Funding of German Lander, Mechanisms and Solidarity

Julien Vandernoot[1,*]

[1]Public Finance and Tax department, Warocqué School of Business and Economics, University of Mons (UMONS), Belgium

*Correspondence: Place Warocqué, 17, 7000 Mons, Belgium.
E-mail: Julien.Vandernoot@umons.ac.be

Abstract

Germany is a federal state made up of 16 constituent states, called Länder. Considering the country's history of division between West and East and the wealth gap which is still much alive between the two regions, German authorities have decided to put in place solidarity mechanisms in order to restore some balance.

The purpose of this article is to gain an understanding of all these mechanisms and assess their impact, based on the rules and formula provided by the German law and on calculations for the year 2010. This article clearly highlights the very redistributive character of the German system and even reveals a paradox of revenues, leading to the poorest Länder becoming some of the wealthiest and vice versa.

Keywords: equalization, federalism, paradox of revenue, solidarity, funding of federated entities, Germany, Länder

1. Introduction(Note 1)

Germany is made up of sixteen Länder, namely: Baden-Württemberg, Bavaria, Berlin, Brandenburg, Bremen, Hamburg, Hesse, Lower Saxony, Mecklenburg-Vorpommern, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holstein and Thuringia.

Some of these (Note 2) are located on the territory of the former Federal Republic of Germany (FRG or West Germany) and others(Note 3) on the territory of the former German Democratic Republic (GDR or East Germany). Berlin used to be divided into East and West Berlin (West Berlin being part of West Germany and East Berlin being part of East Germany).

Three of the current Länder are city-states, composed of one (Berlin and Hamburg) or two disctricts (Bremen).

Today's Federal Republic of Germany was created in 1990 from the unification of all these Länder.

The distinction between west and eastern Länder is important, considering the still great disparity of wealth between the two regions, which gives rise to an appropriate funding of the latters.

The funding of the Länder is not frequently studied in scientific literature. The former funding mechanisms, which took place before the reform of 2001, have nevertheless been evoked by Gunlicks (2003) and Spahn and Werner (2007).

This article will first examine the current funding mechanisms of the Länder and place figures on the amounts they received.

It will then measure the solidarity by calculating the difference between the amounts the Länder have received and the ones the Länder would have received in the absence of redistributive mechanisms.

These elements will highlight the degree of solidarity in the funding system of the German Länder and will identify the contributors and the beneficiaries.

2. Funding Mechanisms

The latest major amendment to the funding mechanisms of German Länder was voted in 2001 and entered into force in 2005, following a German Constitutional Court (Bundesverfassungsgericht) decision of 1999(Note 4) requiring modifications of the mechanisms in force until then.

The financial equalization law between the federal state and the Länder (Finanzausgleichsgesetz) (Note 5) was born.

The decision of the German Constitutional Court came in response to an appeal brought by

the Länder of Baden-Württemberg, Bavaria and Hesse, which are major funding contributors.

Today's funding mechanism of the German Länder includes four stages, namely:

- Distribution of the value added tax, the corporate tax and the income tax between the federal state, the Länder and the municipalities;

- Distribution of the value added tax between the Länder;

- Horizontal equalization;

- Federal grants.

It should also be noted that the financial equalization law currently in force will in principle remain in place until 2019, when some of the funding mechanisms it provides are due to expire. We use the words "in principle", because the Länder of Bavaria and Hesse filed a new appeal against the current equalization system to the Constitutional Court in 2013. (Note 6)

2.1 Distribution of the value added tax, the corporate tax and the income tax between the federal state, the Länder and the municipalities

In 2010, the corporate tax was equally distributed between the federal State and the Länder (50% for each part). The share allocated to the Länder is then divided depending on the Land of domicile of each company(Note 7).

42.5% of the income tax is awarded to the federal state, 42.5% to the Länder and 15% to the municipalities. The criterion of residence applies to the allocation of the Länder's share.

The distribution of the value added tax (VAT) is more complex. The financial equalization law between the federal state and the Länder (Finanzausgleichsgesetz) indeed provides that 9.5% of the VAT receipts are first attributed to the federal state, among other things as a form of compensation for the increase in pension payments made by the State. In addition, 2.2% of the VAT is allocated to the municipalities. The amount that is left is then divided between the federal state (50.5%) and the Länder (49.5%).

2.2 Distribution of the value added tax between the Länder

Section 2 of the financial equalization law between the federal state and the Länder provides a set of rules applicable to the distribution of VAT between the Länder.

The share attributed to the Länder is divided into two parts: the first one amounts to a maximum of a quarter of the total and the second is equal to the balance.

The first part is shared between the Länder whose revenues from income tax, corporate tax and Länder tax are below the average (which was of 1309.23 euro per inhabitant in 2010(Note 8)).

Each of these Länder receives what is called an additional share (ergänzungsanteile).

i. The Länder whose aforementioned revenues are lower than 97% of the average receive an amount calculated according to the following formula:

$$S_L = R_A \times P_L \times \left(\left(\frac{19}{20} \times \left(1 - \frac{RI_L}{100} \right) \right) - \frac{21}{4000} \right) \tag{1}$$

S_L = additional share allocated to the Land in question

R_A = average revenues per inhabitant for all Länder from the income tax, the corporate tax and Länder tax.

P_L = the number of inhabitants in the Land in question

RI_L = the revenues index of the Land (average: 100)

ii. The Länder whose aforementioned revenues are between 97% and 100% of the average receive an amount calculated according to the following formula:

$$S_L = R_A \times P_L \times \left(\left(\frac{1-RI_L}{100} \right) \left(\frac{35}{6} \times \left(\frac{1-RI_L}{100} \right) \right) + \frac{3}{5} \right) \tag{2}$$

S_L = additional Share allocated to the Land in question

R_A = average revenues per inhabitant for all Länder from the income tax, the corporate tax and Länder tax.

P_L = the number of inhabitants in the Land in question

RI_L = the revenues index of the Land (average: 100)

A verification is then made to ensure that the total amount allocated as additional shares (ergänzungsanteile) does not exceeds 25% of the share of VAT receipts attributed to the Länder. No such problem occurred in 2010, the ergänzungsanteile amounting to 12.52% of the Länder share of VAT receipts (10 092 047 000 euro out of 80 587 873 000 euro) (Note 9).

If the authorized thresholds are exceeded, the financial equalization law between the federal state and the Länder provides that the allocated amounts in question shall be reduced proportionally.

The rest of the Länder share of VAT receipts (70 495 826 000 euro in 2010, that is 87.48% of the total) is then shared out proportionately to the population of the Länder.

The amounts received by the Länder as additional shares (Ergänzungsanteile) and as part of the proportional distribution of the VAT are shown in e.g. Table 1.

Table 1. Amounts received by the Länder as additional shares (Ergänzungsanteile) and as part of the proportional distribution of the VAT

Land	Ergänzungsanteile					Distribution proportional to the population			Total allocated amount (*1000 euro)
	Revenues (*1000 euro)	Revenues per inhabitant (euro)	Revenues index per inhabitant (average = 100)	entitlement to the ergänzungsanteile (YES/NO)	Allocated amount (*1000 euro)	Population		Allocated amount (*1000 euro)	
North Rhine-Westphalia	23 488 028	1315.81	100.50	NO	0	17 850 560		15 393 014	15 393 014
Bavaria	21 197 350	1693.20	129.33	NO	0	12 519 130		10 795 580	10 795 580
Baden-Württemberg	16 495 969	1534.52	117.21	NO	0	10 749 924		9 269 946	9 269 946
Lower Saxony	8 898 695	1121.83	85.69	YES	1 357 667	7 932 282		6 840 219	8 197 886
Hesse	10 114 447	1667.98	127.40	NO	0	6 063 885		5 229 050	5 229 050
Saxony	2 737 375	659.03	50.34	YES	2 537 114	4 153 631		3 581 787	6 118 901
Rhineland-Palatinate	5 111 201	1275.57	97.43	YES	101 167	4 006 995		3 455 339	3 556 506
Saxony-Anhalt	1 483 533	632.72	48.33	YES	1 490 773	2 344 679		2 021 879	3 512 652
Schleswig-Holstein	3 461 707	1222.63	93.39	YES	213 488	2 831 364		2 441 561	2 655 049
Thuringia	1 427 639	637.01	48.66	YES	1 415 827	2 241 157		1 932 610	3 348 437
Brandenburg	2 030 142	809.58	61.84	YES	1 173 078	2 507 654		2 162 417	3 335 495
Mecklenburg-Vorpommern	1 056 519	641.66	49.01	YES	1 032 909	1 646 539		1 419 855	2 452 764
Saarland	1 063 211	1042.55	79.63	YES	251 357	1 019 815		879 414	1 130 771
Berlin	3 976 339	1154.44	88.18	YES	482 851	3 444 400		2 970 198	3 453 049
Hamburg	3 667 583	2061.44	157.45	NO	0	1 779 140		1 534 200	1 534 200
Bremen	821 046	1244.84	95.08	YES	35 816	659 561		568 757	604 573
Total	107 030 784				10 092 047	81 750 716		70 495 826	80 587 873
Average		1309.23	100.00						

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, own calculations.

2.3 Horizontal equalization

Equalization is provided for under article 107 of the German Constitution(Note 10), which establishes the principle of it.

The implementation of equalization is however provided for by the financial equalization law between the federal state and the Länder (Finanzausgleichsgesetz), which states that the Länder whose financial strength index is lower than the equalization index shall receive a contribution financed by the Länder whose financial strength index is higher than the equalization index.

These two indexes are calculated according to the following formulae:

$$FSI_L = R_L + (0.64 \times R_M)$$

FSI_L = financial strength index of the Land in question

R_L = revenues of the Land from the income tax, the corporate tax, the Länder taxes, the value added tax and royalties.

R_M = revenues of the municipalities in the Land in question and

$$EI_L = \left(\frac{R_T \times P_L \times C_{L1}}{WP_{T1}}\right) + \left(0.64 \times \left(\frac{R_{MT} \times P_L \times C_{L2}}{WP_{T2}}\right)\right) \tag{3}$$

EI_L = equalization index of the Land in question

R_T = total revenues of all Länder from the income tax, the corporate tax, the Länder taxes, the value added tax and royalties

P_L = population in the Land in question

C_{L1} = population coefficient assigned to the Land in question for the first part of the formula(Note 11)

WP_{T1} = total German population weighted to reflect the population coefficients assigned to the Länder for the first part of the formula (in 2010: 83 809 801.35 inhabitants) (Note 12)

R_{MT} = total municipal revenues for all the Länder

C_{L2} = population coefficient assigned to the Land in question for the second part of the formula(Note 13)

WP_{T2} = total German population weighted to reflect the population coefficients assigned to the Länder for the second part of the formula (in 2010: 84 014 251.5 inhabitants) (Note 14)

    i.   Länder whose financial strength index is lower than 80% of the equalization index receive an equalization amount calculated according to the following formula:

$$EA_L = EI_L \times \left(\left(\frac{3}{4} \times \left(1 - \frac{FSI_L}{EI_L} \right) \right) - \frac{317}{20\,000} \right) \tag{4}$$

EA_L = equalization amount allocated to the Land in question

EI_L = equalization index of the Land in question

FSI_L = financial strength index of the Land in question

    ii.   Länder whose financial strength index is greater than or equal to 80% of the equalization index, but lower than 93% of it, receive an equalization amount calculated according to the following formula:

$$EA_L = EI_L \times \left(1 - \frac{FSI_L}{EI_L} \right) \times \left(\left(\frac{5}{26} \times \left(1 - \frac{FSI_L}{EI_L} \right) + \frac{35}{52} \right) - \frac{2121}{260\,000} \right) \tag{5}$$

EA_L = equalization amount allocated to the Land in question

EI_L = equalization index of the Land in question

FSI_L = financial strength index of the Land in question

    iii.   Länder whose financial strength index is greater than or equal to 93% of the equalization index, but lower than 100% of it, receive an equalization amount calculated according to the following formula:

$$EA_L = EI_L \times \left(1 - \frac{FSI_L}{EI_L} \right) \times \left(\frac{13}{7} \times \left(1 - \frac{FSI_L}{EI_L} \right) + \frac{11}{25} \right) \tag{6}$$

EA$_L$ = equalization amount allocated to the Land in question

EI$_L$ = equalization index of the Land in question

FSI$_L$ = financial strength index of the Land in question

Conversely, Länder whose financial strength index is greater than the equalization index contribute to the equalization.

iv. Länder whose financial strength index is greater than the equalization index, but lower than 107% of it, pay an equalization amount calculated according to the following formula:

$$AP_L = AC \times EI_L \times \left(\frac{FSI_L}{EI_L} - 1\right) \times \left(\frac{13}{7} \times \left(\frac{FSI_L}{EI_L} - 1\right) + \frac{11}{25}\right) \qquad (7)$$

AP$_L$ = equalization amount paid by the Land in question

AC = adjustment coefficient applied in order to match the total amount received as equalization allocations with the total amount paid as equalization contributions, which is calculated according to the following formula:

$$\frac{Total\ amount\ received\ by\ the\ Länder\ benefiting\ from\ equalization}{Total\ amount\ paid\ by\ the\ Länder\ supporting\ equalization}$$

This coefficient was of 0.9901 in 2010.

EI$_L$ = equalization index of the Land in question

FSI$_L$ = financial strength index of the Land in question

v. Länder whose financial strength index is greater than or equal to 107% of the equalization index, but lower than 120% of it, pay an equalization amount calculated according to the following formula:

$$AP_L = AC \times EI_L \times \left(\frac{FSI_L}{EI_L} - 1\right) \times \left(\left(\frac{5}{26} \times \left(\frac{FSI_L}{EI_L} - 1\right) + \frac{35}{52}\right) - \frac{2121}{260\,000}\right) \qquad (8)$$

AP$_L$ = equalization amount paid by the Land in question

AC = adjustment coefficient applied in order to match the total amount received as equalization allocations with the total amount paid as equalization contributions, which is calculated according to the following formula:

$$\frac{Total\ amount\ received\ by\ the\ Länder\ benefiting\ from\ equalization}{Total\ amount\ paid\ by\ the\ Länder\ supporting\ equalization}$$

This coefficient was of 0.9901 in 2010.

EI$_L$ = equalization index of the Land in question

FSI$_L$= financial strength index of the Land in question

vi.   And Länder whose financial strength index is greater than or equal to 120% of the equalization index pay an equalization amount calculated according to the following formula:

$$AP_L = AC \times EI_L \times \left(\frac{3}{4} \times \left(\frac{FSI_L}{EI_L} - 1 \right) - \frac{317}{20\,000} \right) \qquad (9)$$

AP_L = equalization amount paid by the Land in question

AC = adjustment coefficient applied in order to match the total amount received as equalization allocations with the total amount paid as equalization contributions, which is calculated according to the following formula:

$$\frac{Total\ amount\ received\ by\ the\ L\ddot{a}nder\ benefiting\ from\ equalization}{Total\ amount\ paid\ by\ the\ L\ddot{a}nder\ supporting\ equalization}$$

This coefficient was of 0.9901 in 2010.

EI_L = equalization index of the Land in question

FSI_L = financial strength index of the Land in question

The amounts received or paid by the Länder as a form of equalization are shown in Table 2 below.

Table 2. Amounts received or paid as a form of equalization in Germany (2010)

Land	Financial strength index (FSI) (thousand euro) (municipal indexes are multiplied by 0.64)			Equalization index (EI) (thousand euro) (municipal indexes are multiplied by 0.64)			FSI/EI*100	Land: contributor or beneficiary?	Amount received (+) or paid (-) (thousand euro)
	Municipalities	Länder	Total	Municipalities	Länder	Total			
North Rhine-Westphalia	10 265 897	38 881 529	49 147 426	9 847 576	40 056 639	49 904 215	98.48	beneficiary	354 301
Bavaria	8 456 335	31 993 370	40 449 705	6 906 399	28 092 915	34 999 314	115.57	contributor	-3 511 134
Baden-Württemberg	7 181 884	25 722 512	32 904 396	5 930 385	24 122 819	30 053 204	109.49	contributor	-1 708 837
Lower Saxony	4 040 280	17 601 267	21 641 547	4 375 983	17 800 033	22 176 016	97.59	beneficiary	259 089
Hesse	4 319 577	15 344 125	19 663 702	3 345 249	13 607 352	16 952 601	115.99	contributor	-1 752 340
Saxony	1 413 210	8 835 344	10 248 554	2 291 424	9 320 744	11 612 168	88.26	beneficiary	853 882
Rhineland-Palatinate	2 022 122	8 671 563	10 693 685	2 210 529	8 991 693	11 202 222	95.46	beneficiary	266 630
Saxony-Anhalt	798 436	4 991 343	5 789 779	1 319 353	5 261 457	6 580 810	87.98	beneficiary	497 026
Schleswig-Holstein	1 509 717	6 198 675	7 708 392	1 561 972	6 353 578	7 915 550	97.38	beneficiary	101 218
Thuringia	739 627	4 774 149	5 513 776	1 236 374	5 029 154	6 265 528	88.00	beneficiary	472 220
Brandenburg	1 022 210	5 366 385	6 388 595	1 424 893	5 627 173	7 052 066	90.59	beneficiary	401 042
Mecklenburg-Vorpommern	516 823	3 506 440	4 023 263	953 759	3 694 832	4 648 591	86.55	beneficiary	399 149
Saarland	493 615	2 193 982	2 687 597	562 599	2 288 464	2 851 063	94.27	beneficiary	89 331
Berlin	1 495 573	7 362 764	8 858 337	2 565 221	10 434 461	12 999 682	68.14	beneficiary	2 899 964
Hamburg	1 654 598	5 200 044	6 854 642	1 325 017	5 389 724	6 714 741	102.08	contributor	-66 307
Bremen	418 037	1 425 619	1 843 656	491 209	1 998 073	2 489 282	74.06	beneficiary	444 764
Total	46 347 942	188 069 111	234 417 053	46 347 942	188 069 111	234 417 053			0

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010.

2.4 Federal grants(Note 15)

Two different kinds of federal additional grants (Bundesergänzungszuweisungen) are made to the Länder.

On the one hand, general federal additional grants are attributed to Länder whose financial strength index and horizontal equalization compensations combined are lower than 99.5% of the equalization index. These Länder receive 77.5% of the difference.

The amounts received by the Länder as general federal additional grants are shown in e.g. table 3.

Table 3. Amounts received by the Länder as general federal additional grants (2010)

Land	Financial strength capacity + equalization (FSI + E) (thousand euro)	Equalization index (EI) (thousand euro)	(FSI + E)/(EI)*100	Amount received (thousand euro)
North Rhine-Westphalia	49 501 727	49 904 215	99.193	118 549
Bavaria	36 938 571	34 999 314	105.541	0
Baden-Württemberg	31 195 559	30 053 204	103.801	0
Lower Saxony	21 900 636	22 176 016	98.758	127 487
Hesse	17 911 362	16 952 601	105.656	0
Saxony	11 102 436	11 612 168	95.610	350 045
Rhineland-Palatinate	10 960 315	11 202 222	97.841	144 069
Saxony-Anhalt	6 286 805	6 580 810	95.532	202 353
Schleswig-Holstein	7 809 610	7 915 550	98.662	51 431
Thuringia	5 985 996	6 265 528	95.539	192 358
Brandenburg	6 789 637	7 052 066	96.279	176 056
Mecklenburg-Vorpommern	4 422 412	4 648 591	95.134	157 275
Saarland	2 776 928	2 851 063	97.399	46 407
Berlin	11 758 301	12 999 682	90.451	911 697
Hamburg	6 788 335	6 714 741	101.096	0
Bremen	2 288 420	2 489 282	91.931	146022
Total				2623750

Sources: second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, own calculations.

On the other hand, exceptional federal additional grants (Sonderbedarfs-Bundesergänzungszuweisungen) are attributed to Länder sustaining different kinds of burdens. Three categories of exceptional federal grants can be distinguished.

The first one aims to compensate for the backwardness with regard to infrastructures and for the low financial strength of municipalities in the five eastern Länder and in the city-state of Berlin. To this end, they have received 8.743 billion euro in 2010 according to an allocation key provided for by the financial equalization law between the federal state and the Länder. [This amount has been decreasing from year to year since 2005 and will continue to do so until 2019, when the measure is due to expire in accordance with the financial equalization law between the federal state and the Länder.]

The second one provides the five eastern Länder with an amount intended to cover the costs associated with high unemployment and resulting high social charges. One billion euro has been allocated to this purpose in 2010, according to an allocation key provided for by the financial equalization law between the federal state and the Länder.

And the last one is designed to support ten small Länder that have to bear higher political management costs. 516.9 billion euro have been paid as such in 2010.

The amounts received by the Länder as exceptional federal additional grants are shown in e.g. table 4.

Table 4. Amounts received by the Länder as exceptional federal additional grants (2010)

Land	First grant (thousand euro)	Second grant (thousand euro)	Third grant (thousand euro)
North Rhine-Westphalia	0	0	0
Bavaria	0	0	0
Baden-Württemberg	0	0	0
Lower Saxony	0	0	0
Hesse	0	0	0
Saxony	2 279 803	319 000	25 565
Rhineland-Palatinate	0	0	46 016
Saxony-Anhalt	1 375 569	187 000	52 663
Schleswig-Holstein	0	0	53 174
Thuringia	1 250 910	176 000	55 731
Brandenburg	1 252 615	190 000	55 220
Mecklenburg-Vorpommern	921 205	128 000	61 355
Saarland	0	0	63 400
Berlin	1 662 989	0	43 460
Hamburg	0	0	0
Bremen	0	0	60 332
Total	8 743 091	1 000 000	516 916

Sources: Financial equalization law between the federal state and the Länder, own calculations.

3. Summary

Table 5 below summarizes the amounts allocated to each Land in the framework of the different funding mechanisms provided for by the German law.

Table 5. Amounts allocated to the Länder in the framework of the funding mechanisms provided for by the German law (2010, thousand euro)

Land	VAT			Equalization	General federal grants	Exceptional federal grants			
	Ergänzungsanteile	Population	Total			Grant 1	Grant 2	Grant 3	Total
North Rhine-Westphalia	0	15 393 014	15 393 014	354 301	118 549	0	0	0	0
Bavaria	0	10 795 580	10 795 580	-3 511 134	0	0	0	0	0
Baden-Württemberg	0	9 269 946	9 269 946	-1 708 837	0	0	0	0	0
Lower Saxony	1 357 667	6 840 219	8 197 886	259 089	127 487	0	0	0	0
Hesse	0	5 229 050	5 229 050	-1 752 340	0	0	0	0	0
Saxony	2 537 114	3 581 787	6 118 901	853 882	350 045	2 279 803	319 000	25 565	2 624 368
Rhineland-Palatinate	101 167	3 455 339	3 556 506	266 630	144 069	0	0	46 016	46 016
Saxony-Anhalt	1 490 773	2 021 879	3 512 652	497 026	202 353	1 375 569	187 000	52 663	1 615 232
Schleswig-Holstein	213 488	2 441 561	2 655 049	101 218	51 431	0	0	53 174	53 174
Thuringia	1 415 827	1 932 610	3 348 437	472 220	192 358	1 250 910	176 000	55 731	1 482 641
Brandenburg	1 173 078	2 162 417	3 335 495	401 042	176 056	1 252 615	190 000	55 220	1 497 835
Mecklenburg-Vorpommern	1 032 909	1 419 855	2 452 764	399 149	157 275	921 205	128 000	61 355	1 110 560
Saarland	251 357	879 414	1 130 771	89 331	46 407	0	0	63 400	63 400
Berlin	482 851	2 970 198	3 453 049	2 899 964	911 697	1 662 989	0	43 460	1 706 449
Hamburg	0	1 534 200	1 534 200	-66 307	0	0	0	0	0
Bremen	35 816	568 757	604 573	444 764	146 022	0	0	60 332	60 332
Total	10 092 047	70 495 826	80 587 873	0	2 623 750	8 743 091	1 000 000	516 916	10 260 007

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, financial equalization law between the federal state and the Länder, own calculations.

4. Solidarity

Table 6 below describes the changes in the financial position of Länder as the funding mechanisms are gradually being introduced.

It also indicates the solidarity per inhabitant, measured by calculating the difference between the total amounts per capita each Land would receive in case of the application of an allocation key based on the index before funding and the amounts actually received.

Table 6. Changes in the financial position of Länder before and after the introduction of different funding mechanisms (2010)

Land	Personal income tax (PIT), corporate tax (CT) and Länder tax (LT) (thousand euro)	PIT, CT and LT index	VAT (thousand euro)	Royalties (thousand euro)	PIT, CT, LT, VAT and royalties index	Equalization (thousand euro)	PIT, CT, LT, VAT, royalties and equalization index	General federal grants (GFG) (thousand euro)	PIT, CT, LT, VAT, royalties, equalization and GFG index	Exceptional federal grants (EFG) (thousand euro)	PIT, CT, LT, VAT, royalties, equalization, GFG and EFG index	Solidarity per inhabitant (euro)
North Rhine-Westphalia	23 488 028	100.50	15 393 014	486	94.59	354 301	95.46	118 549	94.43	0	89.61	-268
Bavaria	21 197 350	129.33	10 795 580	440	110.98	-3 511 134	98.80	0	97.45	0	92.47	-907
Baden-Württemberg	16 495 969	117.21	9 269 946	320	104.09	-1 708 837	97.19	0	95.85	0	90.96	-646
Lower Saxony	8 898 695	85.69	8 197 886	531 652	96.51	259 089	97.93	127 487	97.27	0	92.31	163
Hesse	10 114 447	127.40	5 229 050	629	109.89	-1 752 340	97.34	0	96.00	0	91.11	-893
Saxony	2 737 375	50.34	6 118 901	1313	92.61	853 882	101.54	350 045	103.75	2 624 368	124.14	1816
Rhineland-Palatinate	5 111 201	97.43	3 556 506	3855	93.98	266 630	96.87	144 069	97.08	46 016	92.60	-119
Saxony-Anhalt	1 483 533	48.33	3 512 652	152	92.54	497 026	101.75	202 353	104.05	1 615 232	126.74	1929
Schleswig-Holstein	3 461 707	93.39	2 655 049	81 919	95.08	101 218	96.63	51 431	96.08	53 174	91.94	-36
Thuringia	1 427 639	48.66	3 348 437	1687	92.58	472 220	101.73	192 358	104.01	1 482 641	125.59	1893
Brandenburg	2 030 142	61.84	3 335 495	748	92.94	401 042	99.88	176 056	101.52	1 497 835	120.62	1446
Mecklenburg-Vorpommern	1 056 519	49.01	2 452 764	690	92.58	399 149	103.11	157 275	105.78	1 110 560	127.80	1938
Saarland	1 063 211	79.63	1 130 771	0	93.43	89 331	97.23	46 407	97.85	63 400	95.38	388
Berlin	3 976 339	88.18	3 453 049	0	93.67	2 899 964	130.24	911 697	139.78	1 706 449	152.79	1590
Hamburg	3 667 583	157.45	1 534 200	104	126.98	-66 307	125.36	0	123.64	0	117.33	-987
Bremen	821 046	95.08	604 573	0	93.87	444 764	123.15	146 022	130.94	60 332	127.98	809
Total	107 030 784	100	80 587 873	623 995	100	0	100	2 623 750	100	10 260 007	100	0

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, financial equalization law between the federal state and the Länder, own calculations.

As can be seen from e.g. table 6 above, the mechanisms in place are extremely redistributive and lead to an important paradox of revenues. We indeed see large differences between the index before funding based on revenues from personal income tax, corporate tax and Länder tax and the index after funding taking into account, on top of these revenues, the entitlement to VAT shares, royalties, horizontal equalization and general and exceptional federal grants.

Before funding, the indexes range from 48.33 (Saxony-Anhalt) to 157.45 (Hamburg) and after funding, between 89.61 (North Rhine-Westphalia) and 152.79 (Berlin). The greatest gap between Länder falls from 109.12 to 63.18.

In fact, nine Länder benefit from the solidarity, receiving between 163 and 1938 euro per inhabitant and the other seven finance it, "paying" between 36 and 987 euro per inhabitant.

The ranking of Länder before and after funding, is shown in Table 7 and Chart 1 below.

Table 7. Ranking of Länder in terms of wealth index per capita, before and after application of funding mechanisms for Länder (2010)

	Before funding			After funding	
Position	Land	Index	Position	Land	Index
1	Hamburg	157.5	1	<u>Berlin</u>	152.8
2	Bavaria	129.3	2	Bremen	128.0
3	Hesse	127.4	3	**Mecklenburg-Vorpommern**	127.8
4	Baden-Württemberg	117.2	4	**Saxony-Anhalt**	126.7
5	North Rhine-Westphalia	100.5	5	**Thuringia**	125.6
6	Rhineland-Palatinate	97.4	6	**Saxony**	124.1
7	Bremen	95.1	7	**Brandenburg**	120.6
8	Schleswig-Holstein	93.4	8	Hamburg	117.3
9	<u>Berlin</u>	88.2	9	Saarland	95.4
10	Lower Saxony	85.7	10	Rhineland-Palatinate	92.6
11	Saarland	79.6	11	Bavaria	92.5
12	**Brandenburg**	61.8	12	Lower Saxony	92.3
13	**Saxony**	50.3	13	Schleswig-Holstein	91.9
14	**Mecklenburg-Vorpommern**	49.0	14	Hesse	91.1
15	**Thuringia**	48.7	15	Baden-Württemberg	91.0
16	**Saxony-Anhalt**	48.3	16	North Rhine-Westphalia	89.6

In Table 7 above, Länder located on the territory of former East Germany are shown in bold and underlined and Berlin is underlined.

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, financial equalization law between the federal state and the Länder, own calculations.
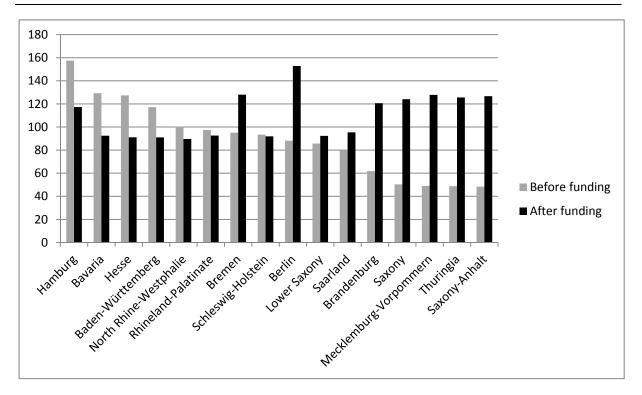
Chart 1. Ranking of Länder in terms of wealth index per capita, before and after application of funding mechanisms for Länder (2010)

Sources: Second order of Germany's federal finance Minister with a view to implementing the financial equalization law of 2010, financial equalization law between the federal state and the Länder, own calculations.

Changes in the ranking of Länder before and after funding allow us to draw a conclusion on the presence of a paradox of revenues, in addition to solidarity.

The Länder all move in the ranking, but some experience a much larger change in relative position than others. Hesse and Baden-Württemberg has both fallen eleven places, going from the third to the fourteenth position and from the fourth to the fifteenth position respectively. By contrast, Saxony-Anhalt has gained twelve places, going from the sixteenth to the fourth position, and Mecklenburg-Vorpommern has climbed eleven places, moving to the third position after funding.

Also interesting to note is that the major beneficiaries of the funding are Länder located on the territory of the former GDR, which are bottom of the league (12th, 13th, 14th, 15th and 16th position) before funding and rank number 3, 4, 5, 6 and 7 after funding. The same applies to Berlin (city-state that used to be divided into East [GDR] and West Berlin [FRG]), which moves from the 9th to the 1st position after funding. The progression of Eastern Länder and of Berlin is mainly due to the exceptional federal grants, one of the aims of which is to compensate for the backwardness with regard to infrastructures and for the low financial strength of municipalities in the five eastern Länder and in the city-state of Berlin.

5. Conclusion

A reform of the financing of German Länder occurred in 2001 and came into force in 2005.

The aim of this paper was to explain the funding mechanisms of Länder and to measure to what extent they generate solidarity and have an influence on the wealth of Länder.

Our analysis has highlighted a very redistributive system, particularly generous to the Länder located in former East Germany, which leads to an important paradox of revenues.

This paradox of revenues may be legitimate in order to relaunch the economy in the poorest Länder. Furthermore, this situation is not an isolated case. A paradox of revenues was for instance observed in Belgium (Pagano, Vandernoot & Tyrant, 2011) and in Spain (Bellanca, Martinez Sans & Vandernoot, 2013).

Further research could be conducted to study the financial flows between Länder on longer periods in order to measure the cumulative extent of the phenomenon.

References

Bellanca, S., Martinez Sans M., & Vandernoot J. (2013). The solidarity in the Spanish funding of autonomous communities. *International Business Research, 6*(5), 45-54. http://dx.doi.org/10.5539/ibr.v6n5p45

Bundesministerium der Finanzen (2012). Der Bundesstaatliche Finanzausgleich. Retrieved from http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Oeffentlic he_Finanzen/Foederale_Finanzbeziehungen/Laenderfinanzausgleich/BFAG.pdf?__blob =publicationFile&v=2

Deutsche Press Agentur (2013, March 26). Karlsruhe prüft Finanzausgleich für Länder. Badische Zeitung. Retrieved from http://www.badische-zeitung.de/deutschland-1/karlsruhe-prueft-finanzausgleich-fuer-lae nder--70338955.html

Frémy, D., & Frémy, M. (2003). *Quid 2004*. Paris, France. Editions Robert Laffont.

Funk, A. (2013, February 4). Bayern und Hessen wollen in Karlsruhe klagen. Der Tagesspiegel. Retrieved from http://www.tagesspiegel.de/politik/laenderfinanzausgleich-bayern-und-hessen-wollen-in -karlsruhe-klagen/7728906.html

Gesetz über den Finanzausgleich zwischen Bund und Ländern (Germany) Retrieved from https://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Oeffentli che_Finanzen/Foederale_Finanzbeziehungen/Laenderfinanzausgleich/Finanzausgleichge setz-15.7.2013.pdf?__blob=publicationFile&v=1

Grundgesetz für die Bundesrepublik Deutschland (Germany). Retrieved from http://www.gesetze-im-internet.de/bundesrecht/gg/gesamt.pdf

Gunlicks, A. (2003). The Länder and German federalism.Manchester, Manchester University Press. http://dx.doi.org/10.7228/manchester/9780719065323.001.0001

Pagano, G., Vandernoot, J., & Tyrant, T. (2011). Vingt ans de solidarité entre les entités fédérées (1989-2009). *Courrier hebdomadaire du CRISP, 2122*, 1-39. http://dx.doi.org/10.3917/cris.2122.0005

Spahn, P. B., & Werner, J. (2007). Germany at the junction between solidarity and subsidiarity. In Bird, R. & Ebel, R. D. (Eds.), *Fiscal fragmentation in decentralized countries: Subsidiarity, solidarity and asymmetry* (pp. 89-113). Cheltenham, United Kingdom, Edward Elgar Publishing.

Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes im Ausgleichsjahr 2010 (Germany). Retrieved from http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Oeffentliche_Finanzen/Foederale_Finanzbeziehungen/Laenderfinanzausgleich/laenderfinanzausgleich-anlage08.pdf?__blob=publicationFile&v=2

Notes

Note 1. Frémy D. and Frémy M., Quid 2004, 2004.

Note 2. Baden-Württemberg, Bavaria, Bremen, Hamburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland and Schleswig-Holstein.

Note 3. Brandenburg, Mecklenburg-Vorpommern, Saxony, Saxony-Anhalt and Thuringia.

Note 4. Bundesverfassungsgericht, 2 BvF 2/98 of November 11, 1999.

Note 5. Gesetz über den Finanzausgleich zwischen Bund und Ländern (Finanzausgleichsgesetz-fag), December 20, 2001.

Note 6. http://www.badische-zeitung.de/deutschland-1/karlsruhe-prueft-finanzausgleich-fuer-laender--70338955.html

http://www.tagesspiegel.de/politik/laenderfinanzausgleich-bayern-und-hessen-wollen-in-karlsruhe-klagen/7728906.html

Note 7. Bundesministerium der Finanzen, Der Bundesstaatliche Finanzausgleich, 7 pages, 2012.

Note 8. Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes im Ausgleichsjahr 2010, 16/09/2011, calculs propres.

Note 9. Zweite Verordnung zur Durchführung des Finanzausgleichsgesetzes im Ausgleichsjahr 2010.

Note 10. Grundgesetz für die Bundesrepublik Deutschland, amended version of July 11,

2012.

Note 11. This coefficient stands at 1.35 for the three city-states (Berlin, Bremen and Hamburg) since they have higher needs per inhabitant due to their dual status. All the other Länder have a coefficient of 1. Source: Bundesministerium der Finanzen, Finanzausgleichsgesetz, op. cit.

Note 12. Source: own calculations.

Note 13. This coefficient stands at 1.35 for the three city-states (Berlin, Bremen and Hamburg) since they have higher needs per inhabitant due to their dual status. The Länder of Mecklenburg-Vorpommern, Brandenburg and Saxony-Anhalt benefit from a coefficient of 1.05, 1.03 and 1.02 respectively, due to their low population density. All the other Länder have a coefficient of 1. Source: Bundesministerium der Finanzen, Finanzausgleichsgesetz, op. cit.

Note 14. Source: own calculations.

Note 15. Financial equalization law between the federal state and the Länder (Finanzausgleichsgesetz)

Copyright Disclaimer