

## TYCHOS SECTOR RISK REPORT

		2017	2018	2019	2020	2021 Q2
<b>Total Private Debt</b>	Debt to GDP	118%	119%	120%	130%	130%
	5 year % change	-2%	-2%	2%	11%	10%
	Billion Euro	€3,850	€3,999	€4,190	€4,378	€4,473
<b>Business Debt</b>	Debt to GDP	65%	66%	67%	72%	72%
	5 year % change	3%	2%	5%	13%	12%
	Billion Euro	€2,121	€2,227	€2,334	€2,436	€2,486
<b>Household Debt</b>	Debt to GDP	53%	53%	53%	58%	58%
	5 year % change	-7%	-5%	-1%	8%	8%
	Billion Euro	€1,729	€1,772	€1,856	€1,942	€1,987

## Areas of Concern

Business Sectors		2017	2018	2019	2020	2021 Q2
<b>Commercial Real Estate</b>	Debt to GDP	14.3%	15.0%	15.4%	17.1%	17.2%
	5 year % change	-7%	-1%	7%	20%	21%
	Billion Euro	€469	€506	€536	€573	€591
<b>Memo: Real Estate</b>	Debt to GDP	12.3%	12.9%	13.2%	14.6%	14.7%
	5 year % change	-7%	-1%	7%	19%	20%
	Billion Euro	€401	€434	€458	€491	€505
<b>Memo: Construction</b>	Loans to GDP	2.1%	2.1%	2.2%	2.5%	2.5%
	5 year % change	-5%	2%	9%	23%	22%
	Billion Euro	€67	€72	€77	€83	€86
<b>Information Technology</b>	Loans to GDP	3.3%	3.4%	3.7%	4.1%	4.2%
	5 year % change	1%	4%	14%	26%	27%
	Billion Euro	€107	€113	€127	€136	€144

Private Debt Lenders		2017	2018	2019	2020	2021 Q2
<b>Foreign Loans</b>	Debt to GDP	19.8%	21.5%	22.1%	23.8%	23.5%
	5 year % change	8%	14%	19%	23%	19%
	Billion Euro	€649	€725	€770	€799	€807
<b>Corporate Bonds</b>	Debt to GDP	6.0%	5.0%	6.0%	7.0%	8.0%
	5 year % change	35%	9%	14%	43%	31%
	Billion Euro	€211	€181	€205	€250	€261

Individual Lenders		2017	2018	2019	2020	2021 Q2
<b>DZ Bank</b>	Loans to GDP	5.9%	5.7%	5.9%	6.2%	6.2%
	5 year % change	21%	16%	22%	29%	4%
	Billion Euro	€192	€192	€204	€209	€213
	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		2017	2018	2019	2020	2021 Q2	
Commercial Real Estate	Debt to GDP	14.3%	15.0%	15.4%	17.1%	17.2%	⚠
	5 year % change	-7%	-1%	7%	20%	21%	⚠
	Billion Euro	€469	€506	€536	€573	€591	⚠
Memo: Real Estate	Debt to GDP	12.3%	12.9%	13.2%	14.6%	14.7%	⚠
	5 year % change	-7%	-1%	7%	19%	20%	⚠
	Billion Euro	€401	€434	€458	€491	€505	⚠
Memo: Construction	Loans to GDP	2.1%	2.1%	2.2%	2.5%	2.5%	⚠
	5 year % change	-5%	2%	9%	23%	22%	⚠
	Billion Euro	€67	€72	€77	€83	€86	⚠
Manufacturing	Loans to GDP	4.0%	4.1%	4.2%	4.4%	4.1%	+
	5 year % change	-16%	-9%	0%	4%	-3%	+
	Billion Euro	€131	€139	€147	€147	€142	+
Information Technology	Loans to GDP	3.3%	3.4%	3.7%	4.1%	4.2%	⚠
	5 year % change	1%	4%	14%	26%	27%	⚠
	Billion Euro	€107	€113	€127	€136	€144	⚠
Wholesale and Retail	Loans to GDP	4.1%	4.1%	4.1%	4.0%	3.9%	+
	5 year % change	-11%	-7%	-4%	-2%	-3%	+
	Billion Euro	€133	€139	€142	€136	€135	+
Utilities	Loans to GDP	3.4%	3.5%	3.4%	3.7%	3.6%	+
	5 year % change	2%	0%	0%	10%	8%	+
	Billion Euro	€113	€117	€119	€123	€122	+
Health Care	Loans to GDP	2.5%	2.4%	2.4%	2.6%	2.5%	+
	5 year % change	-16%	-14%	-8%	0%	0%	+
	Billion Euro	€81	€82	€85	€86	€87	+
Agriculture	Loans to GDP	1.5%	1.6%	1.6%	1.6%	1.6%	+
	5 year % change	-5%	-3%	-4%	0%	-1%	+
	Billion Euro	€50	€53	€54	€55	€56	+
Transportation and Communication	Loans to GDP	1.6%	1.5%	1.4%	1.8%	1.7%	+
	5 year % change	-44%	-40%	-38%	-18%	-12%	+
	Billion Euro	€52	€51	€50	€60	€58	+
Hotels and Restaurants	Loans to GDP	0.7%	0.7%	0.8%	0.9%	0.9%	⚠
	5 year % change	-8%	-3%	3%	17%	15%	⚠
	Billion Euro	€24	€25	€26	€29	€29	⚠
Other Services	Loans to GDP	1.4%	1.3%	1.3%	1.1%	1.1%	+
	5 year % change	-23%	-21%	-13%	-23%	-21%	+
	Billion Euro	€45	€44	€45	€38	€38	+

\* 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		2017	2018	2019	2020	2021 Q2	
Consumer Discretionary	Debt to GDP	12.8%	14.2%	15.2%	15.5%	15.2%	⚠
	5 year % change	13%	29%	32%	22%	16%	
	Billion euro	€419	€479	€530	€521	€521	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Communication Services	Debt to GDP	2.8%	2.8%	3.3%	5.0%	4.9%	⚠
	5 year % change	14%	7%	16%	61%	61%	⚠
	Billion euro	€91	€94	€114	€168	€168	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Industrials	Debt to GDP	3.3%	3.6%	4.1%	4.3%	4.6%	⚠
	5 year % change	12%	35%	47%	45%	39%	⚠
	Billion euro	€107	€123	€142	€144	€159	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Health Care	Debt to GDP	2.0%	2.5%	2.7%	2.9%	3.1%	⚠
	5 year % change	53%	95%	54%	34%	54%	⚠
	Billion euro	€65	€84	€94	€99	€108	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Utilities	Debt to GDP	2.3%	1.7%	2.3%	2.4%	2.6%	+
	5 year % change	-12%	-50%	-27%	-23%	7%	
	Billion euro	€75	€57	€80	€82	€89	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Materials	Debt to GDP	1.7%	1.7%	1.8%	1.7%	1.5%	+
	5 year % change	-8%	-10%	8%	10%	-13%	+
	Billion euro	€56	€56	€64	€58	€53	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Consumer Staples	Debt to GDP	0.6%	0.7%	1.0%	0.7%	0.7%	⚠
	5 year % change	-4%	42%	51%	18%	19%	⚠
	Billion euro	€21	€25	€36	€25	€25	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Information Technology	Debt to GDP	0.4%	0.5%	0.6%	0.8%	0.8%	⚠
	5 year % change	24%	95%	35%	79%	85%	⚠
	Billion euro	€12	€18	€22	€26	€26	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Energy	Debt to GDP	0.2%	0.2%	0.4%	0.3%	0.3%	⚠
	5 year % change	41%	68%	183%	50%	59%	⚠
	Billion euro	€7	€8	€13	€11	12	
	Default Rate	n/a	n/a	n/a	n/a	n/a	
Memo: Automobiles and Components	Debt to GDP	12.4%	13.7%	14.6%	14.6%	14.2%	⚠
	5 year % change	17%	33%	33%	21%	13%	⚠
	Billion euro	€406	€460	€507	€490	489	
	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		2017	2018	2019	2020	2021 Q2	
Mortgage Debt	Debt to GDP	36.0%	37.0%	37.0%	41.0%	42.0%	⚠
	5 year % change	-1%	1%	5%	15%	16%	
	Billion Euro	€1,175	€1,231	€1,301	€1,387	€1,432	
Consumer Credit	Debt to GDP	5.9%	5.8%	5.8%	5.9%	5.7%	+
	5 year % change	-11%	-7%	-2%	1%	-3%	
	Billion Euro	€192	€196	€202	€198	€195	
Other	Debt to GDP	11.1%	10.2%	10.1%	10.6%	10.5%	+
	5 year % change	-19%	-22%	-18%	-11%	-11%	
	Billion Euro	€362	€345	€353	€357	€360	

⚠ 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		2017	2018	2019	2020	2021 Q2	
Commercial and Savings Banks	Debt to GDP	46.2%	48.0%	48.8%	52.6%	52.3%	
	5 year % change	-4%	4%	8%	16%	14%	⚠
	Billion Euro	€1,512	€1,617	€1,700	€1,767	€1,799	
Mortgage and Land Banks	Debt to GDP	13.3%	12.3%	12.4%	13.2%	13.2%	
	5 year % change	-29%	-26%	-21%	-11%	-6%	+
	Billion Euro	€436	€416	€433	€445	€455	
Credit Institutions	Debt to GDP	16.7%	17.1%	17.6%	19.3%	19.5%	
	5 year % change	0%	1%	4%	12%	13%	⚠
	Billion Euro	€546	€577	€611	€649	€670	
Foreign Loans	Debt to GDP	19.8%	21.5%	22.1%	23.8%	23.5%	
	5 year % change	8%	14%	19%	23%	19%	⚠
	Billion Euro	€649	€725	€770	€799	€807	
Other Financial Institutions	Debt to GDP	6.0%	5.6%	6.0%	6.7%	6.8%	
	5 year % change	-5%	-16%	1%	17%	4%	⚠
	Billion Euro	€195	€190	€210	€225	€235	
Corporate Bonds	Debt to GDP	6.0%	5.0%	6.0%	7.0%	8.0%	
	5 year % change	35%	9%	14%	43%	31%	⚠
	Billion Euro	€211	€181	€205	€250	€261	

⚠ High Concern  
⚠ Concern  
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n/a: Data Not Available

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

Debt Security Investment		2016	2017	2018	2019	2020	
Germany Holdings of Foreign Debt Securities	to GDP	57%	60%	54%	59%	69%	
	5 year % change	23%	6%	-7%	8%	18%	⚠
	Billion Euro	€1,778	€1,975	€1,823	€2,066	€2,308	
France	to GDP	8.0%	8.7%	7.9%	8.8%	10.8%	
	5 year % change	18%	-3%	-10%	5%	28%	⚠
	Billion Euro	€252	€284	€266	€307	€362	
United States	to GDP	6.8%	7.1%	6.0%	6.8%	7.9%	
	5 year % change	79%	71%	39%	50%	29%	⚠
	Billion Euro	€213	€232	€202	€238	€264	
Netherlands	to GDP	5.9%	6.2%	6.0%	6.6%	7.5%	
	5 year % change	1%	-11%	-12%	10%	26%	⚠
	Billion Euro	€185	€204	€202	€230	€253	
Equity and Investment Fund Shares		2016	2017	2018	2019	2020	
Germany Holdings of Foreign Equity and Investment Fund Shares	to GDP	29%	35%	29%	37%	45%	
	5 year % change	69%	65%	17%	53%	59%	⚠
	Billion Euro	€912	€1,139	€970	€1,288	€1,515	
Luxembourg	to GDP	13.3%	15.6%	12.8%	15.5%	17.7%	
	5 year % change	47%	46%	12%	38%	36%	⚠
	Billion Euro	€415	€510	€433	€538	€595	
United States	to GDP	3.7%	4.2%	3.7%	5.2%	7.4%	
	5 year % change	130%	103%	38%	75%	112%	⚠
	Billion Euro	€116	€138	€126	€181	€248	
Ireland	to GDP	2.3%	3.0%	2.8%	4.1%	5.4%	
	5 year % change	211%	175%	99%	160%	171%	⚠
	Billion Euro	€72	€97	€94	€143	€180	
Loans		2016	2017	2018	2019	2020	
Germany Holding of Foreign Loans	to GDP	31.2%	30.7%	32.6%	33.3%	34.9%	
	5 year % change	-5%	-10%	4%	7%	10%	+
	Billion Euro	€976	€1,003	€1,101	€1,157	€1,174	
Germany Holding of Foreign Loans: Short Term	to GDP	11.4%	11.4%	11.6%	12.9%	14.3%	
	5 year % change	-5%	-5%	1%	9%	19%	⚠
	Billion Euro	€356	€373	€391	€450	€481	
Germany Holding of Foreign Loans: Long Term	to GDP	19.8%	19.2%	21.1%	20.3%	20.6%	
	5 year % change	-6%	-12%	7%	6%	5%	+
	Billion Euro	€620	€629	€710	€707	€693	

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

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

n/a: Data Not Available

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

Debt Security Investment		2016	2017	2018	2019	2020	
Foreign Holdings of Germany's Debt Securities	to GDP	54%	53%	47%	48%	56%	+
	5 year % change	-8%	-20%	-21%	-11%	-5%	+
	Billion Euro	€1,702	€1,728	€1,580	€1,687	€1,898	
Netherlands	to GDP	5.6%	5.7%	5.1%	5.2%	5.9%	+
	5 year % change	0%	-17%	-18%	-14%	-4%	+
	Billion Euro	€176	€186	€172	€182	€198	
Luxembourg	to GDP	4.2%	4.5%	4.4%	4.9%	5.7%	!
	5 year % change	-27%	-24%	-19%	10%	22%	!
	Billion Euro	€131	€149	€147	€171	€192	
France	to GDP	3.6%	3.1%	2.7%	3.2%	4.1%	+
	5 year % change	-33%	-36%	-30%	-18%	-1%	+
	Billion Euro	€112	€101	€92	€111	€136	
Equity and Investment Fund Shares		2016	2017	2018	2019	2020	
Foreign Holdings of Germany's Equity and Investment Fund Shares	to GDP	28%	34%	25%	30%	33%	!
	5 year % change	78%	58%	-2%	30%	15%	!
	Billion Euro	€875	€1,101	€844	€1,036	€1,116	
United States	to GDP	8.5%	10.8%	7.7%	9.8%	11.0%	!
	5 year % change	82%	68%	-5%	39%	30%	!
	Billion Euro	€265	€354	€259	€340	€368	
Luxembourg	to GDP	4.6%	5.4%	4.5%	5.0%	5.4%	!
	5 year % change	53%	56%	15%	43%	11%	!
	Billion Euro	€143	€176	€151	€174	€181	
France	to GDP	2.6%	2.9%	1.9%	2.3%	2.6%	+
	5 year % change	44%	20%	-24%	-1%	-7%	+
	Billion Euro	€80	€95	€66	€79	€86	

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

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

n/a: Data Not Available

## Derivative Activity

OTC Derivative Activity by Contract Type		2016	2017	2018	2019	2020	
Interest Rate	to GDP	965%	1152%	983%	953%	1016%	
	5 Year % Change	-47%	-26%	-35%	-26%	9%	+
	Billion Euro	€30,198	€37,683	€33,160	€33,167	€34,136	
Foreign Exchange	to GDP	141%	137%	133%	132%	129%	
	5 Year % Change	-30%	-27%	-20%	-27%	-24%	+
	Billion Euro	€4,419	€4,496	€4,496	€4,607	€4,351	
Credit Derivatives	to GDP	44%	48%	22%	18%	23%	
	5 Year % Change	-55%	-29%	-64%	-62%	-48%	+
	Billion Euro	€1,362	€1,577	€735	€642	€766	
Index and Stock-related	to GDP	16%	14%	11%	5%	3%	
	5 Year % Change	-28%	-34%	-35%	-71%	-85%	+
	Billion Euro	€506	€450	€386	€186	€88	
Commodity contracts	to GDP	1%	1%	1%	1%	1%	
	5 Year % Change	-89%	-88%	-83%	-49%	-39%	+
	Billion Euro	€29	€19	€22	€26	€21	
Total Notional	to GDP	1167%	1352%	1151%	1110%	1171%	
	5 Year % Change	-46%	-27%	-34%	-28%	1%	+
	Billion Euro	€36,514	€44,225	€38,799	€38,628	€39,362	

▲ High Concern  
▲ Concern  
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n/a: Data Not Available

## Largest Individual Lenders

Individual Lenders		2017	2018	2019	2020	2021 Q2	
Deutsche Bank	Loans to GDP	12.4%	12%	12.5%	12.9%	n/a	+
	5 year % change	-15%	-12%	-11%	-10%	n/a	
	Billion Euro	€406	€405	€434	€432	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
Commerzbank	Loans to GDP	8.1%	7.4%	7.5%	7.7%	7.6%	+
	5 year % change	-22%	-18%	-8%	5%	1%	
	Billion Euro	€264	€249	€261	€259	€262	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
DZ Bank	Loans to GDP	5.9%	5.7%	5.9%	6.2%	6.2%	⚠
	5 year % change	21%	16%	22%	29%	4%	
	Billion Euro	€192	€192	€204	€209	€213	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	
KfW (State-Owned)	Loans to GDP	3.9%	3.8%	3.7%	4.2%	n/a	+
	5 year % change	-9%	-8%	-9%	-6%	n/a	
	Billion Euro	€128	€127	€129	€141	n/a	
	Charge-off Rate	n/a	n/a	n/a	n/a	n/a	

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 + No Current Concern

n/a: Data Not Available



## Real Estate

Total Debt		2017	2018	2019	2020	2021 Q2
Mortgage Debt	Debt to GDP	36.0%	37.0%	37.0%	41.0%	42.0%
	5 year % change	-1%	1%	5%	15%	16%
	Billion Euro	€1,175	€1,231	€1,301	€1,387	€1,432



Quarterly Residential Housing Summary		Mar-2020	Jun-2020	Sep-2020	Dec-2020	Mar-2021	June-2021
Total Housing Units Approved for Construction	Volume	33,632	38,872	40,758	40,677	45,769	41,911
	Annual Change	3.4%	5.3%	6.3%	18.5%	36.1%	7.8%
Total Housing Units Construction Started	Volume	5,060	5,210	5,197	5,757	6,397	5,185
	Annual Change	10.8%	7.6%	3.9%	14.3%	26.4%	-0.5%
Residential Property Price Index	Index (2015=100)	133.8	136.2	140.3	144.3	145.7	151.1
	Annual Change	7.4%	6.6%	8.3%	8.7%	8.9%	10.9%

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n/a: Data Not Available

## Additional Data




Public Debt		2017	2018	2019	2020	2021 Q2
Total General Government Debt	Debt to GDP	65%	61%	59%	69%	70%
	5 Year % Change	-20%	-22%	-22%	-4%	-2%
	Billion Euro	€2,112	€2,064	€2,047	€2,314	€2,398
Total Central Government Debt	Debt to GDP	41%	39%	37%	45%	46%
	5 Year % Change	-18%	-21%	-22%	-1%	2%
	Billion Euro	€1,350	€1,323	€1,300	€1,513	€1,589
Total State and Local Government Debt	Debt to GDP	24%	22%	22%	24%	24%
	5 Year % Change	-22%	-23%	-22%	-11%	-10%
	Billion Euro	€778	€757	€764	€815	€824

Supplementary Data		2017	2018	2019	2020	2021 Q2
Nominal GDP	Billion Euro	€3,271	€3,372	€3,479	€3,360	€3,438
	Annual % Change	4.5%	3.1%	3.2%	-3.4%	1.0%
Real GDP	Billion 2015 Euros	€3,180	€3,215	€3,250	€3,090	€3,133
	Annual % Change	3.0%	1.1%	1.1%	-4.9%	-0.3%
Consumer Price Index (Inflation)	CPI (2015=100)	102.7	104.4	106.0	105.3	109.1
	Inflation Rate	1.5%	1.7%	1.5%	-0.7%	2.1%
Unemployment	Person (Thousands)	2,443	2,267	2,290	2,789	2,681
	Unemployment Rate	5.5%	5.0%	5.0%	6.1%	5.8%
Current Account Balance	Billion Euros	€254	€267	€265	€228	€258
	to GDP	7.8%	7.9%	7.6%	6.8%	7.5%











▲ 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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