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Sharing the Wealth: An Empirical Analysis of Income Shocks and Intra-Family Transfers in Germany*

By Enrica Croda**

Summary

This paper uses the GSOEP to analyze the impact of the German reunification on financial transfers from adult children to their elderly parents. The extent to which windfall gains are shared within a family is investigated by applying a difference-in-difference approach to estimate the probability and amount of transfers. The analysis demonstrates that Easterners are less likely to make transfers than Westerners, but, over time, the propensity to give increases in the East and declines in the West. Given changes in expected lifetime income for the two groups, these changes in transfers are consistent with intra-family sharing of resources.

1. Introduction

German reunification provides one of the most fascinating natural experiments in economics: the integration of a former centrally planned economy into a market economy. The impact of reunification on the incomes of the German population has been different across groups. East German retirees have benefitted from an increase in pension benefits because of reunification-induced pension adjustments. The incomes of workers in the younger generations have also risen sharply because of the wage agreements induced by reunification and economic growth, but these wage increases have been accompanied by widespread unemployment, previously not experienced in the East. However, unemployment benefits have also been higher than before, again, as part of the reunification package. On the other side, the financial burden of the funding of subsidies to the East has fallen mainly on West Germans, through increases in income taxes and public debt. To the extent that these changes result in differing burdens and benefits across generations, family members may react by directing some of their resources to mitigate the effects of transition.

This paper uses the German Socio-Economic Panel (GSOEP) data for the period 1989 to 1993 to analyze the impact of the reunification shock on financial transfers from adult children to their elderly parents. In particular, the study investigates the extent to which windfall gains are shared within a family. A difference-in-difference approach is applied to compare the differences in transfer behavior between East and West Germans before and after reunification.

Financial transfers within families has been a topic of great interest among researchers in recent years.¹ Considerable efforts have been directed towards theoretical

and empirical analyses of alternative motivations for the provision of resources, with an emphasis on distinguishing between altruistic or income sharing (e.g., Barro 1974; Becker 1974; Jensen 1996) and exchange motivations (e.g., Bernheim, Schleifer, and Summers 1985; Cox 1987). Other researchers view transfers from children to parents as repayment for past resources that flowed from parents to children (Lillard and Willis 1995), or as at least partly induced by some kind of demonstration effects (e.g., Cox and Stark 1994) or guilt feelings (e.g., Cox and Jimenez 1997).

This article contributes to the literature on the motivation behind transfer behavior by examining whether shocks to income are shared within families. Furthermore, it provides documentation of transfers from children to parents in Germany. The literature has focused mainly on transfers from parents to children and, to the best of my knowledge, no empirical work has been done on *inter vivos* transfers from children to their parents in Germany.²

The extent to which income is shared between generations has important policy implications. If family members share income, private behavior (intra-family cash transfers) may neutralize government efforts to alter the intergenerational distribution of resources, such as social security programs or public debt. Therefore, understanding the extent to which generations are willing to share their wealth is crucial for the accurate evaluation of the impact of the social programs.

The plan of the paper is the following. The next section provides a brief overview of the institutional background during the period of interest. Section 3 describes the data used in the analysis and presents summary statistics. Section 4 discusses the empirical specification. The results are analyzed in section 5. Finally, section 6 concludes.

2. Institutional Background

Formal monetary, economic, and social reunification in Germany took place on July 1, 1990. At this time, the West German legal, fiscal, and social insurance systems were extended to the East. In particular, East German wages and pensions were converted to West German marks at an exchange rate of one for one.

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¹ Dunn (1997) provides a review. See also McGarry and Schoeni (1995) and McGarry (1997).

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² As far as western countries are concerned, most work addresses transfers in the United States and France.

In the labor market, the Western trade unions gradually replaced the Eastern wage bargaining system, and the conversion to the Western system was accomplished in most industries over the next year. At the eve of reunification, average gross income from wages and salaries in the East was about one-third of the West German level. By the end of 1992, East German employees were earning, on average, around two-thirds of West German gross income. In the following years, the gap has continued to narrow, but more slowly.³

Following reunification, the pension system in the East was restructured and the West German system was adopted with minor exceptions. On average, East German pensions increased by more than 60 percent between mid-1990 and the end of 1991 (OECD 1996). Since 1992, Germany has had a unified public pension system. With wages converging rapidly to West German levels, pensions are following suit.

The reunification process has been financed mainly by government borrowing, and in part, by a number of tax increases (among which is a solidarity surcharge of 7.5 percent in the income tax system). Subsidies from the Western to the Eastern states have been estimated at around 4 to 5 percent of West German GDP for every year since 1991, and are expected to fall only slightly by the year 2000. They have been estimated at more than 50 percent of East German GDP in 1991, down to about 40 percent in 1993 (see OECD 1996 for details).

3. Data

The data analyzed in this project are drawn from the GSOEP, a large panel survey of individuals in private households in Germany.⁴ When appropriately weighted, the GSOEP is representative of the noninstitutionalized German population. The survey began in 1984 in West Germany. The first wave in the East was fielded in June 1990, the month before the monetary, economic, and social union. Since many of the questions in the survey refer to the previous calendar year, the 1990 wave allows cross-sectional comparisons between East and West before reunification. Hence, respondents in the East and in the West can be followed over time and it is possible to compare the behavior of Easterners and Westerners, before and after reunification. The GSOEP is, therefore, quite wellsuited for the analysis of the impact of changes such as those triggered by German reunification. It is also well suited for studying intergenerational inter vivos transfers. In fact, it provides observations over a number of years and

 $^{\rm 4}$ See Wagner, Burkhauser, and Behringer (1993) for a discussion.

Table 1

Financial Transfers to Parents or Parents-in-Lawa)

	1989	1990	1991	1993	1989-1993
East					
Number of individuals (and spouses)	_	698	701	695	2,094
Number of donors	_	13	15	24	52
Percent	—	1.86	2.14	3.45	2.48
Average amount given DM > 0	_	854	1,200	1,388	1,200
(standard error)	_	(186)	(316)	(252)	(155)
West					
Number of individuals (and spouses)	1,636	1,644	1,669	1,701	6,650
Number of donors	74	76	60	67	277
Percent	4.52	4.62	3.59	3.93	4.16
Average amount given DM>0	3,548	3,017	2,847	2,940	3,103
(standard error)	(550)	(461)	(537)	(349)	(241)

^{a)} Pooled sample of German individuals aged 18 or older (and their spouses) with at least one parent or parent-in-law aged 65 or older and not coresident. Amounts are in constant 1991 prices. A different deflator has been used for East and West. Source: Author's calculations using GSOEP 1989-1993.

³ These wage increases have been accompanied by widespread unemployment, previously not experienced in the East. However, overall the disposable income of unemployed workers has also been higher than before reunification, even after accounting for job losses, because the unemployment benefits became tied to the average wage level (OECD 1996).

contains some information on the parents of every respondent, thus allowing the researcher to control for characteristics of the recipient in the analysis.

Because the goal of the paper is to shed light on the impact of the reunification shock on transfer behavior, I focus on the survey years 1989 through 1993. I use two data points before and two data points after reunification. Data from the survey year 1992 (and 1994) are omitted from the analysis because the transfer questions were not asked in those years. The present study uses the data as repeated crosssections.⁵

The unit of analysis is an individual in the sample (plus spouse, if present) aged 18 or older, with at least one living parent or parent-in-law aged 65 or older who does not reside with the child. Imposing these requirements on the data for every survey year, and then pooling together the records for the period of interest, generates a data set of 8,744 records.

Table 1 gives some insights on the pattern of transfer behavior in Germany, by region. The total number of respondents reporting having made a transfer to parents or parents-in-law outside the household is quite low. In the pooled sample, 329 individuals and their spouses report making a financial transfer to parents or parents-in-law not living with them at some time over the four survey years, about 3.8 percent of the total. In the survey year 1990, the proportion of families making transfers is about 1.9 percent in the East and 4.6 percent in the West.⁶ The average amount of transfers in the East is much smaller than in the West, less than one-third (amounts are in constant 1991 prices).⁷ These differences are consistent with a greater reliance on a government safety net in the East than in the West. By 1993, the average amount given in the East increased by more than 50 percent, whereas there is no noticeable trend in the West. Over time, the proportion of people giving decreased in the West, and increased in the East. The median gift amounts (not shown) follow the same pattern discussed for the means.

Means and standard deviations of selected variables, disaggregated by region, are presented in Table 2. About half (55 percent) of the observations refer to the pre-

⁶ For comparison, I find 3.4 percent of the households in the 1988 wave of PSID making a financial transfer to parents with an average amount of \$1,415.

⁷ Throughout the paper, a different deflator is used for East and West. In the comparisons of the 1990 amounts, an exchange rate of one to one is used. For the following years there is no conversion problem, since there is one unified currency.

Table 2

Means of Selected Variables by Regiona)

Label	All (N = 8,744)		West (N = 6,650)		East (N = 2,094)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Demographic Variables						
Age of head	46.34	(10.36)	46.64	(10.72)	45.36	(9.07)
Head married or with partner	0.82	(0.38)	0.80	(0.40)	0.89	(0.31)
Head years of schooling	12.18	(2.86)	12.05	(2.82)	12.59	(2.94)
Head employed status	0.84	(0.37)	0.83	(0.38)	0.87	(0.34)
Number of children in household	0.68	(0.96)	0.64	(0.95)	0.83	(0.96)
Number of parents-in-law $> = 65$	1.72	(0.85)	1.76	(0.86)	1.59	(0.77)
Homeownership	0.50	(0.50)	0.55	(0.50)	0.35	(0.48)
Income Variables						
Family labor earnings	55,030	(41,005)	62,788	(43,599)	31,591	(16,951)
Household income from assets	976	(3,274)	1,137	(3,698)	432	(563)

a) Sample is individuals aged 18 or older (and their spouses) with at least one parent or parent-in-law aged 65 or older and not coresident. Twenty-four percent of the observations refer to East Germans; 55 percent of the observations refer to the post-reunification period. Amounts are in constant 1991 prices. All the differences between East and West German means are statistically significant at the 1 percent level.

Source: Author's calculations using GSOEP 1989-1993.

⁵ Only the West German and the East German subsamples of the GSOEP are used. Observations from all the immigrant respondents are excluded because their parents are unlikely to be German residents. Individuals are allocated to the two groups, East and West, according to where they resided when they were first surveyed. Hence, both East and West German groups may include people who, since entering the survey (and in particular since 1990), have migrated from East to West or from West to East, as well as persons who commute to their jobs in either direction.

reunification period and about one-fourth (24 percent) of the individuals in the sample reside in the East. The differences between East and West are basically as expected. Labor earnings, homeownership, and income from assets are much higher for West Germans than for East Germans. Westerners are slightly older and have fewer years of education than their Eastern counterparts. There are more children in Eastern households, probably consistent with better child-care policies in the East. The Western families have a slightly larger number of parents still alive. The differences between donors and nondonors (not shown) are basically as expected: donors are wealthier than nondonors, and they report higher labor earnings and income from assets. Regional differences in the propensities to give are discussed in section 5. the decision about the amount to transfer. In order to isolate and measure the impact of the reunification shock on transfer behavior, it is necessary to apply a procedure that controls for other factors, such as economy-wide trends in giving, that are independent of reunification, and regionand time-specific unobservable factors that capture differences in giving between East and West. The differencein-difference approach satisfies these requirements by comparing the change over time in the East to the change over time in the West. The region-specific factors that offset transfer behavior are netted out this way, as are the time effects common to both regions.

This can be accomplished in a regression framework by estimating an equation of the form

4. Empirical Implementation

The empirical approach examines two aspects of transfer behavior: (1) the decision to make a transfer, and (2)

(1)
$$TP_{it} = \beta_0 + \beta_1 EAST_i + \beta_2 UNIF_t + \beta_3 [EAST_i * UNIF_t] + Z'_{it} \gamma + \epsilon_{it}$$

for the propensity to make a transfer, Tp_{it} , and a similar relationship for the amount of the transfer, AMT_{it} . Indivi-

Tab	le	3
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	Probability	y of Transfer	Amount of Transfer		
Variable	Estimate (1)	Standard Error (2)	Estimate (3)	Standard Error (4)	
Intercept	0.084***	(0.031)	232.05	(158.16)	
East Germany	-0.030***	(0.009)	-147.55***	(44.55)	
Post-Reunification	-0.011*	(0.006)	-51.58*	(29.10)	
Interaction East*Unif	0.017	(0.012)	58.01	(59.34)	
Demographic Variables					
Age of head	-0.002***	(0.001)		(2.03)	
Single male	-0.013	(0.012)		(60.32)	
Single female	0.007	(0.011)		(56.25)	
Married (omitted)	—	_	_	_	
Years of schooling	0.004***	(0.001)	18.51***	(4.92)	
Number of children in household	-0.010***	(0.003)	-39.66***	(15.34)	
Number of parents/parents-in-law > = 65	0.010***	(0.004)	72.72***	(19.73)	
Homeownership	-0.001	(0.005)	42.44	(26.73)	
Income Variables					
Log real family labor earnings	0.002	(0.001)	6.59	(6.91)	
Log real household income from assets	0.001	(0.001)	5.96	(6.88)	
Number of observations	6,205		6,	6,203	

a) Regressions include the following additional variables for the children: indicators for satisfaction with health and employment status for the head (and his spouse, if present). The following characteristics of the parents and parents-in-law are also included: indicators for age, schooling, and whether they live far away from the child. — *** indicates statistical significance at 1 percent. — ** indicates statistical significance at 5 percent. — * indicates statistical significance at 10 percent.

Source: Author's calculations using GSOEP, 1989-1993.

duals are indexed by *i*, and time is indexed by *t*. The dummy variable *EAST*_{*i*} indicates whether or not the individuals (and presumably their parents) are East or West Germans (1=east);⁶ *UNIF*_{*i*} is a dummy variable for whether the observation is from before or after reunification (1=after); (*EAST*_{*i*} **UNIF*_{*i*}) is their interaction. The vector *Z*_{*it*} is a set of controls for income (labor earnings and income from assets), education, and demographic variables that may affect the incidence of transfers: age, sex, and marital status, employment status of the head of the family, an indicator of satisfaction with health status, number of children in the household, number of parents or parents-in-law, their education and their distance from the child.

In this framework, $UNIF_t$ and $EAST_i$ control for the impact on transfer behavior of the time effect and the effect of being East German, respectively, and their interaction captures the changes in transfer behavior preto-post-reunification for East Germans, relative to West Germans. The coefficient β_3 measures whether the propensity to give for East Germans changed more after reunification than it did for West Germans.

In both estimation equations, I apply ordinary least squares estimation on the pooled sample. In the first equation, the dependent variable is TP_{it} , an indicator that takes the value of 1 if the individual made a transfer in the survey year and 0 otherwise, generating a linear probability model. The dependent variable in the second equation is AMT_{it} , the amount given, with $AMT_{it} > 0$, if $TP_{it} = 1$, and AMT_{it}

= 0 otherwise. The regressors are the same in both equations. 9

5. Empirical Results

Table 3 presents regression results for the linear probability model and for the ordinary least squares regression for the transfer amounts. As expected, the sign patterns in the two regressions are quite similar. Factors that make it more likely to give a gift also raise the size of the gift. The results are broadly in accordance with prior expectations and with results available for the United States.¹⁰

Children with more education and higher labor earnings and asset income are more likely to have made a transfer to their parents. Home ownership, however, seems to affect negatively the propensity to give, but the coefficient is not statistically significant.¹¹ Single females are more likely to

Table 4

Difference in Difference Matrices for the Probability of Making a Transfer
(standard errors in parentheses)

Panel A: Unadjusted					
	West	East	East vs. West		
Before Reunification	0.047	0.020	-0.026		
	(0.003)	(0.007)	(0.008)		
After Reunification	0.039	0.030	-0.009		
	(0.003)	(0.005)	(0.006)		
After vs. Before	-0.008	0.009	0.017		
	(0.005)	(0.004)	(0.010)		
Panel B: Adjusted					
	West	East	East vs. West		
Before Reunification	0.084	0.054	0.030		
	(0.031)	(0.032)	(0.009)		
After Reunification	0.073	0.060	-0.013		
	(0.031)	(0.031)	(0.008)		
After vs. Before	-0.011	0.006	0.017		
	(0.006)	(0.005)	(0.012)		

⁸ Since no direct information is available on the location of the parent, I assume that each parent resides in the same part of Germany as the child to whom she is linked.

⁹ Probit and Tobit estimates produce very similar results, and are available from the author.

¹⁰ I have estimated similar regressions for different sample periods surrounding reunification. The signs and the magnitudes of the estimates are remarkably similar across different sample periods.

¹¹ In future research, I will explore how families allocate space resources among generations. In that context, I expect to gain a deeper understanding of the meaning of this coefficient.

share financial resources with their parents compared to married couples and to single males. The presence of children in the donor's household reduces the probability of a transfer to parents or parents-in-law. Children of the respondent are potential recipients of transfers, and therefore compete with parents for the donor's limited resources. The number of living parents or parents-in-law is positively correlated with the likelihood that a transfer has taken place, reflecting demand side effects.

Next I focus on the coefficients β_j (j = 0,...,3) that reflect changes in giving across regions and over time. Both the *EAST* and *UNIF* dummies have negative coefficients, whereas their interaction has a positive sign. These estimates indicate, first, that East Germans are less likely to make a transfer compared to their Western counterparts. Second, after reunification Westerners are less likely to have given to their parents. Third, the propensity to give in the East increased after reunification. The same pattern of results holds with respect to the amount of the transfers, as well.

The results in Table 3 are summarized and displayed in "difference-in-difference" matrices, one for the probability of making a transfer (Table 4) and one for the transfer amounts (Table 5). The matrices show the mean value of the probability or amount of transfer in each region pre- and post-reunification. Panel Ain each table provides the unadjusted matrices, derived from regressions not controlling for any factors other than *EAST*, *UNIF*, and their interaction.¹² Panel B provides the adjusted matrices, derived from the regressions reported in Table 3. That accounts for differences in individual characteristics across the two regions and over time (most notably income). Adjusting the matrices by introducing the selected set of controls does not change the sign pattern in the same table. In Table 4, even though the entries in the cells of the matrices all increase as a consequence of the adjustment, the row and column differences and the difference-in-difference are not much affected.

Focusing on the propensity to give (Panel A of Table 4), the row difference between East and West is negative both before reunification (-0.026) and after (-0.009). This is consistent with the fact that in the East there is less of a history of giving, most likely because of the existence of strong state programs to support income, housing, and so on. But a comparison of the East-West difference over time shows a narrowing of the gap from the pre- to postreunification period. From another perspective, the column comparisons show there is a decline over time in giving in the West and an increase in the East. Overall, then, the dif-

Table 5

Panel A: Unadjusted						
	West	East	East vs. West			
Before Reunification	152.16 (16.01)	16.13 (34.69)				
After Reunification	111.63 (15.85)	37.23 (24.51)	—74.39 (29.19)			
After vs. Before	-40.53 (22.53)	21.10 (18.57)	61.64 (48.08)			
Panel B: Adjusted						
	West	East	East vs. West			
Before Reunification	232.05 (158.16)	84.50 (160.82)				
After Reunification	180.47 (159.57)	90.92 (160.52)				
After vs. Before	-51.58 (29.10)	6.43 (26.88)	58.01 (59.34)			

Difference in Difference Matrices for the Amount of Transfer (standard errors in parentheses)

¹² Note that the unadjusted matrix in panel A of Table 4 also could be derived directly from the raw propensities to give in Table 1.

ference-in-difference expression is positive, implying a stronger positive effect for East Germans relative to their Western counterparts.

In Table 5, we see that pre-reunification West Germans gave larger gifts to parents than East Germans, on average DM 136 more, but post-reunification this difference shrank to DM 74. Viewed another way, in the West the average gift fell from DM 152 to DM 111 from 1989 to 1993, while in the East the average gift increased slightly from DM 16 to DM 37. The difference-in-difference calculation, then, suggests the same change in behavior as the propensities calculation in Table 4: East Germans became more generous toward their parents after reunification than they were before, while West Germans moved in the opposite direction, but West Germans still give more often and in larger amounts than East Germans.

6. Conclusions

The results presented here are consistent with intrafamily sharing of lifetime wealth. In this case, working age Westerners interpret reunification as a negative signal for their future earnings and so cut back on gifts to their parents. Conversely, Easterners in the same age group interpret reunification as a positive shock to their lifetime income and therefore give more. Even though Eastern elderly are better off because of the increase in pension benefits accruing to them, it may be that their children expect to be even wealthier in a permanent income sense and are willing to share their windfall gains with their parents. Overall, the findings indicate convergence in the transfer behavior of East Germans toward the transfer behavior of West Germans.

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