INTERNATIONAL MONETARY FUND

CYPRUS

SELECTED ISSUES

October 2014

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October 3, 2014

Approved By
The European Department

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CONTENTS

THE CYPRIOT HOUSEHOLD SAVING RATE[1]

A. Introduction

1.   Over the past decade, Cyprus experienced large fluctuations in its household saving rate. During 2002–08, the saving rate declined steadily from a peak of 15.1 percent in 2003 to 6.7 percent in 2008, while growth averaged 3.6 percent per year, given a period of easy credit and a housing market boom. During 2009–11, as the credit and housing market bubbles burst following the global crisis and growth declined, Cyprus's household saving rate rebounded sharply. Since 2012, the saving rate fell rapidly, even as the domestic recession deepened. This pattern is similar to that observed in other European countries (Ireland, Spain) that suffered a similar credit-housing boom-bust cycle, although the decline in the Cypriot saving rate seems to have been the deepest.

Cyprus: Household Saving Rate and GDP
(Year-on-year percent change)

Sources: Cystat; and IMF staff estimates.

Household Gross Saving Rate
(Percent)

Sources: Eurostat; Cystat; and IMF staff estimates.
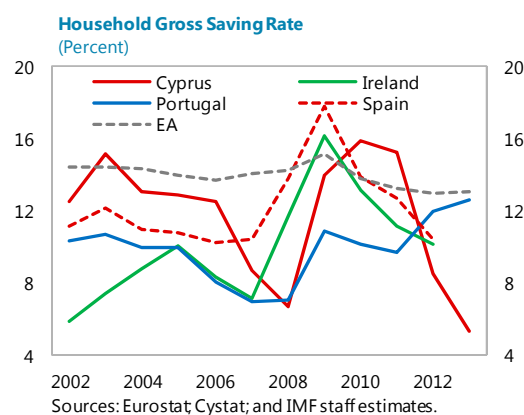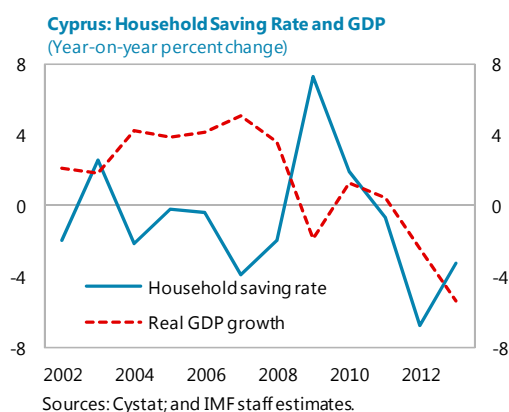
2.   This paper models the evolution of the saving rate to help shed some light on its determinants, which could help inform medium-term projections. Given that private consumption constituted about 66 percent of aggregate demand over 2000–13, understanding the households' consumption-saving behavior in the past and through the recent economic downturn is key to assessing the prospects for the economy's recovery and medium-term growth. Section B presents two simple models of the saving rate and an empirical analysis. On this basis, Section C explores the outlook for the household saving rate. A few concluding remarks are presented in section D.

B. Two Simple Models of the Saving Rate

3.   According to the literature, there are several factors that influence households' saving behavior:[2]

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[1] Prepared by Yinqiu Lu (EUR).

[2] Hüfner and Koske (2010); IMF (2010, 2011, 2012, 2013); and Slacalek (2009).

- **Net financial and non-financial wealth:** According to the permanent income hypothesis, the key determinant of consumption and saving is real wealth. Higher net wealth enables households to consume more and save less, particularly when they are hit by negative income shocks.

- **Real interest rate:** The interest rate affects household saving rate through both the substitution and income effects. A higher interest rate increases the opportunity cost of consumption today, encouraging saving (substitution effect). But a higher interest rate also generates higher income from the same initial stock of wealth, encouraging consumption rather than saving (income effect).

- **Uncertainty:** When facing higher uncertainty, such as an increasing unemployment rate, households tend to save more (i.e. precautionary motive).[3] However, if the unemployment shock materializes, they would dip into their saving to smooth consumption.

- **Fiscal balances:** Some studies have found evidence that loose fiscal policies (i.e. government dis-saving) are associated with higher household saving (the so called Ricardian effect), as households cut consumption in anticipation of higher taxes in the future.[4] Others, however, have shed doubt on these findings, noting that the fiscal position may be a reflection of macroeconomic uncertainty, which affects the saving rate as noted above.[5]

- **Demographics:** According to the lifecycle income hypothesis, workers save part of their income to finance consumption when they retire. Hence, a change in a country's demographic structure is expected to affect the aggregate household saving rate. For example, the higher the share of retirees and children in total population, the lower the saving rate would be.

4.   This paper develops two simple models of the saving rate. A first model looks at the change in the saving rate, while the second model explores the level of the saving rate. Both models are tested in the data, using OLS regressions based on quarterly data from 2004:Q1 to 2013:Q4.[6] The household saving rate is defined as follows:

$$Household\ saving\ rate = \frac{Disposable\ income - private\ consumption}{Disposable\ income}, \text{where}$$

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[3] Carroll (1997).

[4] Barro (1974), and Barro (1979).

[5] Carroll et al. (2012).

[6] Household saving rate is available back to 1995; however, data for key explanatory variables, such as household financial assets and liabilities, are not available until 2004.

$$Disposable\ income = \frac{Compensation\ of\ employees}{Share\ of\ compensation\ in\ disposable\ income}.$$

Such approximation for disposable income is justified by the large and stable weight of compensation in Cypriot household disposable income (estimated at around 60 percent).[7]

5.   The first model aims to explain the year-on-year change in the saving rate. The model includes several explanatory variables, in line with the theoretical literature, which appear to be correlated with the saving rate. The following equation is estimated:

$$\Delta S_t = c + \alpha \Delta X_{i,t-1} + \varepsilon_t,$$

where ΔS_t represents the year-on-year change in the saving rate, and $X_{i,t}$ represents the explanatory variables listed below (see Figure 1 for the plot of the saving rate versus each of them), and α is a vector of correlation coefficient corresponding to each explanatory variable:

- **Household net financial wealth:** This is calculated as household financial assets minus household financial liabilities. The year-on-year change in the ratio to GDP is used in the regression.

- **Housing wealth:** Given the limited and poor quality data for Cypriot housing wealth, the housing price index is used as a proxy for housing wealth. The year-on-year percent change in housing prices is used.

- **Unemployment rate:** The harmonized unemployment rate is used to capture macroeconomic uncertainty and precautionary saving effects. The year-on-year level change is used.

- **General government fiscal balance:** Given high seasonality effects present in the quarterly data, the ratio of four-quarter rolling average fiscal balance to four-quarter rolling average GDP is used. Year-on-year change in the ratio is used.

- **Real deposit rate:** Since household wealth is concentrated in the form of deposits, the deposit rate is used here to capture potential income and substitution effects on the saving rate. It is derived by subtracting the HICP inflation rate from the rate of deposits redeemable at notice up to 3 months (which account for half of total deposits). Year-on-year level change is used in the regression.

All explanatory variables, which are estimated at the same time, enter the equation in lag to minimize endogeneity.

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[7] The quarterly share of compensation in disposable income is interpolated based on annual share.

Figure 1. Cyprus: Change of Household Saving Rate Versus Explanatory Variables
(Year-on-year percent change)

Correlation coefficient = -0.08**

Saving rate
HH net financial assets (% GDP)

Correlation coefficient = -0.06

Saving rate
Housing prices

Correlation coefficient = -0.84**

Saving rate
Unemployment rate

Correlation coefficient = -0.75*

Saving rate
Fiscal balance

Correlation coefficient = 0.18

Saving rate
Real deposit rate
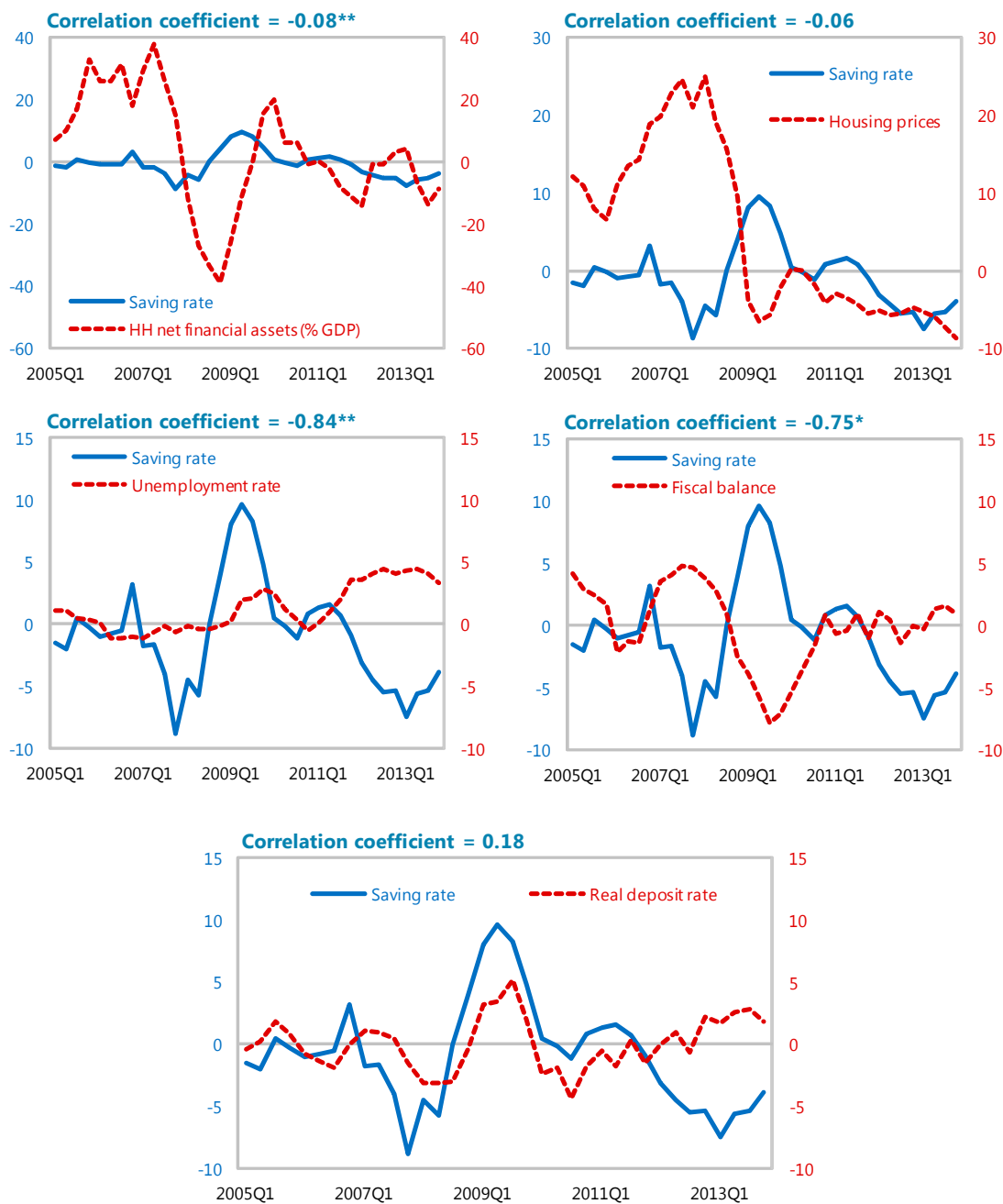
Sources: Cystat; Eurostat; ECB; Haver; and IMF staff estimates.
Note: Bivariate regression of the change of household saving rate against each explanatory variable (one lag) is estimated. ***p<0.01, **p<0.005, *p<0.1.

6.   The regression model can explain the change in the household saving rate reasonably well (Table 1). Both net financial assets and housing prices have negative coefficients, consistent with the theoretical prediction of the model. Every one percent of GDP increase in net financial assets (i.e., €165 million) is associated with a 0.1ppt decrease in saving rate; while every one percent increase in housing price is estimated to lead to 0.15ppt decrease in saving rate. The fiscal balance enters with a negative coefficient with every one percent of GDP fiscal consolidation likely associated with 0.7ppt decline in saving rate. The negative coefficient of unemployment suggests that households in Cyprus tend to smooth consumption by dipping into savings when unemployment rises. Every one percentage point increase in unemployment rate is associated with a decline of saving rate by 2.2ppt. Finally, the positive coefficient of real deposit rate suggests that substitution effects dominate, as a higher interest rate encourages households to save.

Table 1. Determinants of the Change of Household Saving Rate

Dependent variable: **Year-on-year change of household saving rate**
Period: 2004Q1-2013Q4

Explanatory variables	Coefficients	t-statistic	Probability
Net financial assets (change, lagged)	-0.099	-5.633	0.000
Housing price (percent change, lagged)	-0.147	-2.463	0.020
Fiscal balance (change, lagged)	-0.681	-5.522	0.000
Unemployment (change, lagged)	-2.226	-8.189	0.000
Real deposit rate (change, lagged)	0.453	2.690	0.012
Constant	2.587	4.395	0.000
Adjusted R-squared	0.817		

Source: IMF staff estimates.

7.   A decomposition analysis reveals the relative importance of various factors in explaining the savings dynamics over the last decade. The decline in the saving rate during 2005–08 can be largely explained by the increasing net financial wealth and rising housing prices, and to some extent by the improvement in the fiscal position. During 2009–11, the saving rate appeared to be mainly driven by a worsening of both financial wealth and the fiscal position (Box 1 explains in more

Cyprus: Household Savings Rate
(Year-on-year percent change)

Legend: Fiscal balance (-1); Real deposit rate (-1); Unemployment (-1); NFA (-1); Housing price (-1); Actual

Sources: CBC; Cystat; Haver; and IMF staff estimates.

detail developments in households' financial wealth). Since 2012, when the domestic recession deepened, unemployment appears dominant in inducing consumption smoothing through a reduction in the saving rate.
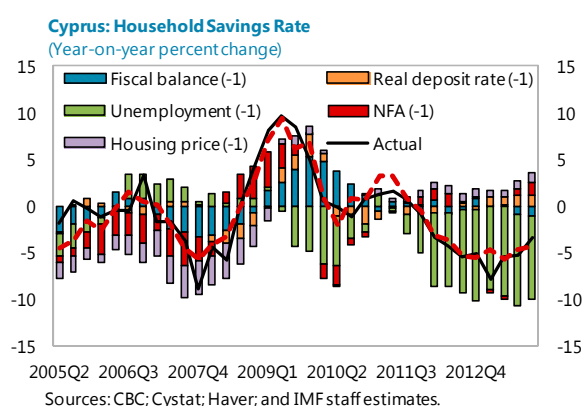
Box 1. The Evolution of Households' Net Wealth

Household net financial wealth increased to 147 percent of GDP by end-2012. During 2005–08—characterized by easy bank credit—households accumulated significant liabilities, which increased by 9 billion (33 percent of GDP). This helped support consumption and growth and fuelled a housing boom. The increase in h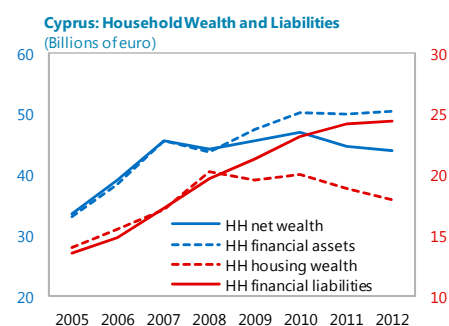ouse prices boosted households' non-financial wealth, which rose by an estimated 6 billion (14 percent of GDP).[1] Financial wealth also increased by 19 billion (59 percent of GDP), despite the declining saving rate, in part reflecting valuation effects as the stock market also boomed. Liabilities continued to rise through 2012, while housing wealth declined with the bust in the housing market, and wealth stabilized.

The banking crisis in 2013 dealt a blow to households' financial assets. Household financial assets fell by about €5 billion in 2013. Half reflect a decline in deposits, of which about €0.5 billion is estimated to have been due to the bank bail in, and the rest is likely due to deposit drawdown to support consumption. The rest reflects a decline in insurance and pension fund assets, which suffered from losses due to the bail in and valuation losses on their stock portfolio. Households also used pension fund assets to finance consumption. Despite this, by end-2013, net financial wealth of households was still significant, at 138 percent of GDP.
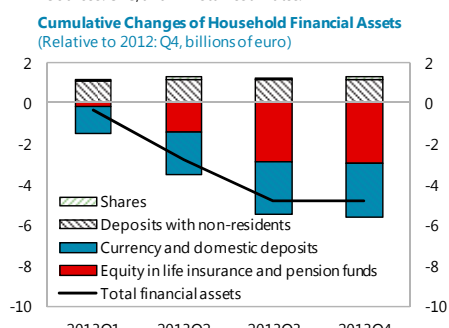
Household debt remains very high. At 140 percent of GDP at end-2013, Cyprus's household debt is among the highest in the euro area. Debt interest payments as a share of disposable income have risen to around 13 percent in 2013, up from 9.5 percent in 2006 despite a relatively stable interest rate during this period. Given the rise in unemployment, an increasing share of households are finding it difficult to service their debt, with the household non-performing loans reaching 45 percent of total loans at end-June 2014.

Still, households' net financial wealth remains large and positive at end-2013, although this masks an uneven distribution. Cyprus's household net wealth is significantly above the euro-area average. This suggests that households in Cyprus maintain a sizeable asset cushion to weather the ongoing recession. Still, its distribution is less even than the euro-area average, implying that those with limited wealth are suffering relatively more from the negative shock experienced in 2013 and may need to raise their saving to repair their balance sheets.

Cyprus: Household Wealth and Liabilities
(Billions of euro)

- HH net wealth
- HH financial assets
- HH housing wealth
- HH financial liabilities

Sources: CBC; and IMF staff estimates.

Cumulative Changes of Household Financial Assets
(Relative to 2012: Q4, billions of euro)

- Shares
- Deposits with non-residents
- Currency and domestic deposits
- Equity in life insurance and pension funds
- Total financial assets

Sources: CBC; and IMF staff estimates.

Financial Liabilities of Households, 2013
(Percent of GDP)

Sources: Haver; and IMF staff estimates.

Household Net Wealth, 2013Q2 (Thousands of euro)

	Net wealth		Real assets		Financial assets	
	Median	Mean	Median	Mean	Median	Mean
All EA	104.3	229.6	111.4	211.1	11.2	47
Cyprus	225.6	626.5	266.4	646.2	15.8	56.2

Household Net Wealth, growth rate 2008Q1-2013Q2 (Percent, real terms)

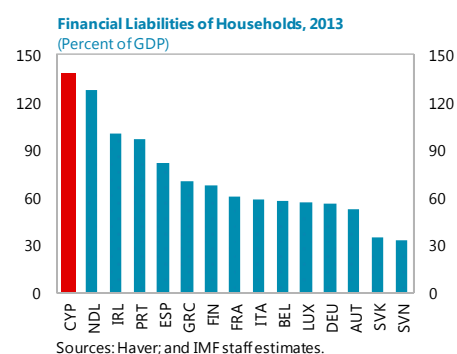|	Net wealth		Real assets		Financial assets	
	Median	Mean	Median	Mean	Median	Mean
All EA	-13.7	-10.5	-16	-11.5	5.1	0.5
Cyprus	-19.9	-9.5	-14.9	-7.2	-10.3	-21.7

Source: Ampudia et al. (2014).

_____
[1] Non-financial wealth is defined exclusively as the value of the dwellings owned by households and non-profit institutions serving households. Data over 2005–11 are from the CBC; while the 2012 data is extrapolated from the 2011 data and the change in housing prices.

8.   The second model attempts to explain the level of the saving rate. The model is based on Carroll et al. (2012) and captures three main channels:

- **Wealth channel:** This captures structural determinants of the household saving rate, which, as before, are the household net financial wealth (now defined as the level in percent of disposable income) and housing wealth (defined as year-on-year percent change in housing prices, similar to the previous model).

- **Precautionary channel:** This captures the cyclical determinants of the saving rate. The percent balance[8] of consumers' unemployment expectations over next 12 months is used to reflect the economic uncertainty and capture precautionary saving motives.

- **Financial channel:** This reflects the role of financial liberalization that makes it easy for households to obtain credit to finance consumption, thus reducing their incentives to save. The percent balance of households' expectations about their financial situation over next 12 months is chosen as a proxy, as the lending survey data for Cyprus is not available until 2009.[9,10] However, this should be interpreted with caution, as it could also reflect rising income prospects.

The main equation is:

$$S_t = c + \alpha X_{i,t-j} + \gamma t + \varepsilon_t,$$

where S_t is the household saving rate, $X_{i,t-j}$ represents the explanatory variables listed above with the lags chosen based on Akaike's information criterion (see Figure 2 for the plot of the saving rate versus each of them). In addition, similar to Carroll et al. (2012), a time trend is included. The results are presented in column 1 of the Table 2.

In a separate specification (column 2 of the Table 2):

$$S_t = c + \alpha X_{i,t-j} + \beta B_{i,t-p} + \gamma t + \epsilon_t,$$

two additional variables are added (represented by $B_{i,t-p}$): the general government fiscal balance, and household debt to disposable income ratio, with the latter capturing the potential uneven distribution between wealth and indebtedness.

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[8] Percent balance equals the percent of respondents expecting an increase in unemployment over next 12 months minus the percent of respondents expecting a decrease in unemployment. The data is sourced from consumer opinion on economic and financial conditions (EC Business and Consumer Survey). Quarterly data is constructed by taking the average of monthly data.

[9] Percent balance equals the percent of respondents reporting an improvement in households' financial situation over the next 12 months minus the percent of respondents reporting a deterioration in households' financial situation over the next 12 months. The data is sourced from consumer opinion on economic and financial conditions (EC Business and Consumer Survey). Quarterly data is constructed by taking the average of monthly data.

[10] Other variables, such as loan deposit ratios, and interest spread, which could potentially capture the availability to credit are tested. However, they turn out to be insignificant.

Figure 2. Cyprus: Household Saving Rate Versus Explanatory Variables

Correlation coefficient [y, x(-2)]=-0.05**
- Saving rate (percent)
- Net financial assets (percent of disposable income)

Correlation coefficient [y, x(-4)]=-0.175**
- Saving rate (percent)
- Housing price (yoy, percent change)

Correlation coefficient [y, x]=0.104
- Saving rate (percent)
- Unemployment expectations next 12 mths (percent balance)

Correlation coefficient [y, x]=0.159**
- Saving rate (percent)
- Financial situation next 12 mths (percent balance)

Correlation coefficient [y, x(-6)]=0.369
- Saving rate (percent)
- Fiscal balance (percent of GDP)

Correlation coefficient [y, x(-4)]=0.134
- Saving rate (percent)
- Household debt (percent of disposable income)

Sources: Cystat; Eurostat; Haver; and IMF staff estimates.
Note: ***$p<0.01$, **$p<0.005$, *$p<0.1$.

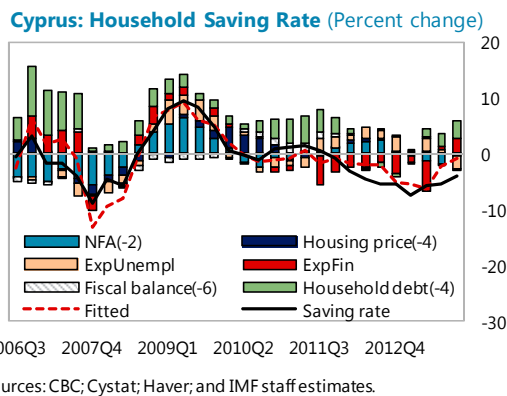### Table 2. Cyprus: Determinants of the Level of Household Saving Rate

Dependent variable: **Level of Household Saving Rate**
Period: 2004Q1-2013Q4

	(1)	(2)
Net financial assets (t-2)	-0.066***	-0.113***
	(-3.292)	(-4.298)
Housing price	-0.153***	-0.131**
(percent change, t-4)	(-2.833)	(-2.695)
Expected unemployment	0.154**	0.179**
	(2.129)	(2.089)
Expected households	0.327***	0.271**
financial condition	(6.591)	(2.477)
Fiscal Balance (t-6)		-0.220
		(-1.010)
Household debt (t-4)		0.325**
		(2.736)
Time	-0.252***	-0.952***
	(-3.314)	(-3.984)
Constant	30.969***	4.161
	(5.316)	(0.365)
Adjusted R-squared	0.648	0.755

Note: T-statistics in brackets. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

9.   This model's results confirm the dominant role of household wealth in explaining the saving rate. Since the model including the fiscal balance and household debt have a better fit, we use this specification to explain the main results of the model. Both net financial assets and housing prices have negative coefficients. Every one percent of GDP increase in net financial assets is associated with a 0.1ppt decrease in saving rate, similar to the previous model. Less contraction or acceleration in the increase in housing prices is associated with a decline in the saving rate: a one percentage point acceleration of the change of housing price is associated with 0.1ppt decrease in the saving rate. The coefficient of expected unemployment (percent balance) is positive, with every 10 percentage point increase in the balance associated with 1.8ppt increase in saving rate. This positive sign contrasts with the negative coefficient of actual unemployment from the previous model. In this model, the positive sign points to the precautionary effect on the saving rate of households *expecting* a future increase in unemployment. In the previous model, once the shock materialized through higher *actual* unemployment, households would smooth consumption. The coefficient of the expected household financial situation is positive, contrary to the prediction of the model that higher credit availability would dis-incentivize saving. In this case, an index chosen (due to data availability constraints) captures the expected financial situation of households, an improvement of which may be linked to an expectation of higher return on assets, which incentivizes saving. The impact of debt on the saving rate is also positive, as higher indebtedness motivates households to save. The fiscal balance is not statistically significant, likely confirming that once macroeconomic uncertainty is accounted for (in this case through unemployment expectations), Ricardian effects disappear.
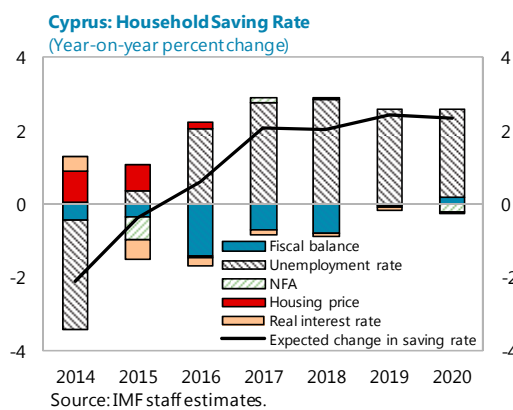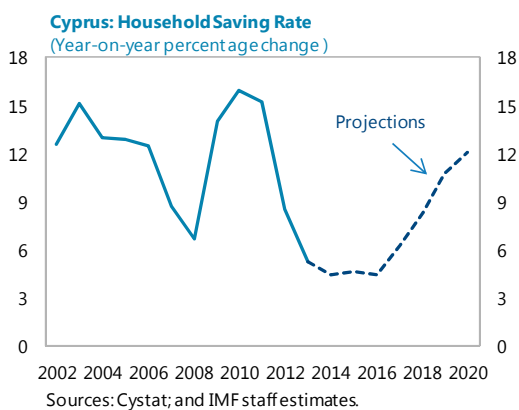
10.   A decomposition analysis reveals the contributions of various factors to saving rate.
The decline in the saving rate during 2007–08 can be largely explained by the increase in net financial wealth, and to some extent the decline in unemployment expectations. During 2009–11, the saving rate appeared to be mainly driven by a worsening of both financial and housing wealth. Since 2012, when the domestic recession deepened, worsening expected financial conditions appear the leading factor for the decline in the saving rate.

Cyprus: Household Saving Rate (Percent change)

Sources: CBC; Cystat; Haver; and IMF staff estimates.

Over the whole period, rising household debt acts to curtail the decline in the saving rate.

C.   Projecting the Household Saving Rate

11.   Out-of-sample projections point to an expected increase in the saving rate.[11] The saving rate is expected to decline further to 4½ percent in 2014 and then gradually increase to about 12 percent by 2020. This is predicated on a further reduction in housing prices by an estimated 10 percent,[12] a reduction in the unemployment rate in line with the macroeconomic forecast by 5.6 percentage points, an improvement in the fiscal balance by about 4.8 percent of GDP in line with the authorities' medium-term fiscal targets, and a gradual decline of real interest rate (assuming no change in interest rate, and a convergence of inflation rate to around 2 percent). We assume that the amount saved by households in each period contributes to an increase in household's net financial assets in each period (through either an increase in financial assets or a reduction in liabilities).

Cyprus: Household Saving Rate
(Year-on-year percentage change)

Sources: Cystat; and IMF staff estimates.

Cyprus: Household Saving Rate
(Year-on-year percent change)

Source: IMF staff estimates.

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[11] The constant in the model is dropped in the out-of-sample forecasting, as no dynamic feedback is built in the model, and, in an equilibrium state, the constant should be zero.

[12] 10 percent is close to the mid-point of the estimated price gap of 7–14 percent relative to equilibrium (see the companion Selected Issues Papers, "The Housing Market in Cyprus: From Boom to Bust").

12.   Under the forecast, households would reduce debt gradually. Assuming that households use about half of their savings to retire debt, and based on the forecast of the saving rate and the feedback loop between saving rate and net financial assets, households are projected to reduce debt gradually to 102 percent of GDP in 2020, consistent with the upper range of estimated deleveraging needs toward a more sustainable debt level. If the entire amount of saving is used to pay down debt, household indebtedness could fall to 85 percent of GDP by 2020, well within the sustainable range.

Cyprus: Household Debt
(Percent of GDP)

Sources: CBC; and IMF staff estimates.
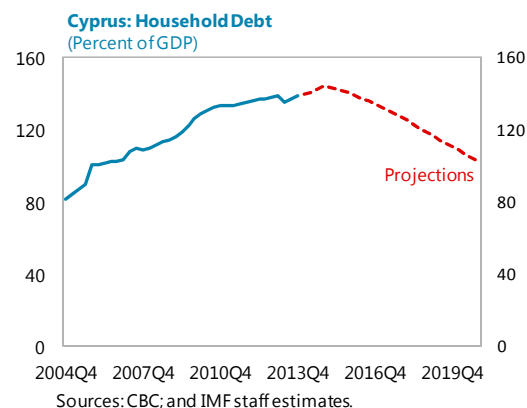
D. Conclusion

13.   This paper suggests that household net wealth and unemployment are key determinants of the saving rate in Cyprus. Cypriot households dissaved in the period preceding the global crisis, as their wealth increased and credit could be used to finance consumption. While they initially increased saving as a precautionary measure as the macroeconomic uncertainty increased and unemployment started to rise after 2008, they eventually reverted to a declining saving rate to smooth consumption. Looking forward, household saving rate is expected to increase to 12 percent in 2020, accompanied by a decline in household debt.

14.   This analysis should be interpreted with caution. The data is noisy, given that some series required generating quarterly data from annual trends. Also data uncertainty, due to various data sources used, and relatively short time-period may affect the regression results.[13] Moreover, in the estimation, the endogeneity between household wealth and the saving rate, as well as between unemployment and the saving rate may have not been fully controlled through lags. Due to the lack of micro level data, the analysis does not explore the distributional consideration with respect to wealth. Since wealth is likely distributed unevenly, high indebted households with limited wealth are likely to reduce their saving rate more than the average to support consumption in the face of economic stress. The forward-looking projections are also subject to considerable uncertainty, and should be interpreted with care.

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[13] In the case of compensation of employees, both annual and quarterly data are used. While the quarterly figures are not precisely summing up to the annual figures, the difference is positive and consistent over time, which suggests that this has a limited, if any, impact on the regression results.

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ESTIMATING CYPRUS'S POTENTIAL OUTPUT GROWTH[1]

A. Introduction

1.   Cyprus experienced a large boom and bust, which may have long-lasting effects on the economy. After growing at an average rate of 3½ percent during 2002–08, Cyprus's economy went into a deep recession. With the pre-crisis boom fueled by rapid growth of the financial and construction sectors, the 2013 bust was associated with a large banking crisis, which led to a credit crunch, collapse in the housing market, and significant contraction in all sectors of activity, in particular financial services and construction. This raises the question of how much output has been lost during the crisis, and what is a sustainable rate of growth over the medium and long term.

2.   This paper aims to shed light on Cyprus's long-term potential output growth rate. It estimates the potential output growth rate prior and immediately after the crisis, and derives some implications for the future trend output growth. This paper uses the production-function approach to estimate Cyprus's potential output growth rate. Given that the potential output growth rate is unobservable and its measurement involves a high degree of uncertainty, the main approach is complemented with other methods, such as the Hodrick–Prescott (HP) filter, the multivariate model developed by Benes et al. (2010), and the "financially-neutral" approach developed by Borio et al. (2013).

3.   The paper is organized as follows. Section B discusses the methodology; Section C presents the overall results; section D assesses historical developments through 2013 through the prism of the methodology and results; and section E derives some conclusions about potential growth looking forward and estimates the output loss from the crisis; section F concludes with some general remarks and policy implications.

B. Methodology

4.   This paper uses the production function approach as the main methodology to estimate Cyprus's potential output growth. It is one of the benchmark methodologies used in the literature. In this paper, we use a Cobb-Douglass production function, with capital and labor as inputs (e.g., Faal, 2005; Denis et al., 2006; Moore and Vamvakidis, 2007; Konuki, 2008; Epstein and Macchiarelli, 2010; Klein, 2011; IMF, 2013; and Johnson, 2013). What remains unexplained (Solow residual) by the function represents total factor productivity (TFP).

5.   The methodology is refined to account for capacity utilization and the quality of labor. This helps to reduce the Solow residual. The adjustments follow Roldos (1997), Estevao and Tsounta

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(2010), and IMF (2013). The basic model is specified as follows: $Y_t = B_t(K_t)^\alpha(L_t)^{(1-\alpha)}$. To this, we add capacity utilization to arrive at: $Y_t = A_t(K_tCU_t)^\alpha(L_t)^{(1-\alpha)}$. When average hours worked are added, the model becomes $Y_t = A_t(K_tCU_t)^\alpha(L_tAHW_t)^{(1-\alpha)}$. Finally, we also add education: $Y_t = A_t(K_tCU_t)^\alpha(L_tAHW_tEDU_t)^{(1-\alpha)}$, where:

- K denotes the capital stock, which is derived based on the usual perpetual inventory model (Epstein and Macchiarelli, 2010; and Teixeira de Silva and Nícias, 2001) as $K_t = (1-\rho)K_{t-1} + I_t$, where ρ is the depreciation rate calibrated from the historical average, and I stands for investment. The capital stock of 2002 is taken as the initial capital stock.

- L is the number of employed persons, based on national accounts.

- α stands for the capital share in the production function.

- CU stands for capacity utilization, measured by a percent balance of respondents reporting an increase versus those reporting a decrease.

- AHW is the average hours worked, also measured according to the national accounts.

- EDU is the education level, measured by the percentage of persons with upper secondary or tertiary education.

- B represents TFP, while A is the residual total factor productivity.

6.   The model is estimated using quarterly data. Quarterly data over 2001:Q1 to 2013:Q4 are used for most specifications, except the basic model, where a longer period is covered, given data availability (1995:Q1–2013:Q1). Labor shares are estimated separately for each specification (Table 1). They appear relatively high (70–90 percent) compared to the euro area average (63 percent, Denis et al., 2006), reflecting the dominance of the service sector in Cyprus's economy (over 80 percent of GDP). Cyclical components related to capacity utilization, average hours worked, education, unemployment rate, and TFP are smoothed through the HP filter (1600). Actual values are used for the capital stock. Derived trend inputs combined with the estimated labor share and capital yield potential output estimates.

Table 1. Estimates of Cobb-Douglas Production Function			
	Labor share (α)	Intercept	R^2
Cobb-Douglas PF			
with Capital and Labor	0.72***(0.03)	-4.12***(0.05)	0.9
with Capital, Labor, and Capacity Utilization	0.92***(0.04)	-4.5***(0.09)	0.9
with Capital, Labor, Capacity Utilization, and Average Hours Worked	0.81***(0.06)	-3.67***(0.07)	0.8
with Capital, Labor, Capacity Utilization, Average Hours Worked, and Education	0.88***(0.05)	-7.47***(0.28)	0.9
Notes: ***denotes 1 percent significance level.			
Source: IMF staff estimates.			

7.   Given the high uncertainty associated with potential output estimates, two other statistical methods are used to cross-check the results. The uncertainty relates not only to the

methodology described above, but also to the large recession that is now taking place in Cyprus. One method employed to verify the results is the HP filter, which is a data smoothing procedure commonly used to estimate the potential output. Another approach is the multivariate model, developed by Benes et al. (2010), which derives a potential output consistent with other macroeconomic variables, including unemployment, inflation, and the gap in capacity utilization (see the Appendix for more detail).[2] A drawback of this model is that it does not distinguish the inter-relation between the various variables and potential output. In addition, it is not suitable for out-of-sample forecasting.

8.   Finally, we also use an alternate methodology that takes into account the financial cycle. The model follows the approach developed by Borio et al. (2013), which augments the output gap equation in the HP filter with variables representing financial sector cycles, such as credit growth and property prices (see the Appendix for more detail). Credit growth and housing price are included in this model to estimate the "financially-neutral" output gap for Cyprus. This is relevant for the case of Cyprus, which experienced a large expansion in credit preceding the crisis, leading to a large property market boom and bust.

C.   Results

9.   Our results from standard models suggest that Cyprus's potential growth has been on a declining trend since the mid 1990s. According to the augmented production-function approach (Figure 1), potential output growth is estimated to have grown at a rapid pace during 1996–2001 and to have only slightly declined in the subsequent period up to 2008, which covered Cyprus's entry into the European Union in 2004. Potential growth slowed considerably after the onset of the global financial crisis in 2008. It turned negative in 2012, when domestic factors and an intensification of the crisis in neighboring Greece led to the Cypriot banking crisis in 2013. Other statistical methods confirm these results, with the HP filter suggesting lower growth in 2009–11, and a deeper subsequent fall.

Estimates of Potential Output Growth Rate (Percent)

	1996-2001	2002-08	2009-11	2012-13
IMF staff				
PF method	3.9	3.4	0.7	-1.2
MV		3.6	1.4	-1.5
HP filter		3.4	0.2	-1.7
Average		**3.5**	**0.8**	**-1.5**

Source: IMF staff estimates.

Estimates of Potential Output Growth Rate (Percent)

	1996-2001*	2002-08	2009-11	2012-13
EC				
PF method	3.6	3.3	1.0	-1.6
HP filter	3.9	2.8	0.4	-0.8
IMF (2010)	3.7	3.3	1.1	
	1995-2012	2000-12		
Pashardes et al. (2013)	2.4	1.8		

Sources: EC; IMF (2010); IMF staff estimates; and Pashardes et al. (2013).
* For EC, 1999-2001.

10.   The results are similar to others recently found in the literature. Our results are also comparable to those found by the European Commission (based on the methodology presented in D'Auria et al., 2010), which used a production function that uses labor, capital stock, corrected for the degree

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[2] IMF (2011), IMF (2012), and Anand et al. (2014) applied the model in their analysis of potential output growth.

Figure 1. Cyprus: Growth Accounting, 2002–13

Cobb-Douglas Production Function
(Contributions to potential growth, percentage points)

TFP L K Potential

C-D PF with Capacity Utulization
(Contributions to potential growth, percentage points)

TFP L K CU Potential

C-D PF w/ Capacity Utulization and Hours Worked
(Contributions to potential growth, percentage points)

TFP L K AHW CU Potential

C-D PF w/ Capacity Util., Hours Worked, and Education (Contributions to potential growth, percentage points)

TFP L K AHW EDU CU Potential

Sources: Haver; and IMF staff estimates.

of excess capacity, and adjusted for the level of efficiency, and HP filter methodology. For 2012–13, the EC's less negative estimated potential growth under HP than the staff's likely reflects a different end-point. An earlier IMF study (2010) using a simple production function approach confirms our results for the pre-crisis period. Finally, Pashardes and Pashourtidou (2013) estimated somewhat lower rates for potential growth during 1999–2008 based on a methodology using the mean of the real growth rate, estimated as a function of the previous year's growth and dummy variables capturing the effects of outliers.

D.   Analysis of Potential Output Developments Through end-2013

11.   During the first period of analysis (1996–2001), potential growth was driven by capital accumulation and productivity gains (Table 2)**.** Capital accumulation was mainly driven by

infrastructure and housing. A flexible labor market, robust growth in high productivity sectors (financial services), and technological development had allowed Cyprus to achieve high TFP growth, and achieve productivity gains relative to the euro area. A negative output gap was opening in 1996–99, as the country was hit by a strong earthquake in 1996, and disorders along Cyprus's "Green line", which affected tourist receipts. The output gap gradually closed over 2000–11, as a consequence of the high technology boom.
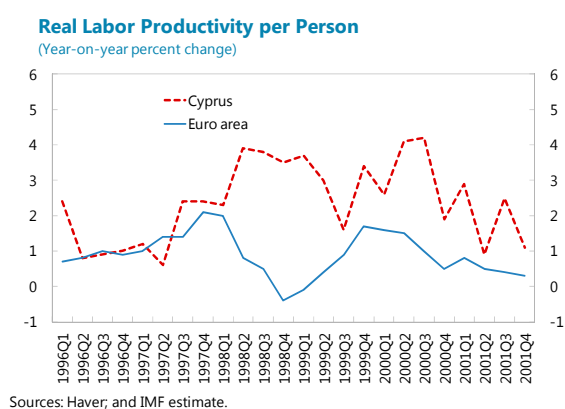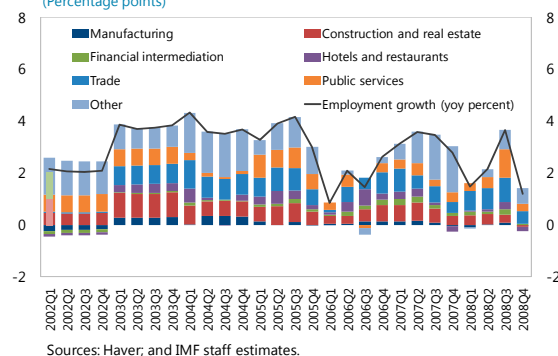
Real Labor Productivity per Person
(Year-on-year percent change)

Sources: Haver; and IMF estimate.

Table 2. Potential Growth Rate (Percent)								
	1996-2001		2002-2008		2009-2011		2012-2013	
	Average values	Contribution to potential	Average values	Contribution to potential	Average values	Contribution to potential	Average values	Contribution to potential
Capital	**6.7**	**1.9**	**4.0**	**0.5**	**3.6**	**0.4**	**1.8**	**0.2**
Labor	1.1	0.8	2.9	2.6	0.0	0.0	-1.4	-1.2
TFP		1.2		0.4		0.3		-0.2
o/w								
Capacity Utilization			0.2	0.2	-0.7	-0.6	-9.8	-1.2
Average Hours Worked			-0.7	-0.6	0.0	0.0	-0.1	-0.1
Education			1.9	1.7	1.6	1.4	1.6	1.4
Residual				-0.8		-0.5		-0.3
Potential Growth-PF		**3.9**		**3.4**		**0.7**		**-1.2**
Potential Growth-MV				**3.6**		**1.4**		**-1.5**
Potential Growth-HP Filter				**3.4**		**0.2**		**-1.7**
Potential Growth-Financially-neutral				**3.0**		**1.3**		**-1.7**

Source: IMF staff estimates.

12.   Employment growth contributed most to potential growth during 2002–08. Following a slowdown in the early 2000s, driven by global developments, activity picked up, especially after Cyprus's accession to the EU in 2004. Strong capital inflows supported a rapid expansion of credit, which financed an expansion of domestic demand and a property market boom. This helped to boost employment, especially in the construction sector, which relied on immigrant inflows to cover labor shortages. Indeed, our analysis suggests that labor had the highest contribution to potential

growth during this time, with the contributions of capital accumulation and productivity slowing relative to the previous period, due to the rapid expansion of sectors with relatively low productivity (such as the construction sector). A negative output gap emerged at the time of the global slowdown in the early 2000s, but started to close in 2004, as the rapid economic expansion outpaced potential output growth, with a positive gap opening up in 2006–07.

Contribution of Sectors to Employment Growth
(Percentage points)

Legend: Manufacturing, Construction and real estate, Financial intermediation, Hotels and restaurants, Trade, Public services, Other, Employment growth (yoy percent)

Sources: Haver; and IMF staff estimates.

13.   Potential growth slowed during 2009–11, following the onset of the global crisis. As foreign inflows slowed, the property market boom turned to bust. This dealt a blow to activity in construction and financial services, which in turn affected employment growth. Without this engine of growth, potential output slowed significantly. Actual output fell in 2009, but recovered moderately in 2010, as the economy was supported by resilient private consumption. It fell below potential in 2011, following the explosion of the main power plant, which crippled activity in the second half of the year and marked the beginning of a prolonged downturn.
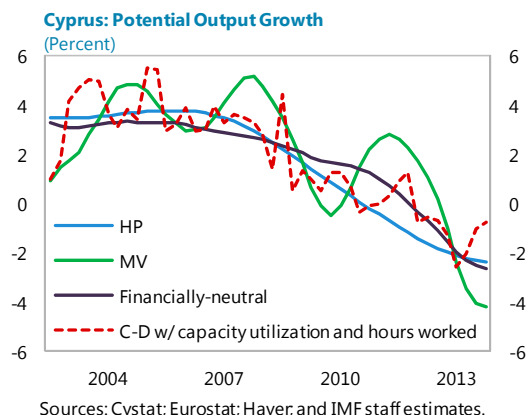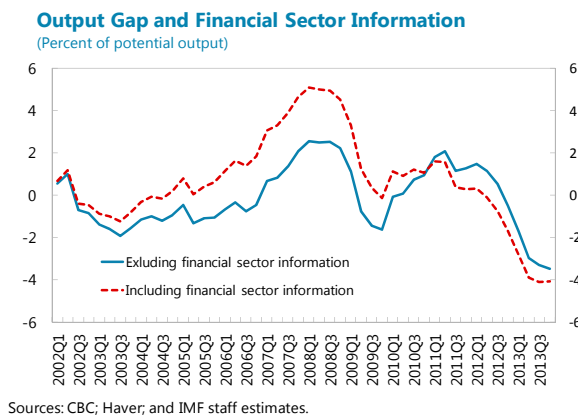
14.   The domestic crisis took a heavy toll on potential output. Investment declined abruptly in 2012, especially in housing construction, which fell by 62 percent between 2008 and end-2012. The banking crisis in 2013 exacerbated the downturn, with all sectors of activity contracting sharply. As a result, the unemployment rate rose to close to 17 percent at end-2013, almost double its level at end-2011, and four times as high as at end-2008. Long-term unemployment also increased, with 42½ percent of the unemployed at

Unemployment Rates
(Percent)

Legend: Unemployment rate, Youth unemployment rate, Long-term unemployment rate, Labor force participation rate (right scale)

Sources: Cystat; and Eurostat.

end-2013 having been out of work for at least one year. Youth unemployed rose to 39½ percent at end-2013. Potential output growth is estimated at around -1.2 percent according to PF approach, driven by the fall in employment and declining productivity.
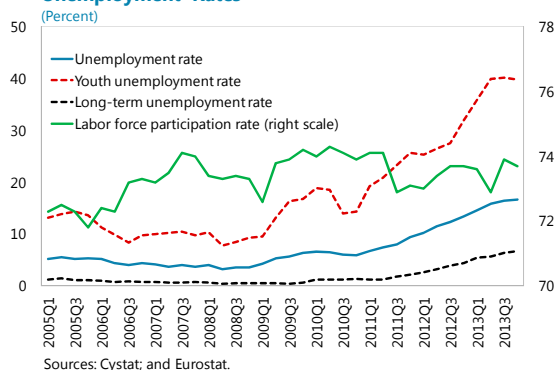
15.   The model incorporating the financial cycle points to broadly similar estimates of the potential-output growth rate. According to this methodology, which adjusts for imbalances created by unsustainable credit and housing price growth, potential output during the boom period (2002–08) was estimated at 3.0 percent—somewhat lower than the estimated results from the more traditional methods (3.4-3.6 percent). This implies that the output gap was relatively higher during the boom period than that predicted by standard methods. Since the beginning of the bust period, the model suggests that potential growth was at 1.3 percent during 2009–11, and -1.7 percent in 2012–13, close to the previous methodologies. In terms of the output gap, the model suggests a higher output gap during the boom times and a correspondingly lower one in the more recent period.

Output Gap and Financial Sector Information
(Percent of potential output)

Sources: CBC; Haver; and IMF staff estimates.

Cyprus: Potential Output Growth
(Percent)

Sources: Cystat; Eurostat; Haver; and IMF staff estimates.

E. Projecting Cyprus's Long-Term Potential Growth

16.   We use the production function approach to estimate potential growth over 2015–20:

- **Labor:** Employment is projected to grow at around 1 percent per year, in line with Eurostat's population growth projections. The relatively lower employment growth compared to the pre-crisis period reflects a likely loss of human capital which can also be permanently affected, owing to hysteresis effects, and to individuals leaving the labor force after long unemployment spells. The large immigrant inflows associated with the construction boom are also expected not to be repeated.

- **Capital:** Capital accumulation is expected to slow to 2.5 percent per year, compared to an average of 5 percent per year prior to the crisis, when the economy was catching up to the EU. This deceleration also reflects physical capital becoming idle and eventually obsolete.

- **Productivity:** TFP growth is expected to be linked with long-term trends in education, at a pace of 1.3 percent per year.

17.   The projected potential output growth rate of 2 percent is lower than the pre-crisis average. As noted above, this reflects a long-lasting impact of the crisis on capital and labor inputs. As a result, capital, and to a lesser extent labor, are expected to contribute relatively less to potential growth compared to the pre-crisis period. Total factor productivity will have a relatively larger role, as resources are expected to be reallocated away from capital intensive sectors (such as construction) to more labor-intensive service sectors with high productivity (like professional services) which Cyprus has a comparative advantage.

Contribution to Potential Growth
(Sum=100)

	1996-2008	2015-20
Capital	30.9	20.0
Labor	47.7	40.0
TPF	21.3	35.0

Source: IMF staff estimates.

18. **The estimates are sensitive to the underlying assumptions, in particular on employment.** Given Cyprus's large share of labor in production function, potential output is particularly sensitive to labor growth. Every one percentage point increase in employment growth will result in an increase of potential output by 0.8 percentage point. For capital accumulation, every one percentage point increase in the rate of capital accumulation will deliver close to 0.2 percentage point increase in potential output.

Future Potential Growth (2015-20)

	2015-2020		Sensitivity analysis	
	Average values	Contribution to potential	Values	Contribution to potential
Capital	2.5	0.4	1ppt	0.2ppt
Labor	1.0	0.8	1ppt	0.8ppt
TFP		0.7		
o/w				
Capacity Utilization	0.0	0.0		
Average Hours Worked	0.0	0.0		
Education	1.6	1.3		
Residual		-0.6		
Potential Growth		**2.0**		

Source: IMF staff estimates.

19. **The production function approach is used to estimate the medium-term output loss due to the crisis.** We follow the methodology of Ball (forthcoming). Actual output (Y) is based on actual data and the latest macroeconomic projections for Cyprus. Potential output Y* is estimated as noted above, based on the production function methodology. The potential output (Y**) that would have been attained without the crisis is taken from IMF (2010), which also used a production function approach with data through 2010 to project long-term potential output.

Potential and Actual Growth Rates (Percent)

	Average growth	Output loss against Y** (2015)
Potential output without crisis (Y**)	3.8	NA
Potential output, 2009-2015 (Y*)	0.1	22.3
Actual and projected, 2009-2015 (Y)	-1.5	31.1

Sources: WEO; IMF (2010); and IMF staff estimates.

20. **Our results indicate a large loss in actual and potential output due to the crisis.** Actual output in 2015 is estimated to be 31 percent below its level in the absence of the crisis. Potential output is 22 percent below its "no-crisis" counterfactual. In cross-country comparison, Cyprus is estimated to have suffered one of the largest losses in output due to the crisis, after Greece and Ireland. Pashardes and Pashourtidou (2013) estimated an output loss relative to projected GDP for the period 2012–20 (as opposed to 2009–15 analyzed in this paper) around 17–48 percent based on different potential growth assumptions.

Actual vs Potential Output, 2015
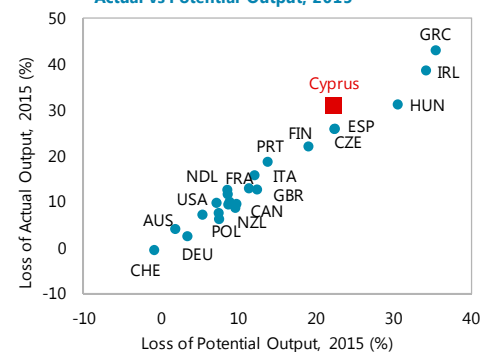
Sources: Ball (2014), and IMF staff estimate.

F. Concluding Remarks

21. **This paper uses several approaches to estimate the potential output growth in Cyprus.** We find that potential growth was strong but gradually declining over 1996–2008, with the decline accelerating in 2009–11. Potential growth turned negative since 2012, as a result of a domestic downturn that culminated in a banking crisis in 2013. The crisis is likely to have a long-lasting impact on Cyprus's potential growth, given losses to both physical and human capital. As a result, potential growth is estimated to reach only 2 percent over the long term, half its pre-crisis level, driven by modest growth in the labor force—underpinned by long term demographic trends—and education-led productivity improvements. Capital accumulation is projected to remain subdued, as corporate

deleveraging continues and the economy shifts away from construction and financial services toward tourism and other business services where Cyprus has a comparative advantage.

22.   Structural reforms could help to boost Cyprus's long-term potential growth rate. Given the high share of labor in production, improving labor market and labor productivity is essential to enhancing potential growth. While wages exhibited flexibility in the aftermath of the crisis, it will be important to ensure that wages and productivity remain aligned. Moreover, with high youth and long-term unemployment, active labor market policies to reactivate the unemployed, in particular through vocational training and educational programs for workers, could be helpful to boost long-term growth. Finally Cyprus could improve on other structural indicators where it lags relative to best practice, including by: (i) opening up of closed professions by streamlining licensing restrictions; (ii) removing barriers to competition, including protection of firms and price controls; (iii) reducing red tape; (iv) strengthening the legal system; and (v) fostering innovation. Indeed, structural reforms in these areas are estimated to have a significant impact on growth (1.5– 3 percentage points (Cheptea and Velculescu, 2014; and IMF, forthcoming)).

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Appendix I. Methodology

Multivariate Model

The approach of the multivariate model, developed by Benes et al. (2010), is built around three equations evolving three gaps—the output gap (y), the unemployment gap (u), and the capacity utilization gap (c):

The inflation equation relates the level and the change of output gap to annual inflation, $\pi 4$:

$$\pi 4_t = \pi 4_{t-1} + \beta y_t + \Omega(y_t - y_{t-1}) + \varepsilon_t^{\pi 4},$$

where output gap is defined as $y_t = Y_t - \bar{Y}_t$.

The unemployment gap, u, is related to the output gap by Okun's law:
$$u_t = U_t - \bar{U}_t = \phi_1 u_{t-1} + \phi_2 y_t + \varepsilon_t^u.$$

The third equation is based on the assumption that capacity utilization gap, c, related to output gap, can help improve the potential output and output gap estimates:
$$c_t = C_t - \bar{C}_t = k_1 c_{t-1} + k_2 y_t + \varepsilon_t^c.$$

Given these relationships, the equilibrium variables are assumed to evolve dynamically by relating these gaps as follows:

$$\bar{Y}_t = \bar{Y}_{t-1} - \theta(\bar{U}_t - \bar{U}_{t-1}) - \frac{(1-\theta)(\bar{U}_t - \bar{U}_{t-20})}{19} + \frac{G_t^{\bar{Y}}}{4} + \varepsilon_t^{\bar{Y}},$$

$$\bar{U}_t = \bar{U}_{t-1} + G_t^{\bar{U}} - \frac{\Lambda}{100} y_{t-1} - \frac{\lambda}{100}(\bar{U}_{t-1} - U^{SS}) + \varepsilon_t^{\bar{U}},$$

$$\bar{C}_t = \bar{C}_{t-1} + G_t^{\bar{C}} + \varepsilon_t^{\bar{C}}$$

$\bar{Y}_t$ is the potential output, θ is the labor share in a Cobb-Douglas production function, and $G_t^{\bar{Y}}$ is an output growth trend, with
$$G_t^{\bar{Y}} = \tau G_{SS}^{\bar{Y}} + (1 - \tau)G_{t-1}^{\bar{Y}} + \varepsilon_t^{G^{\bar{Y}}},$$

where $G_{SS}^{\bar{Y}}$ is the steady state growth rate of output.

$\bar{U}_t$ is the NAIRU, U^{SS} is the steady state NAIRU, $G_t^{\bar{U}}$ is growth in equilibrium unemployment, with
$$G_t^{\bar{U}} = (1 - \alpha)G_{t-1}^{\bar{U}} + \varepsilon_t^{G^{\bar{U}}}.$$

$G_t^{\bar{C}}$ is the growth in trend capacity utilization, with
$$G_t^{\bar{C}} = (1 - \delta)G_{t-1}^{\bar{C}} + \varepsilon_t^{G^{\bar{C}}}.$$

Finally, the system is completed by adding the following equation:

$$y_t = \rho_1 y_{t-1} + \rho_2 (\pi 4_{t-1} - \pi 4^E_{t-1}) + \varepsilon_t^y,$$

where $\pi 4^E_{t-1}$ is the inflation expectation, which follows a random walk.

The full model is estimated by regularized maximum likelihood (Ljung, 1999), a Bayesian methodology. This method requires the user to define prior distribution of the parameters.

The following assumptions are made about steady-state levels and labor share:

Variable	Mnemonic	Value
Trend growth	$G^{\bar{Y}}_{SS}$	1.8
Long-run equilibrium unemployment	U^{SS}	6.1
Labor share	θ	0.83

Financially-neutral Estimate

This estimate is based on Borio et al. (2013), which was motivated by the observation that it is possible for inflation to remain low and stable, and yet for the output to be growing on an unsustainable path when financial imbalances build up.

Starting from the state-space form of HP filter:
$$\Delta y_t^* = \Delta y_{t-1}^* + \varepsilon_{0,t}$$
$$y_t = y_t^* + \varepsilon_{1,t},$$
where $y_t = \ln(Y_t)$, Y_t is real GDP, and $\varepsilon_{i,t}$, for $i=0$, 1, is assumed to be a normally and independently distributed error with mean zero and variance σ_i^2. To embed financial information in the output gap, the second equation can be written as
$$y_t - y_t^* = \gamma' x_t + \varepsilon_{2,t},$$
where x_t is a vector of financial variables. Since x_t is added only to the equation for the output gap, not to the first equation which represents potential output, x_t does not have a direct impact on potential output; while it has a direct impact on output gap. Financial variables considered in Borio et al. (2013) include real interest rate, real credit growth, and real residential property price growth. A Bayesian approach is adopted to estimate the state-space model.

Financial variables (x_t) included in this paper are real credit growth (i.e., credit growth adjusted for HICP inflation); real growth rate of residential housing price; real growth of general index of Cyprus stock exchange; HICP inflation rate; and industry capacity utilization. Data on credit is from the Central Bank of Cyprus; data on housing price, HICP, and industry capacity utilization are from Eurostat; and data on the stock exchange index is from the Cyprus Stock Exchange. Quarterly data are used, and the period covers from 1995: Q1 to 2013: Q4 to the extent that data are available.

THE HOUSING MARKET IN CYPRUS: FROM BOOM TO BUST[1]

A. Introduction

1.   Cyprus experienced a large housing boom, which turned to bust at the onset of the global crisis. Housing prices had been on an increasing trend since 2002. This trend accelerated in 2004, when Cyprus joined the EU, with residential property prices increasing by nearly 30 percent y-o-y, compared to an average annual increase of 3 percent in the previous 2 years. Prices continued to rise rapidly thereafter, and, as a result, they more than doubled in the five years between 2003 and 2008, recording the second highest growth in the euro area during this period, after Estonia. The housing bubble burst when the global crisis erupted, and by the first quarter 2014, they fell by 26 percent from their peak in 2008.

Housing prices
(Index, 2004Q1=100)
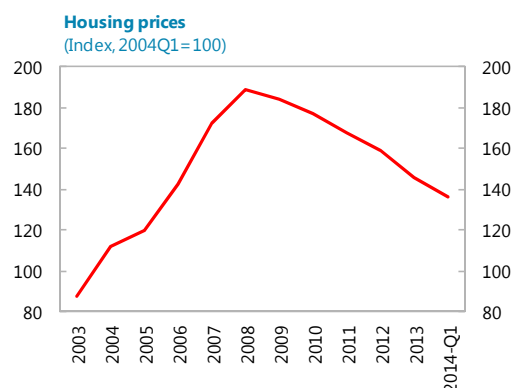
2.   The evolution of Cyprus's house prices raises questions about their future dynamics and effect on the economy. Despite their fall since 2008, current house prices remain substantially higher than their level in 2003, which raises questions about their likely future direction. Their future dynamics have important implications for economic activity via domestic demand and financial stability. They affect households' wealth and banks' profitability—through mortgage-collateral values and provisioning—and therefore consumption and investment.

3.   This paper quantifies the house-price overvaluation gap, which is estimated at around 7–14 percent. First, the paper examines most common housing ratios, such as the price-to-income, real house prices, and price-to-construction costs. Their current values are compared to their long-run values to derive the house price valuation gap. These methods point to a valuation gap in the range of 0–20 percent with an average of 7 percent. Second, a housing market model is developed, and the valuation gap is derived by incorporating estimated long-term values of exogenous variables into the model. The model suggests a valuation gap of 14 percent.

B. The Boom and Bust

4.   During the boom period, the demand for housing was boosted by both domestic and external factors. The most important domestic factors were declining mortgage interest rates and abundant bank liquidity. The interest rate on housing loans declined from above 7 percent in 2004

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[1] Prepared by Jiri Podpiera (EUR).

to below 5 percent in 2010 (even though it remained relatively higher than the euro area average). At the same time, the average growth of housing loans accelerated from 6.5 percent in 2002–05 to 17 percent in 2006–10, and translated into a rapid increase in the debt service ratio of households. Cyprus's entry into the EU in 2004 and removal of restrictions on external payment flows led to an increase in demand of non-residents for Cypriot housing. This was reflected in large FDI inflows into real estate, as well as bank loans to non-residents. FDI originated largely from European countries, equally split between the EU25 and non-EU countries (such as Russia and Ukraine).

5.   **Housing supply responded through a large construction boom.** The construction sector benefitted from low interest rates and FDI inflows. As a result, the stock of dwellings increased by 25 percent during 2005–10, with the issuance of building permits in 2007–09 higher by 70 percent compared to its level in 2002–03. Despite the construction boom, construction costs (excluding land) continued to increase at an average yearly rate of close to 5 percent (see Cystat, 2012).

6.   **Following the onset of the global crisis in 2008, Cyprus's housing boom turned to bust**. A slowdown in foreign inflows reduced external demand for Cypriot housing. Moreover, with a slowing economy after 2009 and an increase in the unemployment rate, loan defaults started to rise, curbing bank lending and thus domestic demand for housing. The construction sector contracted significantly following the moderation in housing demand. Housing prices have been falling since end-2008.

7.   **The Cypriot housing-market cycle resembles other historical episodes.** Helbling (2005) quantified boom-and-bust episodes in 18 cases during 1970–90 by measuring the growth in real house prices in the two years prior to their peak and the depth and length of their subsequent declines. In the two years prior to their peak, real house prices in Cyprus increased by 33 percent, similar to the cross-country verage of 32 percent. However, in Cyprus, the boom had been longer and more pronounced, with prices rising by about 100 percent between 2003 and 2008. During the bust, real house prices have declined by 26 percent since their peak, compared to the average decline of 27 percent over the average length of historical busts of 4–5 years. Nevertehless, house prices in Cyprus have not yet shown signs of having reached a trough, and a further decline may be possible (as will be discussed in the remainder of the paper).

Housing prices
(Index, 2002Q1=100)

8.   **Compared to Ireland and Spain, Cyprus's housing prices adjustment has been similar on the upside but slower on the downside.** Cyprus recorded a similar house price increase as in Ireland and Spain
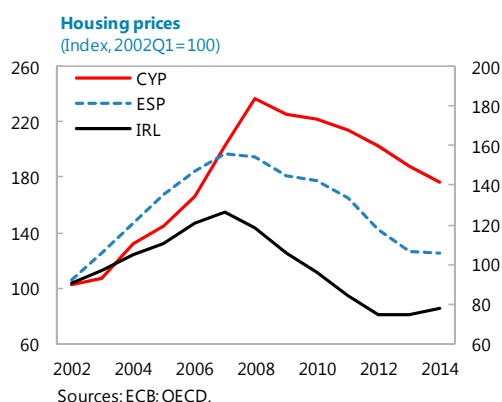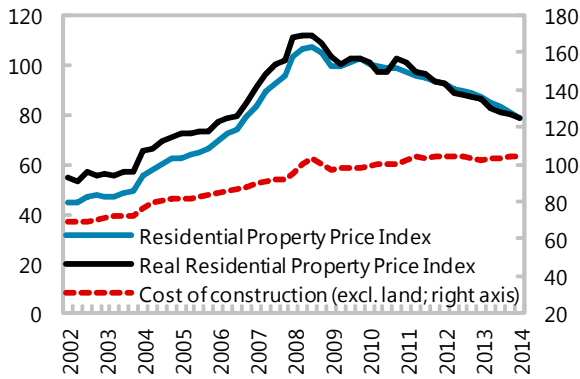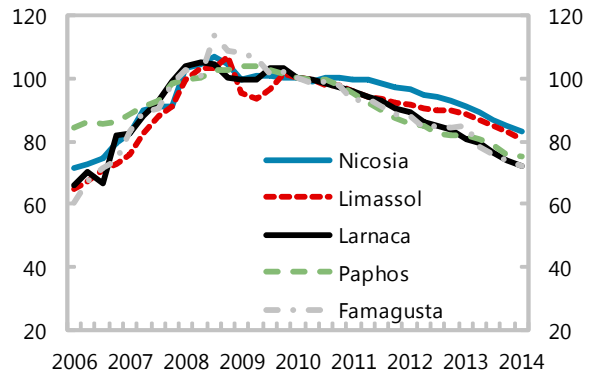
Sources: ECB; OECD.

Figure 1. Cyprus: Housing Market, 2002–14

Residential Prices and Construction Cost
(2010 = 100)

- Residential Property Price Index
- Real Residential Property Price Index
- Cost of construction (excl. land; right axis)

Sources: Haver and IMF Staff calculations

Regional Price Development
(2010=100)

- Nicosia
- Limassol
- Larnaca
- Paphos
- Famagusta

Sources: Central Bank of Cyprus

Foreign Direct Investment
(Accumulated Stock since 2002, Bn Euro)

- FDI (inward into construction)
- FDI (inward into real estate)
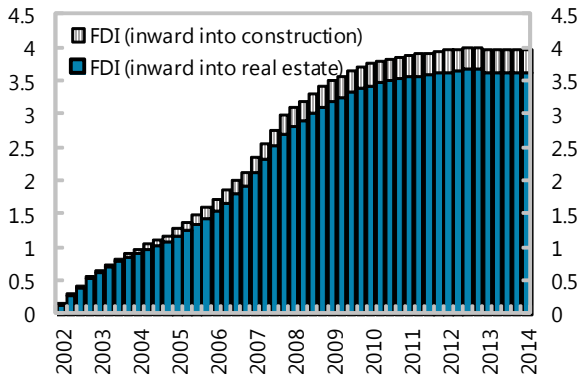
Sources: Central Bank of Cyprus

Housing Loans
(Stock, Bn Euro)

- Euro Area residents
- Nonresidents
- Domestic residents
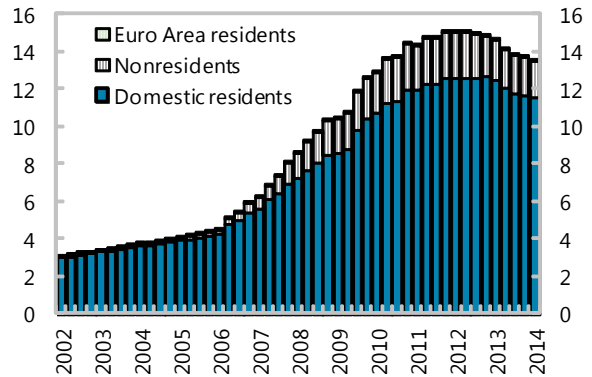
Sources: Haver

Debt Service Ratio and Mortgage Interest Rate
(Percent)

- Debt service ratio
- Mortgage interest rate (right axis)
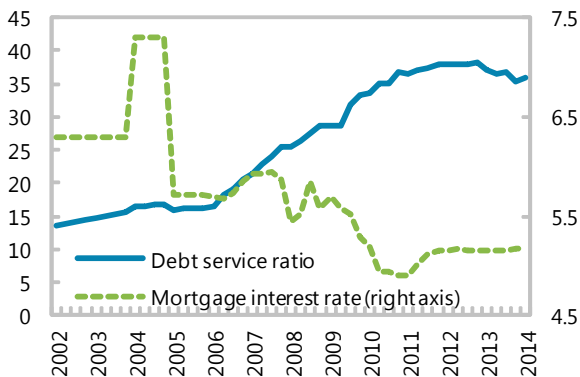
Sources: Haver and IMF Staff calculations

Residential Construction

- Dwellings ('000 units)
- Building permits ('000 sqm; right axis)
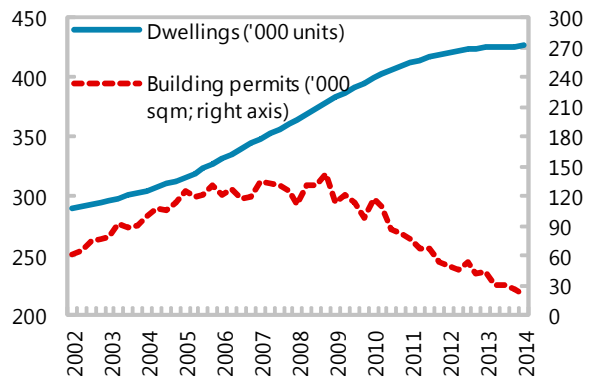
Sources: Cystat and IMF Staff calculations

during the boom.[2] However, its house price adjutsment of 25 percent relative to the peak in a five-year period has been slower than in Ireland and Spain, which experienced a full unwinding of the boom (i.e. declines of 60–70 percent relative to the peak) over a period of 6 years.

C.   Methodology

9.   In the first step, the house-price valuation gap is measured by deviations of the following three ratios from their long-term average:[3]

- Real house prices: Although house prices relative to the overall price level could exhibit some short-term persistent deviations, they tend to revert to the mean in the long term. This is because the share of households' expenses for housing, which is one of the items in the consumer basket, generally tends to remain stable in the long term relative to the rest of the consumer basket. Despite some caveats related to structural breaks, the deviation of house prices from the overall price level has been commonly applied in the literature.[4]

- Price-to-income ratio: The literature finds a robust co-integration relationship between house prices and income. For instance, Barot (2001) finds such evidence in the Swedish housing market during 1970–90. His findings are echoed by Kasparova and White (2001), who studied house prices in Germany, Sweden, Netherlands, and the U.K. during the same period. These findings are intuitive, since the average income is a key variable determining how much an individual can borrow and pay for housing, suggesting that the price-to-income ratio should revert to its mean in the long term.

- Price-to-cost ratio: This is calculated as the ratio of house prices—including the land price, construction costs, and the developers' markup—to construction costs. It essentially measures the evolution of the price of land, assuming constant markups. However, it is likely that along the housing market cycle markups vary, as competition would be higher in the boom phase as additional companies enter the market, while it would be lower in busts, as firms exit. Cyclical movements in the markup may temporarily understate/overstate production costs in boom/bust periods. Nevertheless, in the long term, assuming that land is not constrained (given planning policies that expand areas for building development),growth in house prices is expected to reflect construction costs, and the price-to-cost ratio would revert to the mean.

The long-term average is calculated from data during the last 20 years to account for data consistency and availability.

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[2] While construction relative to GDP was lower than in Ireland and Spain, the increase in completed dwellings was similar.

[3] see IMF (2013a,b), Baker (2006), and UBS (2012).

[4] IMF (2013a).

10.   In the second step, a simultaneous supply-demand model is estimated to determine factors behind the housing market dynamics. The model's specification builds on Kasparova and White (2001) and Tumbarello and Wang (2010) and is extended for FDI inflows to account for Cyprus's specific circumstances. The model (expressed in logarithms) is as follows:

$$P = f\left(S, wY, \frac{E}{pop}, FDIre\right)$$
$$S = f(P, S_{t-2}, r, FDIc)$$

- **Real house prices (P)** depend on the housing stock (S), employment relative to population (E/pop), inward FDI into real estate (FDIre), and the interaction between average income (Y) and the share of income devoted to servicing a mortgage, which is the debt-service ratio (w, see below). An increasing ratio of employment to population is expected to raise demand and lead to an increase house prices. On the contrary, house prices would tend to decline as the housing supply increases.

- **The debt-service ratio** represents a metric for assessing the prudence of bank lending standards: if banks maintain constant lending standards and lend based on clients' capacity to repay, the debt-service ratio would stay constant as debt would grow in line with the increase in income. However, if banks relax lending standards (such as by lending primarily based on collateral value rather than income criteria), the debt service ratio would increase along with increasing debt. Therefore house prices are expected to be increasing with income and the debt service ratio. The debt-service ratio is calculated from the net present value of average income (see Drehmann and Juselius, 2012):

$$w = \frac{D*i}{(1-(1+i)^{-n})*Y},$$

    where D represents household debt, i is the mortgage interest rate, and Y is the quarterly average household income. The average number of remaining maturity of loans is assumed—consistently with calculations in ECB (2013; p. 66)—to be 15 years. Therefore, the number of quarterly outstanding loan re-payments $n = 60$.

- **The housing stock *(S)*** is a function of investment in housing and the lagged housing stock. Investment in housing depends on the interest rate (*r*), price of dwellings (*P*), and the inward FDI into the construction sector (*FDIc*). Time to build is assumed at about 2–3 quarters.[5] The housing stock is expected to be increasing with house prices. As profits rise, this would attract entry and FDI, further increasing supply. On the other hand, supply is inversely related to interest rate, since higher rates increase the cost of capital and reduce profitability.

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[5] The correlation between the change in the housing stock and issued building permits is the strongest (95 percent) when using the two to three quarterly lags.

D. Results

Common House-Price Ratios

11.   The valuation gap based on various house price ratios confirms the boom and bust cycle (Figure 2). The gap tracks the evolution of the three ratios against their long-term average. Although there is variation across the three ratios, they all suggest that the house price boom started around 2004–05 and the bust commenced around 2008–09. This trend holds even under alternative equilibrium asumptions. For instance, using the long-term average during 1995–2005 (excluding the recent boom and bust period) still identifies the boom starting early 2004, while an average through 2008 (excluding only the bust) points to the boom starting in late 2004.

12.   The ratios point to an average valuation gap of around 7 percent at 2014:Q1. While real house prices and the price-to-cost ratio appear to have reached their long-term levels, the price-to-income ratio was still some 20 percent above its long-term average, in part due to the sharp decline in income in the current recession. Using the 2012 income level for the price-to-income ratio (to account for the large GDP decline in 2013–14), the valuation gap falls to 8 percent. Averaging across methodologies, the valuation gap would be around 7 percent. If alternative long-term bechmarks are used instead (such as 1995–2005 and 1995–2008), the valuation gap could increase by 10/15/20 percent under the price-to-income/price-to-cost/ real house price ratios.

13.   On the basis of these ratios, Cyprus's boom was the second largest in the euro area. Cyprus's peak overvaluation was around 30–50 percent in 2008, higher than all other eur-area countries except Estonia, which experienced an 45–65 overvaluation at the peak of its market in 2007. Currently, the euro-area average house prices hace adjusted and stand at their long-term values. However, this masks cross-country variation, with Cyprus, France, Belgium and Austria still exhibiting some overvaluation relative to long-term values, while prices in Estonia, Ireland, Spain and Greece have undershot their long-term values by 10–30 perccent.

Housing Market Model

14.   The model was estimated on the basis of data covering 2002:Q1–2014:Q1 (Table 1). All parameters are significant and enter with the expected sign: a percentage increase in real FDI into real estate, share of income servicing mortgage, and employment relative to population, pushes up real house prices by 0.67, 0.54, 0.75 percentage points, respectively. A percentage increase in stock of dwelling lowers real house prices by 3 percent. Similarly, housing supply increases by 0.003 and 0.012 percentage points with a percentage increase in real FDI into construction and house price increase, respectively. The housing stock growth declines by 0.002 percentage points with a percentage point increase in the interest rate. Although there are several methodological differences with the mainstream literature—primarily the use of co-integration, as in Kasparova and White (2001) and Barot (2001)—the key results are consistent. Cyprus's long-term elasticity of real house prices to income and interest rate of 0.29 and 0.08, respectively, falls into the ranges found in these studies: 0.2–0.9 and 0.003–0.13, respectively.

15.   The model suggests that the boom was driven by FDI and rapid credit growth, while still rising supply in a declining economy with falling employment contributed to the bust (Figure 3). The reduced-form equation for the demand was derived by substituting supply into demand function, using estimated parameters from 3SLS (Table 2). Inward FDI into the real estate pushed up prices by an average of 12 percent per year during 2004–08, while mortgage credit growth added another 7 percent per year. The contribution of real income to the price increase was small, suggesting that banks relaxed lending standards (by relying more on collateral values than on borrowers' capacity to repay). Demand pressures were partly mitigated by an increase in housing supply, which lowered prices by 9 percent per year, on average. As supply continued to rise even after the economic downturn started in 2009, this continued to put downward pressure on house prices by 5 percent annually on average. Declining employment added to the price decline, and FDI disappeared. Bank mortgage lending supported prices, although this trend reversed in 2013.

16.   The model suggests a valuation gap relative to the equilibrium of close to 14 percent in 2014:Q1. The estimated parameters were applied to the long-term averages of the explanatory variables to derive the equilibrium growth rate. An equilibrium debt-service ratio of 15 percent was used, in line with the euro-area average (ECB, 2013). The valuation gap was derived as the difference between the actual real house price growth rate during 2002–2014:Q1 and the equilibrium cumulative growth rate (Table 2). The current gap of 14 percent is driven by the excessive growth in the debt-service ratio. This suggests that further household deleveraging is needed to facilitate the housing price adjustment toward its equilibrium.[6] The speed and magnitude of further house price adjustment will also depend on the performance of the economy, which could help buffer the further fall in prices by generating employment and income growth. Nevertheless, house prices could even undershoot the equilibrium if income and employment continue to decline
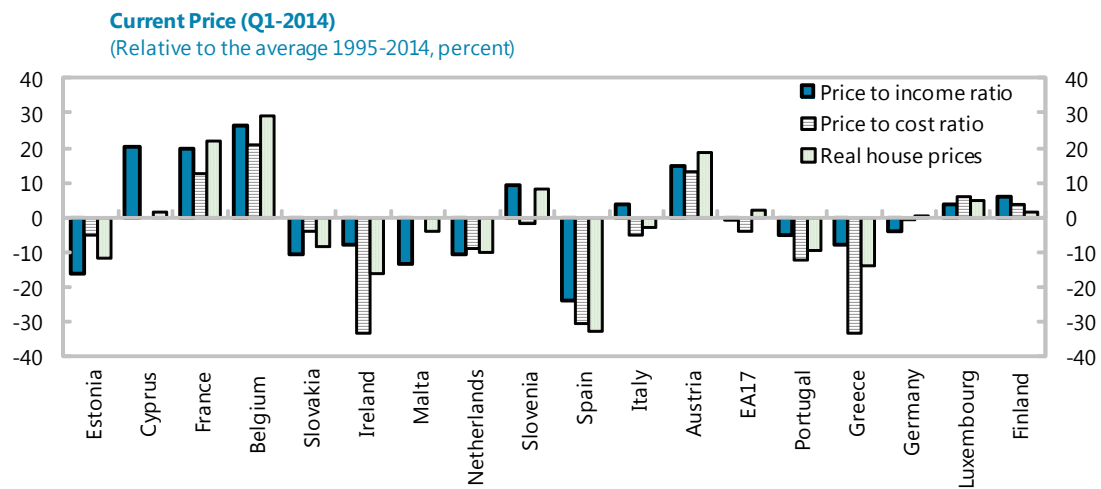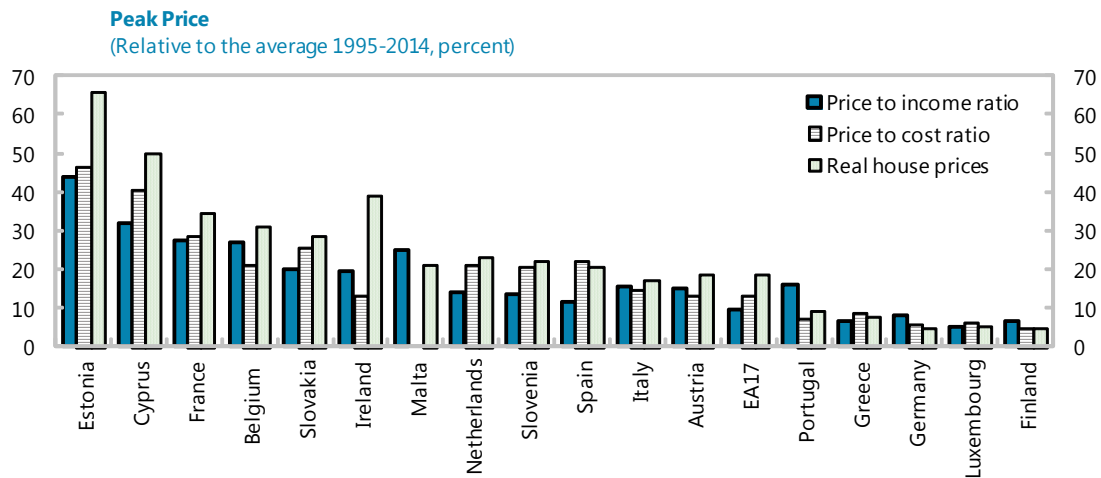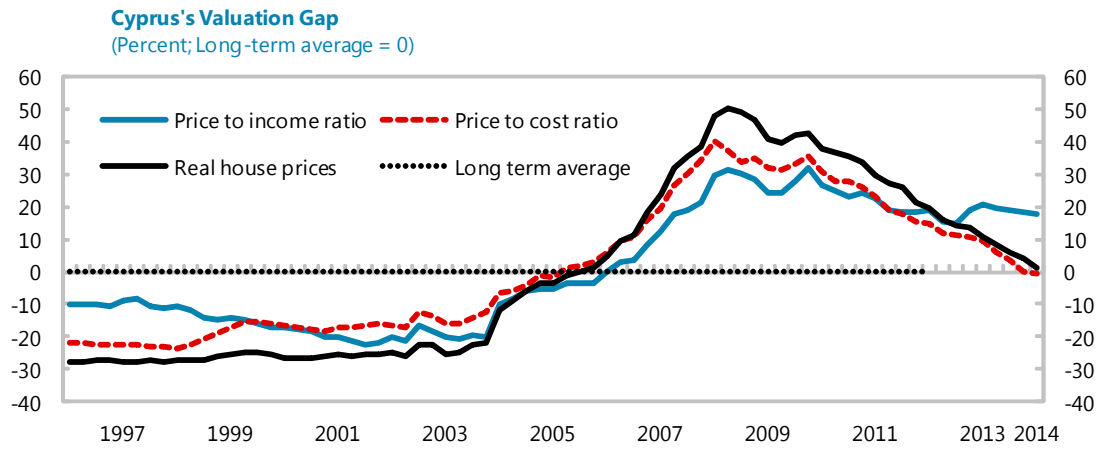
E.   Conclusion

17.   This paper analyzed the housing market boom and bust in Cyprus. The boom, which took place during 2004–08, was among the largest in the euro-area, and was driven by FDI and rapid credit growth. The bust was triggered by a decline in FDI following the onset of the global crisis in 2008 and was exacerbated by falling domestic output and employment starting with 2009.

18.   Despite their sizeable decline to date, housing prices may have further room to fall before reaching equilibrium. House prices have already declined by 26 percent since their peak in 2008. However, according to common house price ratios, the overvaluation gap is around 0–20 percent, with an average across methodologies of 7 percent. According to a housing market model, the valuation gap is around 14 percent.

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[6] See IMF (2013c).

Figure 2. Cyprus: Valuation Gap, 1995–2014

Cyprus's Valuation Gap
(Percent; Long-term average = 0)

Peak Price
(Relative to the average 1995-2014, percent)

Current Price (Q1-2014)
(Relative to the average 1995-2014, percent)

Sources: Haver and IMF Staff calculations

Table 1. Results of the Housing Market Model

|	ln(real house prices)	ln(stock of dwellings)
ln(stock of dwellings)	-3.1***(0.4)	
ln(real income x debt service ratio)	0.54***(0.1)	
ln(employed/population)	0.75**(0.3)	
ln(real inward FDI into real estate)	0.67***(0.06)	
intercept	39.8***(4.7)	
ln(real house prices)		0.012***(0.004)
ln(stock of dwellings, lagged two quarters)		2.1***(0.17)
ln(stock of dwellings, lagged three quarters)		-1.12***(0.17)
interest rate		-0.002***(0.001)
ln(real inward FDI into construction)		0.003***(0.001)
intercept		0.53***(0.08)
Observations	47	47
White's heteroskedasticity test 1/	$\chi2(34)=45$; (0.11)	$\chi2(34)=37$; (0.31)
Durbin-Watson autocorrelation test 1/	d(8,46)=0.8	d(8,46)=1.5
R2	0.96	0.99

Note: 1/ Tests performed on first stage residuals. Standard errors in parentheses. Stars denote significance: *** $p<0.01$ and ** $p<0.05$. Real values obtained using HICP.

Table 2. Valuation Based on Reduced-Form Housing Market Model

	Coefficient	Long-term growth 2002-14 (y-o-y, percent)	Contribution to equilibrium house price growth	Valuation gap in Q1-2014 2/
dln(real income)	0.29	1.2	0.3	
dln(debt service ratio) 1/	0.29	1.0	0.3	
dln(employed/population)	0.40	-0.6	-0.3	
dln(real inward FDI into real estate)	0.36	13.7	5.0	
dln(real inward FDI into construction)	-0.12	26.3	-3.0	
d(interest rate)	0.08	-0.1	0.0	
Total			2.3	14.3

Note: 1/ Sustainable debt service ratio was assumed at 15 percent - the euro area average (ECB, 2013). 2/ Valuation gap is the difference between the actual and equilibrium cumulative house price growth between 2002-2014Q1.

Figure 3. Cyprus: Housing Market Model, 2003–14
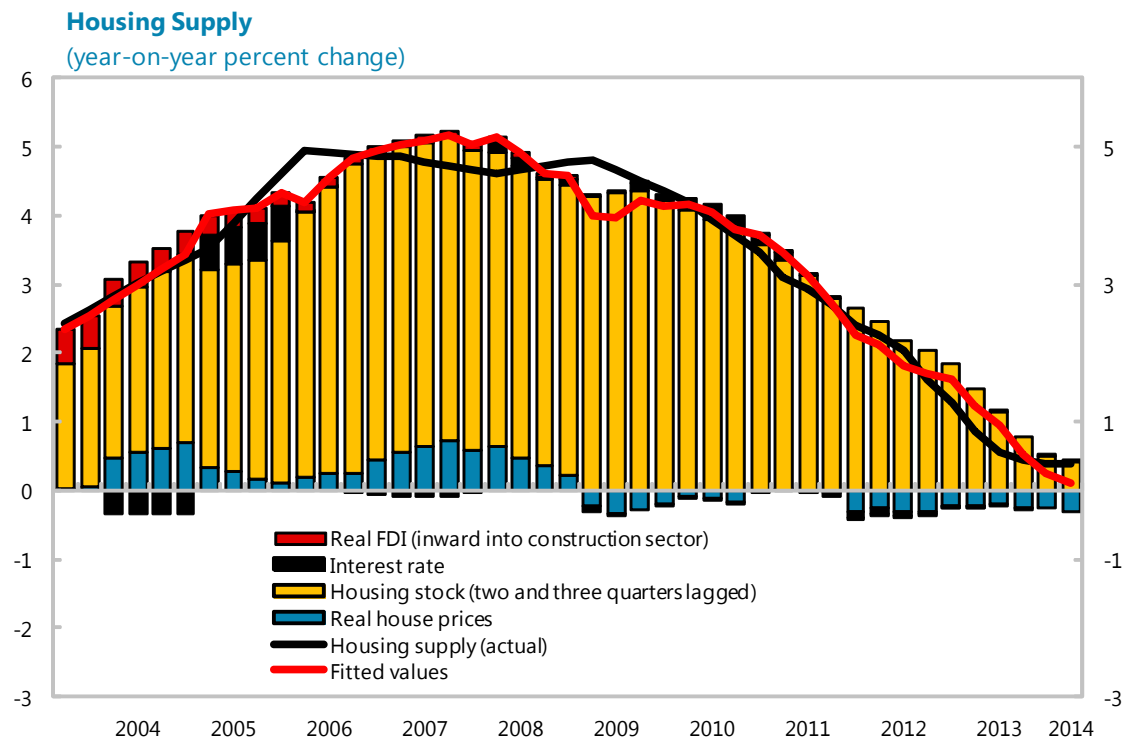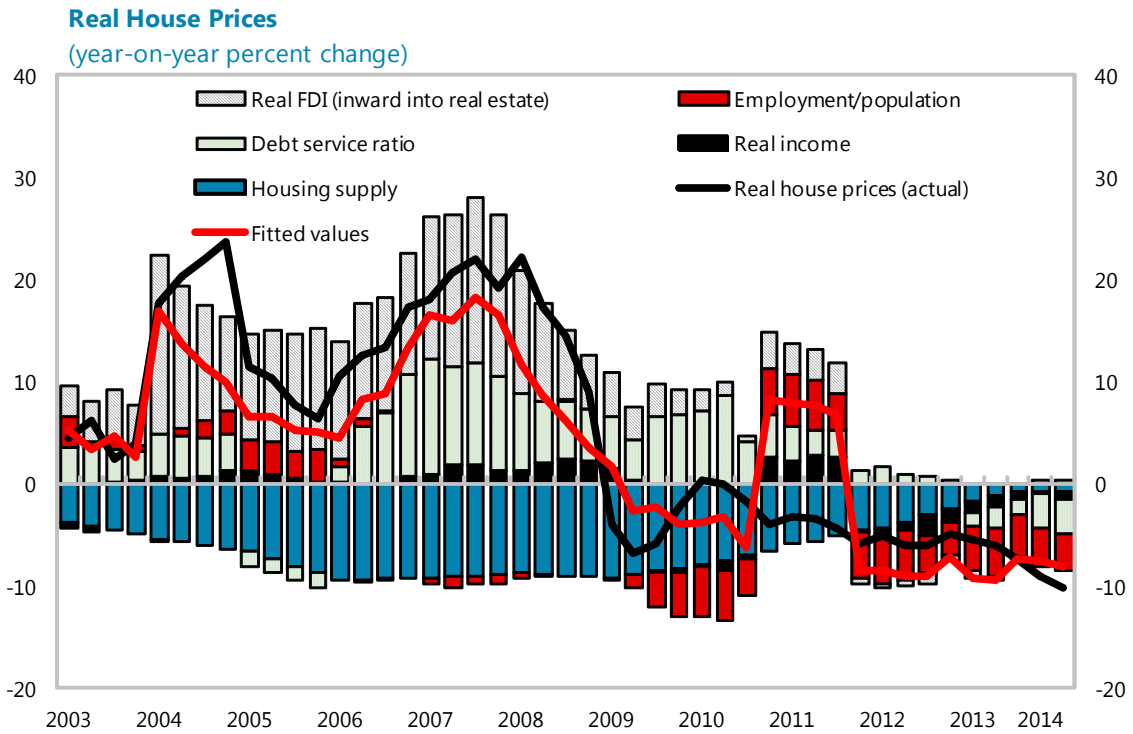
Sources: Cystat; Haver; and IMF staff calculations.

19.   The point estimates should be interpreted with care. The results are sensitive to the choice of long-run benchmarks. In the case of simple ratios, an alternative plausible choice of the benchmark long-run period affects the valuation gap. Similarly in the case of the model-based valuation gap, using plausible alternative long-run values for model's exogenous variables affects long-run equilibrium house price growth and the valuation gap. Therefore, the valuation gap carries a confidence interval of ±10 percent.

20.   The risk of an undershooting of the equilibrium cannot be excluded. Indeed, this has been observed in several other countries that experienced large boom-bust cycles. Declining house prices affect households' wealth and hence consumption behavior, which in turn affects aggregate demand and incomes. Moreover, declining collateral values affect banks' balance sheets and their ability to lend, with detrimental effects on growth. Such feedback loops can exacerbate the fall in prices in the short run.

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Appendix I. Data and Estimation Method

The price of dwellings is derived from the residential property price index and a price survey.
The quarterly residential property price index is compiled and published by the Central Bank of Cyprus (CBC) and runs from 2006 to 2014. The index comprises prices from all five regions (Famagusta, Larnaca, Limassol, Nicosia, and Paphos) and covers apartments and houses. For the earlier period, 2002–05, the CBC has another index which is an average of the Pashardes-Savva index, the BuySell index, and an internal index of the CBC. In addition, since 2010, RICS (2012) conducts regular quarterly surveys about price level per square meter, which were used (prices in 2010) in combination with the available price indexes to derive actual square-meter prices in 2002–12. The price index for 1995–01 was derived through interpolation of house prices in 1983 (derived through cost of construction per square meter, Cystat, 2010, and the average difference between house prices and construction costs observed in 2002–13) and square-meter house prices in 2002.

The remaining data comes from Cystat, Haver, and CBC. Housing stock and construction cost statistics are published in Cystat (2010) for 2002–10, and the more recent data were derived using statistical relationship between building permits, construction costs and completed private dwellings. The average monthly earnings, housing loans by MFIs, FDI, population, employed persons, and the construction cost index are from Haver, and few missing quarterly data were interpolated. Interest rates on housing loans are published by the CBC.

The model has been estimated using 3SLS, following Greene (2003). In the first step, Ordinary Least Squares have been employed to estimate a reduced-from model, that is, a specification, where all exogenous variables are used as explanatory variables (instruments) for both, house price and quantity equations, irrespectively of economic relationships. The fitted values for house price and quantity replaced the actual price and quantity explanatory variables in the structural specification estimated in the second step, which yields unbiased structural parameter estimates of the whole simultaneous system. However, the second step standard errors were not estimated most efficiently since this step does not allow for non-zero co-variances in the variance-covariance matrix of the system of equations. This is introduced in the third step, which improves efficiency of parameter estimates.

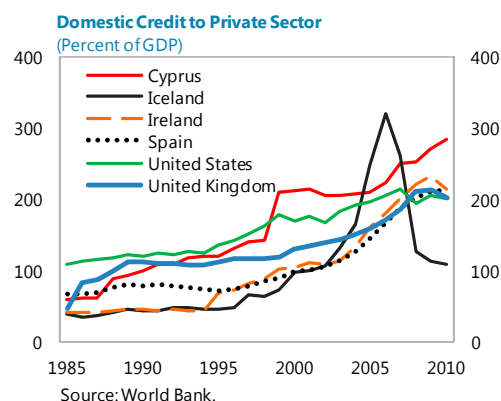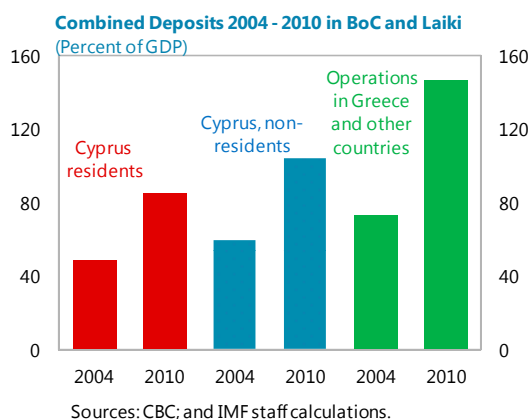# CYPRUS'S BANKING SECTOR: THE CRISIS AND ITS AFTERMATH[1]

A. A Short Retrospective

The Boom

1. Since 2000, Cyprus's banking system expanded rapidly. The system grew from about 360 percent of GDP in 2002 to about 750 percent in 2010. Of this, domestic banks represented over 600 percent of GDP. The sector was highly concentrated, with the two largest domestic banks, Bank of Cyprus (BoC) and Laiki Bank, constituting almost 500 percent of GDP by 2010. The cooperative credit sector added a further 100 percent of GDP.

Banking System Growth
(Percent of GDP)

Sources: CBC; and IMF staff calculations.
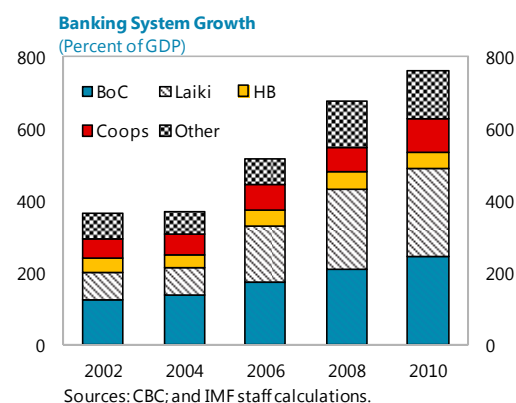
2. This growth was financed by a rapid increase in foreign deposits, which facilitated a rapid expansion of domestic credit. Non-resident deposits in Cyprus increased by 50 percent during 2000–10. Banks also expanded abroad, notably in Greece, where deposits increased by 75 percent. This allowed banks to expand credit much faster than peers, with domestic credit to private sector increasing from about 212 to 284 percent of GDP during 2000–10. This fuelled a rapid boom in the property market in Cyprus, which burst in 2009.[2] Even after the global financial crisis began in 2008, deposit and credit growth continued to increase in Cyprus through 2010.

Combined Deposits 2004 - 2010 in BoC and Laiki
(Percent of GDP)

Sources: CBC; and IMF staff calculations.

Domestic Credit to Private Sector
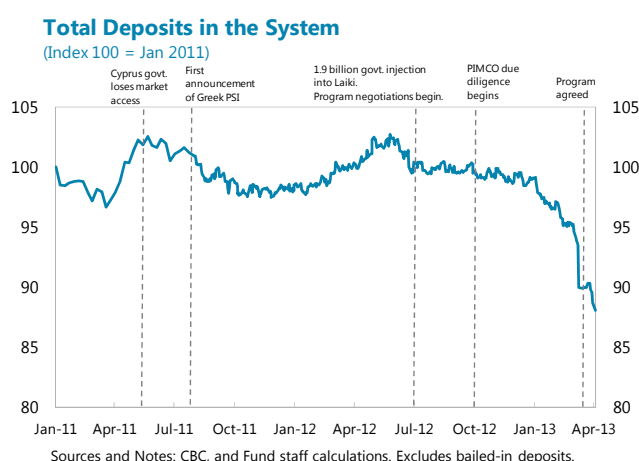(Percent of GDP)

Source: World Bank.

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[1] Prepared by Ruchir Agarwal and Oliver Wuensch (MCM).

[2] See Selected Issues Paper "The Housing Market in Cyprus: From Boom to Bust".

The Crisis

3.   Cypriot banks came under pressure as the domestic economy started to falter and the Greek crisis intensified. Given banks' large exposure to the real estate market, asset quality deteriorated as the real estate boom turned to bust and growth came to a halt. The banks in Cyprus were heavily exposed to Greece with banks' holdings of Greek loans and Greek government bonds amounting to about 130 percent and 40 percent of Cyprus's GDP respectively at end-June 2011. The intensification of the Greek crisis led to an erosion of confidence in Cypriot banks and the sovereign, which lost market access in May 2011. The banks experienced deposit outflows as discussions on a restructuring of Greek debt started in mid-2011. As a result, banks had to resort to Emergency Liquidity Assistance (ELA) from the Central Bank of Cyprus (CBC).

Total Deposits in the System
(Index 100 = Jan 2011)

Sources and Notes: CBC, and Fund staff calculations. Excludes bailed-in deposits.

4.   The Greek PSI dealt a heavy blow to the Cypriot banks. As a result of the Greek debt restructuring, BoC and Laiki suffered combined losses of 25 percent of GDP. While BoC managed to attract capital to cover for the loss, Laiki required public support of €2 billion (10 percent of GDP) in 2012 to meet capital requirements according to an EBA bank assessment. At this point, the Cypriot authorities approached the IMF and European partners with a request for financial assistance. Despite this, deposit outflows continued, funded by ELA.

5.   In early 2013, an independent due-diligence bank assessment found the system to be largely economically insolvent and severely undercapitalized. The bottom-up assessment of banks' loan books found that both Laiki and BoC were economically insolvent as they had negative capital under the forward-looking baseline and stress scenarios. Total capital needs of the sector were estimated at above €10 billion. This was significant not only as a share of Cyprus's GDP (60 percent) but also in comparison with banking crisis costs in other countries.

The Policy Response

6.   Exceptional measures were adopted in March 2013 to address the crisis. With public debt already high (close to 90 percent of GDP at end-2012), recapitalizing the banks with public support was not feasible, as it would have rendered debt unsustainable. The authorities initially

sought to recapitalize banks by imposing a one-off stability levy all deposits (equivalent to about 2 year's interest earnings, and differentiated by size). However, this led to significant deposit withdrawals, as the strategy was perceived to violate insured deposits, requiring the imposition of cash withdrawal restrictions and a bank holiday. The levy was rejected by the Cypriot Parliament. Subsequently, the authorities intervened both Laiki and BoC. Laiki–considering the relatively larger capital needs – was split into a good bank and a legacy bank. The good bank was transferred to BoC—with sufficient assets to cover for insured deposits and ELA and allow for capital to meet regulatory minima—while uninsured deposits and other assets were left in a legacy unit to be wound down over time. BoC was recapitalized through a deposit-to-equity conversion of uninsured deposits, after full bail in of equity shareholders and bond holders. Its uninsured deposits were frozen. At the same time, Cypriot banks' Greek branches were ring-fenced and sold off to a Greek bank, on the basis of the valuation undertaken in the due diligence exercise.

7.   The authorities imposed domestic and external payment restrictions to protect financial stability. Banks opened on March 28, 2013 after almost two weeks of being closed. To protect the system from a potential deposit run, external capital controls and domestic deposit restrictions were put in place on withdrawals, cashing of checks, opening of bank accounts, extensions of term deposits and transfers of funds abroad.

CAPITAL AND DEPOSIT RESTRICTIONS

- ***Cash***:
    - Withdrawal limit: €9,000 per month
    - Export of bank notes limit: €2,000 per journey
- ***Checks, credit, debit***:
    - Cashing of checks prohibited
    - Use of credit card abroad limited to €5,000 per person per month
- ***Wire-transfers:***
    - Business transfers: > €300,000 domestic; > €20,000 cross-border → subject to approval
    - Individuals may transfer up to €3,000 to another domestic bank
    - Legal persons may transfer up to €50,000 to another domestic bank
- ***Prohibition to open new bank accounts***
- ***Extension of term deposits***

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8.   A program supported with international financial assistance was approved in May. Under the program the authorities developed a comprehensive banking sector strategy. The strategy aimed at: (i) completing the recapitalization of the banking sector; (ii) restructuring the sector; (iii) developing a strategy to gradually lift payment restrictions; and (iv) strengthening regulation and supervision.
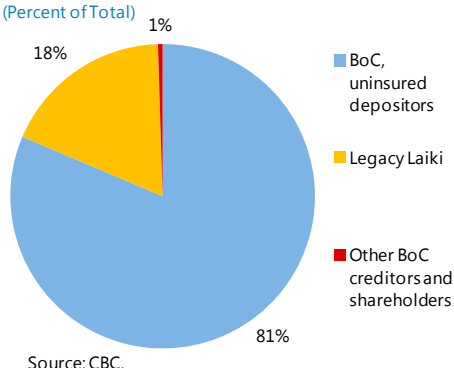
9.   In a first step, BoC's recapitalization was completed through additional bail in of uninsured deposits. In accordance with the new resolution law, BoC (including assets transferred from Laiki) was subject to a separate fair-value assessment. This served to reassess the final amount

of capital needs required to maintain a CT1 capital ratio above the regulatory minimum of 9 percent through end-2015. As a result, the total share of BoC uninsured deposits that were converted into equity amounted to 47.5 percent.

10.   This allowed the bank's exit from resolution at end-July. The ownership structure of BoC upon exit from resolution was heavily concentrated in its own uninsured depositors, who owned 80 percent of the bank. The rest was owned by Laiki's uninsured depositors, who were fully converted into equity and received an 18 percent stake in BoC in exchange for the assets transferred to BoC. To ensure that BoC could continue to finance deposit outflows through its liquidity buffers and expected loan repayments, the bulk of the remaining frozen uninsured deposits were restructured and converted into time deposits with 6, 9, and 12 month maturities, extendable by another 6, 9, and 12 months as needed.

Bail-in Amounts (Billions of euro)

	BoC	Laiki	Total
Uninsured deposits	3.9	4	7.8
Senior debt	0	0.1	0.2
Subordinated debt	0.6	0.8	1.3
Total	4.5	4.9	9.4

Sources: CBC; and IMF staff calculations.

Ownership of BoC
(Percent of Total)

Source: CBC.

Conversion and Release of Uninsured deposits

End-March 2013	End-July 2013
37.5% converted into equity	47.5% converted into equity
22.5% blocked as buffer for final bail-in	12.5% converted into 12 month time dep.
30% blocked	12.5% converted into 9 month time dep.
	12.5% converted into 6 month time dep.
10% released	15% released

Source: CBC.

11.   In a second step, Hellenic Bank was recapitalized using private means. After the sale of its Greek operations, HB's bank capital shortfall identified under PIMCO's adverse scenario amounted to about €300 million, although the bank remained solvent, with positive equity. The authorities launched an offer participation in the bank's capital via equity participation and conversion of junior debt into Tier I convertible instruments. Following the successful completion of the offer at end-October, the bank was fully capitalized through the sale of shares (€100 million) to both domestic and foreign investors and conversion of junior debt (€250 million).

Capitalization of Hellenic Bank
(Millions of euro)

Source: CBC.
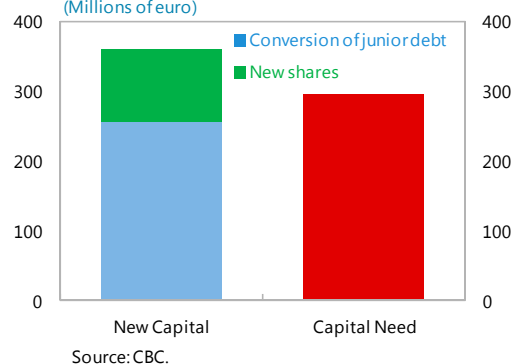
12.   In a third step, the cooperative credit sector was fully recapitalized by the state. With the aim to preserve the sector, given its key role in the domestic economy, in March 2014, the state nationalized and recapitalized it by injecting €1.5 billion in the Central Cooperative Bank (CCB). The

recapitalization amount was identified on the basis of the due diligence assessment under the adverse scenario, supplemented by the CBC's own assessment. Subsequently, the sector was consolidated from 93 into 18 institutions, which received capital from the CCB to ensure a capital ratio of 4 percent CET1. The CCB put into place a restructuring plan for the sector, to be implemented through 2017.

13.   These policy actions allowed for the removal of domestic payment restrictions and a stabilization of bank deposits in mid-2014. During 2013–14, the authorities implemented a milestone-based strategy aimed at gradually lifting domestic payment restrictions as key steps in their banking sector strategy were achieved. Deposit outflows continued through 2013, with the system losing around 15 percent of the total deposit base (excluding bailed-in amounts) during March-December 20–13. Deposits broadly stabilized in 2014.

Total Deposits in Banking System
(March 29, 2013 = 100)

Sources: CBC; and IMF staff calculations.
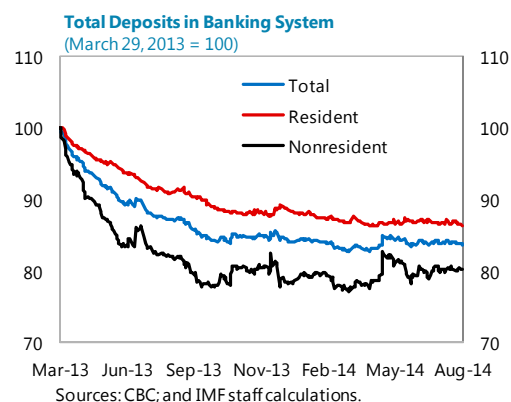
B. Challenges Ahead

14.   While significant progress has been made in addressing the crisis, important challenges remain. First, non-performing loans (NPLs) have risen rapidly, and standing at 54 percent of total loans or 143 percent of GDP at end-June. The growing NPLs strain the already tight capital and liquidity positions of the banks, hindering credit and the economic recovery, thereby setting in motion an adverse feedback loop. Second, credit risk remains high and prospects for bank lending stay weak, reflected in high lending rates, partly due to strained bank -funding conditions. Dealing with both of these issues is critical to ensuring the long-run viability of the sector and paving the way for a resumption of credit and growth and the removal of capital controls.

Managing NPLs—What Can Cyprus Learn from Other Countries

15.   Other countries employed various strategies to deal with NPLs. While only a few countries have experienced such high NPLs ratios as in Cyprus, many have had to deal with protracted elevated NPLs following banking crises.[3] Given the significant variation in the legal, financial, and economic environments across countries, the policy responses have differed. They can be categorized under two broad approaches: (i) maintaining NPLs on

Peak NPL Ratios
(Percent of total loans)

Source: IMF, Laeven and Valencia (2013).

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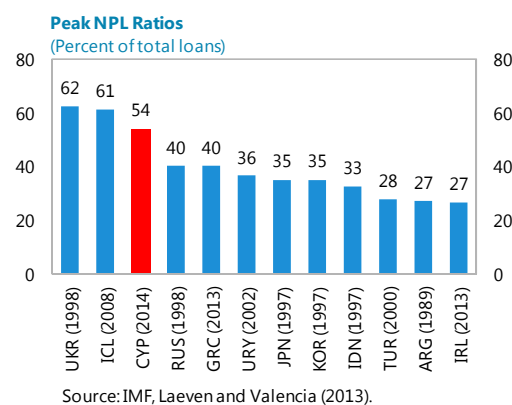
[3] Laeven and Valencia (2013).

banks' balance sheets; and (ii) transferring NPLs partially or fully to centralized agencies, often supported by the state. These have differing implications for risk-sharing between the private and public sector.

16.   A number of countries chose to address NPLs directly on banks' balance sheets (decentralized approach). The rationale is that banks are generally better placed to resolve NPLs, given knowledge of the borrower. They also have incentives to maximize recovery value from NPLs. However, they require resources and skills to deal with NPLs. Such an approach can take several forms:

- **Bank internal-restructuring units:** Under this framework, banks maintain NPLs and associated risks on their balance sheets and manage them through specialized units with dedicated staff focusing on collections and restructuring. In the European context, Bank-internal restructuring setups have been employed in Iceland4, Portugal, Denmark or Greece. In countries like Spain or Ireland, the internal approach was followed for loan segments that were not treated otherwise, such as through AMC solutions (see below). The strategy allows banks to retain the upside associated with the successful restructuring of troubled loans and to leverage their intimate knowledge of the borrower's situation, but leaves them with the burden of risks on the balance sheet for several years until NPLs have been sufficiently resolved. An internal treatment is the baseline scenario for any NPL resolution, although in a systemic crisis it will become a significant part relative to the ongoing activities of a bank, concentrating the banks' resources in debt restructuring and distracting from running day-to-day banking operations. As a result, banks may find it more difficult to attract funding and concentrate on new lending in the short run.

- **Asset-protection schemes** *(APSs).* While NPLs are maintained on banks' balance sheets, the state provides insurance/guarantee to the bank. This shifts downside risks from the private to the public-sector balance sheet, while retaining the upside risks associated with internal management of NPLs. An APS does not require initial public spending, but comes with potentially significant contingent liabilities, which the sovereign would need to be able to cover credibly. For the bank, the insurance generally comes with a recurring fee, that—if set consistent with the insured risk—could have a significant impact on the bottom line and the capital of a bank. Banks would continue to report overall NPL levels, but provisioning and capital needs would be reduced to the extent the APS protects them from a downside development. At the same time, an APS does little to facilitate NPL workout. Consistently, when for example the UK

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[4] In the specific case of Iceland, banks retained NPLs on their balance sheets but certain claims against domestic borrowers (such as FX-denominated mortgage loans) were adjusted upfront through across-the-board schemes. This strategy was feasible as the state took equity stakes in the domestic banks as result of the crisis management strategy, see IMF (2010), pp. 42. In 2014, a state-organized debt relief scheme has been established that will be financed partly by on banks, which are expected to generate sufficient profits to absorb a levy imposed on them, see IMF (2014), p. 46.

adopted such a scheme in 2009, this was done mainly to quickly reduce the risk on bank balance sheets.[5]

17.   Cross-country evidence shows that the primary success factor of an internal workout strategy is an effective NPL resolution framework. Proper incentives for borrowers and lenders are key,[6] while internal workout strategies are not suitable to permanently reduce losses from a macro-economic perspective. For this reasons, lenders need sufficiently capitalized to allow for restructuring, while the regulatory framework, most importantly provisioning rules, should prohibit forbearance strategies. Borrowers need to be exposed to the consequences of non-payment, such as through availability of efficient tools to lenders to realize collateral.

18.   Other countries chose to transfer NPLs from one or various banks to a separate entity (centralized approach). This helps to remove NPLs from banks' balance sheets and allow them to focus on new lending. If NPLs are transferred from several banks to one agency, this can also achieve economies of scale and unified workout practices, could facilitate securitization of a larger pool of assets, break potential bank-corporate links (connected loans), and a centralization of the ownership of collateral, which could provide potentially more leverage over debtors. However, if assets transferred to the separate entity are not actively managed, this could lead to a general deterioration of payment discipline and further deterioration of asset values. This approach could take several forms:

- *Bank Special-Purpose Vehicles* (SPVs): Under this approach, NPLs are transferred to a separate legal entity (SPVs), that is established as subsidiary of the bank. While risks continue to be consolidated into the parent bank's balance sheet, which usually also provides funding to the SPV, it helps to clearly demarcate legacy from ongoing business. Depending on the specifics of the strategy, the separation can be effected legally only, or could gradually involve the setup of a separated organization, with the SPV building its own staff and infrastructure. As long as the bank owns and funds the SPV, both up- and downside risk stay with the bank. However, depending on the SPV's portfolio and market interest, third parties can be attracted to participate in equity or funding, effectively transferring parts of the risk from the bank's balance sheet. This can be a first step in preparing for the sale of the troubled portfolio to a third party. Sweden (1992) and Germany (2009) are examples of such an approach, which allowed the government to provide guarantees selectively against the assets of the SPV.

- *Asset-Management Companies* (AMCs). Under this approach, NPLs are transferred (sold) to a separate entity, which is majority-owned by third-party investors. The bank needs to crystallize losses upfront due to the sale of NPLs at their economic value, which may result in additional capital needs.7 Depending on the risk-sharing agreement, banks might also lose the upside

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[5] UK HMT (2012), p. 21.

[6] Dado and Klingebiel (2002), p. 21.

[7] ECB (2013), p. 118.

from debt restructuring. AMCs can be established as purely legal and financial vehicles, leaving the servicing of the loans with the banks, or as fully fledged operations.

- **Private-sector AMCs:** A key condition is the existence of willing buyers for the NPL portfolio at a reasonable price, which could—depending on the selling banks' ability to cope with additional losses, well beyond fair value. This kind of AMCs are usually favored for narrowly defined portfolio, but as resolution tool in systemic crisis this is usually difficult to achieve.8

- **Private-Public AMCs:** In some cases, private sector parties are only willing to participate in an AMC provided that the state takes a share of the risk. This can be achieved by the state providing equity or funding, or guaranteeing claims of the private sector participants. Ireland (NAMA) and Spain (SAREB) are recent examples of this approach. Public sector participation comes with its own issues. Especially if the AMC owns a large share of banking sector assets, there is the risk of political interference in the restructuring process, leading to forebearance. Also, in the European context, EUROSTAT rules would require consolidation of the AMC onto the government's balance sheet if the government stake exceeds certain limits.

- **Public AMCs:** In case private participation is not forthcoming or desired, AMCs can also be fully public owned and funded, provided that the state has adequate resources. Cases include the U.S. Resolution Trust Cooperation (1989) the Finish "Arsenal" (1993) or the Swedish "Secrum" (1992). Given the absence of private "watchdogs", proper governance and intense oversight is necessary to ensure that assets are managed effectively.

Cross-country evidence shows that AMCs can be effective to workout clearly defined portfolios but a strong legal framework and polticial independence is vital. Further, assets transferred to an AMC need to be liquefiable to prevent the AMC from becoming a forebearance scheme. Other success factors, such as professional and independent management, adequate and skilled staffing as well as effective information systems are as important for AMCs as they are for bank-internal workout.[9]

19.   Regardless of strategy, an adequate legal framework facilitating loan workouts is key to reducing NPLs. A framework providing incentives for borrowers and lenders to come to the table to negotiate debt restructuring solutions is essential for the management of NPLs. Well functioning legal procedures and good access to courts are therefore important. Equally important is a foreclosure framework that facilitates actions by the banks or AMCs to exercise claims on assets and to recover the proceeds of sales of assets if debt is not serviced. At the same time, an insolvency framework that provides for debt-restructuring solutions for viable borrowers and effective liquidation of non-viable ones is also key to dealing with NPLs. Countries that have recently

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[8] Klingebiel (2000), p. 7.

[9] Klingebiel (2000).

improved their legal frameworks and processes for private and corporate insolvency include China (2008), Germany (2009, 2010, 2013), Italy (2008, 2012, 2014), Poland (2009–13) and Spain (2013).[10]

20.   The cross-country evidence suggests that reducing NPLs takes time. As noted above, the success of strategies employed by various countries in attaining their objectives depended on many factors, including the severity of the problem and the extent to which it was widespread, the ability of the state to support the financial system, and the ability to minimize political pressures, among others. In all cases, however, it took time—3–5 years on average, and in some cases longer—for NPLs to return to a downward path. The literature

NPL Evolution in Financial Crises

Sources: EBRD; and IMF.
Note: t = 0 corresponds to the starting year of the crisis.
Transition countries (year of the crisis): Armenia (1994), Azerbaijan (1995), Belarus (1995), Bulgaria (1996), Croatia (1996), Czech Republic (1996), Georgia (1991), Kyrgyz Republic (1995), Latvia (1995), Lithuania (1995), Russian Federation (1998), Slovak Republic (1998), Ukraine (1998)Non- transition countries (year of the crisis): Argentina (2001), Colombia (1998), Dominican Republic (2003), Ecuador (1998), Japan (1997), Korea (1997), Malaysia (1997), Nicaragua (2000), Philippines (1997), Turkey (2000), United Kingdom (2007), United States (2007), Uruguay (2002).

corroborates this, finding that the main driver of a turnaround in NPLs is GDP growth (Beck et. al (2013), Klein (2013)). The literature also finds a large unexplained variation across countries and over time, suggesting that the idiosyncratic features of a given country may be playing an important role in explaining the speed of NPL reduction.
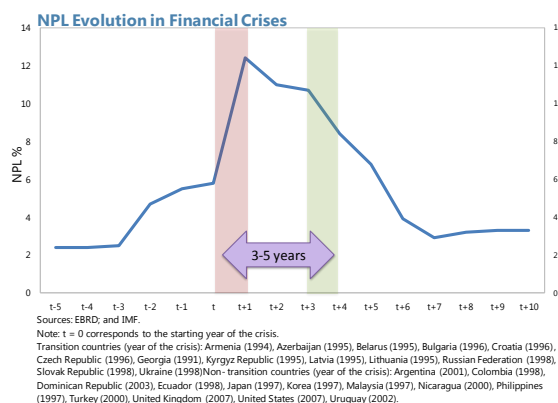
21.   Cyprus's strategy is based on an internal workout of NPLs by banks, given limited fiscal space. With public sector debt exceeding 110 percent of GDP and still rising, the state has limited space to provide direct support to the banks or shoulder part of the risk, such as via an AMC. In this context, banks have set up internal workout units and procedures to deal with NPLs. Policies and practices are guided by a sector-wide arrears management framework and code of conduct. Still, banks have required time to put in place the operational capacity to deal with NPLs.

22.   The strategy's success will critically depend on providing adequate incentives to work out NPLs. In this regard, the ongoing reform of the foreclosure and insolvency legal framework is critical. This is expected to provide incentives (i.e. the threat of foreclosure) for borrowers to re-establish payments if they have the ability, or come to the table and renegotiate, if they can only repay part of the debt. The framework also needs to provide incentives for banks to proactively restructure NPLs. This is particularly important in Cyprus, where bank shareholders—largely the uninsured depositors

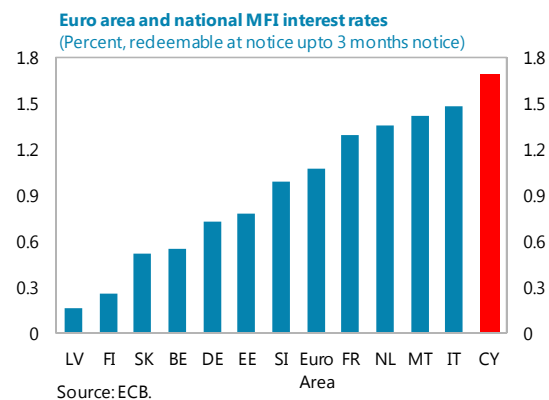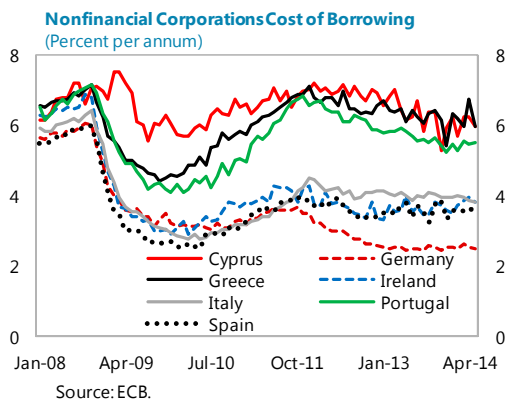**Simplified Illustration for Debt Restructuring**
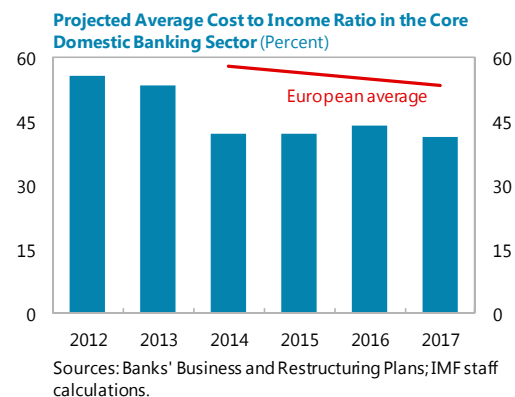
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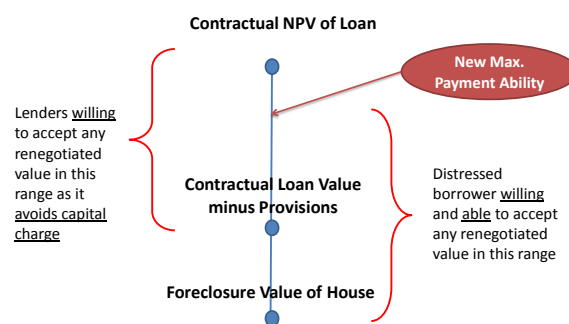
[10] IMF Worldbank (2013).

and junior bond holders who already suffered large losses—may be reluctant to recognize additional losses and instead prefer to wait for a potential upside from the economic recovery. But given the size and importance of the banking sector for the economy, this behavior could instead lead to a vicious cycle of weak bank balance sheets, weak credit, and a weak economy, which in turn would worsen NPLs and affect the banks. To avoid this, the framework needs to help arrive at the optimal solution whereby borrowers are able to meet renegotiated payment obligations, while lenders receive cash-flow but avoid additional capital charges (after provisions are utilized). Foreclosure should be a last resort solution.

Reviving Bank Lending and Profitability

23.   Cyprus's lending rates remain very high in cross-country comparison. High deposit rates appear to be the key driver of lending rates. They are high all maturities, reflecting the risk premia demanded by investors to maintain funds in the Cyprus banking system. In addition, the banks also face high credit risk, given high private sector indebtedness and large NPLs. Furthermore, net interest margins (NIM) are currently about 50–100 basis points above the European average, and are needed to allow banks to build provisions and protect their capital base. Liquidity appears to be less of a constraint, as even banks with ample funding maintain it as cash or low-yielding instruments rather than use it for lending, likely due to weak credit demand.

Nonfinancial Corporations Cost of Borrowing
(Percent per annum)

Source: ECB.

Euro area and national MFI interest rates
(Percent, redeemable at notice up to 3 months notice)

Source: ECB.

24.   The prospects for lowering lending rates in the short-run are limited. Banks have little room to further improve costs, given that they have already reduced their cost to income ratio to below the European average by closing branches, reducing staff, and cutting wages and other operational expenses. Finally, the new ECB programs such as the TLTRO are expected to have only a limited impact on Cyprus. To make use of these programs—which allow banks to borrow commensurate with the amount of net lending to the economy, excluding

Projected Average Cost to Income Ratio in the Core Domestic Banking Sector (Percent)

Sources: Banks' Business and Restructuring Plans; IMF staff calculations.

mortgage loans—banks need to have ECB-eligible collateral and opportunities to lend. In the case of Cyprus, some banks have limited collateral, while demand for credit is weak.

25.   While banks need to improve their funding structure, this is not expected to translate in a reduction of funding costs. Currently, BoC remains highly reliant on central bank funding, which—while comparatively inexpensive—comes with a perceived stigma. Shifting toward market funding would help to boost confidence. With access to wholesale markets limited, in part due to limited colalteral buffers, junior funding could be an option, although it relatively more expensive. The banks also need to rebuild their deposit base. However, to attract cash now outside the system and ensure that the gradual removal of remaining external payment restrictions is not disruptive, they need to offer competitive rates and longer maturities, which will be relatively expensive and hurt profitability.

26.   Ultimately, restoring confidence in the system is needed to allow for an eventual reduction in both deposit and lending rates. The authorities need to continue to implement their banking strategy to help strengthen investor and depositor confidence in the banking system. The recent recapitalization of BoC is a key step toward a normalization of its operations. Successfully meeting the requirements of the ongoing pan-European comprehensive bank assessment will be another important milestone. Progressing with bank restructuring and the reduction of NPLs and an eventual gradual lifting of remaining payment restrictions are essential to strengthen confidence and eventually allow for a normalization of deposit and lending rates and the resumption of credit growth.

C. Conclusion

27.   Cyprus has taken unprecedented measures to stabilize its banking system. Banks have been recapitalized using private and public sector resources, the sector has consolidated and deleveraged significantly, and—while certain constraints on capital movements are still in place—the liquidity and deposit situation has improved.

28.   The recovery of the Cypriot banking sector now hinges primarily on the successful and sustainable resolution of NPLs. High NPLs remain the key vulnerability of the Cypriot banking system, exposing banks' balance sheets to significant downside risks and binding a significant part of the banks' capital and operational capacity. Yet, the legacy will also determine the banks' future business prospects. New lending is expected to be limited, given that the economy remains in recession and the recovery is expected to be modest, reducing the banking sectors' to generate profits, build capital, and attract funding.

29.   Uncertainties related to NPLs also contribute to high funding costs, which translate into lending rates that further constrain credit demand. A successful completion of the ongoing EU Comprehensive Assessment can help to boost confidence in the Cypriot banking sector, reducing
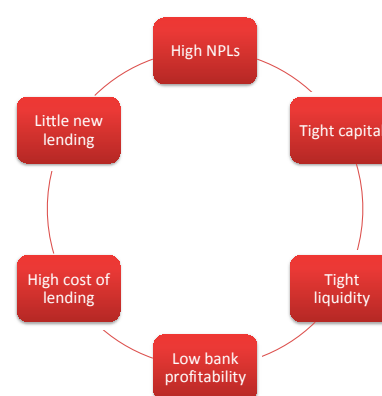
liquidity pressures, and allowing for a gradual convergence of deposit rates with the EUR average along the yield curve. Progress on normalizing liquidity and funding conditions will also shape the future strategy for exiting from capital controls. While the need for the core banks to access market funding would party compensate these funding cost savings, it can help to further increase the safety and stability of the banking sector.

30.   In sum, while progress has been made to stabilize the banking sector, addressing NPLs resolutely will be key to banks' long-term viability and the resumption of credit and growth. The cross-country experience suggests that this takes time, but also resolve to ensure that incentives are in place to facilitate the workout of NPLs. The reform of the legal regime for foreclosures and insolvency is a critical element.

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ACHIEVING A DURABLE FISCAL CONSOLIDATION[1]

A. Introduction

1.   **Cyprus's public finances deteriorated sharply starting in 2008.** During 2004–07, the fiscal balance improved by 10 percent of GDP, reaching a surplus of close to 3.5 percent of GDP by end-2007, which helped to lower public debt to around 60 percent of GDP. This facilitated Cyprus's entry into the euro-zone in 2008. Since then, the fiscal position unraveled rapidly after a succession of negative shocks—including the onset of the global crisis at end-2008, the July 2011 Mari power plant explosion, and the February 2012 Greek PSI—and a loosening of fiscal policies. By end-2012, the fiscal deficit reached about 6.5 percent of GDP, public debt had reached close to 90 percent of GDP, and Cyprus lost access to capital markets.

2.   **In May 2013, the authorities put in place an adjustment program aiming to restore the sustainability of public finances.** The program targets a balanced consolidation path seeking to achieve a primary fiscal surplus of 4 percent of GDP by end-2018 required to place debt on a sustained downward path toward reaching about 100 percent of GDP by 2020. Fiscal adjustment measures estimated at about 7.5 percent of GDP at program approval were implemented in 2013–14 and complemented by structural fiscal reforms of revenue administration, public financial management, wage indexation, the welfare system, and the pension system. These helped to reduce the primary deficit to about 2 percent of GDP at end-2013, despite a deep recession. Still, on the basis of the macroeconomic baseline, additional consolidation measures of about 3.4 percent of GDP are estimated to be required during 2015–18 to achieve a medium-term primary surplus of 4 percent of GDP.

3.   **This paper discusses options to achieve a durable fiscal consolidation consistent with the authorities' long-term fiscal balance and debt targets.** The paper is organized as follows: Section B discusses the buildup of the fiscal imbalance and the pre-program policy response. Section C compares selected fiscal variables with those of other European countries at end-2012. Section D discusses fiscal structural weaknesses affecting public finances. Section E discusses the program fiscal response and its impact as of end-2013. Building on the findings of the previous sections, section F discusses options for future fiscal consolidation. Section G concludes.

B. The Buildup of the Fiscal Imbalance and the Pre-Program Policy Response

4.   **The improvement in the fiscal balance preceding Euro entry was aided by an expanding economy and a growing housing boom.** Housing prices doubled between 2003 and 2008, coinciding with an increase in fiscal revenues of close to 7 percent of GDP. At the same time,

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[1] Prepared by Alejandro Simone (EUR).

the expenditure-to-GDP ratio declined by about 4 percent of GDP, as nominal growth in primary spending in 2003–07 (27 percent) was outpaced by rapid nominal GDP growth in the same period (36 percent).

5.   Starting in 2008, headline and structural fiscal balances deteriorated rapidly. In only two years, the fiscal position shifted from a primary surplus of about 6.5 percent of GDP and an overall surplus of 3.5 percent of GDP in 2007, to a primary deficit of about 3.5 percent of GDP and an overall deficit of about 6 percent at end-2009. This was caused by a fall in revenues of about 5 percent of GDP—as growth declined and the housing boom turned to bust—and an increase in spending of 5 percent of GDP—due to a loosening of fiscal policies. Revenues and expenditures continued to deteriorate during 2009–12 by about 1 percent of GDP each, with the fiscal deficit averaging about 6 percent of GDP per year during this period. In structural terms, the structural balance deteriorated by 10 percent of GDP between 2007 and 2012.

6.   The debt ratio also increased markedly. The deterioration in the fiscal balance led to a rapid increase in the debt ratio from slightly below 50 percent of GDP in 2008 (the debt ratio had continued to decline partly as a result of running down liquid financial assets) to just over 70 percent of GDP at end-2011. This, together with large implicit liabilities from the weakening banking sector, resulted in a loss of market access in mid-2011. In 2012, some of these contingencies materialized, and one of the two largest banks was bailed out through an injection of 10 percent of GDP of state aid. This, combined with a fiscal deficit around 6 percent of GDP, brought public debt to about 90 percent of GDP at the end of 2012.

7.   Declining real estate revenue was one of the critical elements underlying the deterioration of the fiscal position. The fall in real-estate revenue coincides with the fall in total revenues. In 2008–09, total revenue declined by about 5 percent of GDP, and by 2012 it declined by about 5.5 percent of GDP. The capital gains tax, land and survey fees, and VAT on construction and real estate appear to have been the components most sensitive to housing prices. They
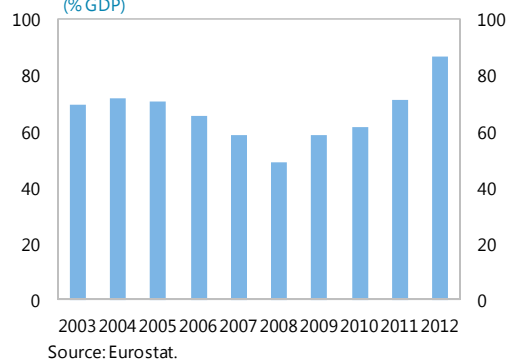

A housing boom led to a revenue surge
(% GDP, 2002Q4 = 100)

Sources: CBC; and Eurostat.
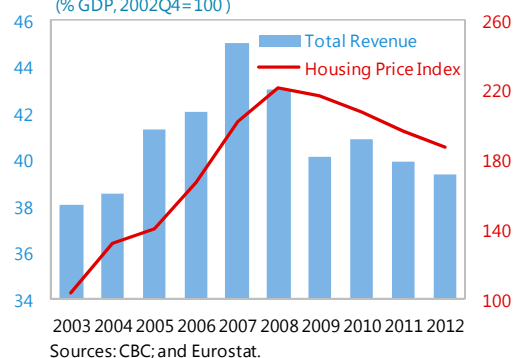
After an improvement preceding entry in the Eurozone, the fiscal position changed dramatically
(% GDP)

Sources: Eurostat; and IMF staff estimates.
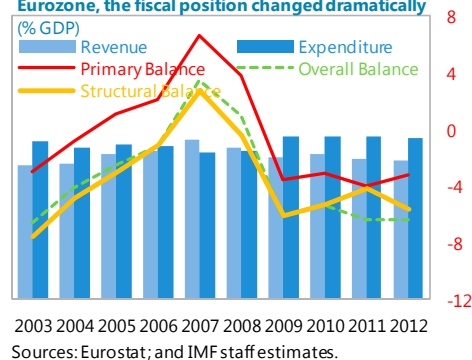
The debt ratio rapidly deteriorated after 2008
(% GDP)

Source: Eurostat.

Real Estate related revenue declined by 6 percent of GDP in 2007-2012 (% GDP,)

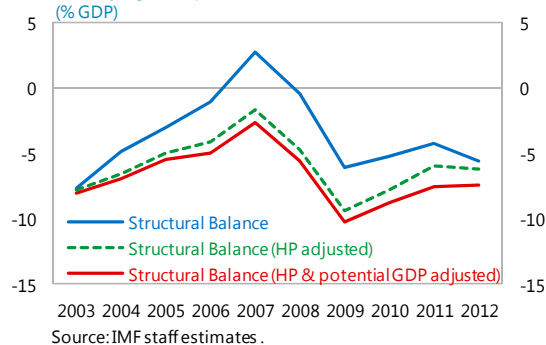Sources: Ministry of Finance; and Eurostat.
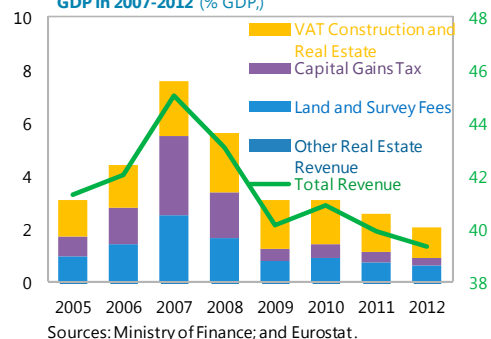
declined by a combined 5 percent of GDP in 2008-2009, and by a further 1 percent of GDP by the end -2012. The rapid decline was due to the sharp fall in real-estate transactions—which constituted the base of most real estate taxes—following the bust of the housing market.

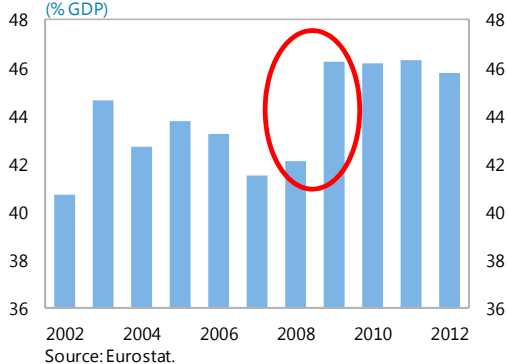**8.   Adjusting for housing price fluctuations, the structural balance during 2003–12 was significantly worse than suggested by the standard methodology.** While standard indicators suggest a structural surplus of about 3 percent of GDP by end 2007, estimates constructed using the methodology in Bornhorst et al. (2011), which adjust for housing price fluctuations (HP), suggest a structural balance of -1.7 for the same year (Box 1). This suggests an impact of the housing boom on the fiscal balance of about 5 percent of GDP, broadly consistent with the real-estate related

Standard structural balance estimates underestimate the underlying fiscal position for most of 2007-12 (% GDP)

Structural Balance
Structural Balance (HP adjusted)
Structural Balance (HP & potential GDP adjusted)

2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Source: IMF staff estimates .

revenue data. Similarly, in 2009, while the standard structural deficit is estimated at about 6 percent of GDP, the one adjusted for housing price movements is close to 9.5 percent of GDP. Moreover, if an adjustment is also made to potential GDP to exclude the impact of the housing/financial boom, the structural deficit reaches close to 10.5 percent of GDP. The measures broadly converge in 2012, as the boom deflated.

**9.   Lax expenditure policies—mainly increases in social transfers and compensation—were the second critical element underlying the deterioration in public finances.** Expenditures surged by 5 percent of GDP in 2008-2009. This was largely the result of a stimulus package implemented in 2009 to counteract the adverse impact on the global crisis on the economy. The main measures targeted an increase in social transfers—which increased by 30 percent in real terms and 3 percent of GDP during 2007–09—and in compensation of employees—which rose by 10 percent in real terms and 1.3 percent of GDP during this period. Other primary spending categories were also increased.

Expenditure surged 5 percent of GDP in 2008-09 (% GDP)

2002   2004   2006   2008   2010   2012
Source: Eurostat.

Social Transfers and the Wage bill drove the increase in primary spending (% GDP)

Social Transfers
Compensation of Employees
Other primary spending

2007   2008   2009   2010   2011   2012
Source: Eurostat.
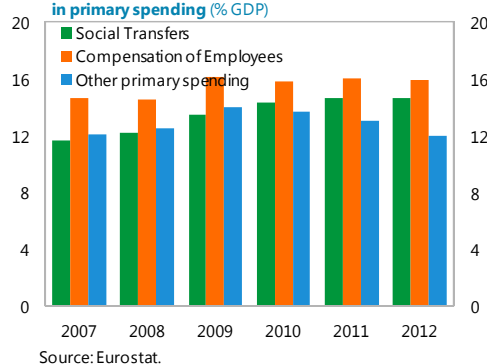
10.   The expansion of social transfers was driven by increasing old age, social exclusion, and unemployment benefits. Old age benefits experienced the largest increase due to the creation of new benefits (such as the grant to pensioners in 2010 and the special Easter allowance), increase

of existing benefits, and cost of living indexation (COLA) at a time when economic growth had slowed considerably. Among social exclusion benefits, monetary benefits to the displaced and distressed and transfers to the central agency of distribution of burdens experienced the largest increases. The growth of unemployment benefits reflected a deteriorating macroeconomic and labor market situation.

**11.   Increasing public-pension costs and a growing payroll underlied the rise in spending on compensation of employees.** The rise in public-pension benefits during 2008–12 reflected the generous indexation applying both COLA and average increases in public salaries to pensions. Early retirements, which accelerated in 2012 in anticipation of potential pension reforms, also contributed to the growth in public-pension costs. The increase in compensation was due to an 8 percent rise in employment during 2008–12, ad-hoc general wage increases, a generous system of automatic wage increases, the application of COLA, and the 2009 increase in social security contribution rates as from April 2009.

Social Transfers increased by 752 million Euros (4 % of 2012 GDP) in 2008-12 (millions of Euro)
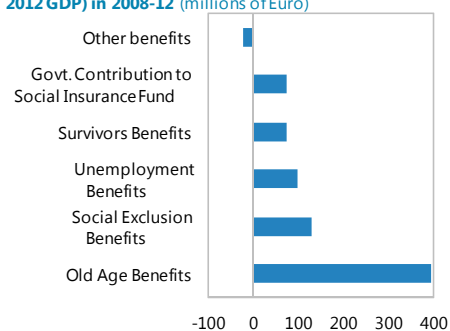
Source: Eurostat (COFOG Classification).

Compensation of Employees increased by 511 million Euros (3 % of 2012 GDP) in 2008-2012 (millions of Euro)
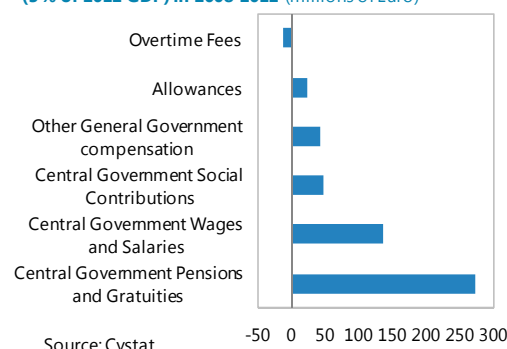

Source: Cystat.

12.   The increase in compensation of employees compounded an already high level compared to other European countries and the gap with the private sector. In 2007, Cyprus was already among the EU countries with the highest compensation of general government employees.[2] Within Cyprus, the gap between public and private sector pay was also sizeable. Pashardes (2011) estimated an average public wage premium of about 30 percent with respect to the private sector in 2009 after correcting for education and age effects. Teachers and unskilled workers stand out, with a

Compensation of employees was already among the highest in the Eurostat database in 2007 (% GDP)
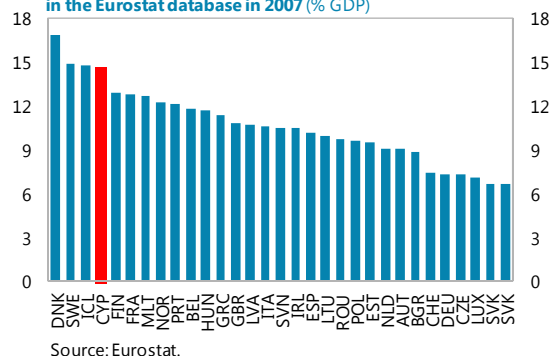
Source: Eurostat.

The Average Public Sector Wage Premium relative to Private Sector Wages averaged about 30 % in 2009
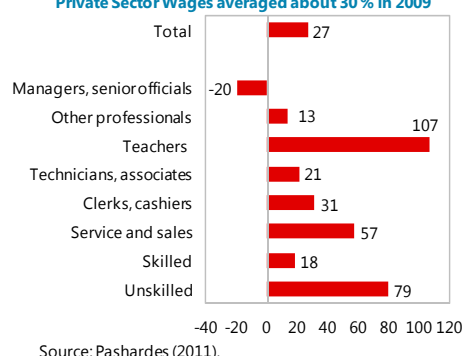
Source: Pashardes (2011).

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[2] Eurostat figures are used to facilitate comparability across countries. Nevertheless, countries report accrued pension liabilities of government pension schemes differently, and distortions may arise as a result.

public-private pay gap of 107 percent and 79 percent, respectively. Moreover, the study does not account for the relatively more generous public pension system, which likely magnifies the disparity in total compensation between the public and private sectors.

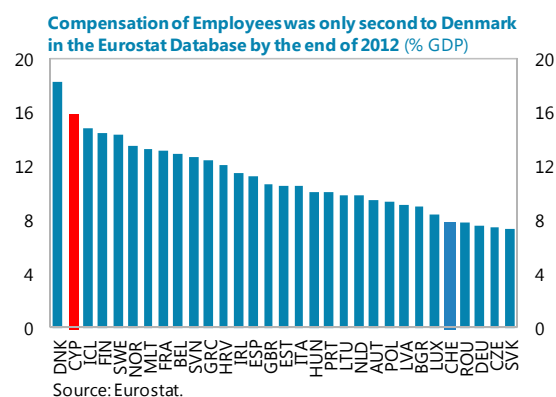**13.   A fiscal consolidation package was implemented in 2012** (Box 2). With exception of a pension reform in 2009 which introduced gradual increases of 1.3 percent in the contribution rate every 5 years and the increase in the vesting period for pension entitlements, no significant measures to address the fiscal imbalance were legislated until the end of the third quarter of 2011. The 2012 package (legislated in 2011 but which had its full impact in 2012), including measures of about 2.6 percent of GDP, aimed at addressing the growing fiscal imbalances. It was broadly balanced between revenue and expenditure, including increases in VAT and social contributions, and measures to better target social transfers and reduce public sector employment through attrition, among others. The package helped to contain the deterioration in the fiscal balance as a result of the economic downturn, resulting in a modest primary balance improvement of slightly below 1 percent of GDP.

C. Cyprus's Public Finances at end-2012 in an International Context[3]

Expenditure aggregates

14.   Compensation of employees relative to GDP stands out in a cross-country comparison. It was among the highest in Europe, second to only Denmark. Total expenditure and all other spending categories are either close to the median or below it. In particular, intermediate consumption was 0.8 percent below the median spending, with Cyprus ranking 24th out 31 countries in the sample. Gross capital formation and capital transfers were close the median.

Compensation of Employees was only second to Denmark in the Eurostat Database by the end of 2012 (% GDP)

Source: Eurostat.

Public Expenditure						
	2007	2008	2009	2010	2011	2012
Difference with Median in Sample (% of GDP)						
Intermediate Consumption	-0.9	-1.0	-0.9	-0.5	-0.6	-0.8
Gross Capital formation	-0.3	-0.2	0.7	0.4	0.6	-0.1
Capital Transfers	0.1	-0.2	0.1	0.3	-0.2	0.3
Rank (highest=lowest expenditure)						
Intermediate Consumption		23	23	24	24	22	24
Gross Capital formation	20	17	9	10	7	18
Capital Transfers	12	19	13	10	20	13

Source: Eurostat

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[3]Cross country data covers the EU-28, Norway, Switzerland, and Iceland using the EUROSTAT database. This includes spending in the different spending categories in the economic and functional (i.e. COFOG) classifications and the level of the major revenue types as a percent of GDP. The data is available at http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database, annual government statistics (gov_a).

15. **The high level of compensation of employees appears to be primarily due to high compensation per employee, but also to pockets of excess employment.** Cyprus's general government employment relative to total employment is slightly below average, suggesting that overall government employment is not out of line with comparator countries. Nevertheless, a low and declining student-teacher ratio for basic education is indicative of excess employment in the education sector. While the number of students has been declining due to smaller cohorts, the number of teachers increased almost continuously since the 90s and only recently stabilized. Secondary education seems to show the largest excess, with an average of only 8 students per teacher in 2011, compared to the European average of 14 in 2010 for basic education.[4]

General government employment as a share of the total employment is slightly below the average compared to other European countries, 2011
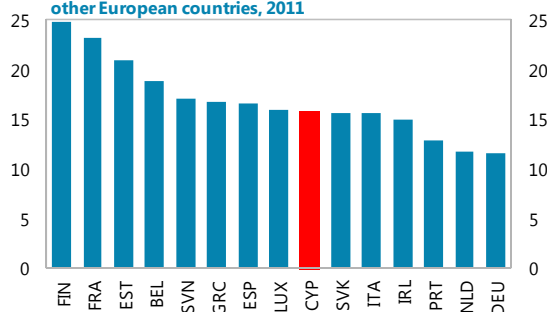
Sources: EC Occasional Paper 117; Eurostat.

Excess of Employment seems likely in the Education Sector

— Number of Students (thousands)
— Number of Teachers (thousands)
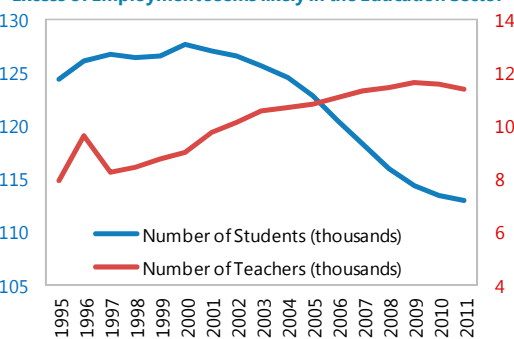
Source: Cystat.

16. **Spending on labor-intensive public services tended to be higher than that of peers.** Cyprus spent relatively more than other countries on general public services, defense, public order and safety and education, where compensation costs exceeded 65 percent of the spending in each

Public Services						
	2007	2008	2009	2010	2011	2012
Difference with Median in Database (% of GDP)						
General Public Services	5.5	5.2	6.0	4.7	5.2	6.4
Defense	0.5	0.4	0.5	0.9	0.8	0.7
Public Order and Safety	0.4	0.3	0.4	0.5	0.5	0.4
Education	0.9	1.2	1.3	1.7	1.5	1.1
Housing and Community Amenities	0.7	0.7	0.8	0.7	0.7	0.7
Social Exclusion	0.5	0.5	0.6	0.8	0.7	0.7
Rank (lowest=highest spending)						
General Public Services	2	1	1	2	2	2
Defense	4	4	5	3	3	3
Public Order and Safety	6	6	5	4	4	5
Education	4	3	3	3	3	4
Housing and Community Amenities	1	1	1	1	1	1
Social Exclusion	3	2	1	1	1	1

Source: Eurostat database (COFOG Classfication) and IMF Staff Estimates

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[4] Student-teacher ratio data was not available from Cystat after 2011.

of these categories by end 2012. For example, for education, spending as a share of GDP in 2012 was 1.1 percent above the median of comparator countries, placing Cyprus among the highest spenders in this category. Cyprus also spent more on social-exclusion and housing benefits relative to GDP than any other country. The trend has remained broadly stable since 2007.

Revenue aggregates

17.   In terms of total revenues, the real estate boom/bust cycle had a significant impact on Cyprus's standing relative to other countries[5]. In 2007, at the peak of the housing boom, Cyprus had an above-median total revenue-to-GDP ratio. Taxes on production and imports as a share to GDP (which included taxes on land and buildings) were among the highest in the sample. Similarly, current taxes on income and wealth were above the median and in the second quartile of the distribution as a result of the taxes on holding gains on capital. By 2012, total revenues to GDP declined below the cross-country median, as real-estate related revenues dissipated. Social contributions during 2007–12 hovered around the bottom of the third quartile or the top of fourth quartile of the distribution, given an immature pension system and the absence of a national health system, permitting lower social contribution rates.

Government Revenues						
	2007	2008	2009	2010	2011	2012
Difference with Median in Sample (% of GDP)						
Total Revenues	3.7	0.9	-0.7	0.0	-1.9	-2.6
Taxes on Production and Imports	5.5	5.3	2.4	2.3	1.1	1.6
of which Taxes on Land, Buildings, and Other Structures	0.9	0.5	0.0	0.1	0.0	-0.1
Current Taxes on Income and Wealth	1.4	1.3	0.5	0.6	0.2	0.0
of which Taxes on Holding gains	2.8	1.6	0.3	0.4	0.3	0.1
Social Security Contributions	-3.7	-3.9	-4.0	-3.3	-3.3	-3.1
Rank (lowest=highest revenue)						
Total Revenues	12	13	17	16	20	21
Taxes on Production and Imports	2	2	5	5	6	9
of which Taxes on Land, Buildings, and Other Structures	3	6	14	12	14	17
Current Taxes on Income and Wealth	10	12	15	14	14	16
of which Taxes on Holding gains	1	2	4	3	3	4
Social Security Contributions	25	24	23	22	22	23

Source:Eurostat

18.   Tax base estimates suggest that the consumption tax base is among the largest relative to other countries, while the opposite is true about the labor tax base[6,7]. The

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[5]Data on the structure of taxes by economic function (consumption, labour income, capital and business income) is available under the heading "Derived tax indicators" (gov_a_tax) at the internet address provided in footnote 2.

[6] Tax base estimates are obtained by dividing a given revenue type by the corresponding implicit tax rate for a given year. For example, to derive the consumption tax base for 2012, consumption tax revenue for 2012 is divided by the implicit tax rate on consumption in 2012.

[7] In Eurostat's methodology consumption taxes include VAT, taxes and duties on imports excluding VAT, taxes on products excluding VAT and import duties (includes excise taxes), and other production and current taxes. Labor income taxes include all personal income and capital gains taxation of households including withholding taxes on the wage bill and payroll taxes and social contributions by employees and employers (except self-and non employed

(continued)

consumption tax base has consistently exceeded by the median by more than 10 percentage points of GDP, reflecting the relative importance of the tourism industry and relatively good enforcement of consumption taxes (see Section D). In contrast, the labor tax base has been below the median by at least around 4 percentage points of GDP, reflecting tax evasion and a relatively weaker enforcement of labor taxes (see Section D). The capital tax base is relatively large, reflecting an unusually a large bank deposit stock (on which a withholding tax on interest is levied); this could be even larger, were foreign companies paying taxes in Cyprus be included (these are currently excluded).

Tax Base						
	2007	2008	2009	2010	2011	2012
Difference with Median in Sample (% of GDP)						
Consumption Tax Base	18.9	18.9	12.9	14.0	16.4	17.4
Labour Tax Base	-3.9	-5.9	-5.5	-4.1	-3.7	-5.1
Capital Tax Base	3.8	9.8	5.0	1.5	5.1	7.3
Rank (lowest=highest rate)						
Consumption Tax Base	1	2	2	2	2	2
Labour Tax Base	21	23	21	20	19	21
Capital Tax Base	7	3	4	6	5	5

Source: Eurostat.

19.   Implicit tax rates for consumption and labor-income taxation were considerably below the median[8]. Implicit rates for consumption taxation were 3.6 percentage points below the median and among the lowest in the database. Implicit tax rates on labor income were almost 6 percentage points of GDP below the median, reflecting, as with social security contributions, the immature pension system and the absence of a national health system. The large positive differential on the implicit tax rate on capital and business income taxes is puzzling, given that the corporate tax rate of 10 percent was among the lowest in Europe in 2012. This may reflect the fact that foreign companies that pay taxes in Cyprus on the basis of double-taxation treaties may be captured in the tax revenues but not in the national-accounts capital tax base**.**

persons). Capital and business income taxes include corporate income and capital gains taxation and social contributions paid by the self-employed persons as employers. For a detailed discussion, see Eurostat (2010).

[8] Data on implicit tax rates is available under the heading "Derived tax indicators" (gov_a_tax) at the internet address provided in footnote 2.

Implicit Tax Rates

	2007	2008	2009	2010	2011	2012
Difference with Median in Sample (% points)						
Implicit Tax Rate on Consumption	-1.1	-0.8	-1.6	-2.1	-3.5	-3.6
Implicit Tax Rate on Labour	-10.1	-8.7	-7.5	-6.8	-7.0	-5.9
Implicit Tax Rate on Capital	10.9	5.7	6.9	7.7	6.1	3.7
Rank (lowest=highest rate)						
Implicit Tax Rate on Consumption	18	18	19	20	26	25
Implicit Tax Rate on Labour	27	26	24	24	25	24
Implicit Tax Rate on Capital	1	3	2	3	3	8

Source: Eurostat.

D. Selected Structural Fiscal Issues

Revenue

20.   **The revenue administration was inefficiently split into two agencies with different enforcement powers and procedures and organized by tax instead of taxpayer segments.** The two-tax-agency organizational structure around tax types (i.e. VAT services collecting VAT, and Inland Revenue collecting personal and corporate income taxes among other direct taxes) rather than taxpayer segments and administrative functions was not in line with international good practices. Such a structure is known to: (i) lead to a fragmentation of collection processes, (ii) reduce the probability of detection of non-compliance with tax obligations given limited coordination between tax agencies, (iii) generate high compliance costs for the taxpayer given the need to pay taxes and respond to the different requirements for each agency, and (iv) increase the administrative cost of collecting revenues given duplication of functions. Moreover, the different enforcement powers and processes available to each tax agency, with stronger and more effective enforcement powers and processes for VAT services compared to Inland Revenue, likely contributed to the relatively large consumption tax base and weaker labor income tax base with respect to other countries.

Expenditure

21.   **The public financial management system was outdated and suffered from several weaknesses:**

- **Deficient commitment measurement and control and expenditure overruns.** Not all commitments were tracked by the government accounting system. This made difficult for spending departments to know with certainty at any time whether there was sufficient space in existing appropriations to cover additional orders against a budget head. This risked expenditure overruns in the context of a comfortable fiscal position and arrears accumulation when fiscal resources are scarce. Moreover, the practice of approving within-year supplementary budgets when spending overruns emerged undermined the credibility of fiscal targets.

- **Absence of a system to monitor and manage fiscal risks.** Detailed data on government guarantees was not available or sufficient to allow for an assessment of risks related to called guarantees and for a plan of action to address them. This exposed the budget to uncertainty and the need to adjust fiscal targets on an ad-hoc basis as risks materialized, further undermining the credibility of the targets.

- **Lack of a medium term-orientation**. Budgeting was largely done on an annual basis, usually by using incremental changes relative to the previous year's budget. This limited the capacity to adapt to changing circumstances. For example, in the case of education spending, budget allocations were not adjusted to reflect a declining student population. Similarly, housing benefits remained generous despite Cyprus's relatively favorable housing conditions in Europe, as captured by one of the highest owner occupancy and lowest overcrowding rates among the EU 27 (Joint Social Protection Report, 2010). The annual focus of the budget also limited the ability to take into account the implications of the current budget year for future budget years.

- **Limited use of cost-benefit analysis to appraise investment projects**. Projects financed by the budget were not subject to a proper appraisal process, making them prone to the risk of pressure from vested interests. This may have affected the allocation of resources and may have reduced the growth- friendliness of capital budgets.

- **Difficulties in managing resources to achieve specific policy objectives.** The focus on inputs and the absence of a program/activities classification with specific performance indicators to measure output/outcomes made it difficult to assess the cost of the budget activities undertaken to achieve a specific policy objective and their effectiveness.

22.   **Pay and promotion were de-linked from performance and wage indexation was not linked to productivity.** The preliminary findings of the World Bank (2014) suggest that promoted individuals received similar salary increases to those who were not promoted (close to 100 percent during 2002–12), given the system of seniority-based automatic increases. This, together with the COLA mechanism which automatically indexed wages to the consumer price index, not only led to increasing compensation of employee costs, but also resulted in a public-wage premium that eroded Cyprus's competitiveness, given the public sector's key role in influencing private-sector compensation decisions.

23.   **Social protection was characterized by a fragmented benefit structure and weak targeting of the benefits.** A large number of benefits were administered by different ministries, which led to inefficiencies and benefit overlaps. Moreover, benefits had different eligibility criteria, sometimes not linked to income or wealth, leading to significant leakage and inequality.

24.   **The pension system was unsustainable over the long run.** The 2012 Ageing Report projected annual public expenditures on pensions during to increase by 8.4 percentage points of GDP during 2010-60, compared to an average of 1.4 percent of GDP. This was due to both population ageing and generous pension parameters, including a relatively low statutory retirement age and generous possibilities for early retirement.

E.   The Program Fiscal Response and Outcomes to Date

25.   In May 2013, the authorities put in place an adjustment program aiming to restore the sustainability of public finances. The program targets a primary balance of 4 percent of GDP by 2018 to put the debt on a downward path toward 100 percent of GDP by 2020. Given the significant adjustment required and the large impact of the 2013 banking crisis on the economy, the consolidation was phased over 6 years to smooth the adverse impact on domestic demand, while implementing a substantial adjustment upfront to instill credibility and address financing constraints. About 7.5 percent of GDP in measures were legislated at end-2012 in the context of program negotiations and implemented in 2013–14, with a projected additional adjustment of 4.7 percent of GDP left for future years.

26.   The 2013–14 fiscal consolidation was broadly balanced between revenue and expenditure. The expenditure component aimed at unwinding some of the spending increase in 2008–12, while the revenue component was intended to partially compensate for the significant revenue loss related to the downturn, including from real-estate related revenues:

Estimated Yield of Implemented Program Fiscal Measures (% GDP)

Source: IMF staff estimates.

- Expenditure measures targeted the compensation of employees and social transfers. Nominal salary cuts of 9–15 percent (depending on the salary level) were implemented in 2013 and 2014, and allowances were reduced. Social transfer measures aimed to achieve savings while improving targeting through the introduction/adjustment of eligibility criteria to focus on income and assets and through the rationalization of overlapping benefits.

- Revenue measures focused on raising tax rates and broadening tax bases. The VAT and reduced VAT were increased by 2 and 1 percentage points in 2013 and 2014, respectively. The corporate tax rate was increased from 10 to 12.5 percent, while excise rates for energy, tobacco, and alcohol products were also increased in both 2013 and 2014. Property tax rates were also raised, while lowering the threshold for exemptions to help expand the tax base. The withholding tax rate on interest was increased from 10 to 30 percent.
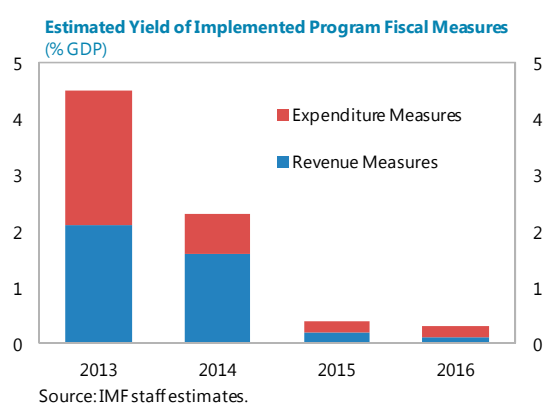
27.   The consolidation was supported by structural fiscal reforms, including:

- A reform of the COLA indexation mechanism was implemented in December 2012 reducing wage indexation to half the increase in the consumer price index and suspending it automatically after two consecutive quarters of negative growth. The reformed COLA will start operating after the current COLA suspension expires at end-2016.

- The social insurance fund pension scheme (GSIS) and the scheme for government employees (GEPS) were reformed in January 2013 by increasing the statutory retirement ages, introducing early retirement penalties, allowing for an automatic adjustment of the statutory retirement age

by life expectancy at retirement, among others. This, together with the closing of GEPS to new entrants in 2011, has helped ensure their long-term sustainability.

- A new Fiscal Responsibility and Budget Systems Law (FRBSL) was adopted in early-2014. The law introduces: (i) a medium-term view to budget formulation with binding expenditure ceilings supported by fiscal rules; (ii) a framework for monitoring and managing fiscal risks (including from PPPs); (iii) a change of emphasis in budgeting from inputs to outputs and performance; and (iv) a strengthening of the evaluation and management of public-investment projects.

- A reform of the revenue administration and measures to strengthen its collection powers were legislated in mid-2014. A new law was passed allowing for the integration of VAT services and IRD into one single agency organized by taxpayer segment. Moreover, legislation was amended to allow the revenue administration to freeze and seize assets in cases on undisputed tax debt.

- A reform of the welfare system was legislated in mid-2014, introducing a single Guaranteed Minimum Income (GMI) scheme replacing the many public assistance benefits, and centralizing the administration of most social benefits in the Ministry of Labor. Eligibility criteria were tightened and oversight enhanced, including by implementing a single beneficiary database, cross-checked with other databases.

28.   As a result of these policies, the 2013 overall and primary deficits declined by about 1 percent of GDP. Tax revenues were stabilized at around 26 percent of GDP despite the deep recession. Taxes on current income and wealth increased as a share of GDP, given the significant measures implemented in this area. While primary expenditure was reduced in nominal terms by about 5 percentage points, it increased by 0.8 percent as a share of GDP. In July 2014, the cumulative primary balance on a cash basis was a surplus of 2.1 percent of GDP, relative to an expected balance in the 4th review.

Selected Fiscal Indicators 2012-13 (% GDP)

	2012	2013 1/
	(percent of GDP)	
Revenue	39.4	41.4
Taxes on production and Imports	14.9	14.5
Current Taxes on Income and Wealth	11.1	11.6
Social Security Contributions	8.5	8.9
Other	4.9	6.3
Expenditure	45.8	46.8
Primary Expenditure	42.6	43.4
Interest Bill	3.2	3.4
Primary Balance	-3.2	-2.0
Overall Balance	-6.4	-5.4
Public Debt	86.6	111.5

Source: Eurostat
1/ 174.8 million Euros in sign in gas bonuses was added to the Eurostat other revenue and primary expenditure data in 2013 to prevent understating primary expenditure in 2013.

29.   Close to a half of the nominal increase in spending during 2008–12 was unwound in 2013. Compensation of employees fell by 1.5 percentage points of 2012 GDP in nominal terms during 2012–13, representing about half the increase in 2008–12. Discretionary spending also fell, in particular intermediate consumption and capital expenditure, where the completion of large investment projects and overall tight control of intermediate consumption more than unwound the increase observed during the 2008–12. Social transfers and housing benefits had a considerably more modest contribution to the decline, given the increased number of retirements and demand for unemployment benefits during the downturn.

Change in Primary Expenditure 1/
(% of 2012 GDP)

	2008-12	2012-13
Primary Expenditure	8.3	-3.6
Recurrent Expenditure	8.1	-2.7
Social Transfers	4.2	-0.1
Housing Benefits	0.0	-0.3
Compensation of Employees	2.9	-1.5
Intermediate Consumption	0.6	-0.7
Subsidies	0.2	0.0
Other Current Expenditure	0.2	-0.1
Capital Expenditure	0.2	-0.9

Sources: Eurostat; and IMF staff estimates.

1/ The figures for the column 2012-13 are adjusted for the following one-offs: compensation of pension funds, Vassilikos insurance payments, sign in gas bonuses, and Cyprus Airways payments. Unlike other adjustments which are deductions, sign in gas bonuses are added to 2013 capital expenditure.

30.   Despite the significant reduction achieved thus far, Cyprus's compensation of employees remains among the highest in the EU[9]. Even after wage cuts of 9–15 percent and a 3 percent decline in central government employment, Cyprus's compensation of employees as a share of GDP is the fourth largest in the EU. The calculation uses 2012 GDP to control for the large output decline in 2013.

Nominal salary reductions accounted for most of the decline in compensation of employees in 2013 (% of 2012 GDP)

Source: Cystat.
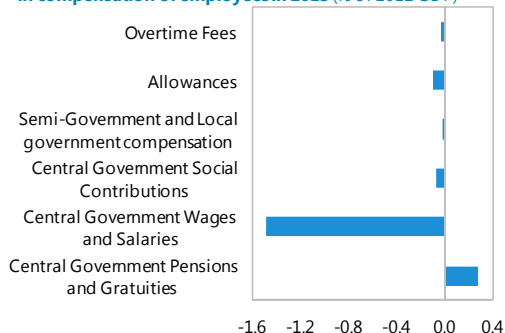
Compensation of Employees remains among the highest in the Eurostat database in 2013 (% of 2012 GDP)

Source: Eurostat.
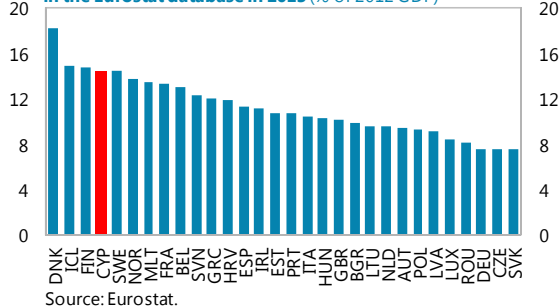
31.   Social transfers remained broadly unchanged in nominal terms despite significant measures, largely reflecting automatic stabilizers. A number of benefits (including social-exclusion, family, and disability) were rationalized in 2013. However, these were largely offset by the increase in unemployment benefits (also including redundancy payments) due to the sharp rise in the unemployment

Despite measures, social transfers remained broadly unchanged due to the difficult labor market situation (% of 2012 GDP)

Source: Cystat.

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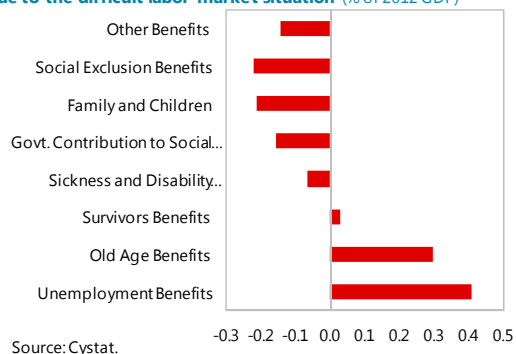
[9] The 2013 compensation of employee figure is distorted by about 0.5 percent of GDP due to the payment of gratuities given the significant increases in early retirements.

rate to close to 16 percent in 2013 from 12 percent in 2012 and under 4 percent in 2008. Moreover, the surge in retirements arising from the difficult labor market situation and from early retirements more than offset the impact of the introduction of penalties for early retirement.

F. Options to Achieve a Durable Fiscal Consolidation

32.   An additional fiscal effort will be needed to achieve medium-term fiscal program targets and put debt on a sustained downward path. While significant progress has been made with fiscal consolidation so far, more efforts will be needed to reverse the permanent spending increase that took place in 2008–12. The medium-term macroeconomic outlook of a gradual and moderate recovery—given high private sector deleveraging needs and protracted high levels of unemployment—will limit revenue buoyancy and maintain the need for unemployment benefit spending over the medium term. Moreover, the unfreezing of pensions and public wages starting in 2017 will likely boost spending. In this context, 3.4 percent of GDP of additional permanent consolidation measures are estimated to be needed to reach the primary surplus of 4 percent of GDP by 2018 and sustain it thereafter. This estimate is lower than at the outset of the program (4.7 percent of GDP) reflecting the over-performance with respect to program targets.

Primary Fiscal Balance and Fiscal Gap Estimates 2015-17
(percent of GDP, cash basis)

	2015	2016	2017	2018
Primary Balance with Unchanged Policies	-1.3	0.2	0.1	0.6
Primary Balance 4th Review Targets	-1.0	1.8	3.0	4.0
Cumulative Fiscal Gap	0.3	1.6	2.9	3.4

Source: IMF Staff Estimates

33.   The future fiscal effort should focus on the expenditure side. Significant revenue measures have already been implemented, which has stabilized revenues in the recession and maintained their level in line with that of peers. On the other hand, spending remains elevated by historical standards. The additional consolidation should, therefore, primarily target expenditures. The bulk of measures will need to come from the largest spending items of the budget, compensation of employees and social transfers, which account for 70 percent of primary general government expenditure, to prevent unduly compressing smaller areas of the budget. In particular, further adjustment in discretionary spending, such as gross capital formation and intermediate consumption, should be limited, to make the budget more growth friendly and ensure the durability of the adjustment.

34.   Further measures to rationalize the compensation of employees could be considered. On the basis of current projections, compensation of employees is expected to remain around 14 percent of GDP by 2018 which is still about 3 percentage points of GDP higher than the 2013 Eurostat database average of 11 percent of GDP. For example, taking measures that would halve the difference with the Eurostat database average (1.5 percent of GDP) could help cut almost in half the

consolidation needed to reach the authorities' primary surplus target of 4 percent of GDP. Options include:

- Reducing public sector wages: To address high levels of public salaries and pensions (including gratuities) the level of salaries could be further reduced. A 2 percent flat cut is estimated to generate savings of 0.3 percent of GDP. To reduce the gap with the private sector, salary cuts could be relatively more targeted to the levels of the salary distribution where gaps are the largest.

- Subjecting public pension gratuities to the income tax: Currently, gratuities (lump-sum payments received at the start of retirement, averaging about €104,637 per person in 2013) are fully exempt from income tax. Taxing them is estimated to yield about 0.2 percent of GDP. Alternatively, fully phasing them out over time could yield up to 0.5 percent of GDP. Such measures may need to be accompanied by an increase in the eligibility age to receive a gratuity and/or an unreduced pension to limit incentives for early retirement.

- Reducing employment in select sectors: To address excess employment in the education sector, the authorities could consider increasing working hours, increasing class size, extending school schedules, and rationalizing non-teaching staff. These strategies would all result in a reduced need for workers on renewable contracts. For example, reducing 2,000 workers on renewable contracts could save about 0.4 percent of GDP in 3 years.

- Measures to rationalize the compensation of employees should be accompanied by a reform of the public administration. The reform would need to address the fiscal consequences of the unfreezing of wages as from 2017, which allows for a resumption of automatic salary increase (of 3.6 percent on average) and other wage increases. Key measures to consider include: (i) carrying out a compensation survey to benchmark government salaries with appropriate private sector comparators and keep the survey updated on a regular basis; (ii) aligning salaries with those of the private sector informed by the results of the compensation survey; (iii) reforming pay scales to eliminate automatic increases unrelated to performance; (iv) revamping the performance appraisal system; and (v) facilitating mobility across the public sector. To maximize its benefits, the reform should also apply to the broader public sector, including SOEs.

35.   Spending on social benefits could also be further reduced over the medium-term, as the recovery takes hold. The authorities need to review the benefits created increased in 2008–12 with a view to phasing them out or better targeting them to the vulnerable. In particular, given relatively favorable housing indicators and that the new welfare reform includes a housing rental allowance for the vulnerable through the GMI, housing benefits should be better targeted and could be gradually phased out, which could yield up to 0.5 percent of GDP.

36.   There is also scope to further limit select categories of other current expenditure. In the education sector, the authorities could introduce/increase gradually tuition fees for tertiary education and reduce commensurately transfers to universities. An elimination of transfers could yield up to 0.6 percent of GDP. Already existing education grants should be retained and targeted to

the vulnerable to ensure that those that cannot afford it can still retain access to tertiary education. Basic education subsidies could also be means tested/gradually phased-out (a yield of up to 0.4 percent of GDP could be achieved through a full phase out). As to semi-government institutions and SOEs more generally, operational improvements could be made to allow for a reduction in transfers which represented about 0.8 percent of 2012 GDP in 2013[10].

G.   Conclusion

37.   The buildup of fiscal imbalances in Cyprus resulted primarily from permanent spending increases financed by what proved to be temporary real-estate revenues. Once the real-estate related revenues dwindled as the housing market boom turned to bust, the permanent increase in compensation of employees and social transfers led to a widening of the fiscal deficit. The authorities took measures in late 2011, but these were insufficient to address the fiscal imbalance and restore confidence in public finances.

38.   The authorities implemented significant measures in 2013–14 to address the causes of the fiscal imbalance. Fiscal measures of 7.5 percent of GDP were implemented, which led to an improvement in the primary balance of about 1 percent of GDP in 2013 despite the deep recession. Revenues were maintained broadly stable, while about half of the nominal spending increase during 2008–12 has been unwound. The fiscal consolidation was complemented by ambitious structural reforms of the pension system, the wage indexation mechanism, revenue administration, budget systems, and welfare.

39.   Nevertheless an additional fiscal effort will be needed in the coming years to reach medium-term fiscal targets. Permanent expenditure increases in 2008-2012 have been only partially reversed, and compensation of employees remains among the highest with respect to other EU countries. Moreover, the unfreezing of pensions and public wages starting in 2017 will likely boost spending. In this context, and given modest growth looking forward, an additional 3.4 percent of GDP in fiscal measures are estimated to be needed in the medium term to reach the primary surplus target of 4 percent of GDP by 2018, needed to put debt on a sustained downward path toward 100 percent of GDP by 2020.

40.   To achieve a durable consolidation, measures should be permanent, of high quality, and focused on the spending side. Options include revising current wage levels and pay scales, eliminating automatic increases, reducing employment in overstaffed areas (i.e. education), and rationalizing public-pension lump-sum payments. Reviewing social benefits increased during 2008–12 and improving the targeting of education subsidies, while increasing tertiary-education fees could also be considered. Even after achieving a 4 percent primary surplus, the authorities need to

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[10] This figure excludes transfers to universities and includes transfers to several semi-government organizations and SOEs of which the largest are the Cyprus Tourism Organization, the Cyprus Broadcasting Corporation, and the Cyprus Sports Organization.

maintain it for some time (10 years or more) to ensure that debt returns to the pre-crisis level and toward the European target of 60 percent of GDP. In this context, it will be important to underpin the consolidation with durable fiscal structural reforms, including of the revenue administration, public financial management, and the public-administration.

Box 1. Calculation of the Structural Balance and Structural Balance Adjusted for Housing Asset Price Movements

The Structural Balance (SB) is computed in line with the methodology discussed in Bornhorst et al. (2011) in three steps. The first step is removing one off fiscal operations which may distort the analysis of the underlying fiscal position. After netting out revenue and expenditures for one offs, the second step is computing the cyclically adjusted balance (CAB) using a cyclical adjustment approach. An aggregated approach is pursued, which is one where elasticities are used to measure the sensitivity of total revenue and spending to the output gap. Elasticity parameters used are equal to the median of the elasticities of a sample of countries which cover the OECD. The third and final step is estimating the effects of other economic cycles, in this case, a housing asset price cycle. Steps 2 and 3 are discussed briefly below. For more details, refer to Bornhorst et al. (2011).

Step 2. Standard Cyclical Adjustment

CAB=Rca-Gca where Rca and Gca are cyclically adjusted revenues and expenditures after netting out one offs for a given year. A time subscript is omitted for simplicity of notation.

Rca=R*(Y*/Y)^(ER,Y) where R are nominal revenues, Y* is potential output, Y is nominal GDP and ER,Y is the elasticity of nominal revenues with respect to the output gap, and ^ symbolizes exponentiation and * multiplication. Similarly, the formula for cyclically adjusted expenditure is Gca= G*(Y*/Y)^(EG,Y) where G is nominal spending and EG,Y is the elasticity of nominal spending with respect to the output gap. Dividing CAB by nominal GDP gives the structural balance for a given period in the text chart given that revenues and expenditures were already adjusted for one offs in the first step. The standard potential output series used in the estimation is consistent with the baseline macroeconomic projection while the adjusted potential output series refers to the financially neutral potential output series discussed in SIP chapter "Estimating Cyprus's potential output growth".

Step 3. Cyclical Adjustment including a housing asset price cycle.

Define A*/A as the asset price gap where A is the house asset price index at a given date and A* is the 10 year moving average of the housing asset price index. CAB2, the cyclically adjusted balance including an adjustment for a housing asset price cycle, is given by the following formula

CAB2=(R*(Y*/Y)^(ER,Y))*((A*/A)^(ER,A)) where ER,A is the elasticity of revenue with respect to house prices. When ER,A=0, the formula boils down to the standard cyclical adjustment formula. Dividing CAB2 by nominal GDP gives the structural balance adjusted for housing asset price movements in the text chart.

Data limitations with the housing asset price cycle index are an issue for Cyprus as the index starts only from 2002 onwards so A* for years such as 2003 is estimated only with two observations. However, given that A* starts to be computed with data starting in 2002 such values are likely to capture house price asset values that are not affected by the real estate boom. Moreover, the fact that the magnitude between the standard structural balance and the structural balance adjusted for housing asset price movements shows a ballpark estimate for the impact of the real estate boom on the structural position in line with actual real estate related revenue data is reassuring.

Box 2. The 2012 Consolidation Package

The 2012 consolidation package had an estimated yield of about 2.6 percent of GDP.

The revenue portion of the package was estimated to yield 1.4 percent of GDP. The main tax revenue measures were a 2 point increase in the VAT rate, an increase in the withholding tax on interest accrued on deposits of local banks from 10% to 15%, introduction of temporary contributions on public and private employees and pensioners depending on their income, an increase in property tax rates and a reduction in the exemption threshold, and a flat corporate levy depending on turnover. Social contributions for government employees were also increased. A contribution of a 3 percent of gross earnings for public employees in the public sector and the contribution rate for the Widows and Orphans Fund was increased by 1.25 percentage points to 2 percent of gross earnings.

The spending portion of the package was estimated to yield 1.2 percent of GDP. Main measures included an initial targeting of social scheme mainly by reducing income thresholds, ad-hoc cuts in transfers to semi-government and local authorities, a reduction of overtime pay by 5% in 2011 and 20% in 2012, a reduction of on call allowances, and finally a reduction of the number of personnel in the broader public sector by 5,000 over the following five years through attrition.

Several measures containing spending increases or having a more long term impact were also implemented. Measures included the suspension of the cost of living adjustment on wages and salaries and pensions in the public sector for COLA for two years, the reduction of salary scales for newcomers in the broader public sector by 10%, the closing of the scheme for public employees (GEPS) to new entrants which is expected to wind down the system by 2060, and the indexation of public pensions only by the cost of living de-linking it from the average increase in public wages.

Main Fiscal Aggregates (% GDP)

	2011	2012
Revenue	39.9	39.4
Tax Revenue	26.4	25.9
Social Security Contributions	8.8	8.5
Other Revenue	4.8	4.9
Expenditure	46.3	45.8
Primary Expenditure	43.9	42.6
Wages and Salaries	16.1	15.9
Social Transfers	14.7	14.7
Other Primary Expenditure	13.1	12.0
Interest Bill	2.4	3.2
Primary Balance	-4.0	-3.2
Overall Balance	-6.3	-6.4

Sources: Ministry of Finance; and IMF staff estimates.

The package had only a modest impact on revenue and expenditure in 2012. The primary balance improved by 0.8 percent of GDP mainly due to declining intermediate consumption and capital expenditure outlays (1.1 percent of GDP in other primary expenditure). In particular:

• Tax revenues defined as the sum of taxes on production and imports and current taxes on income and wealth declined a combined by 0.5 percent of GDP with respect to 2011 compared to a fall of 0.6 percent of GDP of real estate related revenue. This suggests that measures affecting tax revenue in the package mainly managed to compensate the adverse impact of the worsening macroeconomic environment in 2012.

• Social security contributions declined by 0.3 percent of GDP despite measures to increase contributions for public sector pensions in a context of deteriorating labor market conditions.

• Compensation of employees experienced a 0.2 percent of GDP decline as a result of the suspension of COLA and declining public employment. Social transfers remained broadly stable despite measures to reduce them reflecting the impact of increasing unemployment on unemployment and redundancy benefits and increasing old age benefits.

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