PROSPECTS FOR THE PORTUGUESE ECONOMY IN 2001-2002

1. INTRODUCTION

This *Economic Bulletin* presents projections for the Portuguese economy in 2001 and 2002, particularly covering the trend of activity, major expenditure components, inflation and the joint balances of the current and the capital accounts. These projections were prepared by the Banco de Portugal within the scope of the Eurosystem spring projections exercise, whose results for the euro area as a whole were published in the June issue of the *Monthly Bulletin* of the European Central Bank (ECB).

The projections now presented for the Portuguese economy, apart from some hypotheses specific of the Portuguese case, are based on hypotheses adopted by the Eurosystem as a whole, in particular, the technical hypotheses of constant interest rates and exchange rates over the horizon period. Common hypotheses were also considered on the behaviour of the world economy and on the international prices of commodities. It should also be noted that it was ensured that projections for every economy in the euro area implicit in the Eurosystem projections for the euro area as a whole were taken into account in the preparation of projections for the Portuguese economy. As a result of this procedure, the external environment of the Portuguese economy will be featured by less buoyancy, particularly when compared with the situation envisaged in the autumn projections, carried out in October 2000, when signs of a deceleration of the world economy, particularly in the US, were not yet clearly discernible. The growth of external demand relevant for the Portuguese economy is expected to slowdown from approximately 11 per cent in 2000, to 6.8 and 6.2 per cent in 2001 and 2002, respectively. These hypotheses represent a downward revision between 1 and 1.5 percentage points in

both years, vis-à-vis the previous projections exercise.

In 2001, the rate of change of Portuguese GDP, in real terms, will likely stand in a range of between 2 and 2½ per cent, below the 3.2 per cent estimated for 2000 (see Table 1). Projections for 2002 point to a stabilisation of the growth rate of output at levels similar to those recorded in 2001, corresponding to a projection range of between 1¾ and 2¾ per cent.

The output evolution projected for 2001 reflects both a deceleration of exports, mainly determined by the forecasted behaviour of external demand, and a slowdown in domestic demand, which will likely be reflected in a significant deceleration of imports. The latter is expected to dominate the deceleration of exports, such that, in 2001, the net external demand will have a positive contribution for GDP growth, which will occur for the first time since 1996.

The slowdown in domestic demand, which already occurred in 2000, will mainly reflect a correction of the pattern of high growth rates observed in previous years. Therefore, the slowdown in the pace of economic growth is an important element of a process of gradual adjustment of the Portuguese economy, which will be reflected in a gradual decrease of the deficit of the goods external account and, as a result, in a moderation of the pace of increasing of indebtedness.

The information on the economic situation already made available for the first months of 2001 broadly confirms this scenario of slackening economic growth. The activity coincident indicator estimated by the Banco de Portugal indicates a significant deceleration in the first quarter of the year, as can be seen in Chart 1. However, it is possible that the decelerating trend of economic activ-

Chart 1
ACTIVITY COINCIDENT INDICATOR
Year-on-year percentage rates of change
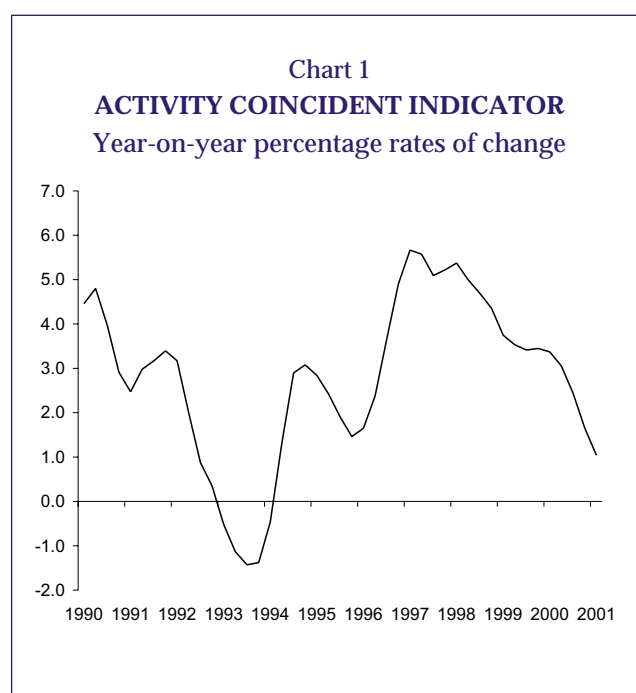
ity revealed by the coincident indicator has been temporarily pronounced in the first quarter due to a combination of special effects, such as extremely high rainfalls over that period.

With regard to inflation, the Eurosystem spring projections pointed to an annual average change

of the Harmonised Index of Consumer Prices (HICP) within a range of between 3.6 and 4.1 per cent in 2001 (2.8 per cent in 2000) (see Table 1). However, it should be noted that the updating of this projection, taking into account the information made available in the meantime, points to higher figures, within a range of between 3.9 and 4.5 per cent (see box "*The recent trend of unprocessed food prices: implications for inflation projections in 2001*").

The rise in inflation in 2001 reflects three major factors. First, note the high growth of some food-stuff prices, mainly determined by developments that have temporarily affected the trend of the HICP. Indeed, reflecting the re-emergence of news related with animal diseases, in particular BSE, and particularly adverse meteorological condi-tions in Portugal, the year-on-year rate of change of "unprocessed food" prices rose significantly, to stand above 10 per cent in recent months. Another important factor is the rise in international infla-tion, reflected in an acceleration of consumer goods prices. Finally, more recently, nominal wages accelerated somewhat, which was reflected in collective bargaining and clearly apparent in the rise in the minimum wage and in the wage scale of civil servants.

Table 1

PROJECTIONS OF THE BANCO DE PORTUGAL WITHIN THE SCOPE OF THE EUROSYSTEM SPRING 2001 PROJECTIONS

Year-on-year rates of change

|	Estimate of the Banco de Portugal	Memo item: Autumn 2000 projections[a]		Spring 2001 projections	
	2000	2000	2001	2001	2002
Private consumption.	2.8	[2¾;3¼]	[2½;3]	[2;2½]	[1¾;2¾]
Public consumption	3.6	3.2	1.7	1.7	1.0
Gross fixed capital formation	4.0	[5¼;5¾]	[2½;4½]	[-1;1]	[-1;3]
Domestic demand	2.9	[3¼;3¾]	[2½;3]	[1½;2]	[1½ ;2½]
Exports	6.9	[8¼;8¾]	[7½;8½]	[5½;6½]	[5¼;7¼]
Overall demand.	3.8	[4¼;4¾]	[3¾;4¼]	[2½;3]	[2½;3½]
Imports	5.3	[8;8½]	[6¼;7¼]	[3;5]	[2¼;6¼]
GDP.	3.2	[2¾;3¼]	[2½;3]	[2;2½]	[1¾;2¾]
Current account + Capital account (% GDP)	-8.5	[-10;-9]	[-9½;-8½]	[-7¾;-6]	[-8¼;-4¾]
Harmonised Index of Consumer Prices.	2.8	2.8	[2.9;3.3]	[3.6;4.1]	[2.1;3.1]

Note: (a) Published in the December 2000 *Economic Bulletin.*

In the second half of the year, the pace of growth of consumer prices is expected to weaken, as a result of the correction of base effects particularly related with excessive increases in prices of some foodstuffs in the second half of 2000. This behaviour will likely determine lower year-on-year rates of change of the consumer prices index in the first months of 2002 than those recorded early this year. This feature, together with the prospects of a reduction in the growth of import prices underlying the hypotheses advanced in the Eurosystem economic projections, and with a deceleration of nominal wages growth reflecting the slowdown in economic activity, is expected to allow for a decrease in inflation in 2002 to figures between 2.1 and 3.1 per cent.

2. HYPOTHESES UNDERLYING THE PROJECTIONS AND THE TREND OF THE EXTERNAL ENVIRONMENT OF THE PORTUGUESE ECONOMY

Projections for the Portuguese economy are based on a series of hypotheses that may be classified in four different groups. A first group includes the technical hypotheses of constant short-term interest rates and exchange rates, the key features of the Eurosystem projections (see the June 2000 issue of the ECB Monthly Bulletin). A second group includes the hypotheses assumed by the Eurosystem as a whole, namely variables such as the evolution of the world economy and of international prices of commodities. A third group includes the hypotheses related with the evolution of the euro area economies. It should be recalled that the consistency of the Eurosystem macroeconomic projections ensures that the forecasts carried out for every national economy forming the euro area were considered in the preparation of the projections for the Portuguese economy. Finally, a fourth group includes the hypotheses on specific behaviour of a set of variables for the Portuguese economy, and which is to a large extent determined by fiscal policy.

Therefore, the revision of projections, that naturally occurs with every new forecast exercise, reflects, inter alia, the changes introduced in those hypotheses, as well as new information on the Portuguese economy made available in the meantime.

Chart 2
GDP
Spring projections
Year-on-year percentage rates of change
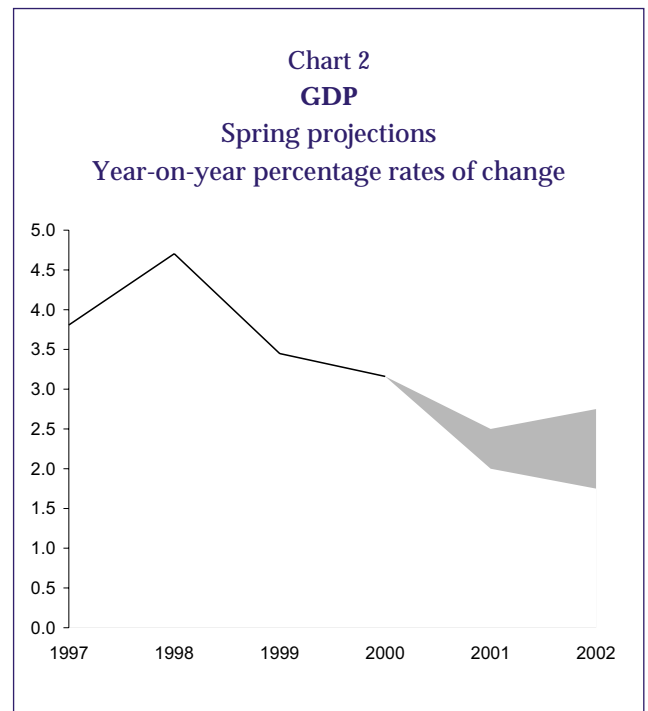
With regard to the external environment of the euro area, the Eurosystem projections acknowledge a slowdown in the world economy in 2001 and 2002, more pronounced than envisaged in the projections released in the December 2000 issue of the ECB *Monthly Bulletin*. Economic activity outside the euro area is expected to increase by 3¼ in 2001 and by 3¾ in 2002, after 5 per cent in 2000. These values are consistent with a slowdown in the US economy in 2001 followed by a gradual recovery, and with a weak economic growth in Japan over the forecast period. Emerging markets, in turn, are expected to show an economic slowdown in 2001 and to resume high growth rates in 2002.

As regards the development of the international oil price, the hypothesis considered in the Eurosystem projections is based on the implicit trend in futures markets, which is reflected in a gradual decrease of prices over the forecast horizon (of approximately 6½ and 9 per cent in 2001 and 2002, respectively, in annual average terms). Therefore, vis-à-vis the previous exercise, there seems to be a downward revision of oil prices.

In line with the Eurosystem projections, economic activity in euro area countries, in turn, is expected to slowdown in 2001 and 2002, after the 3.4 per cent growth recorded in 2000. The June 2000 issue of the ECB *Monthly Bulletin* discloses projection ranges of 2.2-2.8 and 2.1-3.1 for 2001 and 2002,

respectively. This decrease in the pace of growth is explained by the lower contribution of both domestic and external demand. National accounts for the first quarter of 2001 disclosed in the meantime for major economies in the area confirm this slowdown.

Taking this environment into account, and considering each country's weight on Portuguese exports, the increase in external demand for our economy is expected to moderate from approximately 11 per cent in 2000 to 6.8 per cent in 2001 and to 6.2 per cent in 2002. These results represent a downward revision of 1.4 p.p. in 2001 and of 1.2 p.p. in 2002 from the autumn 2000 projections.

In addition, projections for Portugal also took into account the information available on the development of General Government accounts, in particular the State Budget for 2001, as well as the report on the excessive deficit procedure of February 2001. Against this background, a technical hypothesis was assumed that the real growth of public consumption would stand at 1.7 per cent in 2001 and at 1.0 per cent in 2002 (similarly to what was considered for the autumn projections). This development implies a strong deceleration vis-à-vis the trend recently observed (growth rates of 4.9 and 3.6 per cent in 1999 and 2000, respectively). Finally, also similarly to the previous exercise, a technical hypothesis was assumed that consumer fuel prices would remain unchanged over the forecast horizon, after the rise recorded in January 2001.

Note that the technical hypothesis on interest rates, exchange rates, public consumption and fuel consumer prices cannot be used as forecasts for these variables. The evolution of these variables will depend on the economic policy decisions to be taken, and their forecast does not fall within the scope of the Eurosystem projections. The projections presented in Table 1 should be envisaged as forecasts conditional on the set of hypotheses considered.

3. PROSPECTS FOR THE PORTUGUESE ECONOMY IN 2001-2002

3.1. Economic activity

Similarly to the autumn projection, published in the December 2000 issue of the *Economic Bulletin*, the spring forecasts point to a slowdown in the Portuguese economy growth, albeit more pronounced than previously forecasted. Growth is expected to moderate from 3.2 per cent in 2000 to a figure within the 2-2½ per cent range in 2001. Projections for 2002 suggest a stabilisation in the pace of economic growth (see Chart 2).

The deceleration of the Portuguese economy in 2001 is associated with a sustained trend of slowdown in private consumption and, above all, investment. The hypothesised decrease in public consumption growth in real terms will also contribute to this slowdown. This behaviour will permit a gradual adjustment of some imbalances created over recent years by the strong growth of domestic demand. Indeed, according to the present scenario, household savings ratio is expected to increase over the projection horizon, while the deficit of the current plus the capital accounts is expected to narrow.

The decelerating trend of the Portuguese economic activity has been confirmed by recent statistical information. Indeed, on the one hand, despite the fact that the growth rate in 2000 was slightly higher than forecasted in the previous exercise[1], in the meantime the new information made available for the second half of the year, revealed a sharp profile of intra-annual deceleration of domestic demand, in particular investment, and a real growth of exports below what was forecasted before. On the other hand, data on the economic situation for the first months of 2001, such as the preliminary results on external trade and economic agents' confidence indicators confirm, in general, the slowdown scenario for the Portuguese economy.

The downward revision of growth prospects vis-à-vis autumn projections is partly accounted for by a less favourable external environment, reflected in a downward revision of external de-

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(1) This revision was chiefly due to base effects. For further details, see the March 2001 *Economic Bulletin*.

mand for Portuguese economy, which had already been identified as a risk in the previous projection exercise. Actually, the autumn 2000 projections were based on hypotheses about the world economic growth available in October 2000, when such a marked deceleration of North-American economy had not yet been foreseen.

In addition, information recently made available determined a significant revision of projections for the different expenditure components vis-à-vis the previous exercise: (i) there is now a less favourable evaluation of the trend of market shares of Portuguese exports[2], reflecting the deceiving behaviour of exports of goods in the second half of 2000; (ii) the growth of domestic demand in 2000 was clearly below that forecasted in the autumn exercise, (iii) investment seems to have been affected by specific effects in the first months of 2001, namely the changes introduced in the Vehicle Tax and the weather conditions featured by heavy rainfalls; (iv) imports have revealed less buoyancy, in line with the pronounced deceleration of domestic demand and, in particular, of domestic demand components with a higher import content.

3.1.1. Expenditure components

Spring forecasts point to a real growth of private consumption ranging between 2 and 2½ per cent in 2001 and between 1¾ and 2¾ per cent in 2002, following growth rates of 2.8 per cent in 2000, 5.2 per cent in 1999 and 7.2 per cent in 1998 (see Chart 3). The current scenario points therefore to the maintenance of the decelerating trend of private consumption, albeit less markedly.

Similarly to last year's developments, the evolution of private consumption in 2001 will be significantly constrained by less favourable expectations on economic activity growth and on the need to face the growing debt service, as a result of the high growth of the level of indebtedness recently attained by households. In addition, the trend of consumption in 2001 will also be influenced by the

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(2) For a detailed analysis of exports and of the trend of market shares, see the article on Portuguese economy in 2000 published in the March 2001 *Economic Bulletin*, and Section II.3 "Expenditure and Output" of the 2000 *Annual Report*.

Chart 3
PRIVATE CONSUMPTION
Spring projections
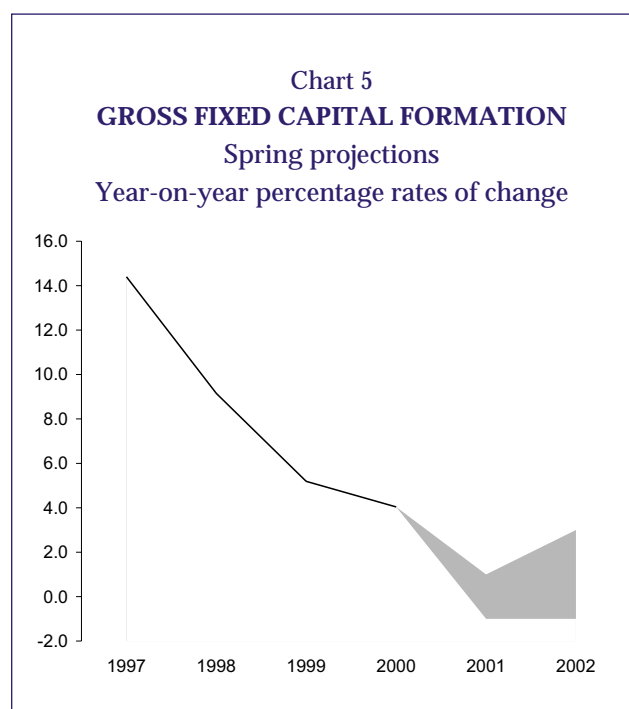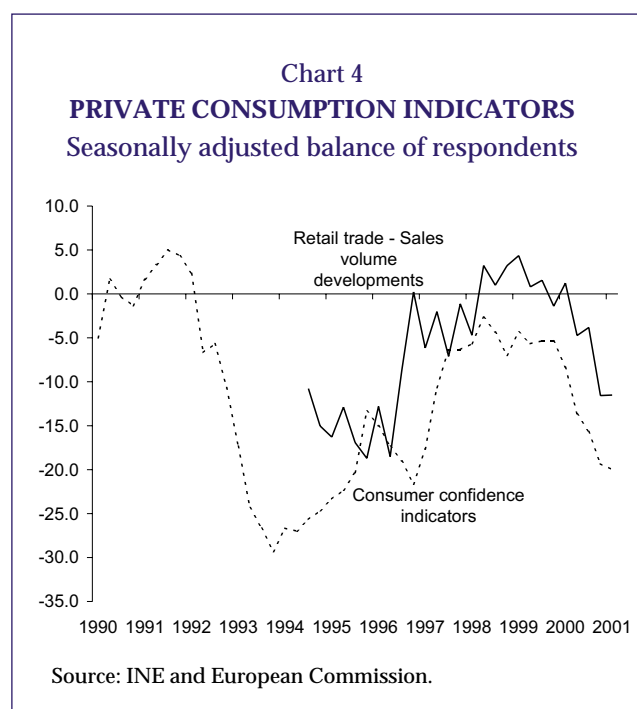Year-on-year percentage rates of change
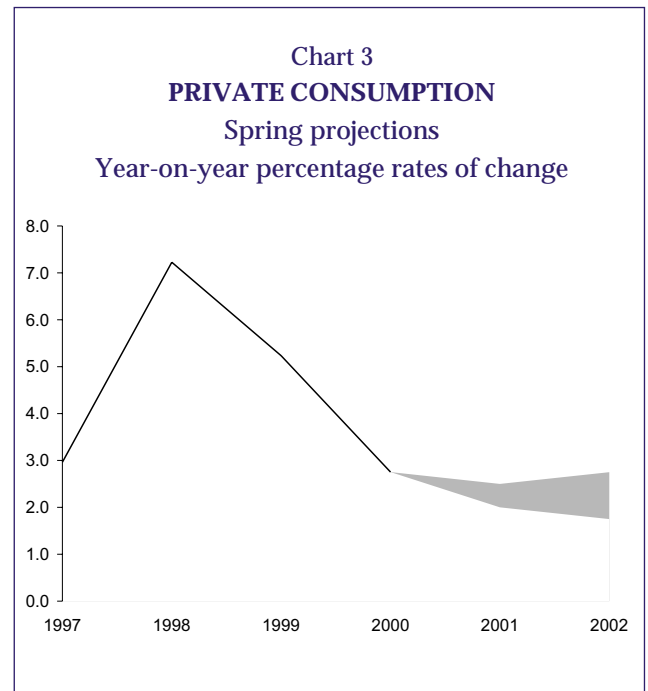
forecasted deceleration of real disposable income, which grew by 3.5 per cent in 2000.

This deceleration of real disposable income will be a consequence of the increase in inflation, given that, in nominal terms, the disposable income is expected to grow at a pace close to that observed in 2000. The growth rate of private consumption in 2001 is expected to be lower than that of disposable income, thus permitting, as in the previous year, an increase in the household savings ratio.

The information available on the economic situation in early 2001 confirms the slowdown in private consumption. In fact, in the first months of the year, the number of light passenger vehicles sold recorded a negative change, with particular emphasis on the so-called four-wheel vehicles[3]. With regard to qualitative information, both the balance of respondents on the volume of retail sales and the consumer confidence indicator stabilised early in the year at values close to those recorded in the last quarter of 2000, as can be observed in Chart 4. Nonetheless, in both cases, they stood at levels considerably lower than the average values recorded in 2000.

Forecasts for 2002, in line with the projected stabilisation of the real growth of household disposable income over the current year, point to an

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(3) Note that the sale of four-wheel vehicles was affected by the changes introduced in the vehicle tax in 2001.

Chart 4
PRIVATE CONSUMPTION INDICATORS
Seasonally adjusted balance of respondents

Source: INE and European Commission.

Chart 5
GROSS FIXED CAPITAL FORMATION
Spring projections
Year-on-year percentage rates of change

increase in private consumption close to that observed in 2001 and to the maintenance of the savings ratio.

Gross Fixed Capital Formation is likely to slow-down significantly in 2001, to recover slightly in 2002. The growth rate stood at 4.0 per cent in 2000 and is expected to stand between –1 and 1 per cent in 2001 and between –1 and 3 per cent in 2002 (see Chart 5).

The investment forecast for 2001 is mainly explained by its private component, since public investment is expected to increase significantly as a result of the implementation of the Third Community Support environment. Indeed, it is possible that some investments in public infrastructures carried out by entities classified outside the general government, as well as some private investments eligible for the Community Support environment may contribute to mitigate the fall in private investment.
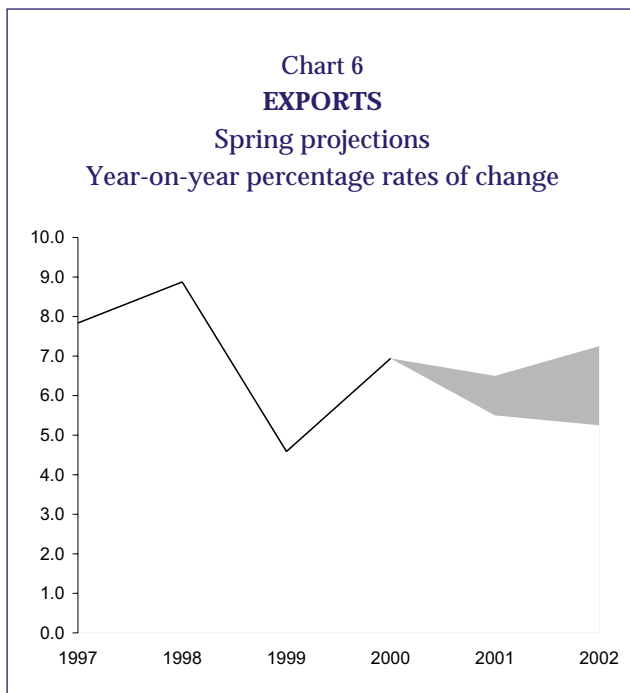
In fact, private investment forecasts in 2001 envisages a significant slowdown in corporate investment and a reduction in housing investment, in the wake of the sharp deceleration observed in the second half of 2000. The high sensitivity of investment vis-à-vis less optimistic prospects for economic activity, the high level of indebtedness of corporations, as a result of the high investment rates in the recent past, and the specific effect of the vehicle tax change on the component "invest-

ment in transportation material" are likely to determine a considerable slowdown in corporate investment. Likewise, the strong pace of growth observed over recent years in household housing investment and the pressure of the corresponding financial burden, together with a less favourable economic environment, may also negatively affect the trend of this type of investment. Most recently available figures confirm this slackening trend of housing investment. In particular, bank housing loans continued to decelerate in the first quarter, and the year-on-year change declined from 20.0 to 17.3 per cent from December 2000 to March 2001[4].

Forecasts for 2002 point to a still negative trend of housing investment, and a slight acceleration of corporate investment, as a result of more favourable developments in transportation material, after the fading of the effect of fiscal changes that have affected this component in 2001. Therefore, private investment will likely show a positive growth in 2002, sufficient to determine a slight acceleration of total investment, despite the stabilisation of the level of public investment envisaged for 2002.

In the wake of the 6.9 per cent real increase in exports of goods and services in 2000, for 2001 growth rates are forecasted to stand between 5½

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(4) In December 1999 and in March 2000, this year-on-year change had stood at 29.7 and 26.3 per cent, respectively.

Chart 6
EXPORTS
Spring projections
Year-on-year percentage rates of change

Chart 7
IMPORTS
Spring projections
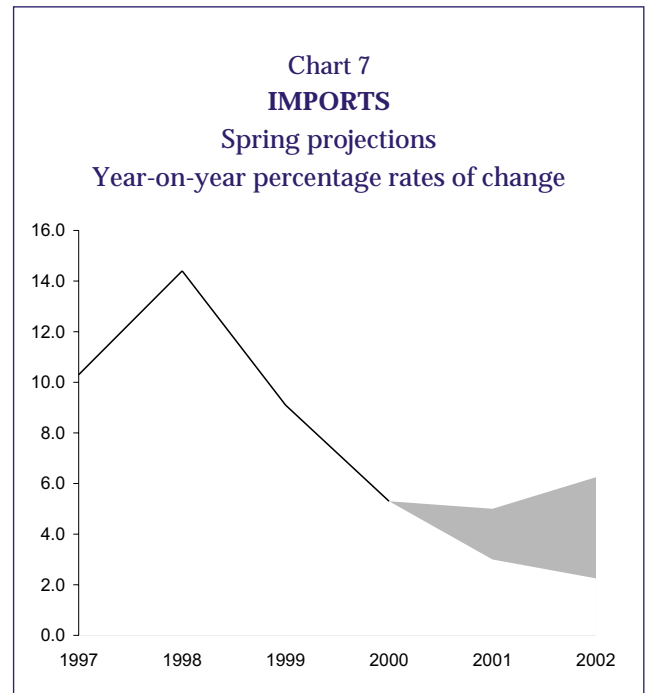Year-on-year percentage rates of change

and 6½ per cent and between 5¼ and 7¼ per cent for 2002 (see Chart 6).

The forecast for exports of goods and services in 2001 reflects the combined effects of three major factors. First, the above-mentioned slowdown in external demand. Second, it is recognised that 2001 and 2002 may continue to witness some loss in market shares, albeit less markedly than in 2000, associated with the behaviour of exports of some specific sectors, particularly clothing and footwear and transportation material. Third, the present projections include the sustained strong growth of exports of tourism services.

The estimated evolution of exports of goods and services for 2001 represents a downward revision vis-à-vis the figures presented in the December 2000 *Economic Bulletin*. This revision is the result, on the one hand, of the 1.4 p.p. downward revision of the hypothesis about the growth of the external demand relevant for the Portuguese economy in 2001. On the other hand, the present projections envisage a less favourable trend of market shares than previously anticipated in the autumn 2000 forecasts.

Considering the expected slowdown in domestic demand, which will be more pronounced in the components with a higher import content, such as investment in machinery and transportation material, forecasts for 2001 point to a deceleration of imports of goods and services. In 2000, due to a marked deceleration of domestic demand in the second half of the year, imports of goods and services increased, in real terms, by 5.3 per cent, which represents a significant downward revision from the 8-8½ per cent projection published in the December 2000 *Economic Bulletin*. According to the spring forecasts, the real growth of imports is likely to stand between 3 and 5 per cent in 2001 and between 2¼ and 6¼ per cent in 2002 (see Chart 7).

3.1.2. Current account and capital account

In 2000, the joint deficit of the current plus the capital accounts posted 8.5 per cent of GDP. Spring forecasts point to a gradual decrease of this deficit to figures between 6 and 7¾ in 2001 and between 4¾ and 8¼ per cent in 2002. This trend will be mainly determined by the reduction in the deficit of the goods and services account and, in 2001, also by the foreseeable recovery of capital inflows from the European Union, associated with the implementation of the Third Community Support environment.

The lower deficit in the goods and services account will be mainly due to the decrease in real growth of imports, which will more than offset the slowdown foreseeable for exports. This volume effect, contrary to that observed in recent years, is

expected to contribute positively to the evolution of the external deficit. In addition, the contribution of terms of trade is also expected to turn positive, mainly reflecting the gradual decrease assumed for the oil price over the forecast horizon.

The gradual decrease in the deficit of the current plus the capital accounts falls within an inevitable adjustment process of the Portuguese economy, mainly associated with a slowdown in domestic demand to more moderate and sustainable growth rates, after the sharp pace of expansion recently observed.

3.2. Inflation

According to the spring forecasts presented in Table 1, the year-on-year rate of change of the HICP is expected to stand between 3.6 and 4.1 per cent in 2001 and between 2.1 and 3.1 per cent in 2002 (Chart 8), which reflects a significant upward revision of the projections for the inflation rate in 2001 published in the December 2000 issue of the Economic Bulletin. However, it should be noted that the updating of spring projections, taking into account the unexpected developments of the Harmonised Index of Consumer Prices in May, points to higher figures, within a range of between 3.9 and 4.5 per cent (see box "*The recent trend of unprocessed food prices: implications for inflation projections in 2001*").

The upward revision vis-à-vis projections obtained at the end of 2000 reflects, firstly, the significant price growth of some foodstuffs (see Chart 9). Indeed, similarly to developments in the other European countries, the re-emergence of news related with animal diseases, in particular BSE, seems to have given rise to a significant price increase in substitutes for veal. Likewise, weather conditions, featured by heavy rainfalls, seem to have led to unusually high increases in prices of other foodstuffs.

Secondly, it should also be mentioned that the increase in import prices in the second half of 2000 was higher than initially forecasted, which may also have contributed to a more unfavourable inflation behaviour. In contrast to what would be desirable and was implicit in the projections made at the end of previous year, the information available points to an acceleration of wages in 2001. This behaviour in wages is being mainly reflected

Chart 8
HARMONISED INDEX OF CONSUMER PRICES
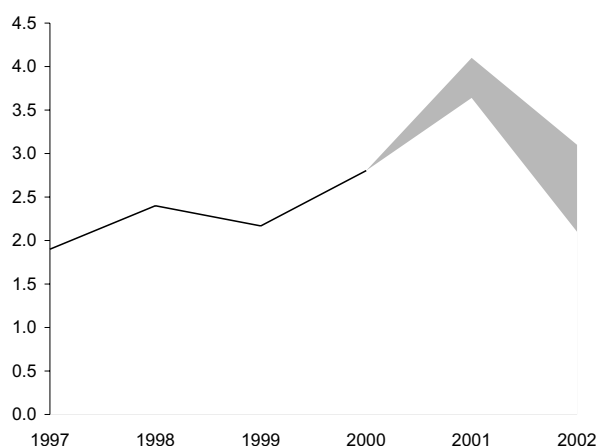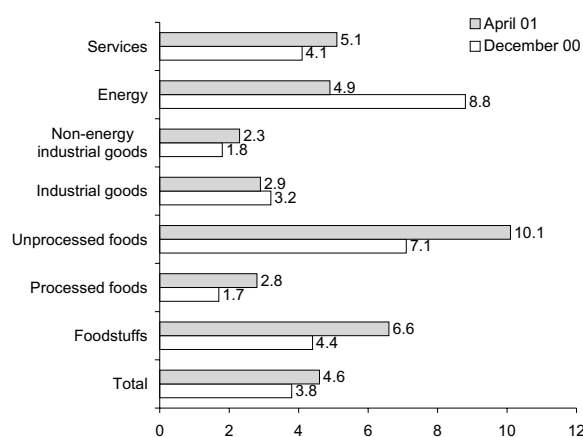Spring projections
Year-on-year rates of change

Chart 9
HARMONISED INDEX OF CONSUMER PRICES
Year-on-year rates of change

in the trend of prices of some services. The labour market tightness – featured by a very low level of the unemployment rate – has been marked by very strong wage increases. In effect, on the one hand, the private sector collective bargaining recorded a rise of 3.9 per cent in the first four months of the year (3.5 per cent in 2000), the wage scale of the general government increased by 3.7 per cent (2.5 per cent in 2000) and the minimum wage rose by 5.0 per cent (4.1 per cent in 2000). On the other hand, the differential between effective pay and the bargained increases in the wage scale (the so-called wage drift) for the private sector continued to show relatively high levels in 2001, after

1.6 p.p. and 1.7 p.p. in 1999 and 2000, respectively. Compensations per employee are therefore expected to increase in 2001 at a pace higher than that observed in the euro area (differentials of 2.9 p.p. in 1999 and 3.3 p.p. in 2000). This difference is not accounted for by larger gains in productivity.

In spite of the upward revision envisaged for 2001, expectations of a correction of the excessive price increases observed in some foodstuffs since the second half of 2000 explain the maintenance of a downward profile for the year-on-year rate of change of prices over the second half of 2001, although this correction has not yet been visible in recent months.

The inflation projections for 2002 are explained by the hypothesis of a deceleration of international prices and by the dissipation of the lagged effects associated with the depreciation of the euro, which may have contributed to the rise in inflation since 2000[5]. In addition, the inflation projections for 2002 are based on a decrease of wage pressures, within the context of a downward profile of the inflation rate over 2001, as a result of the slackening of economic activity.

4. EVALUATION OF RISK FACTORS AND CONCLUSION

As mentioned in section 2 of the present article, these projections dependent on a set of hypotheses. There is naturally an important group of risks associated with the possibility of their non-occurrence that may determine divergences from the projected figures.

With regard to the set of hypotheses about the international economy behaviour, the major risk factor will be a lower growth than that assumed in this exercise. It should be recalled that growth prospects for 2001 were systematically revised downwards, as the information on the recent trend of major economies was being disclosed. The statistical information made available after the cut-off date of this exercise seem to suggest that the world economy will most likely grow less than projected. In particular, the possibility of a sharper and longer deceleration of US economy cannot be ruled out and may pass through to the world

economy and, consequently, to the euro area economy. A change in this sense would necessarily mean a lower growth of Portuguese exports and GDP.

With regard to the prospects for future price changes, stress should be laid on the behaviour of the euro, which now stands below the level envisaged in spring forecasts. As a result, the prospects for the price growth in the euro area and in Portugal will now be less favourable than those included in spring forecasts.

As mentioned in Section 3.2 and in the attached Box, the high volatility of food prices, particularly after the sizeable increases observed since the second half of 2000, is the major uncertainty factor associated with the present projections for the inflation rate. In spite of the temporary nature of present disturbances in the prices of some foodstuffs, there is nonetheless the risk that the current increase in the annual average change of price indices may lead to some effects on wage negotiations in 2002 and, as a result, on future inflation. Such scenario would be extremely negative for the Portuguese economy.

The operation of the Portuguese economy within a wide economic area with a single monetary policy implies that wage negotiations should adopt as relevant reference wage changes in the other countries of the euro area and the productivity differentials. In a situation in which unit labour costs in Portugal have increased clearly more, in average terms, than in the euro area, it would be extremely dangerous to maintain such trend. Against this background, it is very important that the nominal wages changes is not influenced by inflation rate increases associated with shocks of a temporary nature. Otherwise, it would be reflected in a decrease in long-term growth prospects for the Portuguese economy and, consequently, in a sharper increase in the unemployment rate.

Spring macroeconomic projections presented in this *Bulletin* point to a further deceleration of domestic demand in the current year, followed by a growth stabilisation in 2002. A deceleration of exports of goods and services is also expected for 2001, followed in 2002 by a relative stabilisation of the rate of change of this component, mainly reflecting less favourable prospects for the external environment of the Portuguese economy, as well

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(5) These forecasts, as previously mentioned, assume constant exchange rates.

as further losses in market shares, albeit more moderate than in 2000.

The continued slowdown in domestic demand, probably sharpper in the components with a higher import content, and the projected deceleration of exports will lead to a further deceleration of imports in 2001. As a result, in 2001, the contribution of net external demand for GDP growth will likely be slightly positive, which does not happen since 1996. In general terms, the trend of imports and the contribution of net external demand in 2002 will be close to that forecasted for 2001.

In view of the near neutrality of net external demand for output growth, the decrease in the contribution of internal demand will lead to a rate of growth of GDP that in 2001 and in 2002 is expected to stand nearly 1 p.p. below that recorded in the two previous years. This weaker growth of output, associated with less buoyant imports, will probably favour the gradual reduction of net borrowing requirements of the Portuguese economy, reflected in the decrease of the deficit of the current plus the capital accounts. Against this background, spring forecasts envisage a smooth correction of the imbalances that might, in a near future, have affected the sustainability and constancy of economic growth. Therefore, this readjustment process will permit a reduction of the degree of vulnerability vis-à-vis adverse shocks, both of a specific nature and of external origin, the occurrence of which may give rise to a more abrupt adjustment than that envisaged. It should be noted that wage developments more suited to an increase in productivity levels are essential for the non-deterioration of Portuguese companies competitiveness, increasing the possibility that a smoother adjustment may occur.

Compliance with the commitments of the Portuguese Government to a gradual decrease of the budget deficit over forthcoming years is also an imperative factor for the maintenance of a gradual adjustment trend of the Portuguese economy. Otherwise, an adjustment more abrupt than that envisaged in these projections might occur, with inevitable costs in terms of economic growth and unemployment.

Completed in June 2001, on the basis of a projection exercise using data available up to the cut-off date of 17 May 2001. The Box "The recent trend of unprocessed food prices: implications for inflation projections in 2001" was prepared on the basis of information available on 18 June 2001.

THE RECENT TREND OF UNPROCESSED FOOD PRICES:
IMPLICATIONS FOR INFLATION PROJECTIONS IN 2001.

Eurosystem projections resorted to the information available up to 17 May 2001. In the meantime, new pieces of information were made available, whose incorporation would give rise to changes in the projections released. Against this background, particular emphasis should be put on the issue of Consumer Price Indices for May that indicated price increases clearly above those envisaged in the forecasts, suggesting that the downward profile of the year-on-year inflation rate in 2001 would start later than initially envisaged and might be less apparent than expected.

The main reason behind the projection error in May is related with the price trend of unprocessed food[1] that continued to register very sharp increases in most countries in the euro area. In May, according to the Harmonised Index of Consumer Prices, the year-on-year rate of change of prices of these goods stood at 9.0 per cent in the euro area as a whole, attaining 12.7 per cent in Portugal, 12.6 per cent in the Netherlands, 10.6 per cent in Ireland, 10.3 per cent in Germany, 9.7 per cent in France and 9.6 per cent in Spain. Behind these very high increases was the re-emergence of news related with animal diseases – BSE and foot-and-mouth disease – as well as particularly adverse weather conditions in some countries in recent months.

Therefore, the contribution of the anomalous changes in prices of unprocessed food for the increase in the year-on-year rate of change of the HICP has been rather significant both in Portugal and in the euro area as a whole (Charts 1 and 2), stress being laid on the Portuguese case, for two reasons. First, as mentioned above, Portugal recorded the most pronounced increase in prices of unprocessed food. Second, because the weight of these goods in the total index is higher in Portugal (13.0 per cent, compared with 8.0 per cent in the euro area as a whole).

The analysis of the fluctuations of prices of unprocessed food should take into account that these are featured by a marked irregular behaviour. The explanatory variables included in the forecast econometric models do not permit to capture the evolution of prices of these goods, wherefore these are a frequent source of projection errors. Under these circumstances, an explanation should be given on the hypotheses assumed in this exercise and on the type of revision that those hypotheses undergo in order to take into account the most recent information.
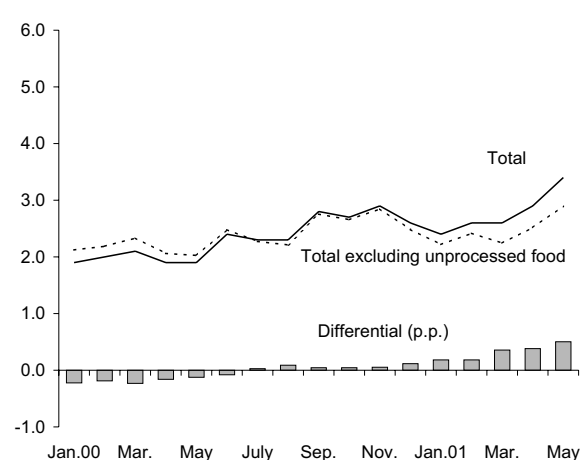
Chart 1
PORTUGAL HICP
Year-on-year percentage rates of change
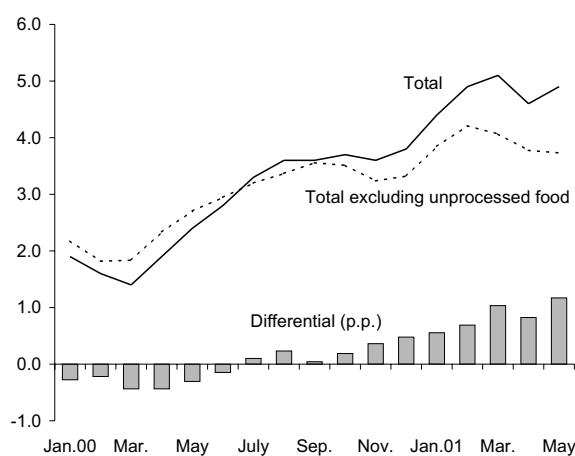
Chart 2
EURO AREA – HICP
Year-on-year percentage rates of change

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(1) This group of the HICP includes the following components: "meat", "fish", "fruit" and "vegetables, potatoes and tubers".

Chart 3
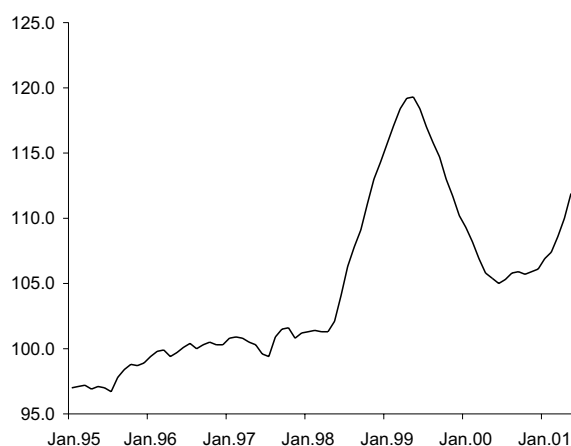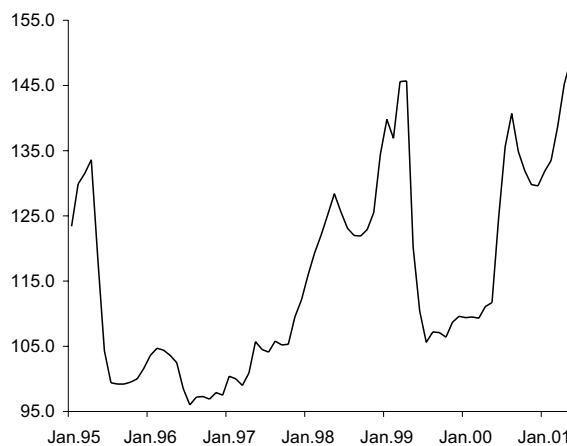**COMPONENTS OF THE HICP**
Fruit
(1996=100)

Chart 4
COMPONENTS OF THE HICP
Vegetables
(1996=100)

Two major types of disturbances should be considered in prices of this type of goods. In a first case, temporary disturbances may occur at the price level, for instance as a result of very adverse weather conditions affecting supply conditions. In this case, the price of a given good is significantly affected but, as soon as normal conditions are resumed, the price returns to the levels prevailing before the disturbance. In such a situation, the chain rates of change of prices start to show abnormally high levels which are followed, as the markets resume normal conditions, by abnormally negative values of the chain rates of change. Similarly to developments occurred in the past, this type of disturbances is affecting prices of "fruits" and "vegetables" (see Charts 3 and 4).

The second case covers situations featured by a constant adjustment of the price level. In this case, the price of the good reaches a new threshold and does not return to previous levels. i.e., in an initial situation, the chain rates of change attain very high figures, which are followed, as soon as the new price threshold has been reached, by regular values of the chain rates of change. An illustrative example of these disturbances occurred in 1998 with "fish" prices. The same seems to be currently occurring not only with "fish" prices (albeit not so pronounced) but also with "meat" prices (Charts 5 and 6).

Spring projections presented in Table 1 of the main text of this article adopted a different approach to the various types of disturbances affecting the trend of prices of unprocessed food. With regard to the foodstuffs included in the first group ("vegetables, potatoes and tubers" and "fruits") it was assumed that a peak had been reached in March and that up to the end of the year there would be a gradual reversal to price levels corresponding to more neutral conditions. In the case of prices of foodstuffs included in the second group ("fish" and "meat") it was assumed that a new threshold had already been reached, around which prices would stabilise by the end of the year, apart from "normal" seasonal fluctuations. When spring projections were prepared, the most recent information available on the evolution of the price index of unprocessed food in April seemed to suggest that these hypotheses were quite reasonable. In fact, from March to April, the prices of these goods had decelerated from 12.0 to 10.1 per cent, year-on-year.

However, in May, the evolution of prices of unprocessed food did not confirm the hypothesis that a peak had already been reached, given that the year-on-year rate of change increased further to 12.7 per cent. In order to evaluate the effect of this maladjustment of the hypotheses, and to take into account data on May, two alternative scenarios were prepared for the evolution of prices of unprocessed food until the end of the year.

Chart 5
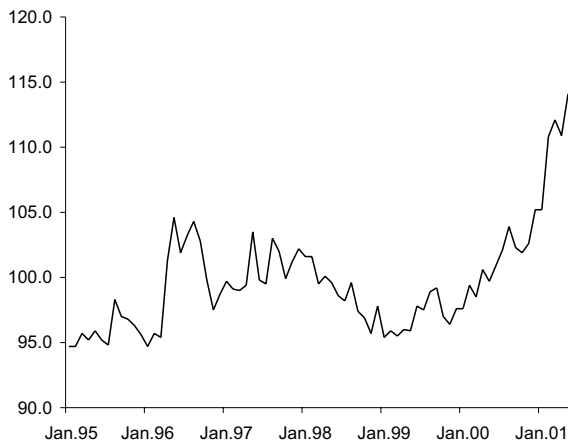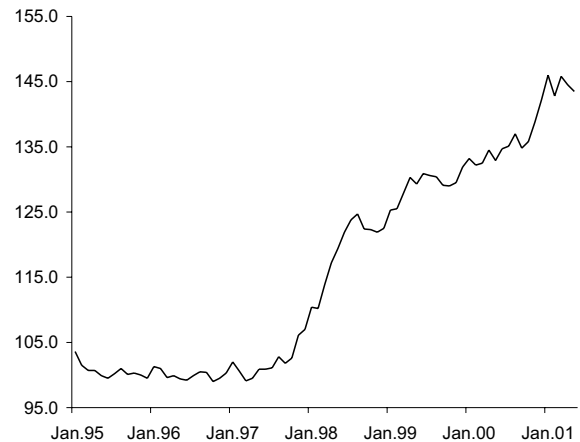**COMPONENTS OF THE HICP**
Meat
(1996=100)

Chart 6
COMPONENTS OF THE HICP
Fish
(1996=100)

The first scenario suggests a less favourable hypothesis for the evolution of prices of unprocessed food (less favourable scenario). As an extreme case, it may be considered that, until the end of the year, no reversal is observed in the prices of "vegetables, potatoes and tubers" and "fruits". Therefore, according to this scenario, prices of these products would tend to fluctuate within average seasonal patterns around the present levels. With regard to the goods included in the second group ("fish" and "meat"), it might be the case that the adjustment to a new price level has not yet been reached, wherefore further additional increases may continue to occur, so that the new stability threshold will be attained later, for instance at the end of the second quarter of the year. Therefore, for this type of goods, there would be an increase in June similar to that observed in recent months.

The second scenario consists in incorporating May unexpected developments – i.e., a price increase above projections – in the forecast, assuming that prices behaviour until the end of the year would be similar to that envis-

Chart 7
PRICE INDEX OF UNPROCESSED FOOD
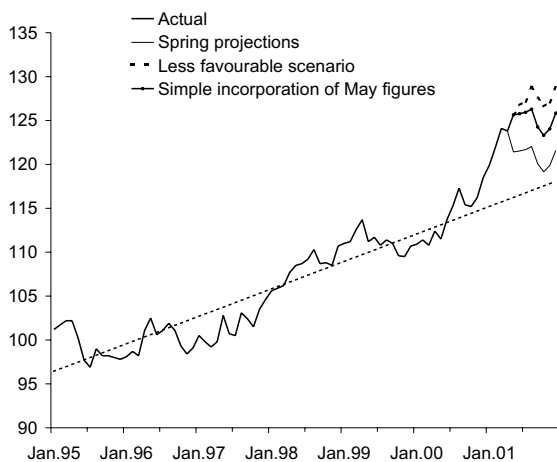
Note: The trend was obtained from a linear regression estimated for the period between January 1995 and October 2000.

Chart 8
PRICE INDEX OF UNPROCESSED FOOD
Year-on-year rates of change
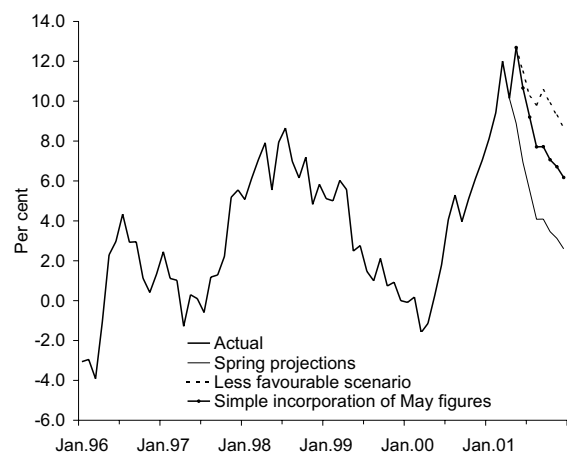
aged in the spring projections (i.e., from May 2001 to December 2001, the growth of prices of unprocessed food would correspond to the implicit value of the projection presented in Table 1 of the main text of this article).

Charts 7 and 8 present the effects of these alternative scenarios – spring projections, less favourable scenario and simple incorporation of May figures – on the levels and year-on-year rates of change of prices of unprocessed food. The differences between the projections for the different scenarios are significant, particularly at the end of 2001, with also significant impacts on the inflation rate projection. The less favourable scenario, when compared with the spring projections, points to increases of ½ percentage point in the annual average rate of change of the HICP and of almost 1 percentage point in the year-on-year rate of change of the HICP in December. The scenario of the simple incorporation of the May error implies increases between ¼ and ½ percentage point in the annual average rate of change of the HICP and of approximately ½ percentage point in the year-on-year rate of change in December 2001. Attaching equal probabilities to each scenario, the revised projection for the average inflation rate in 2001 would stand between 3.9 and 4.5 per cent.

UNCERTAINTY IN THE TAYLOR RULE AND MONETARY POLICY ASSESSMENT*

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1. INTRODUCTION

In recent years, one has witnessed a widespread attention on the way monetary policy is conducted and in particular on the role of the so-called monetary policy rules. Several reasons seem to underlie this renewed interest. Perhaps the most important one is that since the second half of the 1980s, a number of studies have concluded that monetary policy significantly influences the short-term performance of the real economy. A part of this strand of literature tries to identify simple monetary policy rules that could reduce the likelihood of inflationary shocks similar to those of the 1970s.

The conventional approach in the literature consists in estimating reaction functions for a monetary authority (the Federal Reserve, in most cases) in which a nominal interest rate, directly or indirectly controlled by that monetary authority, is adjusted in response to deviations of inflation (current or expected) from target and of output from potential. These reaction functions, usually called Taylor rules, following John Taylor's seminal paper published in 1993, seem to match a number of normative principles set forth in the literature for optimal monetary policy[1].

This seems to provide a good reason for the growing prominence of indications given by Taylor rule estimates in debates about current and prospective stance of monetary policy. However, these indications should be interpreted with prudence. Indeed, they are usually presented as point estimates for the interest rate, giving a sense of accuracy, which may be very misleading. Typically, no weight is placed on the discussion of the risks to such estimates and, at least to a certain extent, the reader is encouraged to concentrate on an apparently precise central projection, ignoring the wide degree of uncertainty and operational difficulties surrounding these estimates. As in any forecasting exercise, there is uncertainty regarding both the estimated parameters and the way the explanatory variables evolve during the forecasting horizon [see Martins (2000)].

Our work aims to obtain a methodology to estimate a probability density function for the interest rate resulting from the application of the Taylor rule (the Taylor interest rate) and assuming that not only the explanatory variables but also the parameters of the rule are random variables. Our ap-

(1) The usefulness of Taylor rules as instruments for monetary policy analysis can be sustained not only on normative grounds, with many studies concluding that simple monetary rules have stabilising properties which are close to those of optimal policy rules, but also on positive grounds, since rules with this kind of formulation seem to depict fairly well the way the major monetary authorities have been conducting monetary policy. Martins (2000) provides a summary of the empirical literature on Taylor rules as well as a discussion on the operational difficulties and limitations associated with the use of this kind of instrument.

proach builds on the work by the Bank of England [see Whitley (1999) and Britton et al (1998)] and the Sveriges Riksbank [see Blix and Sellin (1998)] produced in the context of their inflation forecasting exercises. The method has a Bayesian nature in the sense that involves a subjective component, through a permanent assessment of the state of the economy, based on a central projection and the risks surrounding it. This assessment gives rise to the adoption of asymmetric distributions both for the explanatory variables and the parameters of the Taylor rule. However, unlike the approach followed by the aforementioned central banks, the resulting distribution for the Taylor interest rate is obtained by numerical simulation in line with Esteves, Machado and Martins (2001).

This article is structured as follows. Section 2 presents a brief outline of the Taylor rule and describes the procedure used to compute a probability density function for the Taylor interest rate. This procedure is then applied to the euro area in section 3. Finally, section 4 presents some concluding remarks.

2. TAYLOR RULE: A DISTRIBUTION ASSUMPTION FOR THE EXPLANATORY VARIABLES AND THE SIMULATION OF THE JOINT DISTRIBUTION

The original formulation of the Taylor rule is the following:

$$i_{Tt} = r^* + \pi^* + \beta\left(\pi_t - \pi^*\right) + \theta X_t \qquad (1a)$$

where i_T is the interest rate recommended by the Taylor rule (the Taylor interest rate), π_t the average inflation rate over the previous four quarters (measured by the GDP deflator), π^* the inflation rate target, X_t the output gap and r^* the equilibrium (or neutral) real interest rate[2].

Formulation (1a) by taking into account only the contemporaneous inflation rate and output

gap overlooks the forward-looking nature of monetary policy. To overcome this problem, a forward-looking version of the Taylor rule is used in line with Clarida, Gali and Gertler (1997):

$$i_{Tt} = r^* + \pi^* + \beta\left(\pi^e_{t+2} - \pi^*\right) + \theta X^e_{t+1} \qquad (1b)$$

The different time horizons considered for the output gap and the inflation forecast (one and two years, respectively), has implicit the stylised fact that, at least in large and relatively closed economies, monetary policy affects economic activity faster than it affects inflation [see Ball (1997)].

As it was referred above, the estimation of Taylor rules involves uncertainty regarding not only the estimated parameters (β and θ) but also the way in which the explanatory variables evolve over the forecasting horizon. As a result, in this article all the arguments of the Taylor rule, excluding the inflation target, are assumed to be random variables. It is also considered that the probabilistic behaviour for each of these variables is characterised by a two-piece normal distribution (TPN)[3]. This distribution, which is also used by the Bank of England and the Sveriges Riksbank in their inflation forecasting exercises, provides a simple way to introduce asymmetrical considerations in the analysis.

A random variable W has a TPN distribution if its probability density function is given by:

$$f\left(W; \mu_w; \sigma_{w,1}\right) = C \exp\left[-\frac{1}{2\sigma^2_{w,1}}\left(W - \mu_w\right)^2\right], W \le \mu_w \qquad (2a)$$

$$f\left(W; \mu_w; \sigma_{w,2}\right) = C \exp\left[-\frac{1}{2\sigma^2_{w,2}}\left(W - \mu_w\right)^2\right], W > \mu_w \qquad (2b)$$

with $C = \sqrt{\frac{2}{\pi}}\left(\sigma_{w,1} + \sigma_{w,2}\right)^{-1}$.

This distribution can be understood as a merge of two standard normal distributions with the same mode $\left(\mu_w\right)$ but with different standard deviations $\left(\sigma_{w,1}; \sigma_{w,2}\right)$, which were adjusted in a way to ensure continuity at μ_w[4]. Chart 1 provides an

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(2) Note that if $\beta > 1$ and $\theta > 0$, the real interest rate adjusts in a way that stabilises both inflation and output; if $\beta < 1$, some inflation is accommodated. In this case, the nominal interest rate change is not sufficient to cause the real interest rate to move in the same direction. This also applies to θ, which has to be non-negative for the rule to be stabilising. In Taylor's seminal paper (1993), the rule arguments were set at $\beta = 1.5, \theta = 0.5, \pi^* = 2$ and $r^* = 2.$.

(3) See Johnson, Kotz and Balakrishnan (1994) for a brief description of this distribution.

(4) The factors of adjustment applied to the normal distribution are $2\sigma_{w,1}/\left(\sigma_{w,1} + \sigma_{w,2}\right)$ to the left of the mode and $2\sigma_{w,2}/\left(\sigma_{w,1} + \sigma_{w,2}\right)$ to its right so a to ensure that the probability density function is continuous and the integral adds to 1.

Chart 1
PROBABILITY DENSITY FUNCTION OF A TWO-PIECE NORMAL DISTRIBUTION
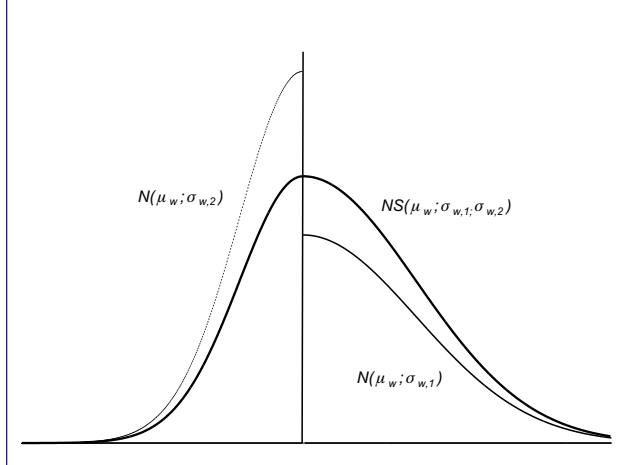$\sigma_{w,1} < \sigma_{w,2}$

illustration with $\sigma_{w,1} < \sigma_{w,2}$. In this example, the probability mass to the left of the mode is smaller than the probability mass to its right, so that both the mean and the median exceed the mode (positive asymmetry).

The mean and the variance for a random variable with this distribution are given by:

$$E(W) = \mu_w + \sqrt{\frac{2}{\pi}}\left(\sigma_{w,2} - \sigma_{w,1}\right) \qquad (3)$$

$$Var(W) = \left(1 - \frac{2}{\pi}\right)\left(\sigma_{w,2} - \sigma_{w,1}\right)^2 + \sigma_{w,1}\sigma_{w,2} \qquad (4)$$

In our analysis, W denotes each of the arguments of the Taylor rule: inflation forecast, output gap,... In order to obtain the three parameters of the distribution $W\left(\mu_w, \sigma_{w,1}, \sigma_{w,2}\right)$, it is necessary to assign values to:

(i) μ_w, which represents the central projection (i.e. the single most likely outcome);

(ii) $\omega_w = h_w\sigma_w$, which represents the standard deviation calculated using historical data (σ_w) adjusted by a factor of additional uncertainty (h_w);

iii) P_w, represents the subjective probability of W being below the central projection – the downside risk[5]. This parameter plays a key role in the analysis, since the asymmetry builds on the particular value of P_w. Notice that if P_w=0.5, the distribution collapses to the standard normal distribution.

Given the distribution for the arguments of the Taylor rule, the question that arises is how to determine the distribution of the Taylor interest rate itself. Unlike the case when random variables follow a normal distribution, the aggregation of random variables with a TPN distribution does not result in new variable with a TPN or any other known distribution. Contrasting with the Bank of England and the Sveriges Riksbank approaches, in our work the Taylor interest rate distribution is obtained by numerical simulation in line with Esteves, Machado and Martins (2001).

One of the problems to be solved before numerical simulation, is the likely statistical dependence among the Taylor rule arguments. Whereas regarding most of them it seems reasonable to assume independence, that would be little realistic vis-à-vis the inflation forecast and the output gap. To model the dependence between these two variables in a simple manner, it is considered that the inflation forecast π^e can be expressed as a linear combination of two random variables π_1^e and π_2^e, which are independent of the output gap (X^e), and follow TPN distributions with common mode $\left[NS\left(\mu_{\pi^e}; \sigma_{\pi_i^e}\right); i = 1;2\right]$:

$$\pi^e = \pi_1^e I\left(X^e > \mu_x\right) + \pi_2^e I\left(X^e < \mu_x\right) \qquad (5)$$

where I(.) stands for the indicator function. In addition, it is assumed that $\sigma_{\pi_1^e,2} > \sigma_{\pi_2^e,2}$, which means that, π_1^e, is relatively more skewed to the right than π_2^e. As a result, if the output gap outcome exceeds (falls behind) its central projection, a higher (lower) proportion of agents will be optimistic (pessimistic) about the inflation prospects, that is the mass of probability to the right (left) of the modal inflation forecast will be greater. In other words, "good news" in terms of output/unemployment will lead a higher proportion of people sharing a less favourable outlook for inflation.

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[5] Bearing in mind that $P_w = \int_{-\infty}^{\mu} f(x)dx = \frac{\sigma_1}{\sigma_1 + \sigma_2}$, it is possible to show that the standard deviations of the TPN distribution are given by:

$$\sigma_{1,w}^2(\sigma_\omega, P_w) = h_w^2\sigma_\omega^2\left[\left(1 - \frac{2}{\pi}\right)\left(\frac{1-2P_w}{P_w}\right)^2 + \left(\frac{1-P_w}{P_w}\right)\right]^{-1} \text{ and}$$

$$\sigma_{2,w}^2(\sigma_w, P_w) = h_w^2\sigma_w^2\left[\left(1 - \frac{2}{\pi}\right)\left(\frac{1-2P_w}{1-P_w}\right)^2 + \left(\frac{P_w}{1-P_w}\right)\right]^{-1}.$$

Table 1

THE EURO AREA TAYLOR INTEREST RATE: CENTRAL PROJECTIONS, UNCERTAINTY AND BALANCE OF RISKS

	Equilibrium real interest rate (r*)	Inflation target (π^*)	Inflation forecast (π^e)		Output gap (X^e)	Coefficient of the "inflation gap" (β)	Coefficient of the output gap (θ)
Main assumptions:							
Central projections (μ_w)	3.00	1.50	1.90		0.30	1.31	0.25
Adjusted standard deviation (ω_w) . .	0.21	-	0.75		1.21	0.09	0.04
Historical standard deviation (σ_w) . .	0.19	-	0.75		1.10	0.09	0.04
Additional uncertainty (h_w)	1.10	-	1.00		1.10	1.00	1.00
Balance of risks			π^e_1	π^e_2			
Upside $(1-P_w)$	0.60	-	0.60	0.40	0.45	0.60	0.70
Downside (P_w)	0.40	-	0.40	0.60	0.55	0.40	0.30
Memo item:							
Mean	3.07	1.50	1.83[a]		0.11	1.34	0.27

Note:

(a) Computed by numerical simulation.

The distribution for the inflation forecast can be computed by numerical simulation on the basis of equation (5). To do that, it is necessary to postulate some values for the distribution parameters. Regarding the X^e distribution, we have to assign values for the central projection (μ_{X^e}); the historical standard deviation (σ_{X^e}) and the factor of additional uncertainty (h_{X^e}); and the downside risk (P_{X^e}). Concerning the inflation forecast, we also have to assume values for the central projection (μ_{π^e}); the historical standard deviation (σ_{π^e}) and the factor of additional uncertainty (h_{π^e}); and the downside risks $P_{\pi^e_i}$ and $P_{\pi^e_2}$ [6]. The simulation of the inflation forecast distribution assumes that $\sigma_{\pi^e_1,1} = \sigma_{\pi^e_2,1} = \nu$, with ν being a constant to be computed following the aforementioned assumptions for the parameters [see Esteves, Machado e Martins (2001)].

Once the distribution of the inflation forecast is defined, on the basis of equation (1b), it becomes possible to obtain by numerical simulation a probability density function for the Taylor interest rate that takes into account the statistical dependence between the inflation forecast and the output gap.

3. AN APPLICATION TO THE EURO AREA

Taking into account the above procedure, this section provides an assessment of the euro area monetary policy stance on basis of data available in December 2001. Table 1 presents the central projections for each of the relevant variables of the Taylor rule, as well as the degree of uncertainty and the balance of risks. The underlying assumptions as well as the remaining calculations needed to compute the Taylor interest distribution are listed below.

3.1 Coefficients

Table 2 presents different estimated values for coefficients β and θ. Even though the results are not qualitatively very distinct, the conclusions drawn in each model could be quantitatively different. To define the baseline scenario and the standard deviations, we took the values estimated

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(6) Given equation (5), it is straightforward to demonstrate that the downside risks are related in following manner: $P_{\pi^e} = (1 - P_{X^e})P_{\pi^e_1} + P_{X^e}P_{\pi^e_2}$. As a result, assuming values for $P_{\pi^e_1}$ and $P_{\pi^e_2}$ is equivalent to assume a value for P_{π^e} and another for $P_{\pi^e_1}$ or $P_{\pi^e_2}$.

for Germany in Clarida, Galí and Gertler (1997), which are similar to those estimated in Peersman and Smets (1998). We did not consider any additional uncertainty. Against the backdrop that most estimates for the United States point to higher coefficients than those of Germany, we considered upside risks greater than 50 percent (60 and 70 percent, respectively for β and θ).

3.2 Equilibrium real interest rate

We assume a value of 3.0 percent for the euro area equilibrium real interest rate. This figure is consistent with estimates derived from a reaction function for the Bundesbank over the last two decades and with the average real interest rates in G7 during the 1990s[7]. Moreover, according to the well-known golden rule of capital accumulation, the marginal product of capital, which in equilibrium equals the real interest rate should not be less than the growth rate of output (otherwise, the economy would be dynamically inefficient). Current estimates for the euro area potential growth rate suggest a lower bound for the real interest rate of around 2.0 to 2.5 percent. For the historical standard deviation, we take the value derived by Smets (1999) from a forward-looking reaction function for the Bundesbank over the period 1979-1997. In this work, the implicit equilibrium real interest rate for an inflation target of 1.5 percent was 3.0 percent as well. As regards the balance of risks, different estimates put forward by the literature for the equilibrium real interest rate for Germany fall overwhelmingly in the range of 2.5 to 3.5 percent, with a slight bias on the upper half. This last evidence seems to indicate that the balance of risks is on the upside, thus justifying the attribution of a 60 percent probability to upside risks. Finally, the possible effects of the so-called "New Economy" induce some uncertainty over the current potential output estimates

Table 2

ESTIMATED COEFFICIENTS β AND θ

		Inflation gap	Output gap
Taylor (1993)................	US	1.50	0.50
Taylor (1999)................	US	1.50	1.00
Ball (1997)	US	1.50	1.00
Christiano (1999)	US	3.00	0.50
Clarida, Galí e Gertler (1998) ...	US	1.80	0.12
Clarida, Galí e Gertler (1997) ...	Germany	1.31	0.25
Peersman e Smets (1998).......	Germany	1.30	0.28

and consequently over the equilibrium real interest rate. As a result, we decided to include a factor of additional uncertainty of 10 percent.
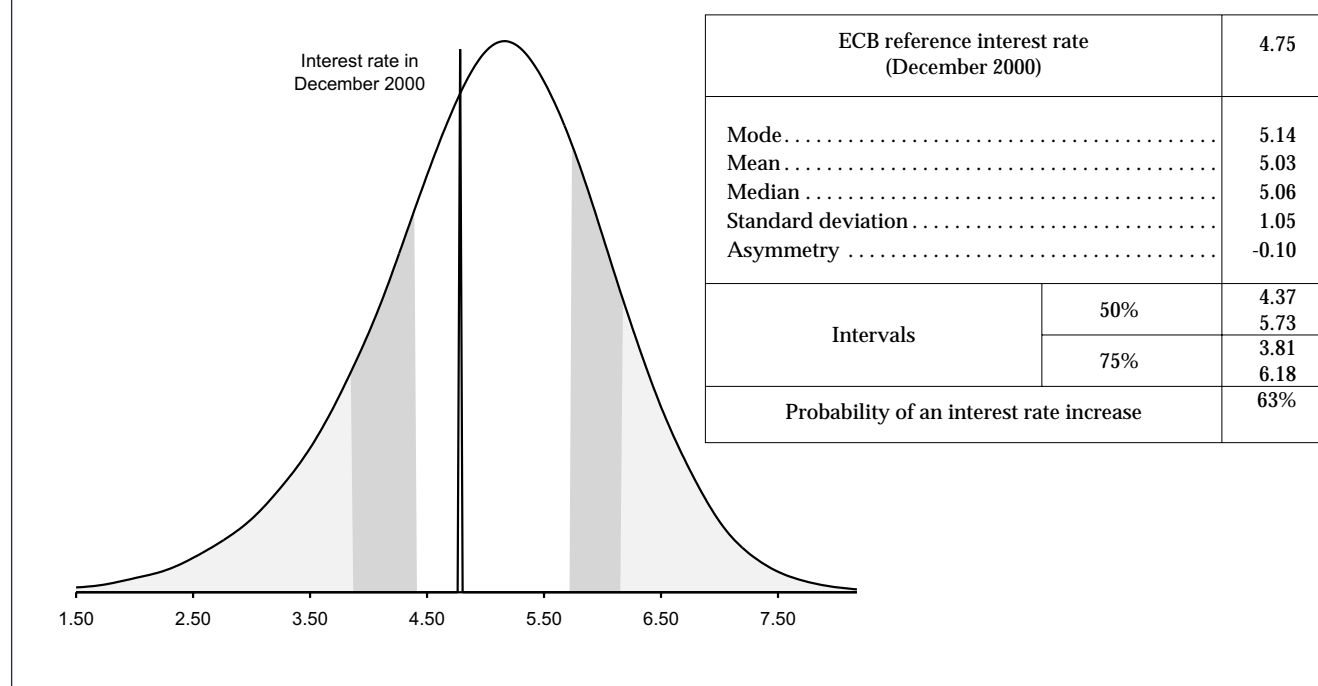
3.3 Inflation target

We assumed an inflation target of 1.5 percent. Recall that within the ECB monetary policy strategy, adopted in October 1998, price stability was defined as an annual increase in the Harmonised Index of Consumer Prices (HICP) of below 2 percent. In addition, the derivation of the reference value for the growth rate of the M3 monetary aggregate had implicit an inflation rate of 1.5 percent. We did not consider any uncertainty regarding this target.

3.4 Inflation forecast

The central projection for the inflation forecast corresponds to the mid-point of the Eurosystem's forecasting interval for the HICP growth in 2002 published in December 2000 – i.e. 1.9 percent. The historical standard deviation was computed taking into account the Eurosystem's forecasting interval (1.3, 2.5) is equal to twice the absolute mean error of the forecasting exercises undertaken over the last years [ECB (2000)]. Considering a normal distribution, this leads to a standard deviation of 0.75. We did not assume any additional uncertainty vis-à-vis the historical standard deviation. Regarding the balance of risks, we took downside risks of 60 percent, if the output gap realisation

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(7) The calculation of the equilibrium real interest rate for the euro area on the basis of the average real interest rates prevailing, for example, over the last decade is likely to show an upward bias. Indeed, over this period, the disinflation process in the current euro area countries, may have caused real interest rates to stand above their equilibrium level. Against this background, it seems more appropriate to take past German interest rates as a benchmark for comparison with today's euro area.

Chart 2
PROBABILITY DENSITY FUNCTION OF THE TAYLOR INTEREST RATE

Interest rate in
December 2000

| 1.50 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |

ECB reference interest rate (December 2000)		4.75
Mode		5.14
Mean		5.03
Median		5.06
Standard deviation		1.05
Asymmetry		-0.10
Intervals	50%	4.37 5.73
	75%	3.81 6.18
Probability of an interest rate increase		63%

falls behind the modal forecast, and of 40 percent, if the output gap realisation exceeds the modal forecast.

3.5 Output gap

The central projection for the output gap in 2001 (0.3 percent) was obtained with the Hodrick-Prescott filter, using quarterly data since 1977. This estimate is in line with the European Commission and the OECD projections for 2001, published in October and November 2001, respectively. The historical standard deviation was computed bearing in mind that the Eurosystem's forecasting interval (2.6, 3.6) for the GDP growth rate is equal to twice the absolute mean error of the forecasting exercises undertaken over several years. Taking into account the effects of the so-called "New Economy"[8], we decided to include a factor of additional uncertainty of 1.1. As to the balance of risks, we admitted a downside

risk of 55 percent, given the prospect that the economic slowdown in the United States could be more pronounced than the available projections.

3.6 Results

With the aforementioned assumptions, all the central statistical measures for the Taylor interest rate would be above the ECB reference interest rate in December 2000 (see Chart 2). Nevertheless, given the significant variance implied by the Taylor interest rate distribution, these indications are surrounded by considerable uncertainty, which are confirmed by the width of the confidence intervals. Indeed, the confidence interval for the Taylor interest rate is (4.37;5.37) with a probability of 50 percent, and (3.82;6.19) if the confidence level is increased to 75 percent. The ECB interest rate in December 2000 lied inside both intervals.

It is interesting to assess the impact of each argument of the Taylor rule on the distribution variance. Chart 3 clearly shows that the greatest contribution is given by the inflation forecast variance, which accounts for 96 percent of total variance[9]. It is also shown that the impact of uncertainty related to the Taylor rule specification (equi-

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[8] Estimates for the current output gap are particularly uncertain, both because recent output figures are in most cases preliminar or because many estimation techniques, namely univariate methods such as the HP filter, pose some end-of-sample problems.
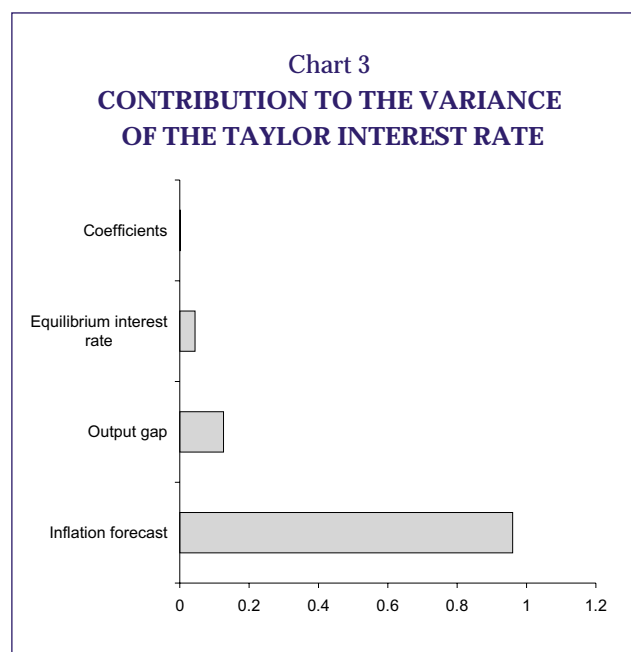
librium real interest rate and coefficients) is negligible.

4. CONCLUDING REMARKS

Empirical evidence suggests that Taylor rules depict fairly well the way major monetary authorities (in particular, the Federal Reserve and the Bundesbank) have conducted monetary policy over the last two decades – a period during which monetary policy is generally considered to be have been rather successful in reducing inflation. In this context, it seems reasonable to sustain that indications given by Taylor rule estimations could be a useful reference when assessing the monetary policy stance.

However, the conventional approach, which consists in presenting these indications as point estimates for the interest rate, seems to be lack prudence, given the high degree of uncertainty and operational difficulties surrounding the derivation of a Taylor interest rate. In particular, the use of Taylor rules in a forward-looking perspective requires the inclusion of macroeconomic forecasts over the period relevant for the monetary policy transmission mechanism. Given the forecasting errors of the past, that requirement provides an important source of uncertainty.

In our work, the informative content of the Taylor rule was presented as a probability density function for the interest rate. This approach makes clear that monetary policy decisions are taken in an uncertain environment, which has to be taken into account explicitly in the context of monetary policy assessment.

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(9) The contribution of each argument is given by the variance of the Taylor interest rate assuming that the variance of other arguments is equal to zero.

Chart 3
**CONTRIBUTION TO THE VARIANCE
OF THE TAYLOR INTEREST RATE**

REFERENCES

Ball, L. (1997) "Efficient rules for monetary policy", National Bureau of Economic Research, *Working Paper* 5952.

ECB (2000), Monthly Bulletin, December.

Blix, M. and Sellin, P (1998) "Uncertainty bands for inflation forecasts", *Working Paper Series*, Sveriges Riksbank, 65.

Britton, E., Fisher, P. and Whitley, J. (1998) "The inflation report projections: understanding the fan chart", *Quarterly Bulletin*, Bank of England, February.

Christiano, L. e Gust, C. (1999) "Taylor rules in a limited participation model", *mimeo*.

Clarida, R. and Gertler, M. (1998) "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory", National Bureau of Economic Research, *Working Paper* 6442.

Clarida, R., Galí, J e Gertler, M. (1997) "Monetary policy rules in practice: some international evidence", Centre for Economic Policy Research, *Discussion Paper* 1750.

Esteves, P., Machado, J., and Martins, F. (2001) "A simple method for simulating the Taylor interest rate", Banco de Portugal, *Working paper*, forthcoming.

Johnson, N., Kotz, S. and Balakrishnan, N. (1994) "Continuous univariate distributions", Second edition, Wiley.

Martins, F. (2000) "Taylor rules", Banco de Portugal, *Economic Bulletin*, March.

Peersman, G. and Smets, F. (1998) "The Taylor rule: a useful monetary policy guide for the ECB?", *mimeo*.

Smets, F. (1999) "The equilibrium real interest rate", European Central Bank, *mimeo*, March.

Taylor, J.B. (1993) "Discretion versus policy rules in practice", *Carnegie-Rochester Conference Series on Public Policy*, 39.

Taylor, J.B. (1999) "The robustness and efficiency of monetary policy rules as guidelines for interest rate setting by the European Central Bank", *Journal of Monetary Economics*, Volume 43, 3, June.

Wallis, K. (1999) "Asymmetric forecasts of inflation and the Bank of England's fan chart", *National Institute of Economic Review,* January.

Whitley, J. (1997) "Forecast uncertainty", Bank of England, *mimeo*.

TAX PARAMETERS IN THE PORTUGUESE ECONOMY
PART II: DIRECT TAXES*

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In the second of two twin papers, we focus on direct taxes and formally discuss the correspondences between statutory and effective tax rates in the Portuguese economy. These correspondences depend on the details of the Portuguese tax law, on a wealth of data information, and on certain priors about the values of behavioral parameters in the economy. For each of the different tax margins, we choose a specification of the tax base that is standard in tax policy evaluation exercises, albeit necessarily only an approximation to the true tax base. In addition to the general correspondences, we present our own estimates of the effective tax rates at the different tax margins. More importantly, however, using the information in this paper, practitioners of tax policy evaluation can obtain their own estimates of the relevant tax parameters.

1. INTRODUCTION

The objective of this series of two papers is to establish the mapping between statutory and effective tax rates in the Portuguese economy. Ultimately, we address the question of how changes in statutory tax rates induce changes in effective tax rates. For the motivation, scope and qualifications of the analysis, see Pereira and Rodrigues (2001a), the first paper of the sequence.

Tax reform proposals are invariably framed in terms of changes in statutory tax rates. However, from the perspective of tax policy evaluation, statutory tax rates are practically irrelevant. This is because, for the analysis of the incentives to work, consume, save, and invest that are induced by the tax code, what matters most is the agent's behavior at the margin. Therefore, tax reform proposals should be framed in terms of changes in marginal tax rates. However, because marginal tax rates are clearly difficult to obtain, effective tax rates are often used in tax policy evaluation as an approximation.

The effective tax rate that we denote by τ, can be simply defined as the ratio between total tax revenues, T, and the tax base from which they were obtained, B, i.e.,

$$\tau = \frac{T}{B}.$$

Observed tax revenues are, however, the result of a set of numerous tax rules. In reality, statutory tax rates, t, along with deductions, D, and tax credits, CR, are the instruments of tax legislation. A highly stylized description of how these three variables come together to determine tax revenues, in general, is:

$$T = t(B - D) - CR.$$

In this paper, we focus on direct taxes. The corporate income tax, employers' social security contributions, employees' social security contributions and the personal income tax are considered in great detail. We present several tables that document the technical details on the correspondence between statutory and effective tax rates at the different margins. We highlight not only the mathematical mapping but also the data information and the economic parameters necessary to establish such mappings. As such, the accompanying text is essentially a guided tour of the different tables complemented with a detailed reference to sources. For a comprehensive description of the Portuguese tax system, in legal terms, the reader is referred to CEF (1997) and KPMG (1997).

2. THE CORPORATE INCOME TAX

Under the Portuguese tax law (CIRC), the corporate income tax (CIT, hereafter) is known as the *imposto sobre o rendimento de pessoas colectivas*. We estimate that corporate income tax revenues, T_{CITd}, which also include municipal taxes called "derramas", averaged 3.1 per cent of GDP at market prices for the period between 1990 and 1998.

The CIRC determines that all types of resident enterprises such as corporations, quota companies and business partnerships are considered taxable entities. Resident enterprises are liable to CIT on their worldwide income and capital gains. Enterprises are considered resident if their head office or effective place of management is located within Portuguese territory, if any of their agents carry out business acts in Portugal for more than 120 days in a year, or if they have a permanent representation from which a commercial, agricultural or industrial activity is exercised.

2.1 The CIT tax base and its basic deductions

The CIT tax base consists of net profits for the year plus certain changes in equity minus allowable previous years' losses and tax incentives. Profit is defined in balance sheet terms as representing the difference in net equity at the beginning and the end of the accounting period, adjusted in accordance with CIRC rules.

In the definition of taxable profits, all costs associated with the normal activity of a company are deductible, subject to limitations, from the CIT base. The main allowable costs are fiscal depreciation allowances and total labor costs, i.e., gross wages plus employers' social security contributions. Other deductions include representation expenses, travel allowances, eligible donations, research and development expenditures, and provisions for irrecoverable debts.

Given the definition of profits as net equity changes, in a framework of individual tax accounting, the determination of the CIT base would require computing a firm's net capital gains as well as evaluating its inventory along with the other deductions mentioned above. Instead, working at a highly aggregated level, we choose to approximate the true tax base using macroeconomic data.

In most tax policy evaluation exercises the corporate income tax is modelled in a very stylized way. Evaluated at factor cost (Y^{FC}), GDP as a whole is typically considered the tax base, and total labor costs, $\theta_L Y^{FC}$, along with fiscal depreciation allowances are the valid deductions thereto.[1] Fiscal depreciation allowances are determined as a fraction, α, of the private sector's investment spending, I^{FC}. Then, on this adjusted base, a tax at the effective rate of τ_{CITd} is levied. Finally, as a tax incentive, an investment tax credit, T_{ITC}, reduces the CIT burden by an amount that is proportional to the private sector's investment spending.

In reality, however, only corporate firms are liable to CIT. For this reason, a closer approximation of the actual tax base, deductions, and credits, demands that we focus on the incorporated sector. In this regard, we must determine the fraction of production, total economy-wide labor costs, and private investment spending that is carried out by the incorporated sector. Let ϕ_1, ϕ_2 and ϕ_3 represent these three fractions respectively. Note that ϕ_1 can be interpreted as the economy's coefficient of incorporation, and is easily parameterized after recognizing that the gross operating surplus for the incorporated sector is computed as $Y^{FC}(\phi_1 - \phi_2\theta_L)$. This variable as well as parameters ϕ_2 and ϕ_3 are determined directly from national account data (*INE, Contas Nacionais*).[2]

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(1)　It should be noted that, in addition to employers' social security contributions, total economy-wide labor costs encompass gross wages paid to dependent and self-employed workers, in the private as well in the public sector.

The CIT base after deductions is then subject to the corporate income tax at a statutory rate of $t_{CIT} = 0.34$, and surcharged with a municipal levy, or "*derrama*", at the statutory rate of $t_{der} = 0.10$. This yields the firms' pre-ITC corporate income tax liability, which we denote as Λ. Finally, through investment tax credits the CIT levy is reduced.

Table 1 summarizes the data and parameters related to the corporate income tax. Furthermore, it makes clear the distinction between statutory and effective terms, i.e., between our approximation of the way tax revenues are obtained in reality (equations 1 and 2), and how these are depicted in a standard tax policy evaluation model (equations 3 and 4). In addition, equations (5) and (6) show how a changes in the statutory tax rates induce changes in the effective tax rates.

Let us now see how fiscal depreciation allowances and investment tax credits are, in reality, determined.

2.2 Depreciation allowances

The CIRC contemplates fiscal depreciation allowances as valid deductions to a firm's taxable profits. In effect, it allows that a fraction of past and present capital expenditures be written off as a cost for tax purposes. Under the straight-line depreciation method over a number, *NDEP*, of periods, depreciation allowances are computed as

$$\left(I_t + I_{t-1} + \ldots + I_{t-NDEP+1}\right) / NDEP.$$

Assuming that corporate capital investment grows at an average rate of g, fiscal depreciation allowances simplify to a proportion, α, of the contemporaneous corporate investment, with given by:

$$\alpha = \left[1 - \left(1 + g\right)^{-NDEP}\right] / NDEP\left[1 - \left(1 + g\right)^{-1}\right].$$

This expression is the reduced form of the difference between two infinite geometric progression sums.[3] In computing CIT and "*derrama*" revenues in statutory terms (see equation 1 in Table 1) after plugging in all the known data and parameters, a value of $\alpha = 0.73477$ is determined residually. In turn, the solution to the above equation for α, after assuming that *NDEP*=16, is $g = 0.0449$. Since gross fixed capital formation for the economy as a whole grew an average of 4.87 per cent from 1990 to 1998 (DGEFA, 1999), the implicit value for g we estimate is very reasonable.

2.3 Investment tax credits

From 1990 through 1998, corporate income tax credits including investment tax credits and transitory regimes, T_{ITC}, averaged 0.09744 per cent of GDP at market prices (*Ministério das Finanças*, 1993, 1995, 1997, 1998).

Investment tax credits, or ITCs, are commonly used by tax authorities as an incentive for some firms to purchase certain capital goods. Clearly, a change in tax credits is important inasmuch as it alters the effective tax rate. This is so, even though the correspondence between statutory and effective tax rates is independent of tax credits.

With the exception of financial intermediaries – such as banks and insurance companies – all entities that are subject to the corporate income tax can apply for an ITC. In effect, by incurring in capital expenditures, with the exception of land (except for firms operating in the primary sector), buildings (except for factories), furniture and light automobiles, these non-financial firms have the opportunity of lowering their pre-ITC CIT liability.

Under the current tax code, a firm's ITC for a given year, is computed as a fraction, $t_{ITC} = 0.10$, of the eligible investment expenditure, measured at factor cost, up to a limit of thirty percent of its pre-ITC adjusted CIT liability. That is, the ITC can never exceed:

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(2) Unless otherwise noted, data and parameters concerning the incorporated sector refer to averages for the 1988 to 1995 period and make use of the latest available information (*INE, Contas Nacionais*).

(3) In this definition of the depreciation allowances we capture the depreciation corresponding to investments occurred in the past. While this is the relevant notion for tax purposes it should be pointed out that investment decisions are at the margin forward looking. This means that they are based on the future depreciations derived from such investment spending (King and Fullerton, 1984, and Jorgenson and Landau, 1993). If we assume that the past trend of growth or corporate investment, g, continues into the future, then historical depreciations will be a good guide for investment decisions at the margin around that trend.

Table 1

CORPORATE INCOME TAX AND INVESTMENT TAX CREDITS

In statutory terms

$$T_{CITd} = t_{CIT}(1 + t_{der})\left\{\left(Y^{MP} - T_{VATET}\right)(\phi_1 - \phi_2\theta_L) - \alpha\phi_3\left(I^{MP} - T_{VATET,I}\right)\right\} - T_{ITC} \tag{1}$$

$$T_{ITC} = t_{ITC}.\varepsilon.\eta.\phi_3\left(I^{MP} - T_{VATET,I}\right).\beta \tag{2}$$

In effective terms

$$T_{CITd} = \tau_{CITd}\left\{Y^{FC}\left(1 - \theta_L\right) - \alpha I^{FC}\right\} - T_{ITC} \tag{3}$$

$$T_{ITC} = \tau_{ITC}I^{FC} \tag{4}$$

How a change in the statutory tax rate induces a change in the effective tax rate

$$\frac{\partial \tau_{CITd}}{\partial t_{CIT}} = \left(1 + t_{der}\right)\left\{Y^{FC}\left(\phi_1 - \phi_2\theta_L\right) - \alpha\phi_3 I^{FC}\right\} / \left\{Y^{FC}\left(1 - \theta_L\right) - \alpha I^{FC}\right\} \tag{5}$$

$$\frac{\partial \tau_{ITC}}{\partial \tau_{ITC}} = \varepsilon\eta\phi_3\beta = \frac{\tau_{ITC}}{t_{ITC}} \tag{6}$$

Data

$$T_{CIT} = 0.031Y^{MP}, T_{ITC} = 0.0009744Y^{MP}, T_{VATET} = 0.142Y^{MP}, \theta_L = 0.475,$$

$$T_{VATET,I} = 0.01841Y^{MP}, I^{MP} = 0.215Y^{MP}, t_{CIT} = 0.34, t_{der} = 0.10, t_{ITC} = 0.10,$$

Gross operating surplus for the incorporated sector $= Y^{FC}\left(\phi_1 - \phi_2\theta_L\right) = 0.17926Y^{MP}$

Parameters
$\phi_1 = 0.51554, \phi_2 = 0.6454937, \phi_3 = 0.6491375, \alpha = 0.73477, \varepsilon = 0.35, \eta = 0.77728, \beta = 0.28067$

The calculated effective tax rates

$\tau_{CITd} = 0.10449, \quad \tau_{ITC} = 0.004957$

The calculated differential effects

$$\frac{\partial \tau_{CITd}}{\partial t_{CIT}} = 0.30734, \quad \frac{\partial \tau_{ITC}}{\partial t_{ITC}} = 0.04957$$

Sources: DGEP (1999), *INE Contas Nacionais*, Authors' calculations.

$$\min\left\{0.3\Lambda; t_{ITC}I^{FC}_{Eligible}\right\}.$$

To proceed, let us begin by assuming that the thirty percent limit is not an active constraint for any firm. Then, ITCs are attributed according to $t_{ITC}I^{FC}_{Eligible}$.

From 1988 to 1995, non-financial corporations, the only kind that qualify for investment tax credits, carried out investment expenditures that to-

talled 10.848 per cent of GDP at market prices, only $\varepsilon = 0.35$ of which was eligible for ITCs (*INE, Contas Nacionais*, several issues). Evaluated at factor cost, non-financial corporate investment represents $\eta = 0.77728$ of all corporate investment, $\phi_3 I^{FC}$. Therefore, $I^{FC}_{Eligible} = \varepsilon.\eta.I^{FC}$, which corresponds to 3.472 per cent of GDP at market prices.

Data on the ITCs effectively attributed, however, suggest that only a fraction, $\beta = 0.28067$, of

the eligible investment spending is covered by the above formula. It follows that the value of the ITCs actually granted can be written as

$$T_{ITC} = t_{ITC} . \varepsilon . \eta . \phi_3 I^{FC} . \beta,$$

where β is a coverage coefficient residually determined using equation (2) in table 1.[4]

If all of the eligible non-financial corporate investment had been covered, the ITCs handed out would have reached an average of 0.347 per cent of GDP at market prices, from 1990 through 1998, around 3.5 times the value that was in reality attributed. Therefore, our calculations suggest that, in the recent past, most of the eligible non-financial corporate investment, i.e. around 2.5 per cent of GDP at market prices did not take advantage of this tax incentive.

These figures suggest that the ITC benefits are underutilized. What can explain this fact? If we reject, as we should, the hypothesis that entrepreneurs are unaware that such a tax incentive exists, the answer is that tax evasion may be a factor in the underutilization of ITCs.

Finally, given the aggregate nature of most tax policy evaluation models, it is custom to express ITCs as a fraction, τ_{ITC}, of total private investment, evaluated at factor cost, i.e.,

$$T_{ITC} = \tau_{ITC} I^{FC}.$$

Using the available data, the effective ITC rate is calculated at $\tau_{ITC} = 0.004957$.

The differential effect of a change in the statutory ITC rate on the associated effective rate is determined according to

$$\frac{\partial \tau_{ITC}}{\partial t_{ITC}} = \varepsilon \eta \phi_3 \beta = \frac{\tau_{ITC}}{t_{ITC}} = 0.04957.$$

3. SOCIAL SECURITY CONTRIBUTIONS

The Portuguese social security system operates on a pay-as-you-go basis in accordance with an intergenerational solidarity principle. Under the conventional taxonomy of the three pillars (see

World Bank, 1994, for example), only the first pillar – a state-operated regime with mandatory contributions – and the third pillar – an individual complementary regime with favorable tax treatment that is managed by pension funds – exist.

The state-operated social security comprises two systems: a general system for private sector workers and a civil servants' system. In addition to these two, a special system for banking employees exists that operates on a capitalization basis.

Within the general system, or *Regime Geral*, two sub-regimes exist – a general contributory regime funded by employers' and employees' contributions, and a non-contributory regime funded by Government transfers. The general contributory system grants pensions in substitution for lost income due to old age and other contingencies such as sickness, invalidity, death and unemployment. The non-contributory scheme provides a minimum protection to persons not covered and suffering from social and or economic hardships, with an income level below a certain threshold.

The public sector workers' scheme, or *Caixa Geral de Aposentações*, is financed by civil servants' contributions as well as by Government transfers. Contributors are covered for all the above-mentioned contingencies with the exception of unemployment.

3.1 Employers' social security contributions

We estimate that social security contributions from private sector employers, or *contribuições patronais para a segurança social*, T_{FSSC}, represent an average of 5 per cent of GDP at market prices for the period 1990-1998. Note that this value does *not* include contributions paid out by the public sector, as an employer, to the civil servants' social security fund. Also, social security contributions of the self-employed are accounted for under the employees' social security contributions.

More formally, private sector enterprises pay a statutory social security contribution rate of $t_{FSSC} = 0.2375$ on the gross wages paid out to their dependent workers. Gross wages for dependent workers in the private sector are obtained by netting out the civil servants' gross wages, $Wages_{PS}$, and gross self-employed workers' income, from economy-wide gross labor income, $\theta_L Y^{FC} - T_{FSSC}$. Data limitations regarding the share of the gross

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(4) Note that, if the thirty percent limit is in fact an active constraint, then the fraction of all eligible corporate investment covered is even lower.

labor income that is absorbed by self-employed workers force us to use an approximation to the statutory tax base. We assume gross private-sector labor income as the relevant tax base to be adjusted by a parameter, ξ. That is, we use

$$\xi\left(\theta_L Y^{FC} - T_{FSSC} - Wages_{PS}\right)$$

as an approximation of the statutory tax base for employers' social security contributions (see equation 7 in Table 2). Note that, because self-employed workers' income is non-zero, a value of ξ below one is determined.[5]

Tax policy evaluation models do not generally distinguish between public and private sector employees, much less between dependent and self-employed workers. As presented by equation (8) in Table 2, firms' social security contributions, T_{FSSC}, are computed as a fraction, τ_{FSSC}, the effective firms' social security contributions rate, of the economy-wide gross labor income.

To determine how changes in the statutory tax rate, t_{FSSC}, induce changes in the effective tax rate, τ_{FSSC}, we factor out T_{FSSC} in equations (7) and (8) of table 2 to obtain expression (9) in table 2. This differential effect is computed according to:

$$\frac{\partial \tau_{FSSC}}{\partial t_{FSSC}} = \left(\frac{\partial T_{FSSC}}{\partial t_{FSSC}}\right)^{-1} \frac{\partial T_{FSSC}}{\partial \tau_{FSSC}}.$$

3.2 Employees' social security contributions

We estimate that employees' social security contributions, or *contribuições dos empregados para a segurança social*, T_{WSSC}, averaged 4.1 per cent of GDP at market prices over the period 1990-1998.

Dependent workers in all sectors, private and public, pay a statutory social security contributions rate of $t_{WSSC}^{dep} = 0.11$ on their gross labor income. Gross wages for dependent workers are computed as the sum of gross dependent labor income in the private sector, $\xi(\theta_L Y^{FC} - T_{FSSC} - Wages_{PS})$, and gross labor income in the public sector, $Wages_{PS}$.

Self-employed workers, however, whose contributions are included in T_{WSSC}, can choose their con-

tribution base – between 1 and 12 statutory minimum wages – as well as a statutory contribution rate of $t_{WSSC}^{se,min} = 0.254$ or $t_{WSSC}^{se,max} = 0.32$ – depending on whether they want a mandatory minimum or a broader coverage, respectively. This fact introduces a great degree of ambiguity in the definition of both the tax base and the tax rate for self-employed workers. All we can infer is that, on average for the 1990-1998 period, social contributions from self-employed workers, $t_{WSSC}^{se,min} B_{WSSC}^{se,min} + t_{WSSC}^{se,max} B_{WSSC}^{se,max}$, amount to 0.2624 per cent of GDP at market prices, approximately 6.5 per cent of all employees' social security contributions.[6]

Once again, as tax policy evaluation models are often highly aggregated, we write T_{WSSC} as a fraction, τ_{WSSC}, the effective social security contributions rate, of gross economy-wide labor income (see equation 11 in Table 3).

Finally, in computing the correspondence between statutory and effective tax rates we focus only on dependent workers because both the contribution base and the contribution rate for self-employed workers cannot be determined. The differential effect, by which changes in the statutory tax rate for dependent workers, t_{WSSC}^{dep}, induce changes in the effective tax rate, is easily determined as equation (12) in Table 3.

4. THE PERSONAL INCOME TAX

4.1 General aspects of the PIT base

Under the Portuguese tax legislation (CIRS) the personal income tax (PIT, hereafter) is designated by *imposto sobre o rendimento de pessoas* singulares, or IRS. We estimate that personal income tax revenues, T_{PIT}, averaged 6.1 per cent of GDP at market prices for the period 1990 to 1998.

The taxable unit is the family, which is composed of either a married couple living in a joint household with their dependent children, or separated persons, unmarried parents and their dependents. A married couple living in a single household is taxed according to an income splitting system which allows spouses to divide their

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(5) Our calculations imply that of the total gross labor income, civil servants, private dependent workers, and self-employed workers receive 38.64 per cent, 58.89 per cent, and 2.47 per cent, respectively.

(6) It is interesting to note that if all self-employed workers had opted for the maximum coverage, implying that $B_{WSSC}^{se,min} = 0$, then, on average, the contribution base chosen would have been equivalent to 93.35 per cent of their gross labor income.

<div align="center">Table 2</div>

<div align="center">**EMPLOYERS' SOCIAL SECURITY CONTRIBUTIONS**</div>

In statutory terms

$$T_{FSSC} = \xi . t_{FSSC} \left[\theta_L \left(Y^{MP} - T_{VATET} \right) - T_{FSSC} - Wages_{PS} \right] \tag{7}$$

In effective terms

$$T_{FSSC} = \tau_{FSSC} \left[\theta_L Y^{FC} - T_{FSSC} \right] \tag{8}$$

How a change in the statutory tax rate induces a change in the effective tax rate

$$\frac{\partial \tau_{FSSC}}{\partial t_{FSSC}} = \frac{\left(1 + \tau_{FSSC} \right)^2}{\theta_L Y^{FC}} \cdot \frac{\xi \left[\theta_L Y^{FC} - Wages_{PS} \right]}{\left(1 + \xi t_{FSSC} \right)^2} \tag{9}$$

Data

$T_{FSSC} = 0.05 Y^{MP}, t_{FSSC} = 0.2375, Wages_{PS} = 0.13818 Y^{MP}, T_{VATET} = 0.142 Y^{MP} \ \theta_L = 0.475$

Parameters

$\xi = 0.959686$

The calculated effective tax rate

$\tau_{FSSC} = 0.139841$

The calculated differential effect

$\dfrac{\partial \tau_{FSSC}}{\partial t_{FSSC}} = 0.546565$

Sources: DGEP (1999), *INE Contas Nacionais,* Authors' calculations.

combined income to avoid a higher tax rate. Individuals are deemed to be residents if they remain within Portuguese territory for more than 183 days. Residents in Portugal are liable to IRS on their worldwide income. Non-residents are liable to IRS only on income derived in Portugal, subject to a myriad of bilateral international tax agreements.

In Portugal, the PIT is a levy on the family's entire income, irrespective of its source. In practice, though, capital and non-capital incomes are taxed quite differently. Capital income is paid out net of a flat tax immediately withheld at the source. Non-capital income, on the other hand, which is essentially comprised of labor and pension incomes, benefits from certain deductions that are contingent on the behavior and characteristics of the household, and is then subject to a progressive tax rate structure. Tax credits then effectively lower the family's tax burden. For these reasons we analyze the taxation of capital and non-incomes separately. It should be pointed out

that such a distinction is also common in tax policy evaluation models.

Until recently, the concept of income encompassed nine categories, which differed with respect to the source of income: employment income including fringe benefits, self-employment income, income from commerce and industry, income from agriculture, investment or capital income, real-estate income, capital gains, pensions including annuities and alimony payments, and other income which included proceeds from lotteries, gambling and other games of chance.[7]

Even though capital income is one of the nine income categories considered, the taxpayer can choose whether or not to report in his PIT return the capital income he has received and on which a rate of t_r was already levied (see section 4.3.). Nat-

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[7] As of 2001, the number of categories is reduced to six – basically, self-employed, commercial, industrial and agricultural income merge into a single category called business and professional income.

<div align="center">

Table 3

EMPLOYEES' SOCIAL SECURITY CONTRIBUTIONS

</div>

In statutory terms

$$T_{WSSC} = t_{WSSC}^{dep} \left\{ \xi \left[\theta_L \left(Y^{MP} - T_{VATET} \right) - T_{FSSC} - Wages_{PS} \right] + Wages_{PS} \right\} + t_{WSSC}^{se,min} \cdot B_{WSSC}^{se,min} + t_{WSSC}^{se,max} \cdot B_{WSSC}^{se,max} \quad (10)$$

In effective terms

$$T_{WSSC} = \tau_{WSSC} \left[\theta_L Y^{FC} - T_{FSSC} \right] \quad (11)$$

How a change in the statutory tax rate induces a change in the effective tax rate

$$\frac{\partial \tau_{WSSC}}{\partial t_{wssc}^{dep}} = \frac{\xi \left(\theta_L Y^{FC} - T_{FSSC} - Wages_{PS} \right) + Wages_{PS}}{\theta_L Y^{FC} - T_{FSSC}} \quad (12)$$

Data

$T_{WSSC} = 0.041 Y^{MP}, \, t_{WSSC}^{dep} = 0.11, \, t_{WSSC}^{se,min} = 0.254, \, t_{WSSC}^{se,max} = 0.32,$

$T_{VATET} = 0.142 Y^{MP}, \qquad T_{FSSC} = 0.05 Y^{MP}, \qquad \theta_L = 0.475, \qquad Wages_{PS} = 0.13818 Y^{MP}$

Parameters

$\xi = 0.959686, \, t_{WSSC}^{se,min} \cdot B_{WSSC}^{se,min} + t_{WSSC}^{se,max} \cdot B_{WSSC}^{se,max} = 0.002624 Y^{MP}$

The calculated effective tax rate

$\tau_{WSSC} = 0.114669$

The calculated differential effect

$\frac{\partial \tau_{WSSC}}{\partial t_{wssc}^{dep}} = 0.975266$

Sources: DGEP (1999), Authors' calculations.

urally, he will only choose to report this income as long as the marginal tax rate he is subject to, on all of his personal income, is strictly smaller than t_r, in which case he is entitled to a rebate. As such, to simplify matters, we assume that capital income is only paid out to high-earning households, who would choose not to report their capital income in their PIT returns because doing so would entail paying higher taxes.

4.2 Non-capital income

We estimate that the PIT revenues corresponding to the taxation of non-capital income, T_{NCI}, averaged 3.224 per cent of GDP at market prices from 1990 to 1998. We base our calculation on the taxation of non-capital income on a tax calculator developed at the Ministry of Finance. A family's personal income levy is computed on the basis of the information annually reported to the tax authorities in the form of a tax return. DGITA (1999) is a 1997 database that contains 40000 of these in-

dividual tax records. This information is primarily used to build a tax calculator that performs tax policy analyses in a micro-simulation framework. By definition, the 1997 vintage of this instrument contains the mathematical formulas that the Treasury then used to determine how much personal income tax each person had to pay on the income received. In general, the tax calculator as a whole can be considered the expression of the PIT in statutory terms. On aggregate, such calculations allow us to compute the fraction, $\tau_{PIT,NCI}$, of the non-capital income reported that was paid in personal income tax.

Essentially, non-capital income comprises labor and taxable pension income, including dependent workers' and self-employed workers' income as well as business income from the non-incorporated sector. This suggests that we define the non-capital income base for PIT purposes as:

$$\left(1 - \tau_{WSSC}\right)\left(\theta_L Y^{FC} - T_{FSSC}\right) + \varphi\, TR,$$

where $\left(1 - \tau_{WSSC}\right)\left(\theta_L Y^{FC} - T_{FSSC}\right)$ is gross labor income net of employees' social security contributions, and TR represents old age, survivors', and disability pensions, only a fraction, φ, of which enters the PIT base. This fraction corresponds to the percentage of all pensions that exceed a multiple of the annual statutory minimum wage.[8]

In computing the net income of each income category, a percentage of expenses on activities directly related to generating such income is deductible. In 1997, these deductions included unreimbursed health-related expenditures, interest on health-related loans, compulsory pension payments, a part of home mortgage interest payments, a fraction of premiums paid on qualifying insurance policies, trade union dues, education expenses, housing and living expenses for the elderly, costs with the acquisition of equipment for producing renewable energy, and part of the contributions made to a complementary pension plan.[9]

After deducting certain expenses from total gross income, the resulting balance is the taxable base to which a progressive tax rate structure is applied. This is depicted by equation (13) of table 4, where net income, *RL,* that is total income minus specific deductions, is subject to a rising schedule of marginal tax rates, $t_{PIT,1} < \ldots < t_{PIT,4}$, one for each of the income brackets that have $E_0 < \ldots < E_3$ as their upper limits. See Table 4 for the parameterization of these variables in 1997.

It should be noted that reporting income for PIT purposes is only compulsory for households with gross annual incomes that exceed the threshold of fourteen times the monthly statutory minimum wage, that is E_0. The proportion of all non-capital income that is received by these households is $\Pr(RL < E_0) = 5.4\%$ (DETEFP 1997). For this reason, the DGITA (1999) income base had to be scaled up by dividing it by $1 - \Pr(RL < E_0)$.

Finally, a resident taxpayer may then credit against his final tax liability certain lump-sum amounts. This is the case of family credits, which increase with the number of dependents and depend on the marital status of the taxpayer. Also, if the tax payer received rent income, he can credit the lowest of the following two amounts: the municipal real estate tax, or *contribuição autárquica*, that was paid on the underlying real estate, and a fraction, the share of rent income in total non-capital income, of his pre-tax credits PIT levy.

With the effective tax rate, $\tau_{PIT,NCI}$, determined using the tax calculator, after plugging in values for all the known variables of equation (14) in Table 4, PIT revenues levied on non-capital income are estimated at 3.224 per cent for the 1990-1998 period.

A different statutory tax rate exists for each of the non-capital income brackets. Therefore, there are just as many correspondences between the statutory tax rates and the non-capital income effective tax rates. For illustration purposes we chose to present how a change in the statutory tax rate of the highest income bracket, $t_{PIT,4}$, would induce a change in the effective non-capital income tax rate, $\tau_{PIT,NCI}$. This is depicted by equation (15) in Table 4. Put simply, it means that a change in the statutory tax rate, $t_{PIT,4}$, only impacts the effec-

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(8) In 2000, with the monthly statutory minimum wage at PTE 63800, and the exemption limit for pensions set at PTE 1482000, this multiple was set at 1.6592.

(9) In 1999, for equity reasons, the expensing regime was changed. Certain expenses, such as unreimbursed health expenditures, insurance premiums, spending on old age and nursing homes, and real estate expenses, that used to be claimed as deductions to total income were then transformed into tax credits.

<div align="center">Table 4</div>

<div align="center">**PERSONAL INCOME TAX: NON-CAPITAL INCOME**</div>

In statutory terms ... according to the tax calculator model

$$\tau_{PIT,NCI} = \left\{ \sum_{i=1}^{40,000} RL_i \left(RL_i \geq E_0 \right) \left[1 - \Pr\left(RL < E_0 \right) \right]^{-1} \right\}^{-1} .$$

$$. \left\{ t_{PIT,1} \left[\sum_{i=1}^{40,000} \left(E_1 - E_0 \right) 1\left(RL_i \geq E_1 \right) \right] + \right.$$

$$+ t_{PIT,2} \left[\sum_{i=1}^{40,000} \left(E_2 - E_1 \right) 1\left(RL_i \geq E_2 \right) \right] +$$

$$+ t_{PIT,2} \left[\sum_{i=1}^{40,000} \left(RL_i - E_1 \right) 1\left(E_2 > RL_i \geq E_1 \right) \right] +$$

$$+ t_{PIT,3} \left[\sum_{i=1}^{40,000} \left(E_3 - E_2 \right) 1\left(RL_i \geq E_3 \right) \right] +$$

$$+ t_{PIT,3} \left[\sum_{i=1}^{40,000} \left(RL_i - E_2 \right) 1\left(E_3 > RL_i \geq E_2 \right) \right] +$$

$$\left. + t_{PIT,4} \left[\sum_{i=1}^{40,000} \left(RL_i - E_3 \right) 1\left(RL_i \geq E_3 \right) \right] - Credits \right\}$$

(13)

In effective terms

$$T_{NCI} = \tau_{PIT,NCI} \left[\left(1 - \tau_{WSSC} \right) \left(\theta_L Y^{FC} - T_{FSSC} \right) + \varphi TR \right]$$

(14)

How a change in the highest statutory tax rate, $t_{PIT,4}$, induces a change in $\tau_{PIT,NCI}$

$$\frac{\partial \tau_{PIT,NCI}}{\partial t_{PIT,4}} = \sum_{i=1}^{40,000} \left(RL_i - E_3 \right) 1\left(RL_i > E_3 \right).$$

$$. \left\{ \sum_{i=1}^{40,000} RL_i 1\left(RL_i \geq E_0 \right) \left[1 - \Pr\left(RL < E_0 \right) \right]^{-1} \right\}^{-1}$$

(15)

Data

$$T_{PIT} = T_{CI} + T_{NCI} = 0.061 Y^{MP}, \ \ TR = 0.093 Y^{MP}, \ \ \Pr\left(RL < E_0 \right) = 0.054,$$

$$\theta_L = 0.475, \ \ \varphi = 0.075, \ \ t_{PIT,1} = 0.15, \ \ t_{PIT,2} = 0.25, \ \ t_{PIT,3} = 0.35, \ \ t_{PIT,4} = 0.40,$$

$$\text{In 1997 } (PTE) : E_0 = 793800, \ \ E_1 = 1050000, \ \ E_2 = 2435000, \ \ E_3 = 6150000,$$

Parameters

$$T_{NCI} = 0.03224 Y^{MP}$$

The calculated effective tax rate

$$\tau_{PIT,NCI} = 0.09964$$

The calculated differential effect for the tax rate associated with the highest income bracket

$$\frac{\partial \tau_{PIT,NCI}}{\partial t_{PIT,4}} = 0.07100$$

Sources: DETEFP (1997), DGEP (1999), DGITA (1999), Authors' calculations.

Table 5

PERSONAL INCOME TAX: CAPITAL INCOME

In statutory terms
$$T_{CI} = t_r \left(r^{PD}PD + OII + \Gamma.\Pi \right) \tag{16}$$

In effective terms
$$T_{CI} = \tau_r \left(r^{PD}PD + OII + \Gamma.\Pi \right) \tag{17}$$

How a change in the statutory tax rate induces a change in the effective tax rate
$$\frac{\partial \tau_r}{\partial t_r} = 1 \tag{18}$$

Data
$$T_{PIT} = T_{NCI} + T_{CI} = 0.061Y^{MP}, \ t_r = 0.20, \ r^{PD} = 0.0525, \ PD = 0.6321Y^{MP}$$

Parameters
$$T_{CI} = 0.02876Y^{MP}, \ OII = 0.10851Y^{MP}, \ \Gamma.\Pi = 0.0021Y^{MP}$$

The calculated effective tax rate
$$\tau_r = t_r = 0.20$$

The calculated differential effect
$$\frac{\partial \tau_r}{\partial t_r} = 1$$

Sources: DGEP (1999), Authors' calculations.

tive tax rate by altering the tax liability of the households with the highest incomes.

4.3 Capital income

We estimate that personal income taxes levied on reported capital income, T_{CI}, averaged 2.876 per cent of GDP at market prices from 1990 to 1998.

According to the CIRS, capital income is subject to a flat tax, t_r the proceeds of which are withheld by the payer at the source and then handed to the Treasury. This means that capital income is paid out net of taxes.

At the PIT margin, three components make up the capital income base – interest received on national public bonds, $r^{PD}PD$, other interest income such as interest received on saving certificates and bank deposits, OII, and distributed profits, that are a fraction, Γ, of after-tax corporate profits, Π. It should be noted that the capital income that is paid out and reported to the tax authorities gener-

ally differs from the capital share in the economy, θ_K, because not all firms belong to the incorporated sector, these may choose to retain part of their earnings, and finally, some of the distributed profits will inevitably escape taxation. This suggests that we define capital income, reported for personal income tax purposes, as:

$$CI = r^{PD}PD + OII + \Gamma.\Pi.$$

Under the assumption that the average gross yield of a Treasury bond is 5.25 per cent in real terms, and knowing that public indebtedness averaged 63.21 per cent of GDP at market prices from 1990 to 1998 (DGEP, 1999), straightforward arithmetic suggests that other interest income plus distributed corporate profits, $OII + \Gamma.\Pi$, averaged 11.061 per cent of GDP at market prices from 1990 to 1998.

Finally, it should be noted that, because neither deductions nor tax credits are considered, capital

income taxation at the PIT margin is written in the same way both in statutory and in effective terms. Obviously then, the differential effect is unitary.

5. SOME CONCLUDING REMARKS

In this paper, we focus on direct taxes and we formally discuss the correspondences between statutory and effective tax rates in the Portuguese economy. The corporate income tax, employer's social security contributions, employees' social security contributions, and the personal income tax are considered in great detail. The correspondence between statutory and effective tax rates depends on the details of the Portuguese tax law, on a wealth of data information, as well as on certain priors about the values of behavioral parameters in the economy. In addition to the general correspondences, we present our own estimates of the effective tax rates at the different tax margins. In doing so, detailed tax information was organized in a systematic way and the main characteristics of the Portuguese tax system were sketched and parameterized.

The information in this paper was recently put to good use by Pereira and Rodrigues (2000a, 2000b), in the context of an ongoing research project on tax reform in Portugal. In the ambit of Social Security reform, see Pereira and Rodrigues (2001b). More importantly, however, using the technical information in this paper practitioners of tax policy evaluation can obtain their own estimates of the relevant tax parameters to be used in their own work.

REFERENCES

Centro de Estudos Fiscais, CEF, (1997), *The Portuguese Tax System, Direcção-Geral de Contribuições e Impostos*, DGCI, *Ministério das Finanças.*

Departamento de Estatística do Trabalho, Emprego e Formação Profissional, DETEFP, (1997), *Estatísticas Sobre a Estrutura e a Distribuição dos Ganhos –* 1995, *Ministério do Trabalho e Solidariedade.*

Direcção-Geral de Estudos e Previsão, DGEP, (Setember 1999), *The Portuguese Economy –* Statistical Annex, *Ministério das Finanças.*

Direcção-Geral de Informática e Apoio aos Serviços Tributários e Aduaneiros, DGITA, (1999), *Uma Amostra Aleatória de 40000 Declarações de I.R.S. Referentes a 1997*, a database, *Ministério das Finanças.*

Instituto Nacional de Estatística, INE, Contas Nacionais, several issues.

Jorgenson, D., and R. Landau, (1993), *Tax Reform and the Cost of Capital,* The Brookings Institute.

King, M., and D. Fullerton, (1984), *The Taxation of Income from Capital*, Chicago University Press.

KPMG, (1997), *European Tax Handbook*, KPMG, International Tax Services.

Ministério das Finanças, (1993), *Orçamento Geral do Estado para* 1994.

Ministério das Finanças, (1995), *Orçamento Geral do Estado para* 1996.

Ministério das Finanças, (1997), *Orçamento Geral do Estado para* 1998.

Ministério das Finanças, (1998), *Orçamento Geral do Estado para* 1999.

Pereira, A., and P. Rodrigues, (2000a), "On the Impact of a Tax Shock in Portugal", *mimeo*, *Ministério das Finanças.*

Pereira, A., and P. Rodrigues, (2000b), "Strategies for Fiscal Reform in Portugal in the Context of the EMU", *mimeo, Ministério das Finanças.*

Pereira, A., and P. Rodrigues, (2001a), "Tax Parameters in the Portuguese Economy: Part I - Indirect Taxes", Economic Bulletin, *Banco de Portugal*, March.

Pereira, A., and P. Rodrigues, (2001b), "Kou-rei-na-mi in Portugal: A Tale of Aging and the Sustainability of the Public Pension Schemes", *mimeo, Ministério das Finanças.*

World Bank, (1994), *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth*, New York: Oxford University Press.

January*

4 January (Instruction no. 1/2001, Official Gazette no. 14, Series II)

Pursuant to the provisions set forth in subparagraphs f) and g) of paragraph no. 1 of article 6 of the Statute of the Public Credit Management Institute, approved by Decree-Law no. 160/96 of 4 September, and in article 11 of Decree-Law no. 280/98 of 17 September, lays down the rules governing the issuance of Treasury bonds as well as the access conditions and the rights and obligations of financial operators in the primary market. Revokes Instruction no. 2-A/98 (Series II) of 17 December, to come into force as from 1 January 2001.

29 January (Circular Letter of the Banco de Portugal no. 2/DMR)

Following Circular Letter no. 347/DMR of 27 October 1999, fixes the rate of return of Deposit Securities, Series B, at 4.77%, for the quarterly interest rate calculation period to start on 4 February 2001.

30 January (Decree-Law no. 19/2001, Official Gazette no. 25, Series I, A)

Introduces changes in the legal framework of mutual guarantee companies, classifying them as credit institutions whose activity is restricted to the carrying out of financial operations and to the provision of related services, on behalf of small and medium-sized companies.

February

2 February (Notice of Banco de Portugal no. 1/2001, Official Gazette no. 34, Series I - B)

Amends Notice no. 1/93, of 8 June, concerning the calculation of the solvency ratio of credit institutions. Introduces changes, namely, in the risk weightings of some assets items (eg. loans secured by mortgages, real estate financial leasing operations and securities collateralised by mortgage loans), as well as in the calculation of the weighted value of off-balance sheet items related to (e.g. swaps, futures and options) contracts on interest rates, exchange rates, equities, precious metals and commodities, which are not traded in a recognised market.

15 February (Instruction of Banco de Portugal no. 1/2001, BNBP no. 2/2001)

Sets forth the procedure regarding the notification to the Banco de Portugal of the sale of credit within the scope of securitisation operations.

15 February (Instruction of Banco de Portugal no. 2/2001, BNBP no. 2/2001)

Amends Instruction no. 4/96 (Chart of Accounts for the Banking System), requiring the publication, in the Notes annexed to the annual accounts, information of securitisation operations.

16 February (Notice of Banco de Portugal no. 2/2001, Official Gazette no. 40, Series I - B)

Considering the drawing closer of the start of the physical circulation of the euro in 1 January 2002, encourages the utilisation of cheques denominated in euro, regulating some aspects concerning their utilisation.

March

2 March (Circular Letter of Banco de Portugal no. 4/01/DSBDR)

Makes known that Instruction no. 6/2001 - amending the scope of account "9203 - Irrevocable credit lines" of the Chart of Accounts for the Banking System - has been approved. In this conformity, within one month from the date of receipt of the above-mentioned Circular Letter, institutions must reclassify the credit lines and communicate to the Banco de Portugal the resulting change in the amount of the provisions for general credit risks.

20 March (Notice of Banco de Portugal no. 3/2001, Official Gazette no. 67, Series I, B)

In accordance with the provisions laid down in no. 4 of article 1 of Decree-Law no. 3/94, of 11 January, as worded by Decree-Law no. 53/2001, of 15 February, establishes the requirements to be complied with by exchange offices wishing to provide cash transfer services to and from abroad.

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* The chronology for monetary measures of the Eurosystem can be found in the Monthly Bulletin of the European Central Bank.

April

3 April (Notice of Banco de Portugal no. 4/2001, Official Gazette no. 79, Series I, B)

Adds no. 9-A and rewords nos. 5 and 8 of Notice no. 12/92, of 22 December, published in Official Gazette no. 299 Series II, 2nd Supplement, of 29 December 1992, which provides for the assets that can be included in the own funds of institutions subject to the supervision of Banco de Portugal and defines their characteristics. In particular, deductions from own funds shall include, for their purchasing price, the amount corresponding to securities, resulting from securitisation operations, held by entities that do not assign the underlying assets, when the latter, due to their characteristics, concentrate the credit risk of the said assets.

3 April (Regulation no. 5/2001 of the Stock Market Commission, Official Gazette no. 79, Series II)

Changes Regulation no. 24/98, of 28 December, with a view to simplifying and making more flexible the procedures regarding the execution of the redenomination methods approved. Rewords articles 11, 18 and 19 and revokes articles 8 and 17 of the above-mentioned Regulation, in which the reference to "*Central de Valores Mobiliários*" is replaced with "*Interbolsa*".

17 April (Decree-Law no. 118/2001, Official Gazette no. 90, Series I, A)

Introduces changes in articles 4, 6, 39, 59, 64 and 65 of the Organic Law of the Banco de Portugal, approved by Law no. 5/98, of 31 January, in force since the date of adoption of the euro. Article no. 64 of the Organic Law, as worded by the mentioned Decree-Law, is effective as of 1 January 2001.

17 April (Decree-Law no 117/2001, Official Gazette no. 90, Series 1, A)

Regulates, on the monetary segment, the period for the double currency circulation from 1 January to 28 February 2001. It shall be incumbent on the Banco de Portugal to establish, by means of a Notice, the rules applicable to any regulation that may be deemed necessary. For a period of 20 years, from 28 February 2002 onwards, the Banco de Portugal shall receive and pay in euro the banknotes mentioned in article 2 submitted to it.

19 April (Notice of the Banco de Portugal no. 5/2001, Official Gazette no. 92, Series I, B)

Introduces changes in sub-section III of section B of the annex VI to Notice no. 7/96, of 24 December, taking into account the changes in the concept of over-the-counter derivative instruments envisaged in Directive no. 93/6/EEC, of 15 March, considering the entry into force of Directive no. 2000/12/EC of the European Parliament and of the Council of 20 March, and considering also the provisions laid down in articles 9 to 11 of Decree-Law no. 250/2000, of 13 October. As a result, the assessment of own fund requirements for the coverage of counterparty risk of any over-the-counter derivative instruments included in the trading portfolio shall be made according to the "mark-to-market" valuation.

23 April (Decision no. 8484/2001, Official Gazette no. 95, Series II)

Approves, pursuant Article no. 63 (1) of the Organic Law of the Banco de Portugal (Law no. 5/98, of 31 January) the adjustments introduced in the Chart of Accounts of the Banco de Portugal, as a reduced version.

23 April (Notice of the Banco de Portugal no. 6/2001, Official Gazette no. 95, Series I, B)

Adds an item c) to article 5 of Notice no. 8/94, of 2 November (which embodies provisions relating to supervision on a consolidated and sub-consolidated basis), widening the scope in which the Banco de Portugal may require supervision on a sub-consolidated basis.

24 April (Decree-Law no. 134/2001, Official Gazette no. 96, Series I, A)

Reviews the personal income tax withholding system. Introduces changes in a number of articles, adds an article 2-A and fully republishes Decree-Law no. 42/91, of 22 January, with the changes introduced by Decree-Laws no. 263/92, of 24 November, 95/94, of 9 April, 18/97, of 21 January, by Law no. 87-B/98, of 31 December, and by the present Decree-Law.

26 April (Regulation of Stock Market Commission no. 2/2001, Official Gazette no. 97, Series II)

Introduces changes in article no. 2 of Regulation no. 10/98, of 5 August, which lays down the rules governing repo operations and security lending, carried out on behalf of transferable securities investment trusts.

30 April (Circular-Letter of the Banco de Portugal no. 7/DMR)	Informs that, in the wake of Circular-Letter no. 347/DMR, of 27 October 99, the rate of return of the Certificates of Deposit, Series B, is fixed at 4,77%, to prevail on the quarter started on 4 May 2001.

May

7 May (Decision no. 9501/2001, Official Gazette no. 105, Series II)	Approves the final plan for the transition of financial administration to the euro, taking into account the proposal submitted by the working group created by Decision no. 15379/2000 of 28 July, and considering the provisions laid down in no. 2 of the Resolution of the Council of Ministers no. 170/2000, of 7 December.
11 May (Resolution of the European Council of 23 March 2001 (OJ C 138, 11.5.2001))	Resolution of the European Council on more effective securities market regulation in the European Union.
12 May (Regulation no. 3/2001 of the Stock Market Committee, Official Gazette no. 110, Series II)	Pursuant to the provisions set forth in paragraph 1 b) of article 353 of the Stock Market Code, and for the purposes of the provisions of articles 8 and 24 of Decree-Law no. 276/94, of 2 November, as worded by Decree-Law no. 323/99, of 13 August, lays down the rules according to which the entities managing mutual funds must publish in one of the stock market bulletins the disaggregated composition of the placements of each investment fund managed by them, the respective overall net value, the off-balance sheet liabilities and the number of equities outstanding. Revokes Regulation no. 7/98, of 25 June.
17 May (Circular Letter of Banco de Portugal no. 10/01/DSBDR)	Recommends for credit institutions and financial companies that resort to the Internet as a distribution channel for their services, a set of procedures to be followed within the framework of their internal organisation and control, in order to reduce the risks to which they are exposed, taking into account the increased use of electronic means in the provision of such services.
18 May (Circular Letter of Banco de Portugal no. 11/01/DSBDR)	Recommends that the clients of credit institutions who suffer damages due to delay in the settlement of debits unduly made for reasons imputable to such institutions, shall be compensated, at least, with the payment of an amount corresponding to the application of the official interest rate to the amounts in question, calculated between the date on which they should have been processed and the respective settlement date.
23 May (Circular Letter of Banco de Portugal no. 12/01/DSBDR)	Informs that considering the changes to be introduced in Notice no. 6/95, which are in course of preparation, and which are foreseen to take effect from the beginning of the second half of 2001 onwards, it is allowed, provided that some conditions are met, the registration against results carried forward of increases in liabilities arising from early retirements.

June

6 June (Notice of the Banco de Portugal no. 7/2001, Official Gazette no. 131, Series I, B)	Fixes at EUR 50,000 the value of the initial contribution to be delivered by credit institutions to the Deposit Guarantee Fund (Revokes Notice no. 8/95).
15 June (Instruction of the Banco de Portugal no. 10/2001, BNBP no. 6/2001)	Lays down the regulations governing the reporting to the Banco de Portugal of the composition of financial groups.
15 June (Instruction of the Banco de Portugal no. 11/2001, BNBP no. 6/2001)	Lays down the requirements to be complied with by credit institutions, when these promote among the public, by means of third parties, the carrying out of operations they are authorised to conduct.
15 June (Circular-Letter of the Banco de Portugal no. 10/2001/DSB)	Contains prudential recommendations on the provision of financial services through the Internet.

15 June (Circular-Letter of the Banco de Portugal no. 12/2001/DSB)

Authorises, up to the entry into force of the changes introduced in Notice no. 6/95 (on the coverage of liabilities in survivorship and retirement pensions) the exemption, against results carried forward, of liabilities accrued on account of early retirements.

21 June (Recommendation of the European Central Bank)

Recommendation of the European Central Bank on the statistical requirements of the European Central Bank related with balance of payments statistics, the institutional reserves model and the international investment position (BCE/2000/5). This Recommendation replaces Recommendation BCE/1998/NP21, pursuant to the rectifications to pages 4 to 6 included in the OJ, Series C, no. 179, of 23-06-2001.

July

3 July (Decree-Law no. 198/2001, Official Gazette no. 152, Series 1, A)

Approves the overall revision of the provision laid down in the Personal Income Tax Code, approved by Decree Law no. 442-A/88, of 30 November, in the Corporate Income Tax Code, approved by Decree-Law no. 442-B/88, of 30 November, and in the Statutes on Tax Incentives, approved by Decree-Law no. 215/89, of 1 July, and publishes, in attachment, the respective provisions. Revokes Articles nos. 5, 9 and 10 of the said Decree-Law no. 215/89, of 1 July.

WORKING PAPERS

1998

1999

Working Papers