

TYCHOS SECTOR RISK REPORT

		2018	2019	2020	2021	2022 Q1
Total Private Debt	Debt to GDP	120%	122%	130%	129%	128%
	5 year % change	-3%	3%	11%	10%	8%
	Billion Euro	€4,047	€4,239	€4,432	€4,647	€4,702
Business Debt	Debt to GDP	67%	68%	73%	73%	72%
	5 year % change	-2%	7%	14%	13%	10%
	Billion Euro	€2,274	€2,383	€2,490	€2,606	€2,643
Household Debt	Debt to GDP	53%	53%	57%	57%	56%
	5 year % change	-5%	-1%	6%	6%	6%
	Billion Euro	€1,772	€1,856	€1,942	€2,042	€2,059

Areas of Concern

Business Sectors		2018	2019	2020	2021	2022 Q1
Commercial Real Estate	Debt to GDP	15.0%	15.4%	16.9%	17.1%	17.1%
	5 year % change	-1%	7%	19%	19%	19%
	Billion Euro	€506	€536	€573	€615	€627
Memo: Real Estate	Debt to GDP	12.9%	13.2%	14.4%	14.4%	14.3%
	5 year % change	-1%	7%	18%	16%	17%
	Billion Euro	€434	€458	€491	€517	€525
Memo: Construction	Loans to GDP	2.1%	2.2%	2.4%	2.7%	2.8%
	5 year % change	2%	9%	22%	37%	30%
	Billion Euro	€72	€77	€83	€98	€101
Information Technology	Loans to GDP	3.4%	3.7%	4.0%	3.9%	3.9%
	5 year % change	4%	14%	24%	21%	20%
	Billion Euro	€113	€127	€136	€141	€144

Private Debt Lenders		2018	2019	2020	2021	2022 Q1
Foreign Loans	Debt to GDP	23.1%	23.6%	25.5%	25.1%	24.6%
	5 year % change	1%	27%	32%	29%	22%
	Billion Euro	€777	€822	€866	€901	€902
Corporate Bonds	Debt to GDP	5.4%	5.9%	7.0%	7.0%	6.7%
	5 year % change	9%	14%	35%	20%	11%
	Billion Euro	€181	€205	€238	€252	€245

Individual Lenders		2018	2019	2020	2021	2022 Q1
DZ Bank	Loans to GDP	5.7%	5.9%	6.2%	6.1%	n/a
	5 year % change	16%	22%	29%	-2%	n/a
	Billion Euro	€192	€204	€209	€217	n/a
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a

▲ High Concern
 ▲ Concern
 ▲ Low Concern
 ▲ Current or recent crisis
 + No Current Concern

n/a: Data Not Available

Business Debt

Bank Loans by Industry		2018	2019	2020	2021	2022 Q1	
Commercial Real Estate	Debt to GDP	15.0%	15.4%	16.9%	17.1%	17.1%	⚠
	5 year % change	-1%	7%	19%	19%	19%	
	Billion Euro	€506	€536	€573	€615	€627	
Memo: Real Estate	Debt to GDP	12.9%	13.2%	14.4%	14.4%	14.3%	⚠
	5 year % change	-1%	7%	18%	16%	17%	
	Billion Euro	€434	€458	€491	€517	€525	
Memo: Construction	Loans to GDP	2.1%	2.2%	2.4%	2.7%	2.8%	⚠
	5 year % change	2%	9%	22%	37%	30%	
	Billion Euro	€72	€77	€83	€98	€101	
Manufacturing	Loans to GDP	4.1%	4.2%	4.3%	4.1%	4.1%	+
	5 year % change	-9%	0%	2%	2%	0%	
	Billion Euro	€139	€147	€147	€146	€151	
Information Technology	Loans to GDP	3.4%	3.7%	4.0%	3.9%	3.9%	⚠
	5 year % change	4%	14%	24%	21%	20%	
	Billion Euro	€113	€127	€136	€141	€144	
Wholesale and Retail	Loans to GDP	4.1%	4.1%	4.0%	3.9%	4.0%	+
	5 year % change	-7%	-4%	-3%	-5%	-5%	
	Billion Euro	€139	€142	€136	€140	€145	
Utilities	Loans to GDP	3.5%	3.4%	3.6%	3.6%	3.7%	+
	5 year % change	0%	0%	9%	7%	10%	
	Billion Euro	€117	€119	€123	€128	€134	
Health Care	Loans to GDP	2.4%	2.4%	2.5%	2.5%	2.4%	+
	5 year % change	-14%	-8%	-1%	-1%	-2%	
	Billion Euro	€82	€85	€86	€89	€89	
Agriculture	Loans to GDP	1.6%	1.6%	1.6%	1.6%	1.5%	+
	5 year % change	-3%	-4%	-2%	-4%	-4%	
	Billion Euro	€53	€54	€55	€56	€56	
Transportation and Communication	Loans to GDP	1.5%	1.4%	1.8%	1.5%	1.5%	+
	5 year % change	-40%	-38%	-19%	-15%	-15%	
	Billion Euro	€51	€50	€60	€56	€55	
Hotels and Restaurants	Loans to GDP	0.7%	0.8%	0.8%	0.8%	0.8%	⚠
	5 year % change	-3%	3%	16%	11%	9%	
	Billion Euro	€25	€26	€29	€29	€30	
Other Services	Loans to GDP	1.3%	1.3%	1.1%	1.2%	1.1%	+
	5 year % change	-21%	-13%	-24%	-17%	-17%	
	Billion Euro	€44	€45	€38	€41	€42	

* Commercial Real Estate industry includes Real Estate and Construction loans

⚠ High Concern
⚠ Concern
⚠ Low Concern
⚠ Current or recent crisis
⊕ No Current Concern

n/a: Data Not Available

Business Debt

Corporate Debt by Industry		2018	2019	2020	2021	2022 Q1	
Consumer Discretionary	Debt to GDP	14.2%	15.2%	15.3%	13.9%	13.5%	⚠
	5 year % change	29%	32%	21%	6%	4%	
	Billion euro	€479	€530	€521	€499	€496	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Communication Services	Debt to GDP	2.8%	3.3%	4.9%	4.7%	4.8%	⚠
	5 year % change	7%	16%	59%	52%	58%	
	Billion euro	€94	€114	€168	€170	€176	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Industrials	Debt to GDP	3.3%	3.7%	3.9%	4.0%	4.0%	⚠
	5 year % change	34%	47%	45%	31%	33%	
	Billion euro	€111	€130	€133	€143	€147	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Health Care	Debt to GDP	2.5%	2.7%	2.9%	3.0%	3.0%	⚠
	5 year % change	95%	54%	32%	45%	45%	
	Billion euro	€84	€94	€99	€107	€109	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Utilities	Debt to GDP	1.6%	2.3%	1.9%	2.3%	2.5%	+
	5 year % change	-48%	-24%	-37%	-3%	8%	
	Billion euro	€55	€78	€64	€84	€93	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Materials	Debt to GDP	1.6%	1.8%	1.7%	1.4%	1.5%	+
	5 year % change	-8%	8%	14%	-19%	-16%	
	Billion euro	€55	€63	€59	€50	€53	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Consumer Staples	Debt to GDP	0.8%	1.1%	0.8%	0.7%	0.7%	⚠
	5 year % change	28%	47%	17%	13%	5%	
	Billion euro	€26	€37	€27	€26	€25	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Information Technology	Debt to GDP	0.5%	0.6%	0.8%	0.7%	0.7%	⚠
	5 year % change	95%	35%	83%	61%	79%	
	Billion euro	€18	€22	€27	€25	€27	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Energy	Debt to GDP	0.2%	0.2%	0.2%	0.2%	0.1%	⚠
	5 year % change	68%	58%	-30%	-29%	-30%	
	Billion euro	€8	€7	€5	€5	5.45	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Memo: Automobiles and Components	Debt to GDP	13.7%	14.6%	14.4%	13.1%	12.7%	⚠
	5 year % change	33%	33%	19%	4%	1%	
	Billion euro	€460	€507	€490	€469	€467	
	Default Rate	n/a	n/a	n/a	n/a	n/a	

* Sector aggregates are based on limited data availability

Household Debt

Household Debt, by Type		2018	2019	2020	2021	2022 Q1	
Mortgage Debt	Debt to GDP	36.5%	37.4%	40.8%	41.4%	41.1%	⚠
	5 year % change	1%	5%	14%	15%	15%	
	Billion Euro	€1,231	€1,301	€1,387	€1,486	€1,505	
Consumer Credit	Debt to GDP	5.8%	5.8%	5.8%	5.4%	5.4%	+
	5 year % change	-7%	-2%	0%	-8%	-9%	
	Billion Euro	€196	€202	€198	€196	€196	
Other	Debt to GDP	10.2%	10.1%	10.5%	10.0%	9.8%	+
	5 year % change	-22%	-18%	-12%	-13%	-15%	
	Billion Euro	€345	€353	€357	€360	€357	

⚠ High Concern
⚠ Concern
⚠ Low Concern
⚠ Current or recent crisis
⊕ No Current Concern

n/a: Data Not Available

Private Debt by Lender/Holder

Private Debt Lenders		2018	2019	2020	2021	2022 Q1
Commercial and Savings Banks	Debt to GDP	48.0%	48.8%	52.0%	51.5%	51.5%
	5 year % change	4%	8%	15%	12%	12%
	Billion Euro	€1,617	€1,700	€1,767	€1,850	€1,886
Credit Institutions	Debt to GDP	17.1%	17.6%	19.1%	19.3%	19.2%
	5 year % change	1%	4%	11%	17%	16%
	Billion Euro	€577	€611	€649	€694	€705
Mortgage and Land Banks	Debt to GDP	12.3%	12.4%	13.1%	13.0%	12.9%
	5 year % change	-26%	-21%	-12%	-6%	-6%
	Billion Euro	€416	€433	€445	€468	€472
Foreign Loans	Debt to GDP	23.1%	23.6%	25.5%	25.1%	24.6%
	5 year % change	1%	27%	32%	29%	22%
	Billion Euro	€777	€822	€866	€901	€902
Other Financial Institutions	Debt to GDP	5.3%	5.6%	6.1%	6.0%	6.1%
	5 year % change	-20%	-4%	9%	-11%	-8%
	Billion Euro	€177	€196	€206	€216	€223
Corporate Bonds	Debt to GDP	5.4%	5.9%	7.0%	7.0%	6.7%
	5 year % change	9%	14%	35%	20%	11%
	Billion Euro	€181	€205	€238	€252	€245



High Concern
 Concern
 Low Concern
 Current or recent crisis
 No Current Concern

n/a: Data Not Available

Portfolio Loans & Investment (Total Economy) - Germany into Foreign Countries

Debt Security Investment		2017	2018	2019	2020	2021 Q2	
Germany Holdings of Foreign Debt Securities	to GDP	82%	73%	75%	96%	89%	
	5 year % change	-15%	-31%	-16%	37%	17%	!
	Billion Euro	€2,676	€2,465	€2,599	€3,233	€3,066	
France	to GDP	11.8%	10.7%	11.1%	15.1%	13.9%	
	5 year % change	-23%	-34%	-18%	48%	26%	!
	Billion Euro	€385	€360	€386	€508	€478	
United States	to GDP	9.6%	8.1%	8.6%	11.0%	11.2%	
	5 year % change	37%	3%	17%	49%	33%	!
	Billion Euro	€314	€274	€299	€370	€384	
Netherlands	to GDP	8.5%	8.1%	8.3%	10.5%	9.5%	
	5 year % change	-29%	-35%	-14%	46%	23%	!
	Billion Euro	€276	€273	€289	€355	€328	
Equity and Investment Fund Shares		2017	2018	2019	2020	2021 Q2	
Germany Holdings of Foreign Equity and Investment Fund Shares	to GDP	47%	39%	47%	63%	69%	
	5 year % change	32%	-14%	20%	84%	100%	!
	Billion Euro	€1,544	€1,312	€1,619	€2,123	€2,394	
Luxembourg	to GDP	21.2%	17.4%	19.5%	24.8%	27.2%	
	5 year % change	17%	-18%	8%	58%	70%	!
	Billion Euro	€691	€585	€677	€833	€938	
United States	to GDP	5.7%	5.1%	6.5%	10.3%	11.9%	
	5 year % change	63%	2%	36%	146%	178%	!
	Billion Euro	€188	€170	€227	€347	€409	
Ireland	to GDP	4.0%	3.8%	5.2%	7.5%	8.6%	
	5 year % change	120%	47%	102%	213%	230%	!
	Billion Euro	€131	€127	€180	€252	€297	
Loans		2017	2018	2019	2020	2021 Q2	
Germany Holding of Foreign Loans	to GDP	30.7%	32.7%	33.3%	34.9%	36.1%	
	5 year % change	-10%	4%	7%	10%	16%	!
	Billion Euro	€1,003	€1,101	€1,157	€1,174	€1,243	
Germany Holding of Foreign Loans: Short Term	to GDP	11.4%	11.6%	13.0%	14.3%	15.7%	
	5 year % change	-5%	1%	9%	19%	32%	!
	Billion Euro	€373	€391	€450	€481	€541	
Germany Holding of Foreign Loans: Long Term	to GDP	19.3%	21.1%	20.3%	20.6%	20.4%	
	5 year % change	-12%	6%	6%	5%	6%	+
	Billion Euro	€629	€710	€707	€693	€702	

* Total Economy includes Financial, Non-Financial and General Government sectors

Portfolio Loans & Investment (Total Economy) - Foreign Countries into Germany

Debt Security Investment		2017	2018	2019	2020	2021 Q2	
Foreign Holdings of Germany's Debt Securities	to GDP	72%	63%	61%	79%	70%	+
	5 year % change	-36%	-42%	-30%	10%	2%	
	Billion Euro	€2,343	€2,138	€2,122	€2,663	€2,412	
Netherlands	to GDP	7.7%	6.9%	6.6%	8.3%	7.6%	+
	5 year % change	-34%	-40%	-33%	11%	-4%	
	Billion Euro	€252	€232	€230	€278	€262	
Luxembourg	to GDP	6.2%	5.9%	6.2%	8.0%	7.4%	!
	5 year % change	-40%	-40%	-14%	41%	29%	
	Billion Euro	€202	€199	€216	€268	€255	
France	to GDP	4.2%	3.7%	4.0%	5.7%	5.6%	!
	5 year % change	-49%	-49%	-36%	14%	7%	
	Billion Euro	€137	€125	€140	€191	€193	
Equity and Investment Fund Shares		2017	2018	2019	2020	2021 Q2	
Foreign Holdings of Germany's Equity and Investment Fund Shares	to GDP	46%	34%	38%	46%	45%	!
	5 year % change	26%	-28%	1%	33%	57%	
	Billion Euro	€1,492	€1,142	€1,304	€1,561	€1,554	
United States	to GDP	14.7%	10.4%	12.3%	15.3%	16.0%	!
	5 year % change	34%	-30%	8%	50%	70%	
	Billion Euro	€480	€350	€428	€516	€551	
Luxembourg	to GDP	7.3%	6.1%	6.3%	7.4%	7.6%	!
	5 year % change	25%	-15%	12%	28%	38%	
	Billion Euro	€239	€204	€220	€251	€261	
France	to GDP	3.9%	2.6%	2.9%	3.6%	3.6%	!
	5 year % change	-4%	-44%	-23%	7%	37%	
	Billion Euro	€128	€89	€99	€121	€125	

* Total Economy includes Financial, Non-Financial and General Government sectors

Derivative Activity

OTC Derivative Activity by Contract Type		2017	2018	2019	2020	2021 Q2	
Interest Rate	to GDP	1152%	983%	953%	1016%	1067%	
	5 Year % Change	-26%	-35%	-26%	9%	3%	+
	Billion Euro	€37,683	€33,160	€33,167	€34,136	€36,669	
Foreign Exchange	to GDP	137%	133%	132%	129%	131%	
	5 Year % Change	-27%	-20%	-27%	-24%	-19%	+
	Billion Euro	€4,496	€4,496	€4,607	€4,351	€4,517	
Credit Derivatives	to GDP	48%	22%	18%	23%	24%	
	5 Year % Change	-29%	-64%	-62%	-48%	-43%	+
	Billion Euro	€1,577	€735	€642	€766	€828	
Index and Stock-related	to GDP	14%	11%	5%	3%	2%	
	5 Year % Change	-34%	-35%	-71%	-85%	-88%	+
	Billion Euro	€450	€386	€186	€88	€85	
Commodity contracts	to GDP	1%	1%	1%	1%	1%	
	5 Year % Change	-88%	-83%	-49%	-39%	-20%	+
	Billion Euro	€19	€22	€26	€21	€24	
Total Notional	to GDP	1352%	1151%	1110%	1171%	1226%	
	5 Year % Change	-27%	-34%	-28%	1%	-3%	+
	Billion Euro	€44,225	€38,799	€38,628	€39,362	€42,123	

 High Concern
  Concern
  Low Concern
  Current or recent crisis
  No Current Concern

n/a: Data Not Available

Largest Individual Lenders

Individual Lenders		2018	2019	2020	2021	2022 Q1	
Deutsche Bank	Loans to GDP	12%	12.5%	12.8%	13.4%	n/a	+
	5 year % change	-12%	-11%	-10%	1%	n/a	
	Billion Euro	€405	€434	€432	€477	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
Commerzbank	Loans to GDP	7.4%	7.5%	7.7%	7.5%	n/a	+
	5 year % change	-18%	-8%	5%	-14%	n/a	
	Billion Euro	€249	€261	€259	€265	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
DZ Bank	Loans to GDP	5.7%	5.9%	6.2%	6.1%	n/a	!
	5 year % change	16%	22%	29%	-2%	n/a	
	Billion Euro	€192	€204	€209	€217	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
KfW (State-Owned)	Loans to GDP	3.8%	3.7%	4.2%	3.9%	n/a	+
	5 year % change	-8%	-9%	-6%	-10%	n/a	
	Billion Euro	€127	€129	€141	€140	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	

 High Concern
  Concern
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  No Current Concern

n/a: Data Not Available

Real Estate

Total Debt		2018	2019	2020	2021	2022 Q1
Mortgage Debt	Debt to GDP	36.5%	37.4%	40.8%	41.4%	41.1%
	5 year % change	1%	5%	14%	15%	15%
	Billion Euro	€1,231	€1,301	€1,387	€1,486	€1,505



Quarterly Residential Housing Summary		Dec-2020	Mar-2021	June-2021	Sep-2021	Dec-2021	Mar-2022
Total Housing Units Approved for Construction	Volume	40,677	45,769	41,911	41,897	38,837	37,893
	Annual Change	18.5%	36.1%	7.8%	2.8%	-4.5%	-17.2%
Total Housing Units Construction Started	Volume	5,757	6,397	5,185	5,527	5,157	4,836
	Annual Change	14.3%	26.4%	-0.5%	6.3%	-10.4%	-24.4%
Residential Property Price Index	Index (2015=100)	144.3	145.7	150.9	157.1	161.9	163.2
	Annual Change	8.7%	8.9%	10.8%	12.0%	12.2%	12.0%

High Concern
 Concern
 Low Concern
 Current or recent crisis
 No Current Concern

n/a: Data Not Available

Additional Data

Public Debt		2018	2019	2020	2021	2022 Q1
Total General Government Debt	Debt to GDP	61%	59%	68%	69%	68%
	5 Year % Change	-22%	-22%	-5%	0%	0%
	Billion Euro	€2,063	€2,046	€2,314	€2,476	€2,483
Total Central Government Debt	Debt to GDP	39%	37%	45%	46%	46%
	5 Year % Change	-21%	-22%	-2%	6%	7%
	Billion Euro	€1,323	€1,300	€1,513	€1,666	€1,671
Total State and Local Government Debt	Debt to GDP	22%	22%	24%	23%	23%
	5 Year % Change	-23%	-22%	-12%	-11%	-11%
	Billion Euro	€756	€763	€815	€824	€825

Supplementary Data		2018	2019	2020	2021	2022 Q1
Nominal GDP	Billion Euro	€3,370	€3,479	€3,398	€3,593	€3,663
	Annual % Change	3.0%	3.2%	-2.3%	5.7%	7.9%
Real GDP	Billion 2015 Euros	€3,215	€3,250	€3,090	€3,179	€3,208
	Annual % Change	1.1%	1.1%	-4.9%	2.9%	4.6%
Consumer Price Index (Inflation)	CPI (2015=100)	104.4	106.0	105.3	111.3	116.1
	Inflation Rate	1.7%	1.5%	-0.7%	5.7%	7.6%
Unemployment	Person (Thousands)	2,267	2,289	2,786	2,397	2,303
	Unemployment Rate	5.0%	5.0%	6.1%	5.2%	5.0%
Current Account Balance	Billion Euros	€271	€269	€233	€269	€239
	to GDP	8.0%	7.7%	6.9%	7.5%	6.5%

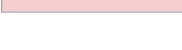
 High Concern
  Concern
  Low Concern
  Current or recent crisis
  No Current Concern

n/a: Data Not Available

Explanatory Notes

Color Code	Total Private Debt Cell Description
	5 Year % Change > 20%
	5 Year % Change > 13% < 20%
	Residual Risk Period

* Due to the size of total private debt, five-year percentage growth constitutes greater concern as compared to the individual sector data

Color Code	Sector Data Cell Description
	5 Year % Change > 40%
	5 Year % Change > 40%
	Debt to GDP < 1.5% (immaterial)
	5 Year % Change > 20% < 40%
	5 Year % Change > 20% < 40%
	Debt to GDP < 1.5% (immaterial)
	5 Year % Change > 13% < 20%
	5 Year % Change > 13% < 20%
	Debt to GDP < 1.5% (immaterial)
	Residual Risk Period

 High Concern
  Concern
  Low Concern
  Current or recent crisis
  No Current Concern

n/a: Data Not Available

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