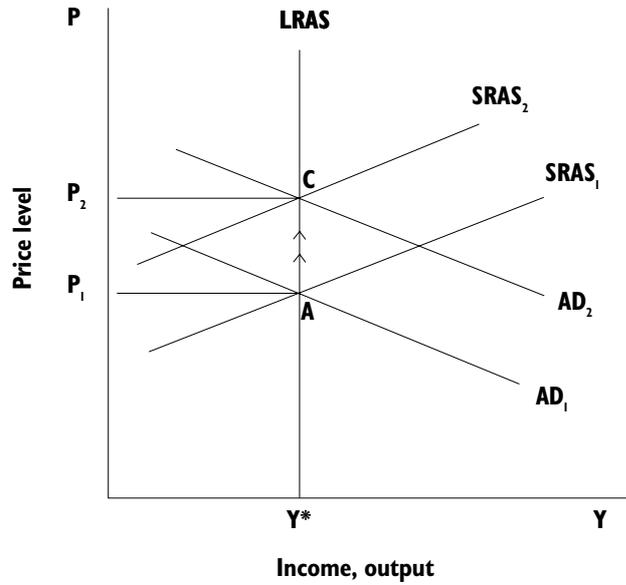
Figure 2



Supply shock with accommodating monetary policy

In response to an adverse supply shock the central bank could try to increase aggregate demand by reducing interest rates (and increasing the money supply) shifting AD_1 to AD_2 . This is shown in Figure 3. This would shift the economy from point A to point C. Output would remain at its potential level but the price level would be permanently higher.

Figure 3



A permanent reduction in potential output, involving a leftward shift in the LRAS curve, would inevitably produce a reduction in actual output in the long term, though monetary policy could potentially smooth the adjustment.

Begg et al. (1994) summarise the basic effects of demand and supply shocks (without any policy adjustment) as in the table below:

Reaction of the economy to shifts in demand and supply				
Rightward shift of:	Effect on output		Effect on price level	
	Short run	Long run	Short run	Long run
Demand (AD)	Rise	Zero	Rise	Higher

Symmetric and asymmetric shocks **B7** A further distinction concerns whether shocks are symmetric (common) or asymmetric (country-specific) with respect to different regions or countries. This is a key distinction in the OCA literature. A single currency area could face problems in handling asymmetric shocks. Demand shocks which affect all countries equally could be offset by euro area monetary policy changes, but this is not the case with asymmetric demand shocks. If they are common, there might be benefits from maintaining an independent monetary policy.⁴ The EMU Study *Analysis of European and UK business cycles and shocks* attempts to identify the degree to which shocks are symmetric or not and the prevalence and type of demand and supply shocks. Of course, even outside EMU, asymmetric demand shocks hit the different UK regions and this cannot be offset by monetary policy which is set at a national level. Therefore, assuming that demand shocks are symmetric within a country can be misleading.

B8 Symmetric shocks can have an asymmetric impact because of differences in structures. For example, a shock to the US economy will have different impacts in different regions depending on relative trade and investment exposures. The speed of adjustment to shocks can also differ. For instance, different institutional frameworks or different degrees of nominal rigidity can cause initially symmetric shocks to have an asymmetric impact. This would complicate the task of setting a common monetary policy.

Key questions **B9** This discussion suggests several key questions in relation to shocks, including:

- how important are asymmetric shocks that might require either a different interest rate in the UK compared with the euro area, or a change in the exchange rate, or both?;
- how important are differences in the propagation of these shocks, or in the transmission mechanism of monetary policy in response to the shocks?;
- if these factors are important, is the degree of wage and price flexibility sufficient to allow rapid adjustment to shocks?;
- what types of shocks are observed? Demand shocks are well-suited to control by monetary and exchange rate policies, although financial market shocks might be handled well within a monetary union. Supply shocks that are of a permanent nature cannot be effectively offset by monetary policy (or changes in the exchange rate), and even for temporary supply shocks, output can only be stabilised at the cost of (temporarily) higher inflation; and
- do monetary policy and the exchange rate help to stabilise the economy or are they themselves sources of disturbances and hence a source of divergences between the cycles in different countries?;

B10 These questions play a central role in the assessment of the five tests, particularly the convergence and flexibility tests, and in the EMU studies. The EMU study *Analysis of European and UK business cycles and shocks* considers the historical occurrence of shocks in the UK and Europe. The EMU studies *Housing, consumption and EMU* and *EMU and the monetary transmission mechanism* consider whether there are important structural differences between the UK and the euro area. The EMU study *Modelling shocks and adjustment mechanisms in EMU* builds a simple economic model to analyse the likelihood of shocks and the responses to them. The EMU study *EMU and labour market flexibility* examines the labour market's potential role in adjustment to shocks.

⁴ Unless the shocks are themselves due to policy mistakes or the nominal exchange rate.

Box B2: Using models to simulate aspects of EMU membership

There are a number of approaches to macroeconomic modelling of the effects of shocks in a monetary union:

- partial shock simulations – examining the impact that particularly large shocks have on countries when inside and outside monetary union;
- global level shock simulations – analysing how being in a monetary union might affect overall volatility in the future for a given set of shocks experienced in the past; and
- counterfactual simulations – such as that at the beginning of the previous section.

The first approach is used in the National Institute Global Econometric Model (NiGEM) which has forward looking behaviour and new Keynesian properties: prices are sticky in the short run – implying that changes in nominal variables have real effects – but not in the long run. This approach has also been adopted by a number of researchers including Oxford Economic Forecasting.

The second modelling approach is the basis for the advanced modelling technique which is at the heart of the macro level analysis in the EMU study *Modelling shocks and adjustment mechanisms in EMU* and the assessment of the flexibility test. This ‘stochastic simulation’ technique allows for modelling of all the shocks that are likely to hit the economy, using a stylised model developed for the five tests assessment. This approach has been pioneered by the National Institute and Liverpool modelling groups, using models with different properties.

A third approach is to remodel the recent past on the basis of an alternative regime and the economic and policy assumptions that implies.