ECFIN COUNTRY FOCUS

Highlights in this issue:

- After a decade of sluggishness Germany`s consumption looks set to pick up
- Labour market remains resilient as the main driver of consumption
- VAT increase and accelerated inflation are expected to stop weighing on consumption
- Backsliding of labour market reforms could impede consumption

German consumption: is there hope for a revival?

By Carsten Eppendorfer and Michael H. Stierle*

Summary

In Germany private consumption virtually stagnated for nearly a decade and clearly lagged behind GDP growth. This Country Focus uses the estimation of a consumption function to show that the drop in employment is the most important factor behind the reluctance to consume in the first half of this decade. However, given the significant labour market improvement since 2005, employment cannot explain the persistent sluggishness of consumer expenditure since then. We found that additional factors such as various components of disposable income, perceived inflation and one-off events like the VAT increase and the expiry of the more generous depreciation rules have also held back private consumption. Since these one-offs will no longer weigh on private consumption, employment continues to increase and inflation will hopefully abate, there are reasons for optimism for a (moderate) revival of private consumption in Germany.

For nearly 10 years German consumption has hardly contributed to growth

German consumption: dormant for nearly a decade

While German growth lagged only slightly behind that of other European Union countries during the 1990s, the gap clearly widened thereafter. Much of this deviation can be explained by the sluggishness of private consumption. While in practically all other European economies private consumption contributed substantially to growth and rose on average by nearly 20% since 1999, it stagnated in Germany, no longer rising in parallel with GDP. In comparison to previous cycles, consumption clearly lags behind in the current recovery (see Chart 1).

Chart 1: Sluggishness of private consumption in Germany

Consumption: a European comparison[*]
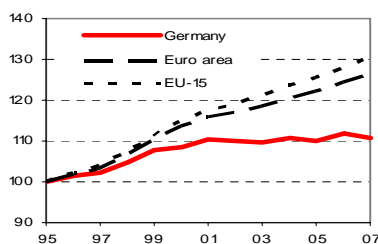
German consumption: a comparison over different business cycles[**]
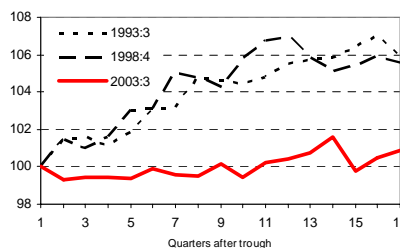
[*] Index 95 = 100, [**] Index 93:3, 98:4 and 03:3 = 100, constant prices. See *European Commission* (2007) for a detailed analysis of GDP components in the German business cycles.
Source: Destatis, Eurostat, Commission Services.

In order to investigate whether the sluggishness of private consumption during the last nearly 10 years can be explained by underlying fundamentals or whether a structural break has taken place, we estimate the German consumption function in an error correction model based on data from 1991 to 2007 (see Box).

The economic literature offers a wide range of possible determinants of private consumption. The neo-classical theory postulates that interest rates determine the choice between savings and consumption. Keynesian approaches explain private consumption as a stable function of disposable income, while the life-cycle hypothesis (*Modigliani* and *Brumberg*, 1954) and permanent income hypothesis (*Friedman*, 1957) assume an inter-temporal budget restriction of private household consumption based on income and wealth. Accordingly, a stable long-run equilibrium between consumption as well as private disposable income and/or wealth can be derived. Error correction models (ECMs) combine the analysis of long-run equilibrium or co-integration relation of variables with their dynamic short term adjustment to equilibrium.

Box: Estimation results[1]

Theoretically and empirically, private disposable income has proven to be the main driver of private consumption. For Germany the graph below displays this close relationship as from 1991.
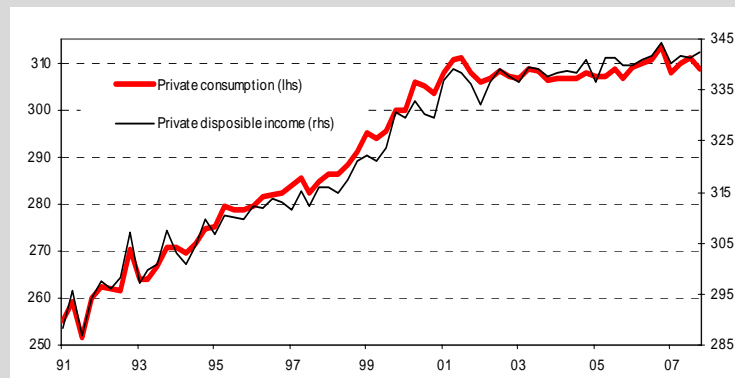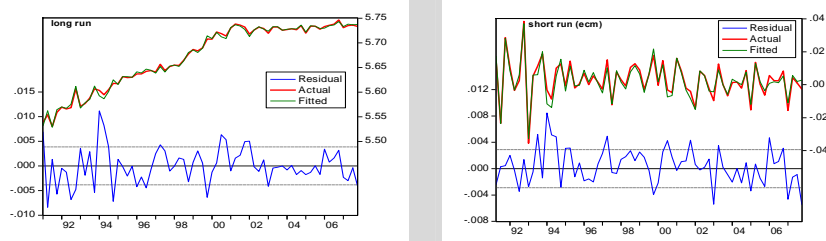

However, the variable 'disposable income' is a rather aggregated variable, which thus mask the relationship between its components and private consumption (*pc*). For this reason, in the estimation disposable income is broken down into its components, namely gross labour income (which is split into employment (*empl*) and compensation per employee (*w*)), labour income tax (*tax*), consolidated social benefits/contributions, duties, and net transfers (*soc*) as well as income from self-employed and capital (*nonlab*). These exogenous variables add up exactly to total private disposable income. Besides the disaggregated disposable income a measure of uncertainty is included in the equation. Theoretically, consumers tend to be risk-averse so that they save more when uncertainty is high. Therefore, results from a consumer-survey opinion on price trends over the last 12 month were integrated as a proxy for perceived inflation (*pinfl*). Based on quarterly data, the ECM of German consumption (Model 1) is estimated for the sample from 1991:1 to 2007:4. Variables are seasonally adjusted, deflated by consumer prices and enter the equation in logarithms (therefore estimated coefficients can be interpreted as elasticities):

$$\Delta pc_t = \beta_1 \Delta empl_t + \beta_2 \Delta w_t + \beta_3 \Delta tax_t + \beta_4 \Delta soc_t + \beta_5 \Delta nonlab_t + \beta_6 \Delta pinfl_t +$$
$$\gamma(pc_{t-1} - \alpha_0 c - \alpha_1 empl_{t-1} - \alpha_2 w_{t-1} - \alpha_3 tax_{t-1} - \alpha_4 soc_{t-1} - \alpha_5 nonlab_{t-1} - \alpha_6 pinfl_{t-1}) + \varepsilon_t$$

Model 1: Estimation results						
long run (cointegration-vector)	**c**	**empl**	**w**	**tax**	**soc**	**nonlab**	**pinfl**
	-11.710	0.875	0.717	-0.074	0.134	0.380	-0.004
	(-17.87)	(21.66)	(14.49)	(-5.61)	(27.79)	(45.55)	(-3.46)
short run	**γ**	**Δempl**	**Δw**	**Δtax**	**Δsoc**	**Δnonlab**	
	-0.729	0.813	0.599	-0.099	0.113	0.334	
	(-6.96)	(7.71)	(10.13)	(-4.25)	(22.63)	(22.76)	
	R^2 adj: 0.93	DW: 1.75					

Observed and simulated consumption function

The results for the long run co-integration relation show especially high elasticity with respect to employment. An increase of 1% of employment translates into an increase of private consumption expenditures by 0.88%. Strong responses come also from wages as well as non-labour income. Perceived inflation enters with the expected negative sign. The short-run dynamic of the consumption function in growth rates also proves the strong influence of employment and wages, while the coefficient of perceived inflation is not significant. The error-correction term γ indicates that the system tends quickly to the long term equilibrium - on average 73% of the deviations are reduced within one quarter.

To analyse the wealth effect of private consumption, Model 1 was extended by net private financial wealth (*wealth*). To ensure a parsimonious parameterisation of Model 2, employment and compensation per employee were merged as wage bill (*wbill*). Income tax, social benefits and contributions, duties, net transfers and non-labour income were condensed to all other disposable income (*diother*):

$$\Delta pc_t = \beta_1 \Delta wbill_t + \beta_2 \Delta diother_t + \beta_3 \Delta pinfl_t +$$
$$\gamma(pc_{t-1} - \alpha_0 c - \alpha_1 wbill_{t-1} - \alpha_2 diother_{t-1} - \alpha_3 wealth_{t-1} - \alpha_4 pinfl_{t-1}) + \varepsilon_t$$

Model 2: Estimation results

long run (cointegration-vector)	c	wbill	diother	wealth	pinfl
	-0.941	0.908	0.343	0.021	-0.007
	(-7.12)	(34.59)	(19.31)	(2.35)	(-6.85)

short run	γ	$\Delta wbill$	$\Delta diother$		$\Delta pinfl$
	-0.521	0.629	0.317		-0.004
	(-5.14)	(12.51)	(24.58)		(-1.83)
	R^2 adj: 0.91	DW: 1.76			

Note: t-values in brackets. *MacKinnon* (1991) critical values were used for co-integration testing. Residual tests (DW for autocorrelation, JB for normality and BGP for heteroscedasticity) did not indicate a violation of model assumptions. Cusum of squares test did not indicate parameter instability (structural break) over the sample. The model specification also assumes one co-integration relationship. Testing for the number of co-integration equations with the Johansen procedure delivers one co-integration relationship for model 2. For model 1 the results were mixed. While the Trace test does not rule out the existence of more than one co-integration relation the Maximum Eigenvalue test supports the existence of one co-integration relationship. Testing for weak exogeneity showed that all explanatory variables are weakly exogenous, so that a single co-integration equation would be appropriate. All time series are from German federal statistical office (Destatis), except net private financial wealth, which is taken from Deutsche Bundesbank.

Observed and simulated consumption function
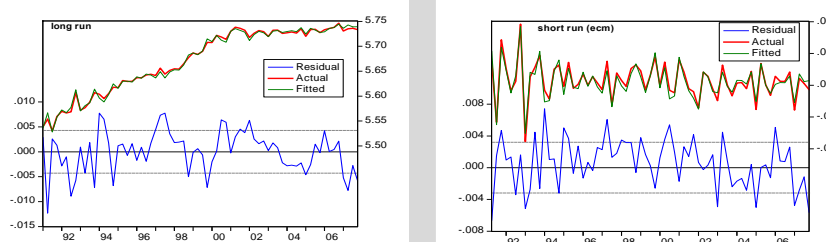
Not surprisingly, gross wage bill proves to be the main driver of consumption. With an elasticity of 0.02% the contribution of net financial wealth to consumption is rather small in the long run and has no significant role in short run dynamics. With 52% again the system tends to get to the long term equilibrium quickly.[2]

Reason for sluggishness in the first half of this decade

*Employment as
the main driver of
private
consumption*

Our estimation reveals an especially strong contribution from employment and wages to the explanation of private consumption. But also the remaining components of disposable income, namely labour income tax, net social transfers and non-labour income show a significant influence.

Approaching 90% in the long-term co-integration relation of the ECM, employment elasticity of consumption is the highest of all the components of disposable income. In the first half of this decade overall employment fell substantially (see Chart 2), with full-time jobs subject to social security contributions being worst hit, while part-time and atypical working arrangements actually rose. These developments acted as a substantial drag on private consumption until 2005 as the reliability of income (or unemployment expectations) is a key factor in consumption decisions.

Chart 2: Private consumption, employment and wages in Germany
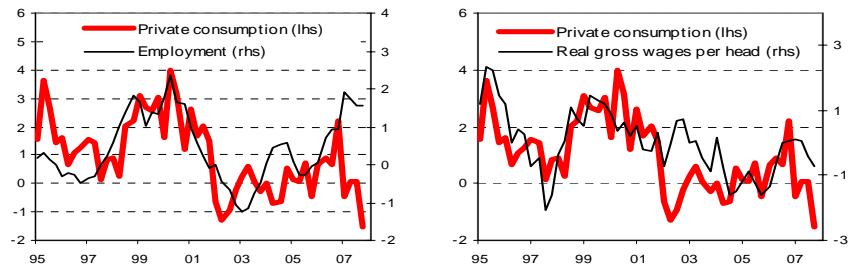
Source: Destatis.

*Wage restraint is
prima facie weighing
on consumption*

Growth of real gross wages per head was subdued after 1992 and even showed a slight decline after 2002 as a result of the long-lasting wage restraint that became necessary after the extraordinary increase during the reunification boom.[3] This constituted a significant drag on private consumption in the first half of the decade and was accompanied by a continued decline of the wage ratio. And even in 2007, when nominal wage growth clearly picked up, the stronger acceleration of inflation led to a decline in real wages. However, that can hardly explain the sluggish consumption in 2006 and 2007 as the overall wage bill increased due to positive employment growth.
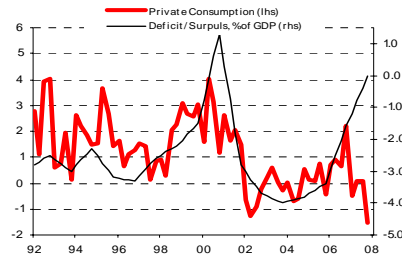
*Labour taxes paid
and net social
transfers reflect
labour market
improvement*

Taxes paid on labour income (in our model with the expected negative sign) and received net social transfers have been shown to be significant contributors to private consumption. Both variables together – which represent most of the financial flow between private households and the general government – helped private consumption in the first half of the decade and clearly dampened consumption growth in 2006 and 2007. However, an economic interpretation is complicated by two factors. First, these developments are to a large extent automatic consequences of the positive labour market trend as higher employment leads to higher labour income taxes and social security contributions, and, conversely, lower unemployment leads to a reduction in social transfers. Second, from a Ricardian equivalence perspective it is also not possible to conclude that tax reductions and higher social transfers would help private consumption as there might exist a close link between private consumption and the public deficit (see Chart 3). Private consumption was reduced when Germany was in the excessive deficit procedure. This might have contributed to the increase in precautionary savings, even if both variables certainly have a cyclical component. However, the improvement of the cyclically adjusted balance in Germany since 2003 by 3 percent of GDP (EU27 only 1.8 percent of GDP between 2004 and 2007) does not seem to have stimulated private consumption in the last few years and cannot be shown to have a statistical significance in the estimated models.

This is also in line with the fact that in Germany the savings rate (which is the mirror image of the consumption share of disposable income) has increased by about 2 percentage points since the beginning of this decade (see Chart 3). This contrasts particularly with the savings rate in the euro area, which has shown rather a declining trend until 2005 and only recently caught up to the level in 2000. A crucial factor behind these different developments might be that the public debate in

Germany about the sustainability of the German pension system contributed to an increase in precautionary savings. This was also supported by public subsidies to increase private capital building. Moreover, pension payments in the public PAYG system were dampened by a sustainability factor and the pension age was increased.

Chart 3: Ricardian equivalence and savings ratio

Consumption and government deficit   Savings rate
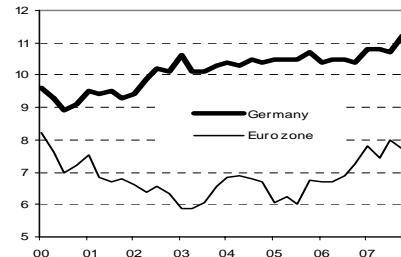
Source: Destatis, Deutsche Bundesbank, Eurostat.

Non-labour income as stable contributor

The remaining about 38% of disposable income, i.e. non-labour income, of which 1/3 broadly consists of income of self-employed and 2/3 of profits and capital income, proved to be – in line with expectations – the explanatory variable with the highest marginal consumption rate[4] and to be highly significant (see Box). Given its mainly stable increase, non-labour income is a relatively reliable contributor to private consumption over the entire timespan analysed.

Factors weighing on consumption since 2006

The sluggishness of private consumption in Germany until 2005 can to a large extent be traced back to weak employment. However, since 2005 Germany has witnessed some fundamental changes, most notably the creation of more than 1 million new jobs – many of which are full time jobs subject to social security contributions, and not so called "mini jobs". In spite of this, consumption has not picked up, because the stimulus was overcompensated by three additional factors:

Inflation substantial drag

The first factor is a strong acceleration of inflation, which has reduced real wage and disposable income gains. Indeed, inflation and private consumption show a negative correlation (see Chart 4). In addition, perceived inflation might have accelerated stronger than actual inflation as price increases were concentrated in high frequency purchases like fuel and food. Accordingly, perceived inflation in our estimation helps to explain the negative consumption swing in 2007.

Chart 4: Private consumption and inflation
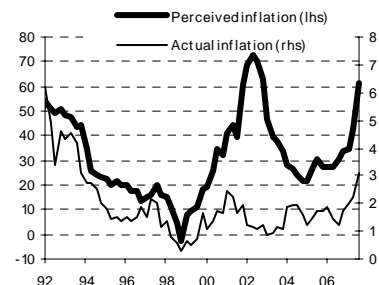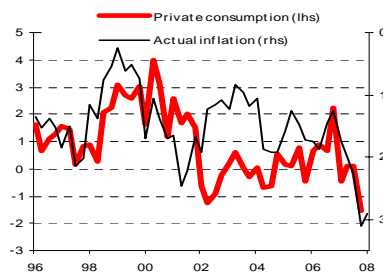
Source: Destatis, Deutsche Bundesbank, DG ECFIN.

Negative echo effects of advanced purchases due to VAT increase

The second factor is the increase of the standard VAT rate from January 2007 by 3pp, which led private households to bring forward purchases considerably. This is clearly shown by the remarkable swings in retail sales around this date, particularly visible for big items like cars and white goods (see Chart 5). The magnitude of this VAT anticipation effect was stronger than on other occasions in Germany and other economies, because the VAT increase was large and announced more than one year in advance (so that private households had time to adjust their expenditure plans).

Thirdly, in the last quarter of 2007 self-employed and family-owned companies may have taken advantage of the favourable depreciation rules (in operation until the end of 2007) to invest at the expense of consumption. This may help to explain why private consumption fell further in the fourth quarter of 2007 by 0.8% compared with the previous quarter. Indeed, while investment in machinery and investment accelerated from an already high level, private consumption did the opposite.

Chart 5: Effects of VAT increase in Germany
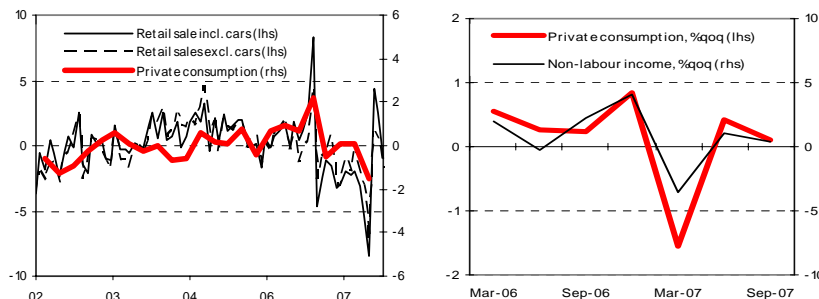

Source: Destatis, Deutsche Bundesbank.

These latter two factors presumably explain why the estimation residual for 2007 is negative. As the cost pass-through of the VAT increase started already in 2006, non-labour income (profits) jumped in 2006Q4 by 4% qoq. In contrast, as the pass-through was not completed in 2007Q1, profits fell by 3.6% qoq. The relatively high marginal consumption rate of, and substantial swings in, this disposable income component lead to corresponding swings in private consumption as well (see Chart 5). Indeed, when net financial wealth is included in the estimation (see Box) and due to the link between stock and flow variables the coefficient of non-labour income is reduced, residuals are substantially higher and would ask for the inclusion of a VAT and depreciation rules related dummy in 2007.

Conclusions and outlook: is there hope for a revival?

Overall, the sluggishness of private consumption over nearly a decade can largely be explained by the development of the different components of real disposable income, perceived inflation and net financial wealth of private households. The existence of a structural break, which is sometimes suggested, cannot be confirmed.

While the subdued labour market performance can explain the almost non-existent growth of private consumption in the first half of this decade, it cannot for 2006 and 2007. In those two years, accelerating inflation (reducing real disposable income), tax and social transfer developments related to the improved labour market, and, to a limited extent, perceived inflation can largely explain why consumption remained broadly constant, even though non-labour income, employment and GDP grew strongly. In addition, the VAT echo effect from purchases being brought forward into 2006 as well as the ending of the improved depreciation rules played a role.

Chart 6: Underlying fundamentals and expectations of consumption in Germany

Contributions to consumption growth[*]   Observed and expected[*] consumption
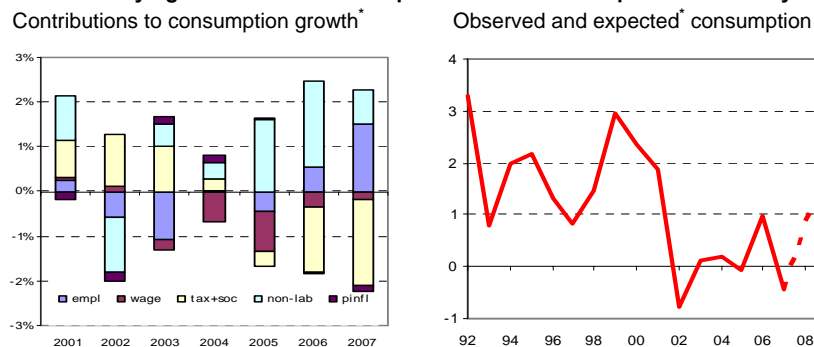
Source: Destatis, Commission Services. [*] The calculation is based on the estimated coefficients of model 1 (see Box).

The positive fundamentals underlying private consumption can be expected to prevail, because the temporary effects of the VAT increase and the improved depreciation rules will cease to weigh on private consumption in 2008 and inflation might gradually decelerate in the second half of 2008. With declining but still positive employment growth and accelerating wage increases, rising real disposable income will help private consumption to pick up moderately. Improved job security will also be supportive as unemployment should fall towards 7% in 2009 – one-third lower than in 2005. This could boost households' spending propensity, thereby lowering the persistently high savings rate, if these positive effects will not be overcompensated by negative confidence effects in the context of the current financial turmoil. Based on the estimated coefficients of our model as well as the Commission spring forecast for the explanatory variables,[5] a pick-up to close to 1% and 1½% can be expected for 2008 and 2009 respectively (see Chart 6).

The long-lasting wage restraint after German reunification is finally paying off, leading to a strong increase in employment – and thereby consumption. Insofar, the estimated positive impact of wages on consumption cannot be used as an argument for unreasonable wage increases as the corresponding negative impact on employment has to be taken into account. Wage increases should remain in line with productivity growth in order not to add to inflationary pressures, in particular at this delicate juncture. With employment proving to be the strongest driver of German consumption, the risk of backsliding behind the labour market reforms of "Agenda 2010" should be avoided (partial prolongation of unemployment benefit periods, introduction of sector-specific minimum wages) as it could stifle the expected consumption pick-up and also put Germany`s recovery at risk. Implemented labour market reforms require a strong and sustained political commitment to lead to a structural turnaround on the German labour market.

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[1] We would like to thank *Jörg Rahn* from the German Council of Policy Advisers (Sachverständigenrat) for helpful comments on the econometric model.

[2] Testing of further variables (short- and long-run interest rates, several survey indicators on consumer confidence, housing prices and stock market indices) showed no significant influence on German consumption. For current research of German consumption function see also *Deutsche Bundesbank* (2007), *Nastansky* (2007), *European Commission* (2006), *Dreger* and *Reimers* (2005) and *Hamburg* et al. (2005).

[3] See *European Commission* (2007).

[4] The marginal consumption rate can be obtained by multiplication of the coefficient (i.e. the elasticity) with the value of the explanatory variable divided by consumption spending. Note that due to the inclusion of a (negative) constant in our estimation, the marginal consumption rate of total disposable income is higher than 1.

[5] European Commission (2008). Perceived inflation was assumed to remain constant at the level of 2008Q1.