MONETARY POLICY & THE ECONOMY

Quarterly Review of Economic Policy

Q1/18

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Contents

Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank or of the Eurosystem.

Call for applications: Visiting Research Program

The Oesterreichische Nationalbank (OeNB) invites applications from external researchers (EU or Swiss nationals) for participation in a Visiting Research Program established by the OeNB's Economic Analysis and Research Department. The purpose of this program is to enhance cooperation with members of academic and research institutions (preferably postdoc) who work in the fields of macroeconomics, international economics or financial economics and/ or pursue a regional focus on Central, Eastern and Southeastern Europe.

The OeNB offers a stimulating and professional research environment in close proximity to the policymaking process. Visiting researchers are expected to collaborate with the OeNB's research staff on a prespecified topic and to participate actively in the department's internal seminars and other research activities. They will be provided with accommodation on demand and will, as a rule, have access to the department's computer resources. Their research output may be published in one of the department's publication outlets or as an OeNB Working Paper. Research visits should ideally last between three and six months, but timing is flexible.

Applications (in English) should include
• a curriculum vitae,
• a research proposal that motivates and clearly describes the envisaged research project,
• an indication of the period envisaged for the research visit, and
• information on previous scientific work.
Applications for 2018 should be e-mailed to eva.gehringer-wasserbauer@oenb.at by May 1, 2018.

Applicants will be notified of the jury's decision by mid-June. The following round of applications will close on November 1, 2018.

Analyses

Austria's economy maintains growth momentum in first half of 2018

Gerhard Fenz,
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Austria's economy grew by 3% in 2017 and will sustain its strong pace of growth at least until mid-2018, benefiting from the strong international economy and robust domestic demand. As a consequence, employment has augmented markedly, while unemployment has declined. Short-term indicators decreased somewhat in early 2018, but remain close to their historical highs. Based on its quarterly forecasting exercise, the Oesterreichische Nationalbank (OeNB) therefore expects real GDP in Austria to continue to expand substantially by 0.8% (quarter on quarter) both in the first and second quarters of 2018. For 2018 as a whole, Austria's economy is anticipated to grow at least at the same rate as in 2017. The OeNB forecasts annual HICP inflation in Austria to come to 2.0% in 2018 and to reach 1.9% and 2.0%, respectively, in 2019 and 2020. The decline in inflation – in 2017, inflation was still at 2.2% – is driven above all by lower commodity prices and the appreciation of the euro. At the same time, the inflation of industrial goods prices (excluding energy and services) is set to remain persistently high or to rise on account of the favorable growth prospects. As a result, core inflation (excluding energy and food) will remain almost stable, at or above 2.0%, from 2018 to 2020.

1 Austria's economy grew by 3% in 2017

The Austrian economy maintained its strong growth momentum up to the end of 2017. At 0.9% (quarter on quarter; in real terms; trend-cycle component adjusted for seasonal and working-day effects), real GDP growth in the fourth quarter continued almost unabated compared with the previous quarters. For 2017 as a whole, economic growth comes to 3.0% (2.9% non-seasonally adjusted).

The expansion of the Austrian economy is broad-based. Private consumption expenditure rose by 0.4% quarter on quarter in real terms over the last three quarters of 2017. For the year as a whole, overall household consumption increased by 1.5% against 2016. Despite losing some of its vigor in the second half of the year, investment activity remained stronger than forecast in the December 2017 outlook. In the fourth quarter of 2017, real gross fixed capital formation was 0.8% higher than in the third quarter, bringing the annual growth rate for 2017 to 4.8%. The steady, yet relatively moderate growth of construction investment (+2.4% in 2017) contrasts with an equipment investment cycle that continues to be robust (+8.6% in 2017). The need for expansion investments, particularly investment in machinery, remains high (+9% in 2017). This reflects the optimistic sentiment of businesses and thereby points to a continuation of the favorable economic developments in the first half of 2018.

In 2017, Austrian exporters benefited from robust external conditions. In the fourth quarter, exports of goods and services rose by 1.9% quarter on quarter, bringing full-year growth to 5.9%. As forecast by the OeNB's Export Indicator, goods exports stood out with a particularly marked increase (+2.4%) in the fourth quarter. Ultimately, in the fourth quarter of 2017, the contribution of net exports was only slightly positive at 0.4 percentage points (0.5 percentage points in 2017 as a whole), as strong investment also resulted in high import growth.

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National accounts data for Austria

	GDP	Private consumption	Government consumption	Gross fixed capital formation	Exports	Imports	Domestic demand (excluding changes in inventories)	Net exports	Changes in inventories	Statistical discrepancies
	Change on previous period in %						*Contribution to GDP growth in percentage points*			
Q1 17	+0.9	+0.3	+0.1	+1.5	+2.1	+2.0	+0.5	+0.2	−0.0	+0.2
Q2 17	+0.8	+0.4	+0.2	+1.5	+1.5	+1.5	+0.6	+0.1	+0.1	−0.0
Q3 17	+0.9	+0.4	+0.5	+1.2	+1.3	+1.1	+0.6	+0.2	+0.1	−0.0
Q4 17	+0.9	+0.4	+0.6	+0.8	+1.9	+1.3	+0.5	+0.4	+0.1	−0.0
2014	+0.8	+0.3	+1.0	−0.5	+3.1	+2.8	+0.2	+0.2	+0.3	+0.1
2015	+1.1	+0.5	+1.3	+1.0	+3.0	+3.0	+0.7	+0.1	+0.2	+0.0
2016	+1.5	+1.5	+2.0	+3.8	+2.4	+3.6	+2.1	−0.5	+0.1	−0.1
2017	+3.0	+1.5	+1.3	+4.8	+5.9	+5.2	+2.2	+0.5	+0.1	+0.2

Source: WIFO, OeNB calculations.

The healthy growth of exports has also been a major stimulus to the domestic manufacturing industry. Measured in terms of gross value added, industrial production grew by 3% against the previous quarter in the last three months of 2017, expanding about three times as fast as the economy as a whole. For the full year 2017, industrial production went up by 7%. Such buoyant industrial activity is typical of boom periods. Similarly steep growth rates were recorded in 2000, 2006–2007 and 2010–2011.
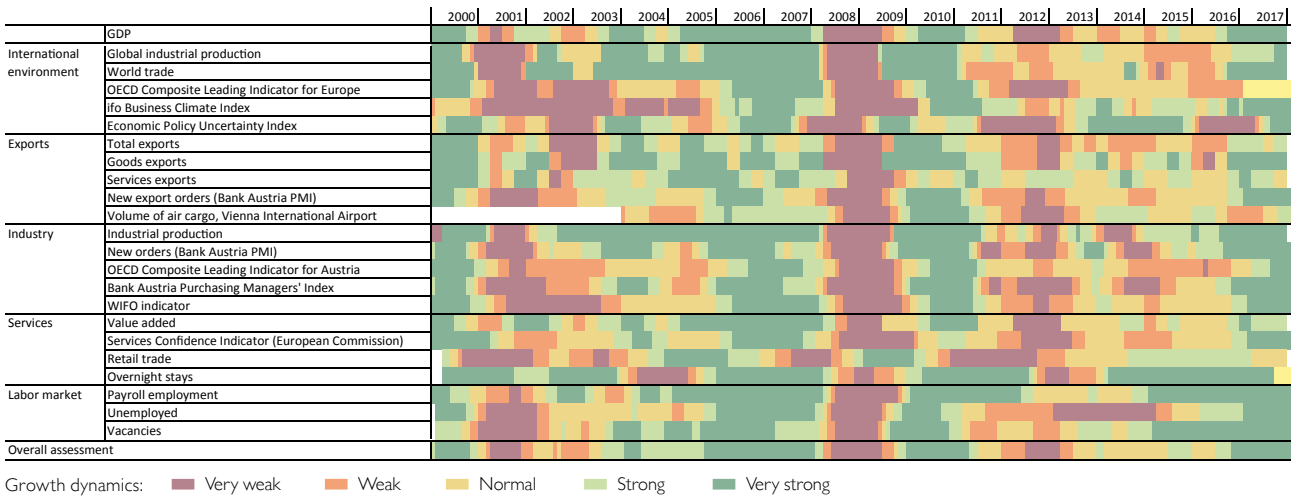
2 Economic indicators just below historical highs – upswing seems to have peaked

Available leading indicators suggest that the Austrian economy will continue to grow at a vigorous pace over the next few months. A heat map of the state of the Austrian economy (chart 1) concisely depicts a range of key indicator results for five areas: international environment, exports, industry, services and the labor market. The overwhelming majority of indicators is green, signaling that the current upswing has reached all major parts of the Austrian economy.

Several key leading indicators reached historical highs at end-2017: In December, the European Commission's Economic Sentiment Indicator (ESI) climbed to its highest value since 1990, and the Purchasing Managers' Index (PMI) compiled by Bank Austria hit an all-time high in the same month. In early 2018, these confidence indicators and their subindices receded somewhat (chart 2), but in February both the ESI and the PMI still pointed to very strong growth, standing at 117.8 and 59.2 points, respectively. The same holds true for the ifo Business Climate Index published by the ifo Institute, which has good leading indicator properties also for the Austrian economy. The expectations component of the ifo Business Climate Index dropped slightly three times in a row recently – albeit from a very high level – but these corrections are still too weak to be interpreted as a signal of a potential turning point in economic activity. That said, the declines hint that the peak of the current economic cycle has already been reached.

Chart 1

Economic heat map for Austria

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	GDP																		
International environment	Global industrial production																		
	World trade																		
	OECD Composite Leading Indicator for Europe																		
	ifo Business Climate Index																		
	Economic Policy Uncertainty Index																		
Exports	Total exports																		
	Goods exports																		
	Services exports																		
	New export orders (Bank Austria PMI)																		
	Volume of air cargo, Vienna International Airport																		
Industry	Industrial production																		
	New orders (Bank Austria PMI)																		
	OECD Composite Leading Indicator for Austria																		
	Bank Austria Purchasing Managers' Index																		
	WIFO indicator																		
Services	Value added																		
	Services Confidence Indicator (European Commission)																		
	Retail trade																		
	Overnight stays																		
Labor market	Payroll employment																		
	Unemployed																		
	Vacancies																		
Overall assessment																			

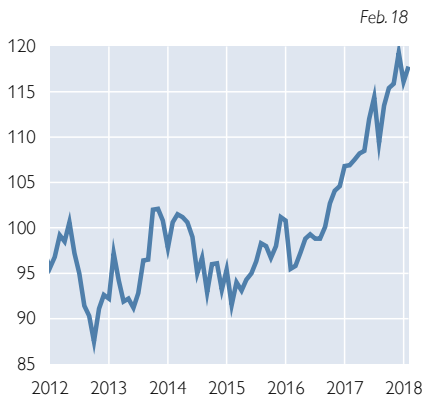Growth dynamics: Very weak   Weak   Normal   Strong   Very strong

Source: CPB, OECD, ifo, EPU, Statistics Austria, WIFO, Vienna International Airport, European Commission, Eurostat, AMS.

Chart 2

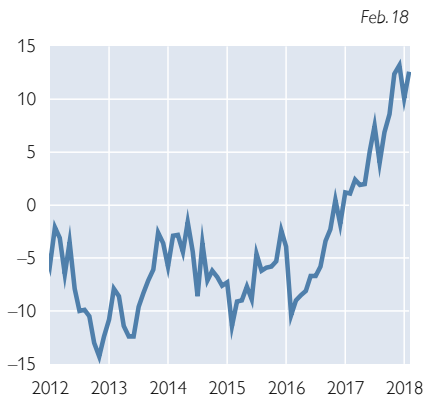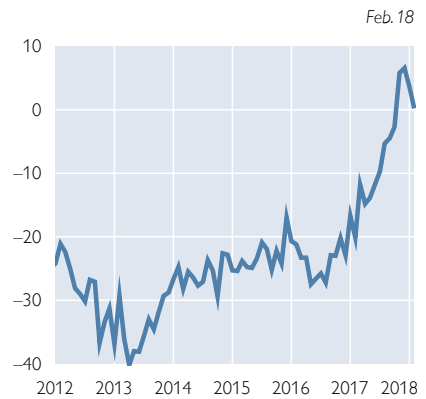## Confidence indicators for the Austrian economy
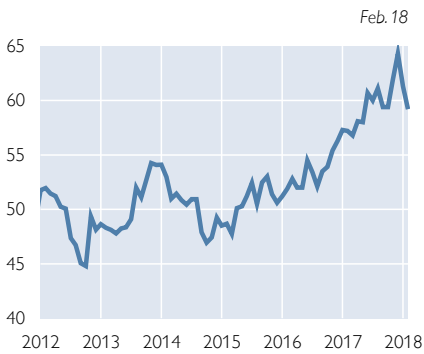
Economic Sentiment Indicator (ESI)

Feb. 18

ESI: industrial confidence

Feb. 18

ESI: export order books

Feb. 18

Purchasing Managers' Index (PMI)

Feb. 18

PMI: new orders

Feb. 18

PMI: new export orders

Feb. 18
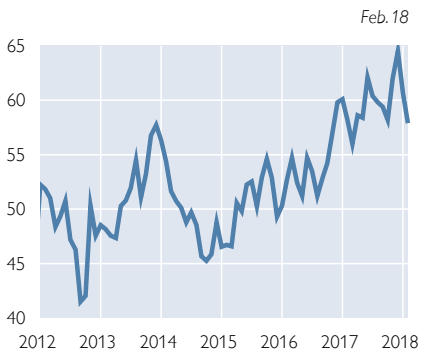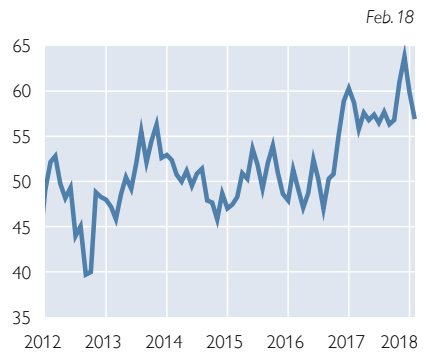
Source: European Commission, Bank Austria.
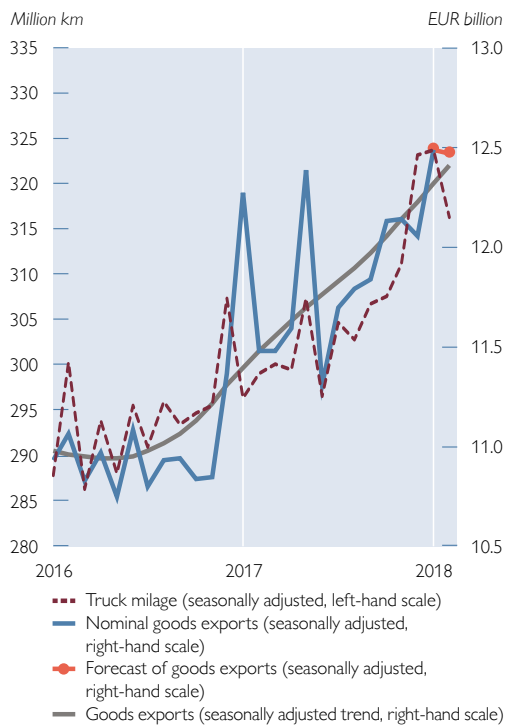
3 Strong export growth

Austrian export growth was very strong in 2017, with goods exports outpacing last year's growth rate by 8.2%, according to Statistics Austria's latest figures. This means that the goods trade stagnation seen in 2016 (when nominal goods exports fell by 0.3%) has been overcome. Austrian exporters took the chances that a globally synchronized economic upswing and a concomitant expansion of world trade were offering. In particular, healthy demand in Austria's key export markets – the euro area and CESEE – provided important momentum. Thanks to the strongly synchronized global upswing, the expansion in exports is broad-based across regions and sectors. Exports to the euro area and CESEE each picked up by 9%, which is slightly above average. A contraction was observed only for exports to the U.K. and Switzerland (by 5% and 2%, respectively). A breakdown by goods categories shows that exports of chemicals, vehicles and processed goods grew by more than 10%. Exports of machinery accelerated only in the second half of the year and, as a result, did not grow beyond 6% for the full year 2017.

The outlook for goods exports is characterized by very positive leading indicators in the short run and heightened (economic) policy risks in the medium term. Leading indicators like new export orders are not pointing to an imminent

Chart 3

OeNB Export Indicator and leading indicators for foreign trade signal strong export growth

Truck milage and goods exports (seasonally and working-day adjusted)

Million km — *EUR billion*

Truck milage (seasonally adjusted, left-hand scale)
Nominal goods exports (seasonally adjusted, right-hand scale)
Forecast of goods exports (seasonally adjusted, right-hand scale)
Goods exports (seasonally adjusted trend, right-hand scale)

Leading indicators for foreign trade

Annual change in %; balance — *Points*

Forecast of export growth (annual change in %, smoothed, left-hand scale)
Export growth (annual change in %, smoothed, left-hand scale)
ESI expected new export orders (smoothed, four-month lag, left-hand scale)
PMI new export orders (smoothed, four-month lag, right-hand scale)

Source: ASFINAG, Eurostat, Statistics Austria, Bank Austria, OeNB.

slowdown in exports. Also, current results of the OeNB's Export Indicator, which is based on truck milage data, show nominal goods export rates of 5% and 9% for January and February 2018, respectively. This means that export momentum subsided somewhat after the peaks seen in October (15%) and November (11%) but has remained very strong. Over the medium term, restrictive trade policies, such as the tariffs on imports recently imposed by the U.S. administration, are a downward risk to export activity. The direct macroeconomic effects of the U.S. levying a 25% tariff on steel imports and a 10% tariff on aluminum imports on the Austrian economy are likely to be small. Steel and aluminum exports to the U.S.A. amount to no more than 0.2% and 0.1%, respectively, of Austria's total goods exports, or less than EUR 0.5 billion in total. However, since 4% of Austria's total steel exports and 7% of Austria's total aluminum exports would still be affected, some domestic companies may end up feeling the impact of the new U.S. tariffs. From a macroeconomic perspective, the actual macroeconomic risk consists in a further escalation of the trade war, however.

Turning to the services sector, next to transport and other business-related services, tourism performed particularly well in 2017. The number of overnight stays increased by 2.5%, reaching an unprecedented high of 144 million. An above-average contribution to this record figure came from the number of nights spent in Austria by visitors from abroad, which rose by 3% (106 million overnight stays). This trend continued into January 2018, which saw a 5.4% increase in overnight stays (and a 5.7% increase in the number of nights visitors from abroad spent in Austria).

In sum, both goods and services export growth is expected to remain robust in the first half of 2018.

4 Strong employment growth and higher wage growth support private consumption in 2018

Modest productivity growth and low inflation in 2016 prompted relatively moderate wage settlements for 2017. Negotiated wages went up by 1.5% in 2017 – an increase that was lower than the HICP inflation rate of 2.2%. Wage growth is expected to accelerate significantly in 2018 in view of the economic boom. The wage settlements that have been concluded so far point to a rise in negotiated wages by more than 2½% in 2018. As a consequence, real wage growth will be robust and support additional private consumption expenditure.

At the same time, employment has been growing particularly fast. In 2017, the number of persons in payroll employment increased by 68,400. In the first two months of 2018, annual payroll employment growth continued to accelerate sharply to 94,000 persons on average. Employment growth is broad-based across sectors. Major contributions to employment growth have been coming from private sector services (NACE G to N, +44,600 jobs), industry (NACE C to E, +24,100 jobs) and public services (NACE O to R, + 23,300 jobs). The sharp increase in the number of registered job vacancies indicates that employment dynamics will remain robust over the next few months.

The number of unemployed persons declined by 17,300 to 340,000 in 2017. This positive trend continued in early 2018. January and February 2018 saw a sub-stantial year-on-year drop in unemployment. The number of persons participating in AMS (Public Employment Service Austria) training programs, i.e. persons not deemed to be unemployed, continued to rise, however, coming to 79,800 in

Table 2

Key indicators for the Austrian labor market

	Payroll employment		Unemployed persons		Unemployment rate in %			Registered job vacancies		Persons in training programs	
	Thousands	Annual change in thousands	Thousands	Annual change in %	AMS definition (NSA[1])	AMS definition (SA[2])	EU definition (SA[2])	Persons	Annual change in %	Persons	Annual change in %
2015	3,535	+31	354.3	+11.0	9.1	9.1	5.7	29,251	+11.1	65,126	−13.5
2016	3,587	+52	357.3	+0.8	9.1	9.1	6.0	40,277	+37.7	67,210	+3.2
2017	3,655	+68	340.0	−4.9	8.5	8.5	5.5	56,854	+41.2	72,098	+7.3
Q1 17	3,579	+59	392.3	−1.8	9.9	8.8	5.7	49,230	+39.3	74,481	+8.2
Q2 17	3,646	+65	320.0	−4.8	8.1	8.6	5.5	58,812	+41.0	74,426	+7.0
Q3 17	3,723	+70	307.2	−5.4	7.6	8.5	5.4	63,117	+46.3	66,196	+6.8
Q4 17	3,673	+79	340.4	−7.7	8.5	8.2	5.5	56,255	+37.5	66,196	+6.8
Sep. 17	3,705	+61	302.8	−6.3	7.6	8.4	5.4	62,445	+46.9	72,092	+4.9
Oct. 17	3,689	+78	315.7	−7.4	7.9	8.3	5.4	59,202	+44.5	77,307	+8.6
Nov. 17	3,683	+78	326.9	−8.1	8.2	8.2	5.5	54,745	+37.2	77,823	+5.9
Dec. 17	3,646	+81	378.7	−7.7	9.4	8.1	5.5	54,818	+31.0	64,740	+6.6
Jan. 18	3,649	+102	379.2	−10.2	9.4	8.0	5.5	59,103	+30.9	76,651	+7.1
Feb. 18	3,662	+86	364.7	−9.0	9.1	7.9	x	62,867	+27.3	79,776	+6.1

Source: Main Association of Austrian Social Security Institutions, AMS, Eurostat, OeNB.

[1] *NSA = non-seasonally adjusted.*

[2] *SA = seasonally adjusted.*

February 2018. This uptrend is attributable to the increasing number of foreign workers, in particular recognized asylum seekers and persons eligible for subsidiary protection, who participate in these training programs.

In 2017, Austria's unemployment rate (national definition) decreased by 0.6 percentage points to 8.5% year on year. In February, it came to 7.9% (seasonally adjusted). In January, the unemployment rate (Eurostat definition) remained unchanged against 2017 as a whole, at 5.5%.
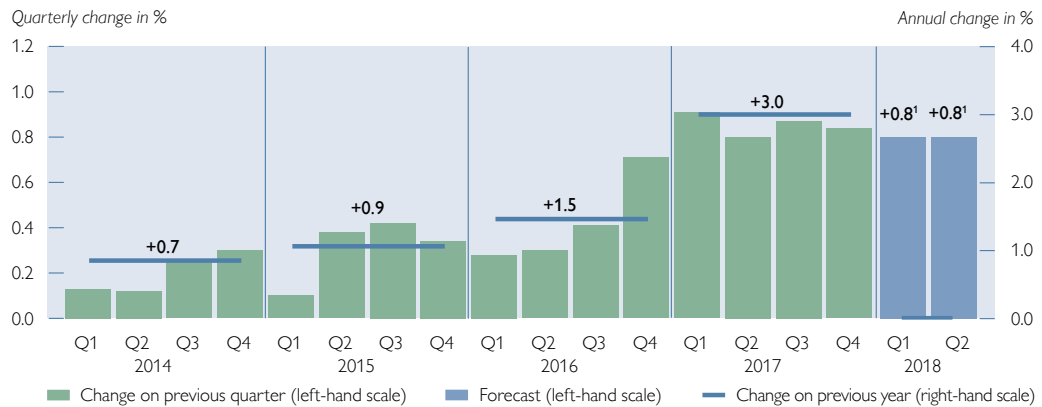
5 OeNB's Economic Indicator of February 2018: economic momentum to continue in first half 2018

On the back of strong domestic and external demand, the current boom period will continue in the first six months of 2018. Austrian exporters will be able to boost their sales of goods and services further, given their high level of competitiveness and favorable international economic activity. In Austria, strong employment growth and rising wages will leave scope for additional private consumption. Against this backdrop and in view of the fact that capacity utilization continues to be well above average, domestic companies will have to invest in expanding their production capacities also in early 2018. While currently investments are made above all in new machinery, construction investment has also been increasing steadily. Obviously, the extended period of weak growth following the crisis brought about an investment backlog, which now makes for a particularly pronounced investment cycle.

This means that the cyclical momentum will continue to be particularly robust over the next few months. The OeNB expects the Austrian economy to grow by 0.8% (quarter on quarter) both in the first and second quarters of 2018; this would be around twice the long-term average growth rate observed since 2000. For 2018 as a whole, economic growth is expected to be at least as strong as in 2017.

Chart 4

Outlook for Austrian real GDP for the first and second quarters of 2018 (seasonally and working-day adjusted trend series)

Quarterly change in %   *Annual change in %*

Source: OeNB's Economic Indicator of February 2018.

[1] Forecast.

6 HICP inflation and core inflation down markedly since fall 2017

Austria's rates of HICP inflation and core inflation (excluding energy and food) peaked at 2.5% in September 2017 and have gone down markedly since. This decline was observed across all HIPC components (services, industrial goods excluding energy, energy and food) and was attributable to an appreciation of the euro and, during the first two months of the year, a slowdown in commodity prices; the latter fed through to consumer prices via earlier stages of production (producers, wholesale trade). Although compensation of employees has clearly picked up again lately, strong productivity growth drove unit labor costs further down. Therefore, labor costs also had a downward impact on inflation in recent months.

7 Inflation outlook: energy and food prices dampen rate of inflation

The OeNB expects the average HICP inflation rate for Austria to come to 2.0% in 2018, 1.9% in 2019 and 2.0% in 2020 (chart 5). Unlike in the past, commodity prices have not continued to rise. Both commodity prices and a stronger euro have dampening effects on HICP inflation, which in turn are bound to impact the HICP's energy and food component in particular. However, the decline in inflation is constrained by domestic factors. Given favorable cyclical developments, production capacity utilization is high, which also helps improve the labor market situation. Therefore, unit labor costs are expected to keep increasing more strongly (starting from their currently low level). The resulting price pressures affect above all services and nonenergy industrial goods inflation.

Core inflation (excluding energy and food) in Austria is thus expected to hover close to or above 2.0% over the forecast horizon (2018: 2.0%, 2019 and 2020: 2.2%).

Chart 5

Contribution of components to Austrian HICP and core inflation

Annual inflation rate; contribution to inflation in percentage points

Forecast: March 2018 to December 2019

HICP Inflation rate: 2018: 2.0%
2019: 1.9%

Legend:
- Services
- Energy
- Industrial goods excluding energy
- HICP
- Food
- Core inflation (excluding energy and food)
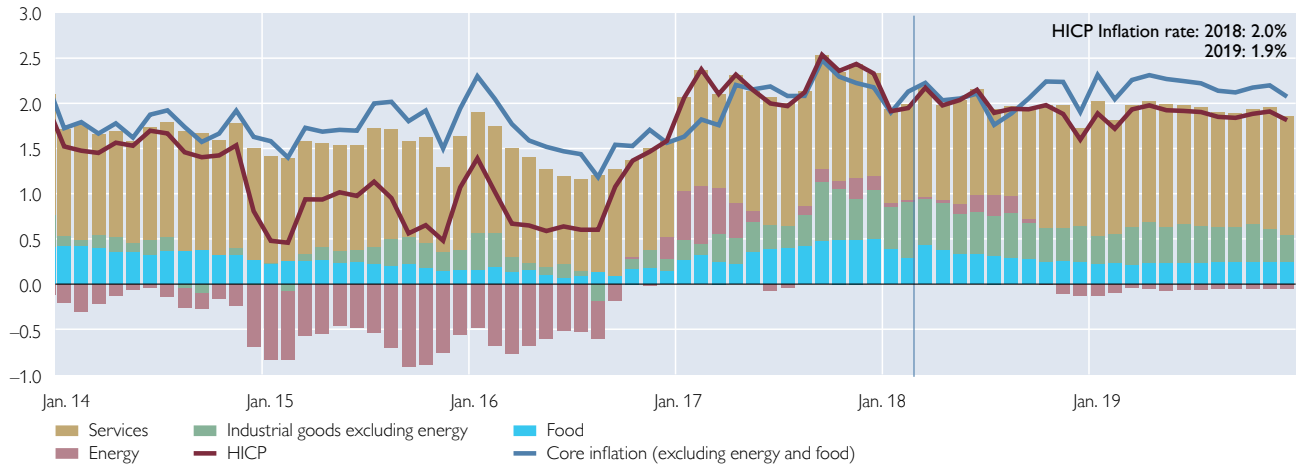
Source: Statistics Austria, OeNB.

Financial literacy in Austria: a survey of recent research results

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Elisabeth Ulbrich[1]

Refereed by:
Tim Kaiser, University of Koblenz-Landau, Department of Economics and German Institute for Economic Research, Department of International Economics

This article summarizes the main findings of recent studies based on OECD data on adults' financial literacy and the Austrian Survey of Financial Literacy (ASFL). The ASFL is the Austrian contribution to the OECD's financial literacy data exercise, which has a broad focus covering aspects of financial knowledge, behavior and attitudes. The results of recent studies show that (1) Austria scores above the OECD country average in terms of overall financial literacy, mostly due to a favorable behavior score; (2) cross country differences in financial literacy can be explained by a combination of endowment effects, experience effects and institutional factors; (3) financial education pays off in the sense that there is strong evidence for a direct link between better financial knowledge and more favorable financial behavior; and (4) women's larger knowledge gaps result from differences in individual characteristics such as education attainment and lower financial involvement, but are partly compensated by their particularly prudent financial behavior. For policymaking, these results indicate promising pathways for financial education with regard to the complex financial decisions that households have to make.

Among other socio-economic determinants, financial literacy has been identified as an important ingredient for the economic and financial decision-making of consumers and investors. Previous research documents that financial literacy is of relevance both for the asset and debt side of households' balance sheets and matters for overall economic stability (see e.g. Jappelli, 2010; Lusardi and Mitchell, 2014). Moreover, in a recent study, Lusardi et al. (2017) illustrate that financial knowledge might have a role in explaining wealth inequality among households. The authors estimate that according to their model as much as 30% to 40% of retirement wealth inequality is attributable to differences in financial knowledge.

Supporting financial literacy is part of the mission statement of the Oesterreichische Nationalbank (OeNB), given that financial literacy is expected to contribute substantially to safeguarding price stability and financial stability. The OeNB has been an active provider of financial education and one of the major stakeholders of financial education in Austria for many years. Designing targeted measures requires a thorough understanding of the level and distribution of financial literacy among the Austrian population. In this context, it is especially important to identify gaps and potential needs with regard to financial literacy.

In autumn 2014, the OeNB therefore conducted a financial literacy survey among around 2,000 individuals in Austria[2], the Austrian Survey of Financial Literacy (ASFL). This survey was part of a broad cross-country data exercise at the initiative of the OECD's International Network on Financial Education (INFE)[3]. Silgoner and Weber (2015), Silgoner et al. (2015) and Greimel-Fuhrmann et al. (2016) describe the major findings of the ASFL.

The aim of this article is twofold: first, to summarize the main findings on cross-country differences in financial literacy based on the recent OECD/INFE microdata; second, to present recent research[4] conducted on the financial literacy gaps of the Austrian population. More specifically, we answer the following questions:

- How does the Austrian population score in financial literacy compared with the population of other countries?
- What explains cross-country differences in financial literacy?
- What can explain the gender gap in financial literacy?
- Is there a link between financial knowledge and financial behavior?

The paper is structured as follows: section 1 describes the OECD's approach to measuring financial literacy, the construction of financial literacy scores and their distribution across countries. Section 2 discusses factors that help explain cross-country dispersions in financial literacy. Section 3 briefly summarizes the main findings of the OeNB's contribution to the OECD's survey, i.e. the ASFL, and sheds some light on the gender gap identified in financial literacy. Section 4 shows some evidence on the causal link between financial knowledge and financial behavior based on the OECD/INFE microdata. Section 5 concludes by drawing policy conclusions from an OeNB perspective.

1 The OECD/INFE international survey of adult financial literacy competencies

Until recently, research on financial literacy was either limited to individual (or small sets of) countries or, alternatively, to cross-country exercises that use just a very small number of questions to assess the level of financial literacy. A benchmark in this respect are the three questions designed by Lusardi and Mitchel (2008) that have been extensively used in cross-country comparisons.[5] Lusardi and Mitchell (2014), Fonseca et al. (2012) and Hastings et al. (2013) provide comprehensive

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[2] The survey comprised 1,994 computer-assisted personal interviews (CAPIs) conducted from October to November 2014. The non-response rate was about 30%. If not indicated differently, we use survey weights to produce descriptive population statistics throughout the paper. The weights consist of a combination of sampling and/or design weights and poststratification weights based on external population statistics on age and gender at the level of the Austrian provinces.

[3] The INFE was set up in 2008 to create an international forum for public authorities with an interest and expertise in financial education. Currently, 120 countries participate; around 71% of them are non-OECD countries.

[4] Some of the papers mentioned in this article are still works in progress or in their working paper stage. Any comments or suggestions on this preliminary work is thus highly welcome.

[5] These three questions are: (1) Suppose you had USD 100 in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow: more than USD 102; exactly USD 102; less than USD 102; do not know; refuse to answer; (2) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, would you be able to buy: more than, exactly the same as, or less than today with the money in this account; do not know; refuse to answer; (3) Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund": true; false; do not know; refuse to answer.

surveys on financial literacy studies carried out around the globe over the last decades.

The OECD's INFE working group started a new initiative in 2008 to collect data on financial literacy in a wide range of countries, using a broad definition of financial literacy and striving to achieve a comparable basis. After a pilot exercise in 2010 (Atkinson and Messy, 2012), the OECD (2015) provided a guide on how to design national financial literacy surveys. The OECD's survey format has the advantage that it is explicitly designed to work in countries of different levels of development. It includes an extended set of questions, covering the areas of financial knowledge, attitudes and behavior. This corresponds to the OECD's definition of financial literacy as "a combination of financial awareness, knowledge, skills, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being" (Atkinson and Messy, 2012).

The OECD/INFE data project provides a unique data source. Between 2014 and 2017, financial literacy surveys were conducted in more than 30 OECD and non-OECD countries. The main results were summarized in OECD (2016).[6] From the answers to the individual survey questions, the OECD extracted three subscores, which were then added up to derive a total financial literacy score (for details, see OECD, 2016, annex 2):

- The *financial knowledge score* ranges from 0 to 7 and is calculated as the number of correct answers to seven financial knowledge questions that deal with respondents' understanding of economic and financial concepts such as inflation, interest, interest plus principal, compound interest, risk diversification and the link between return and risk.
- The *financial behavior score* ranges from 0 to 9 and is based on ten questions related to household budgeting, active participation in financial decisions, savings behavior, financial housekeeping and planning, and product comparison before taking financial decisions.
- The *financial attitude score* ranges from 1 to 5 and, on the basis of three questions, describes whether respondents would rather save for the future or spend their money right away.
- The *total financial literacy score* takes a maximum value of 21. It is calculated by simply adding up the three subscores. This fits in with the OECD/INFE idea that all three factors in the end contribute to financial well-being.

The three subscores for each country are presented in chart 1 (OECD, 2016). Total financial literacy scores differ widely across countries. On the one hand, countries such as France or Finland reached a fairly high overall financial literacy score (almost 15 out of a maximum of 21). On the other end of the distribution, countries such as Russia, Brazil, Croatia, Belarus or Poland achieved a total financial literacy score of only 12. Section 2 sheds more light on these cross-country differences.

Austria achieved a *financial knowledge score* of 4.9; this means that, on average, respondents correctly answered about five out of the seven questions relating to financial knowledge. This score is equal to the average of all participating OECD countries. The OECD defines a minimum target score of five (or more) correctly

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[6] *After the survey results were published in OECD (2016), a number of other countries performed an OECD/INFE-style financial literacy survey. Some of their results have been published in OECD (2017).*

Chart 1

Financial literacy across countries

Mean score

Country	Knowledge score	Behavior score	Attitude score
France (14.9)	4.92	6.75	3.19
Finland (14.8)	5.20	6.27	3.32
Norway (14.6)	5.25	5.76	3.61
Canada (14.6)	4.93	6.16	3.47
Hong Kong, China (14.4)	5.76	5.95	2.69
New Zealand (14.4)	4.98	5.67	3.71
Korea (14.4)	5.45	5.74	3.16
Belgium (14.3)	4.85	6.24	3.20
Austria (14.2)	4.88	6.01	3.31
Germany (14.2)	5.10	5.78	3.27
Portugal (14.0)	4.75	5.91	3.37
Average, OECD countries (13.7)	4.87	5.36	3.44
Lithuania (13.5)	4.71	5.52	3.24
Netherlands (13.4)	4.89	5.24	3.28
Estonia (13.4)	5.26	4.91	3.21
Latvia (13.3)	5.11	5.27	2.97
Average, all countries (13.2)	4.61	5.44	3.25
United Kingdom (13.1)	4.21	5.58	3.28
British Virgin Islands (13.0)	3.58	6.16	3.30
Thailand (12.8)	3.90	5.82	3.06
Albania (12.7)	4.17	5.17	3.39
Jordan (12.6)	4.29	5.73	2.61
Czech Republic (12.6)	4.43	5.04	3.09
Turkey (12.5)	4.61	4.83	3.06
Hungary (12.4)	4.72	4.25	3.47
Georgia (12.4)	4.56	5.01	2.85
Malaysia (12.3)	3.57	5.71	2.98
Russian Federation (12.2)	4.14	5.11	2.90
Brazil (12.1)	4.32	4.62	3.13
Croatia (12.0)	4.27	4.81	2.95
Belarus (11.7)	3.82	5.04	2.86
Poland (11.6)	4.42	4.44	2.77

■ Knowledge score ■ Behavior score ■ Attitude score

Source: OECD (2016), Deutsche Bundesbank: OeNB calculations.

Note: OECD country averages do not contain Germany.

answered questions. In Austria 66% of respondents reached the minimum target score compared with an average of 62% across OECD countries (OECD, 2016). When interpreting these scores, we should keep in mind that all survey questions refer to economic concepts that are relevant for dealing with standard financial products.

Austria scored considerably above the OECD average when it comes to financial behavior. Its *financial behavior score* is 6.0 and thus markedly higher than the OECD average of 5.4. 95% of respondents in Austria declared that they are alone or jointly responsible for day-to-day financial decisions of their household, which is high by OECD standards.

At 3.3, the *financial attitude score* reached by respondents in Austria is slightly below the OECD country average of 3.4. Summing up the three subscores, Austria reached a *total financial literacy score* of 14.2 and thus came in ninth among all participating countries. Thanks to Austria's favorable financial behavior score, its total score is higher than the OECD country average of 13.7.

2 What is behind the cross-country differences in financial literacy?

Cupak et al. (2018) shed light on the potential factors driving the observed cross-country differences in financial literacy scores (OECD, 2016) by focusing on the financial knowledge score. Broadly speaking, there may be two types of reasons for cross-country differences in financial literacy:

First, surveyed respondents may systematically differ across countries in their individual characteristics such as gender, age, family status, education, employment status, etc. For example, respondents in country A may, on average, have a higher level of education than respondents in country B. Since Silgoner et al. (2015) identified respondents' level of education as one of the relevant factors for their level of financial knowledge, one would thus expect that country A reaches a higher financial knowledge score. In the literature, this effect is usually called the *endowment effect*, since it refers to a given distribution of personal characteristics within a population.

Second, countries may differ in terms of the economic environments relevant for financial literacy. Jappelli (2010) presents a list of relevant country-level indicators such as comprehensiveness of the welfare state, dissemination of Internet use or school enrolment ratios. If, for example, the welfare state is rather comprehensive in country A compared to country B, the need to invest in private pension or insurance products may be less pressing in country A, which could in turn translate into a lower need for individuals to invest in their financial literacy (e.g. Jappelli and Padula, 2013). This factor may be summarized as the influence of *institutional differences*.

In Cupak et al. (2018), the authors decompose cross-country differences in financial knowledge scores along the two dimensions discussed above, following standard decomposition approaches (Fortin et al., 2011). To do so, they employ microdata from 12 countries[7] that by summer 2017 had provided access to their national survey data for research purposes.

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[7] *Austria, Brazil, Canada, Croatia, Finland, Germany, Hong Kong, Hungary, Jordan, the Netherlands, the United Kingdom and Russia. Finland serves as a benchmark.*

Cupak et al. (2018) find that on average only about one-third of the cross-country variation in financial knowledge scores can be explained by varying individual characteristics (endowments). The authors argue that the remaining (larger) part of the variation (which can neither be explained by basic individual characteristics nor by characteristics capturing experience with finance) can be attributed to institutional differences between countries. These are measured by country-level indicators such as life expectancy, Internet use, the school enrolment ratio, market capitalization as a proxy for the financial deepening of the economy and social contributions as a measure of welfare state activity. The results suggest that differences in economic environments across countries are an important source of differences in financial literacy.

3 Financial literacy in Austria

Results on the financial literacy of Austrian households from the OeNB's representative Household Survey on Financial Wealth 2004 were first available in 2007. Fessler et al. (2007) highlighted the importance of financial experience for financial behavior. Furthermore, the authors found that younger people tend to have lower financial literacy than older people do. Not many households in Austria were found to own risky financial products, and even these households said they usually relied on advice from their respective banks.

All these results are confirmed by the results of the ASFL (Silgoner et al., 2015), which is based on the OECD (2015) toolkit but uses an extended set of eleven financial knowledge questions, covering e.g. the link between interest rates and bond prices or the impact of currency depreciation on the outstanding value of foreign currency loans.[8]

Silgoner and Weber (2015), Silgoner et al. (2015) and Greimel-Fuhrmann et al. (2016) describe the ASFL's main results, which confirm the common finding of national and international surveys that major financial knowledge gaps exist in the population. Many respondents are not familiar with very basic economic concepts such as inflation or interest rates. A regression analysis in Silgoner et al. (2015) shows that financial knowledge gaps are larger for women than for men, bigger in the youngest and oldest age cohorts than in the cohorts in between, and most pronounced among respondents with low educational attainment and low incomes. All these findings are in line with international experience, as summarized in Lusardi and Mitchell (2014).
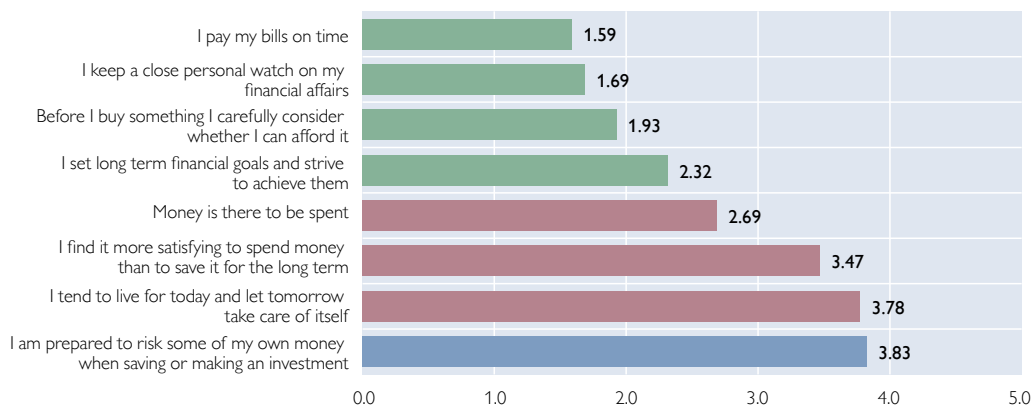
Basing their analysis on the ASFL, Silgoner and Weber (2015) also show that most individuals are rather prudent, forward oriented and risk averse. Most respondents agreed with the statement that they paid their bills on time, kept a close watch on their financial affairs and carefully considered purchases (chart 2). In all cases, the share of respondents who (rather) agreed with the above statement was higher than the OECD average. Most people in Austria disagreed with the statement that they preferred to spend money rather than to save it or that they were prepared to risk some of their money when saving or investing.

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[8] The full list of questions is reported in Silgoner et al. (2015), box 1, or in Greimel-Fuhrmann et al. (2016), table 16.1.

Chart 2

Financial behavior and attitudes

Mean score

I pay my bills on time	1.59
I keep a close personal watch on my financial affairs	1.69
Before I buy something I carefully consider whether I can afford it	1.93
I set long term financial goals and strive to achieve them	2.32
Money is there to be spent	2.69
I find it more satisfying to spend money than to save it for the long term	3.47
I tend to live for today and let tomorrow take care of itself	3.78
I am prepared to risk some of my own money when saving or making an investment	3.83

Source: OeNB.

Note: 1 = completely agree, 5 = completely disagree. Statements with green bars are used for the calculation of the financial behavior score, those with red bars are used for the financial attitude score.

Table 1 shows that in Austria, men outperform women in terms of financial knowledge,[9] but score worse in financial behavior and attitudes. Financial knowledge and behavior both improve with the level of education. Respondents with tertiary education also achieve the highest financial attitude scores. With regard to the performance of individual age groups, it is striking that all three subscores show markedly lower results for the youngest group of respondents, probably because of their missing or scant experience with working life and financial markets.

Table 1

Financial literacy scores according to sociodemographic subgroups

		Knowledge score	Behavior score	Attitude score	Literacy score
		Mean score			
Gender	Male	5.1	5.8	3.5	14.4
	Female	4.7	6.1	3.8	14.5
Education	Primary	4.7	5.7	3.7	14.0
	Secondary	5.0	6.2	3.6	14.8
	Tertiary	5.6	6.4	3.8	15.8
Age category	18–29	4.7	5.4	3.3	13.4
	30–44	4.8	6.1	3.8	14.7
	45–59	5.0	6.0	3.7	14.6
	60–79	5.0	6.1	3.8	15.0

Source: OeNB.

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[9] *Table 1 refers to the OECD score methodology. The financial knowledge score presented here is therefore based only on the set of seven financial knowledge questions used by the OECD.*

The finding that, on average, women score worse in financial knowledge than men is common in the literature, as documented in the literature survey of Lusardi and Mitchell (2014)[10]. Several explanations have been put forward for this gender gap:

First, men and women may differ in important individual characteristics such as income or education. Greimel-Fuhrmann and Silgoner (2017a) show that the gender gap coefficient declines markedly when moving from a univariate to a multivariate regression with controls such as income, education or employment status, but it remains significant. In other words, women's and men's financial knowledge differs even if their socioeconomic characteristics are comparable.

Second, the financial knowledge gender gap may reflect the fact that in survey settings women behave differently from men (Brown and Graf, 2013; Bucher-Koenen et al., 2016). Greimel-Fuhrmann and Silgoner (2017b) show that for each of eleven financial knowledge questions in the ASFL, more women answer "I don't know" than men. Women may be more risk averse and thus admit that they are not sure of something instead of just making the most probable guess. This behavior may add to their lower share of correct answers.

Third, within households women may be less involved in financial decision-making because of the prevailing division of tasks. As a result, women would benefit less from learning-by-doing effects. Actually, Greimel-Fuhrmann and Silgoner (2017a) confirm that there is no significant gender gap when the sample is restricted to widowed or divorced individuals or to people living alone as these need to take care of their own finances and thus accumulate financial knowledge. The authors conclude that financial involvement is crucial for building financial knowledge through learning-by-doing. By contrast, Bucher-Koenen et al. (2016) and Grohmann (2016) observe a gender gap in financial knowledge not only for married but also for single or widowed individuals. Moreover, Fonseca et al. (2012) find no strong support for the division of tasks between genders for the U.S.A.[11]

Table 1 shows that while men outperform women in terms of financial knowledge, women score higher in financial behavior and attitudes. Actually, the total financial literacy score is almost identical across genders. In their analysis, Greimel-Fuhrmann and Silgoner (2017b) use a proxy for financial well-being and show that, with regard to well-being, there is no significant difference between men and women. There are obviously several ways of achieving the same level of financial well-being. Women may compensate for their lack in financial knowledge by extra-prudent or forward-looking financial behavior and attitudes.

4 Does financial education pay off?

A fundamental assumption behind financial education initiatives is that people who have a better understanding of financial terms and economic concepts also show a more "favorable" economic behavior over their lifetimes. As an important financial education provider, the OeNB regularly assesses the effectiveness of financial education measures, both with feedback forms completed by participants

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[10] Interestingly, the gender gap is much smaller or even insignificant in formerly communist countries (Bucher-Koenen and Lamla, 2014).

[11] Cultural factors may add to this list. Grohmann (2016) argues that the gender gap is smaller in countries where women are integrated better into the labor market and where gender income inequality is smaller.

in financial education measures and via impact assessments.[12] In addition, the OeNB is highly interested in gathering more universal evidence of the link between financial knowledge on the one hand and financial behavior and financial attitudes on the other, i.e. of the effectiveness of financial education measures.

The definition of "favorable" behavior is of course normative. From the way the OECD scores are calculated, we can conclude that the OECD finds it desirable that people run a household budget, keep watch of their financial affairs, have long-term financial goals and try to achieve them, and that they take well-informed financial decisions. National goals may of course deviate from this concept.

Several studies have investigated the link between financial literacy and financial behavior. They have shown, for example, that financial knowledge promotes retirement planning (e.g. Lusardi and Mitchell, 2007; Skimmyhorn, 2016), the accumulation of financial assets (Fort et al., 2016) or stock market participation and the diversification of household portfolios (Van Rooij et al., 2011; von Gaudecker, 2015). Brown et al. (2016) show that financial education at the high school level decreases reliance on nonstudent debt and improves repayment behavior. Numerous experimental studies go even further by quantifying the causal links between financial knowledge and financial behavior (e.g. Drexler et al., 2014; Bruhn et al., 2016; Carpena et al., 2017 and Bover et al., 2018).

In a meta-analysis, Fernandes et al. (2014) summarize the empirical literature in this field, including observational studies based on the control of observables, instrumental variables, quasi experiments and randomized trials. They find a significantly positive effect of financial literacy on financial behavior, which is however rather small in the most trustworthy case of randomized trials. Kaiser and Menkhoff (2017) also perform a meta-analysis and confirm that financial education significantly affects financial literacy and ultimately financial behavior. Financial education is, however, less effective for low-income participants and in low- to lower-middle-income economies. For the effectiveness of education measures, it is essential to catch the "teachable moment" when teaching is directly linked to immediate financial decisions. Both Kaiser and Menkhoff (2017) and Miller et al. (2015) indicate that it is easier to influence people's savings behavior than their borrowing behavior.

Recently, Fessler et al. (2017) used the OECD/INFE data for Austria to investigate whether respondents with high financial knowledge scores outperform those with lower knowledge in terms of financial behavior and attitudes, using the three respective OECD scores. Chart 3 illustrates the link between the financial knowledge and the financial behavior scores for 30 countries. While the chart indicates a positive correlation, we need to take a potential endogeneity or selection bias problem into account when drawing conclusions about causality. The OECD's financial behavior score e.g. includes a question on whether respondents tried to compare across providers and looked for information or advice before choosing a financial product. Even if those with a higher financial knowledge score show a higher tendency of comparing offers, we could not conclude that there was a causal link between financial knowledge and financial behavior. Causality may actually

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[12] To further investigate financial knowledge transfers, the OeNB cooperates with the Vienna University of Economics and Business in an ongoing research project.

(also) run the other way round, as people acquire financial knowledge while comparing various offers of financial products.

Chart 3

Scatter plot of knowledge score versus behavior score
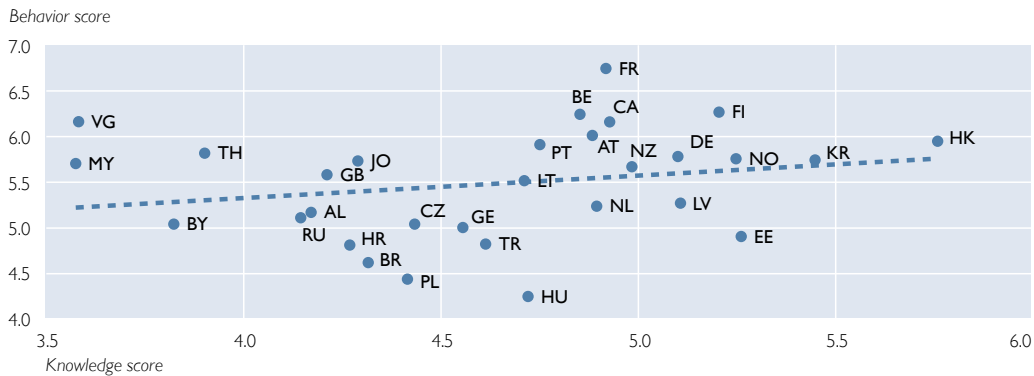
Source: OeNB based on OECD (2016) data. Germany: OeNB cacluations.

Fessler et al. (2017) use an instrumental variable approach to identify a causal link between financial knowledge and financial behavior. They use a novel instrument to analyze financial knowledge, based on (economic) newspaper reading habits. The authors find significant evidence for a causal link between higher financial knowledge and more favorable financial behavior. The effect is actually stronger when the instrument is used in their analysis, which points toward a negative selection bias. This bias might be due to a measurement error or nonobservable characteristics. Furthermore, their study also shows that financial attitudes play an important role in shaping people's financial behavior. In fact, a mediation analysis indicates that about 13% of the total effect of financial knowledge on financial behavior is mediated via financial attitude.

5 Conclusions

After decades of peace and growth in Western Europe after World War II, households have accumulated substantial wealth. As an alternative to holding this wealth in relatively safe assets, investors have been increasingly confronted with complex financial decisions and sophisticated financial products. With the emergence of high-quality microdata on household balance sheets and on measures of the financial literacy of consumers, empirical evidence on household finances and on financial literacy has recently made substantial progress.

This article summarizes major findings of several studies based on the recent OECD/INFE survey on adults' financial literacy and its Austrian contribution, the ASFL, investigating the following questions:

(1) How do respondents in Austria score in financial literacy compared to the population of other countries?
(2) What explains cross-country differences in financial literacy?
(3) What explains the gender gap in financial literacy?
(4) Is there a direct link between financial knowledge and financial behavior?

According to the OECD's methodology, Austria achieved a total financial literacy score of 14.2, which is slightly above the OECD average. The total financial literacy score is calculated by adding up the financial knowledge, financial behavior and financial attitude subscores. Among these three subscores, Austria reached a particularly high score in financial behavior. None of the other countries in the survey comes even close to the maximum possible score of 21, with France achieving the highest score of 14.9.

In their recent paper, Cupak et al. (2018) show that, mostly, the observed gaps in financial literacy scores across countries are not purely attributable to varying levels of individual characteristics but rather to differences in institutional factors impacting financial literacy at the country level (measures of market capitalization, welfare state activity or the general level of education). Policy measures taken in an international context (e.g. by the OECD/INFE) to upgrade countries to institutional best practice could help reduce the remaining differences in financial literacy. The OeNB is an active supporter of OECD/INFE initiatives to foster the coordination of (inter)national financial literacy research and policy measures.

Recent research based on OECD/INFE data (e.g. Fessler et al., 2017) also provides evidence of a causal link between higher financial knowledge and better financial behavior. As a result of financial education, we may thus expect consumers to be active savers and planners and to be more mature in their financial decision-making. This finding serves as a strong argument for promoting financial education measures. The OeNB is an active stakeholder in financial education.

While the focus of the OeNB's financial literacy activities used to be on traditional central bank core tasks and goals (price stability, monetary policy, financial stability, cash and payment services), it has recently been shifting toward questions of how to use and manage money in a responsible way.

In 2015, the OeNB started a financial education initiative[13] aimed at enhancing the financial literacy, capability and awareness of future consumers and targeting specifically primary and secondary school students aged 6 to 18 as well as the general public. Under this initiative, the OeNB offers a broad range of educational programs such as student workshops (both at the OeNB and at schools), teaching materials, teacher seminars, lectures, cash handling trainings, interactive online tools, videos, competitions and contests.

Financial stability essentially rests on the interplay of stable financial institutions, comprehensive financial supervision and regulation as well as consumer protection and a financially literate public. Financial education alone will not be able to prevent the pitfalls of sophisticated financial products or financial innovations where risks are shifted toward the individual. Rather, it will require a combination of regulation, consumer protection and educational approaches. In this sense, financial literacy is not a substitute but rather a complement to financial regulation and consumer protection. Informed consumers take better decisions, but are also more accessible for regulation.

Financial education has become critically important in the wake of the financial crisis and in view of the ongoing digitalization and increasing complexity of our

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[13] For further details, see www.eurologisch.at (in German only).

financial and economic system. Risks associated with financial decisions have become more relevant to individual consumers than they used to be. The OeNB's financial literacy program aims at empowering individuals to make informed judgments and sounder financial decisions based on solid financial and economic knowledge.

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