Inequality and Happiness in Germany

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For a long time, objective measures of well-being such as GDP per capita and life expectancy have been used as proxies for the success of economic and public policies. Yet, policy makers and academics alike have sought to find new ways of informing decision making processes through the use of "subjective" measures of well being (Easterlin, 2006). In doing so, a large body of literature on the topic of happiness – which is often referred to as subjective well-being (SWB) or life satisfaction - has emerged. Though the determinants of happiness are multiple, much of the economic research done on this topic has focused on the material determinants of happiness, notably by paying special attention to income levels, relative income, and inequality. In line with this body of work, this research uses German Socio-Economic Panel (GSOEP) Data to measure the association of life satisfaction to income over time in Germany. The data and methodology used in this research are addressed in section 1, some exploratory results are provided in section 2 the results and discussion are presented in section 3 and 4.

1. DATA AND METHODOLOGY

1.1. Data sources

The SOEP is a longitudinal annual survey of individuals and households in Germany which spans from 1984 to 2009 and includes observations for individuals over 17 years old. The sample has been updated throughout the years to reflect changes in Germany's population over the years. A sample was first added in 1990 for East Germany, in 1994 for immigrants and in 2002 for high-income households, along with several new samples added throughout the years to increase the representativeness of the sample (Headey, 2010). The SOEP covers a range of different topics such as family, social occupations, labour dynamics and income via questions administered through interviews or questionnaires for respondents who had participated several times already. The West German component of the survey is the oldest panel in the world to collect data on individual life satisfaction (Headey, 2010). Another characteristic of the data is the high response rates and low longitudinal attrition rates which make the sample representative of the population

in Germany (Gerstorf, 2008). An important note on the regional sampling of the GSOEP must be made. The West Germany sample represents a much larger share of the total sample compared to East Germany. This was done to account for the major differences in the regional population distribution within the country. As Fuchs-Schündeln et al. (2010) noted, between 1991 and 2006 the net migration of East Germans to West Germany was of 1.45 million people. As a result, in 2006 East Germany had a population of 13.2 million inhabitants while West Germany's population was of 62.9 million inhabitants.

For the purposes of this research two variables are used: overall life satisfaction and household post-government income. Regarding life satisfaction, individuals are asked to report how satisfied they are with their life in general on a scale of 0 to 10, in which 0 means completely dissatisfied and 10 means completely satisfied. Household post-government income refers to the total of family income and encompasses private sources of income (e.g. labour earnings, asset flows etc.) and public sources of income (e.g. public transfers, social security, pensions) while subtracting total family taxes (Grabka, 2010). For each year, the values of the variable are reported in current year euro. This measure of income was selected insofar as it holds the potential of capturing residual income inequalities after governmental intervention.

1. 2. Methodology

To begin with, a Gini variable is created based on household post-government income using the World Bank's (Loshkin, Sajaia, 2006) user-written program. Before presenting our measure of the association of income to life satisfaction, an issue must be addressed. As previously observed by Barrington-Leigh (2010), ordinal income is a better predictor of happiness than cardinal income. For this reason, an income deciles variable was constructed based on the household post-government income variable of each individual in the sample, for each year of the sample. From a more theoretical standpoint, the income deciles variable provides a proxy for social stratification at the individual level. As

Wilkinson & Pickett (2007) noted, the prevalence of a wide range of social problems varies depending on income distribution across countries. Because of the panel nature of the data, calculating the income deciles enables us to observe changes in income distributions over time and individuals within Germany and, importantly, its impact on life satisfaction.

1.2.1. Assessing B_q

In trying to assess the effect of income rank on life satisfaction, both a cross-sectional and longitudinal model are used. Regarding the cross-sectional regression model, standardized income deciles are regressed to standardized life satisfaction over the years, and over East and West Germany. This can be formally written as follows:

$$H_i = a + B_q Q_i + \varepsilon$$

Where H_i is a standardized variable based on life satisfaction which is measured on a 0-10 scale. Q_i is the standardized variable of the within-year income quantile of respondent i and B_q. B_q constitutes what Barrington-Leigh (2010) calls the economic gradient of well being, that is, the income-related component of happiness. In other words, it measures how tightly associated income rank – or social status – is to life satisfaction.

The fixed effect panel regression model follows the same regression equation and makes use of standardized variables as well. It provides another interesting way of looking at the relationship between life satisfaction and income rank insofar as it measures differences in responses for each individual in the data set, and over a set duration. Furthermore, this approach is especially novel as there have been no measures of economic gradients of well-being using panel data to date. Finally, an important aspect of the fixed effect model is that it holds individual personality traits constant, such as optimism or pessimism, which may potentially bias an individual's life satisfaction rating (Kahneman et al, 1999).

2. EXPLORATORY ANALYSIS OF THE VARIABLES

2.1 Life Satisfaction

2.1.1. *Summary Statistics*

As can be seen in table 1, almost 400 000 observations are available for the life satisfaction question. This figure excludes non-responses which were reported as missing observations. Mean life satisfaction in Germany in the period under review is of about 7 out of a possible 10. To put things in a comparative perspective, Blanchflower and Oswald (2008) have noted that Germany, like Portugal and Italy tend to report lower levels of happiness than Nordic European countries such as Denmark or the Netherlands. However, OECD countries on the whole generally report higher levels of happiness than non-OECD countries (Becchetti et al, 2011). Coming back to life satisfaction in the German data under study, the importance of the panel aspect of the data is visible in the within and between groups standard deviation output. Indeed, even though the variation in life satisfaction occurs predominantly between individuals in the dataset (standard deviation = 2.59), a large part of the variation also takes place within individuals (standard deviation = 1.58). In other words, an individual's life satisfaction fluctuates over his or her life span and may be influenced by a range of life events.

2.1.2. *Panel Statistics*

This table (figure 2) measures the likelihood of moving from one happiness level to another in the sample. Using an extreme example, it is very unlikely that individuals will move from rating their life satisfaction as 0 to 10 – only 3% of individuals do – or from moving from 10 to 0 – 0.5 % of individuals surveyed do. Surprisingly, an important share of individuals in the 0 to 5 category are likely to change their rating to 5. Despite this attraction to the centre of the distribution, most individuals in the sample tend to be more likely to change their life satisfaction rating to a closer value than to a more remote one.

2.1.3 *Cross-Sectional Evolution of Life Satisfaction*

Before addressing the results per se, an important note must be made: using mean life satisfaction provides a reliable source of the general trends in the evolution of life satisfaction in Germany. Kahneman et al (1999) contended that personality traits such as optimism and pessimism introduced noise in reports of life satisfaction, yet averaging life satisfaction per year smoothes out some of this noise.

Starting with a yearly mean life satisfaction variable, the general tendency within Germany has been one of a decline in life satisfaction in Germany over the years. Once again, differences remain between East and West Germany but tend to remain stable at a -0.5 point difference over the years. In the East German context, Easterlin (2008) explained the fluctuations in life satisfaction using information on the economic circumstances in the country. According to him, life satisfaction rose after unification due to increases in GDP, however, life satisfaction then followed a decline as unemployment rose and GDP growth slowed down (Easterlin, 2008).

Interestingly, as observed in figure 3, the general shape of the curves for both East and West has been very similar starting in 1997, while the gap in life satisfaction may have in fact started narrowing down in 2009. It appears that potential common driving forces may have impacted the evolution of life satisfaction in similar ways, and this, despite the differentiated level of life satisfaction across both regions. However, to this day, no research on life satisfaction in Germany has addressed common major policy shifts and events that may have occurred in Germany's recent history– with the exception of the fall of the Berlin Wall (Frijters et al, 2002).

Still, it may come as some surprise that life satisfaction has been declining over the years while income has been increasing in Germany, a trend which is addressed in section 2.2.4. However, as Zimmerman and Easterlin (2008) had previously found in the German context, better predictions of trends in life satisfaction can be obtained using satisfaction with income and unemployment variables. In the case of unemployment, this is not particularly surprising as one of

the major economic differences between East and West remains that of unemployment rates (Frijters et al, 2003) even though, in both cases unemployment remains a strong predictor of changes in life satisfaction (Kassenboehmer et al, 2009). Another possible line of explanation for the variation in mean life satisfaction could be found at a more aggregate level, in the recent political history of the country. As Radcliff (2001) observed, politics and welfare policies play a major role in explained different reported levels of life satisfaction across countries. Changes in the German social model are addressed in section 4 as a response to this issue.

2.2. Cardinal Income, Income Rank and Gini Coefficients

2.2.2. *Cardinal Income Summary Statistics*

For post-government income and income rank, just under 450 000 observations are available in the dataset (figure 1). Here again, the predominant part of the variation in income rank and post-government income is observed between individuals, compared to within individuals, even though a considerable amount of variation still occurs at the individual level. This indicates that an individual's income and therefore his or her rank in the income distribution may vary across this person's life span. That is to say that the income stratification in Germany is not static and that people may experience rank promotion or downward rank mobility.

2.2.3. *Cardinal Income Panel Statistics*

Figure 4 provides a general view of the likelihood of moving from one rank in the income distribution to another. The results indicate low levels of social mobility in Germany. Indeed, most individuals in the sample tend to move to the next rank in the income distribution, whereas major jumps in social status seem unlikely to occur. For example, the chances of moving from rank 5 in the income distribution to rank 10 are of 0.51% while in the opposite case of downward social mobility, the chances of moving from rank 10 to rank 5 are of 0.65%. That is to say that chances

of drastic social mobility are fairly low in Germany. The results for both East and West are in line with the general results presented above (Figures 5 and 6).

2.2.4. *Cross-Sectional Statistics*

a) Income and Income Rank

In trying to look at potential drivers in this decline of life satisfaction, it is important to consider material differences between East and West as both regions have been undergoing different economic situations. One measure of such a material difference in the condition of both regions is mean income. In figure 7, mean post-government income was plotted from 1984 to 2009, for East, West and all of Germany. One striking observation is that despite governmental intervention, the gap between East and West remains high in recent years, and that while mean post-government income has grown steadily throughout the years in the West, mean income in the East has stagnated starting from 2003 to 2009. This last finding is particularly worrisome for East Germany as this measure of mean post-government income does not account for inflation.

b) Gini and Income Rank

Figure 8 shows Gini coefficients plotted over the years in Germany. Two major periods emerge in this diagram, one in which Gini coefficients have remained relatively stable and one, starting after 1999, in which Gini coefficients have gone up.

The first period is not surprising, as the stability of the wage structure has been largely documented in the literature (Gernandt et al, 2006). Prasad (2004) provided an econometric and political analysis of the phenomena and concluded that institutional factors, rather than market forces, explained much of this observed stability. In this case, unions and wage bargaining structures were the key institutions in insuring wage stability, which according to the author may have caused a rise in unemployment as labour demand shifted toward a more skilled labour force. Moreover, Prasad reports (2004) that even though wage inequality

increased modestly from 1984 to 1997, wage growth at the top of the income distribution was only 5% superior than to that at the bottom of the income distribution. Yet it is suspected that these institutional factors have changed at the end of the 1990s.

In looking at figure 9 it clearly appears that over the years the ratio of the top income decile to that of the lowest income decile has grown. That is to say that the top income deciles have grown richer compared to the bottom of the income distribution. Overall the top income decile represented about 8.5 times that of the lowest income decile in Germany in 1985, in 2009 the top income decile was about 10 times greater than that of the lowest decile. It also appears that most of the increase in the gap between top and bottom income deciles occured after 2001. Bach et al (2008) attribute rising inequalities in Germany to the fact that the economic elite in Germany has grown wealthier compared to the rest of Germany's population. According to this research, a substantial share of the increase in real market income for the top of the income distribution in Germany can be attributed to capital and business income, in contrast with wages which represent a much larger share of a German's income in lower income ranks (Bach et al, 2008).

An important aspect of the data to keep in mind is that income rank is computed based on post-government income. Fuchs-Schündeln et al. (2010) and Bach et al (2008) argue that government transfers have substantially helped in reducing the increase of inequality in Germany. This is especially true of the use of the solidaritätszuschlag, the tax increases which have largely contributed to financing solidarity transfers between East and West Germany, thereby contributing to the reduction of inequality between East and West. Still, figure 7 indicates that despite governmental intervention, the gap in income between East and West Germany remains high throughout the years and has been increasing from 2003 to 2009.

2.2.5. *Cross-Sectional Variable Correlations*

Figure 10 provides a plot of life satisfaction over income rank throughout the years of the survey. Two periods can be distinguished in the data. The first period spans from 1984 to 1991 and precludes the integration of East Germany into the sample while the second period starts in 1992 and includes East Germany. The main difference between the two periods is the steepness of the OLS correlation line. Indeed, the linear relationship between income rank and life satisfaction has grown stronger in the second period since the OLS line describing the association between the two variables has become steeper. Moreover, the correlation between income rank and life satisfaction is significant at a 95% confidence level (figure 11). Such patterns will be observed in greater detail in section 3 and 4.

3. RESULTS

3.1 A Cross Sectional Analysis of B_q

As Figure 12 shows, B_q has fluctuated sensibly over the years in Germany, even though the general pattern has been one of an increase in the association between life satisfaction and income rank throughout the years. It is particularly interesting to see that the increase in the association between the two variables happened post-unification in 1990.

As observed in figures 13, 14 & 15, the increase in the association of life satisfaction to income rank is differentiated across German regions. Indeed, while both East and West Germany display a growth in B_q over time, the growth appears much steeper for the East when compared to the West. This is a surprising finding, as it indicates that the transition to a market economy in the post-unification setting of the East has been translated in a greater attachment to income rank. This may reveal that East Germany may have grown more materialistic over the years. As Zagorski (2011) noted with the example of Poland, transition economies move from

materialistic to post-materialistic values as they develop. This change then reduces the association of happiness and income over time. In the context of East Germany, the opposite pattern occurs. Yet, it is worth mentioning that unlike Poland, East Germany not only underwent a process of economic transition but also one of re-unification, which may explain the singularity of the East German example. Previous work on Germany using SOEP data found a higher association of cardinal (log) income to life satisfaction in the East when compared to other similar studies (Frijters et al, 2002). However it appears here that not only cardinal income per se is associated to life satisfaction in East Germany, but economic status is as well. As Frijters et al (2002) noted, the "clean" nature of the SOEP data may have improved the results.

3.2. A Panel Analysis of B_q

As previously mentioned, the panel economic gradient of well-being provides a new and different way of looking at the association between life satisfaction and income rank. It was calculated for each 5 year span, with the exception of the first wave which includes observations from 1984 to 1989. This was done to limit sample attrition over the years, as using observations from 1984 to 2009 would only represent individuals included in the original sample of 1984 and who had consistently participated in the survey ever since. Moreover, using a 5-year span enables us to include the new samples that have been introduced in the SOEP survey throughout the years.

In essence, the B_q obtained from using panel regression informs us about the individual-specific effect of changes in income rank to changes in life satisfaction. The results obtained here are different from what had been observed using cross-sectional betas. Betas are much lower in the panel regression model than they were in the cross-sectional one (Figure 15 to 18). It is difficult to determine temporal tendencies in B_q here since each Beta is representative of a 5 years span, which smoothes the variation in time. However, the general tendency of an increase in the association of life satisfaction to income rank is visible once again (Figure 16).

Another interesting result is that the Betas obtained for East and West Germany still remain different using a panel regression. This is especially true for the period spanning from 1995 to 2005. Whereas West Germany saw some major fluctuations in Beta, Beta remained very stable in the East. Going back to Zagorski (2011) this may be indicative that, during this period, the transition to a market economy led to a period of stability in the association of life satisfaction to income rank after the first 5 years following unification. It may have been that East Germans were getting more accustomed to living in a market economy, while also benefiting from increased revenues provided through redistribution programs from the state. If it were so, then the panel version of B_q partly contradicts the pattern observed in section 3.1. However, as with West Germany, B_q increased in the period going from 2005 to 2009.

In summary, changes in income rank have had a stronger effect on life satisfaction in the period ranging from 2005 to 2009 than in previous years. This is true for both East and West, even though changes in B_q have been much steeper in the West compared to the East for the period ranging from 2000 to 2009. This contrasts with figure 15 in which cross-sectional betas for the west have been growing more steeply than in the West and have somewhat converged starting in 2000. Going back to our discussion on the differences between cross-sectional and panel results of B_q discussed in section 2 of this research, panel data encompasses measures of between and within-group variation. On the other hand, cross-sectional analyses do not account for variations at the individual level. The differences between cross-sectional and panel versions of B_q appear to indicate that, using the example of the years ranging from 1995 to 2005 in the East, the within-group variation has mitigated the between-group variation in the association of life satisfaction to income rank. This would explain the discrepancy in the values of B_q observed through cross-sectional and panel analysis. In other words, at an individual level, changes in income rank in the East have had less of an effect on happiness than differences in income rank across different individuals from 1995 to

2005 in East Germany. This may indicate that East Germans grew more accustomed to changes in their income levels after the first five years of transition, while in contrast, comparisons to other individuals in terms of income rank have impacted their life satisfaction in a greater way. It is worth mentioning that changes in their individual income were expected as East German wages were realigning with those of the West (Figure 7). Yet differences between East and West German wages remained, which may explain why cross-sectional differences in income rank affected life satisfaction in a greater way during that period.

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4. SUMMARY OF THE RESULTS & DISCUSSION

Using SOEP data allowed us to look at relevant social trends in income inequality and happiness and draw from some of the literature on this topic in the German context, which in turn enabled us to enrich our findings with some historical and social context. The main findings of this research are threefold. First, an increase in inequality is observed within Germany: between and within East and West Germany, with a beginning date in the early 2000s. Second, happiness has been declining steadily for Germany as a whole, while it has fluctuated for East Germany. Finally, income rank and life satisfaction have come to be increasingly associated starting in the 2000s, this pattern is found using both aggregate cross-sectional regressions and individual panel regressions. An important contribution of the fixed-effect panel regression is that it holds personality traits constant, that is, the pattern observed at an individual level still holds even after controlling for personality traits biases.

The obvious question that ensues from these results is a simple: *Why?* This is a hard question to answer as no research has produced a case study of economic gradients of well-being in Germany. Nevertheless, recent developments in Germany's political and social history may shed some light as to why income rank has grown more important for individual happiness in the last decade in Germany.

Indeed, major shifts in state policy are likely to affect income and inequality. Radcliff (2001) in a study of 16 OECD countries found that life satisfaction is positively affected by qualitative aspects of the welfare state. On the other hand, Veenhoven (2000) found the contrary to be true even though his research included non-OECD countries as well as OECD countries. Still, the impact of changes in the welfare system of an individual country over time has not been studied previously in itself. Moreover, as Prasad (2004) mentioned, institutions have played a key role in the German economy, especially with regards to income inequality. As a result, discussing the changing German social and political context may shed some light on the results previously discussed.

The German social model is given many names, ranging from a "social market economy" (*soziale marktwirtschaft),* an ordoliberal system, or finally the Rhineland market economy (see Hudson et al, 2011; Bonefeld, 2011). What all those names have in common is a characterization of the German political and socio-economic system as one in which state intervention and regulation is omnipresent (Bonefeld, 2011). In the field of wages, and government transfers, which is most associated to the inequality and income variables that are used in this research, this is translated in many ways.

Strong unionizations rates, and a consensus-seeking culture of collective bargaining are an important characteristic of this social model (Prasad, 2004). This involves a high degree of protection for specialised industries and for employees (Hudson et al, 2011). Yet, many have reported the erosion of the German model (Dufour et al, 2011; Hassel, 1999). Many explanations have been suggested to describe this shift in the German social model. Among them is the incapacity of German collective bargaining groups to extend their role beyond traditional economic sectors such as the manufacturing industry (Hassel, 1999). With regards to policy decisions in and of themselves, the Hartzcommission put forward by Chancelor Shröder in 1999 constitutes a break in the German social model as well. As Grahl (2004) contended, this policy change shifts the costs of social transfer payments to individuals and households and puts more pressure on unemployed individuals to take work. The

Hartzcommission placed a great emphasis on the deregulation of low paid service jobs to combat unemployment, while cutting spending on unemployment indemnities and tightening eligibility conditions for such benefits (Grahl, 2004). Hudson et al (2011) have also suggested that the reforms made under the second Schröder administration, and the following Merkel-led grand coalition of 2005, have led to even bigger changes in the German social model (Hudson et al, 2011), so much that the distance between the German and Anglo-American social model may is said to have diminished (Fleckenstein, 2008).

Given the cross-sectional and longitudinal evidence that in the period starting in 2000 income rank and life satisfaction are more tightly associated than they had been in the past, one can wonder whether the erosion of the original German social model led people to care more deeply about their income status. This theory would require testing, but beyond the theoretical level the results also hint at possible policy implications. Indeed, if income rank and happiness are more closely associated, then changes in income rank will impact individual happiness in a greater way than they would have before. During the same period, the policy shifts made by Schröder and Merkel have introduced greater flexibility in labour (Hunt et al, 2008) and cutbacks on sets of social spending (Grahl, 2004). With less of a safety net and greater labour flexibility, people may be more likely than before to experience changes in their income ranks as the performance of the economy fluctuates. In other words, because income rank would be more associated to the economic performance of the country after the reforms, happiness would also be more tied to the economic performance of the country.

Appendix

Figure 1. Summary statistics for life satisfaction, income rank and post-government income

Variable		Mean	Std. Dev.	Min	Max	Observations
Income rank	overall	6.032	2.804	1	10	N = 447922
	between		2.589	1	10	n = 48252
	within		1.575	-2.621	13.90741	T-bar = 9.282
Life satisfaction	overall	6.997	1.8366	0	10	N = 397855
	between		1.5012	0	10	n = 48404
	within		1.2961	-2.157	14.67702	T-bar = 8.219
Post-govt income	overall	32409.42	33961	0	6421190	N = 447922
	between		31618	0	3047113	n = 48252
	within		20870	-2945224	3406486	T-bar = 9.282

Figure 2. Table of the transition in levels of life satisfaction

Levels of life satisfaction	0	1	2	3	4	5	6	7	8	9	10	Total observations
0	337	136	173	185	130	337	94	99	104	30	51	1,676
(% of total observations)	*20.11*	*8.11*	*10.32*	*11.04*	*7.76*	*20.11*	*5.61*	*5.91*	*6.21*	*1.79*	*3.04*	*100*
1	129	151	210	187	142	240	94	92	84	45	25	1,399
(% of total observations)	*9.22*	*10.79*	*15.01*	*13.37*	*10.15*	*17.16*	*6.72*	*6.58*	*6*	*3.22*	*1.79*	*100*
2	162	210	587	683	467	792	354	342	313	90	55	4,055
(% of total observations)	*4*	*5.18*	*14.48*	*16.84*	*11.52*	*19.53*	*8.73*	*8.43*	*7.72*	*2.22*	*1.36*	*100*
3	171	200	674	1,407	1,263	2,080	1,047	936	679	171	72	8,700
(% of total observations)	*1.97*	*2.3*	*7.75*	*16.17*	*14.52*	*23.91*	*12.03*	*10.76*	*7.8*	*1.97*	*0.83*	*100*
4	120	157	496	1,285	1,878	3,165	1,851	1,682	1,011	216	105	11,966
(% of total observations)	*1*	*1.31*	*4.15*	*10.74*	*15.69*	*26.45*	*15.47*	*14.06*	*8.45*	*1.81*	*0.88*	*100*
5	344	282	893	2,177	3,352	14,012	7,188	7,272	5,224	988	692	42,424
(% of total observations)	*0.81*	*0.66*	*2.1*	*5.13*	*7.9*	*33.03*	*16.94*	*17.14*	*12.31*	*2.33*	*1.63*	*100*
6	102	126	433	1,071	1,948	7,234	8,819	10,327	6,587	1,136	569	38,352
(% of total observations)	*0.27*	*0.33*	*1.13*	*2.79*	*5.08*	*18.86*	*22.99*	*26.93*	*17.18*	*2.96*	*1.48*	*100*
7	110	101	414	1,150	1,826	7,434	10,975	25,476	21,239	3,732	1,300	73,757
(% of total observations)	*0.15*	*0.14*	*0.56*	*1.56*	*2.48*	*10.08*	*14.88*	*34.54*	*28.8*	*5.06*	*1.76*	*100*
8	125	113	361	840	1,241	5,791	7,145	22,844	46,153	12,956	3,860	101,429
(% of total observations)	*0.12*	*0.11*	*0.36*	*0.83*	*1.22*	*5.71*	*7.04*	*22.52*	*45.5*	*12.77*	*3.81*	*100*
9	42	45	90	190	270	1,183	1,429	4,259	14,406	12,696	3,612	38,222
(% of total observations)	*0.11*	*0.12*	*0.24*	*0.5*	*0.71*	*3.1*	*3.74*	*11.14*	*37.69*	*33.22*	*9.45*	*100*
10	74	23	67	142	149	942	643	1,696	5,063	4,452	7,820	21,071
(% of total observations)	*0.35*	*0.11*	*0.32*	*0.67*	*0.71*	*4.47*	*3.05*	*8.05*	*24.03*	*21.13*	*37.11*	*100*
Total	1,716	1,544	4,398	9,317	12,666	43,210	39,639	75,025	100,863	36,512	18,161	343,051
(% of total observations)	*0.5*	*0.45*	*1.28*	*2.72*	*3.69*	*12.6*	*11.55*	*21.87*	*29.4*	*10.64*	*5.29*	*100*

Figure 3. Cross-sectional variation of life satisfaction in Germany

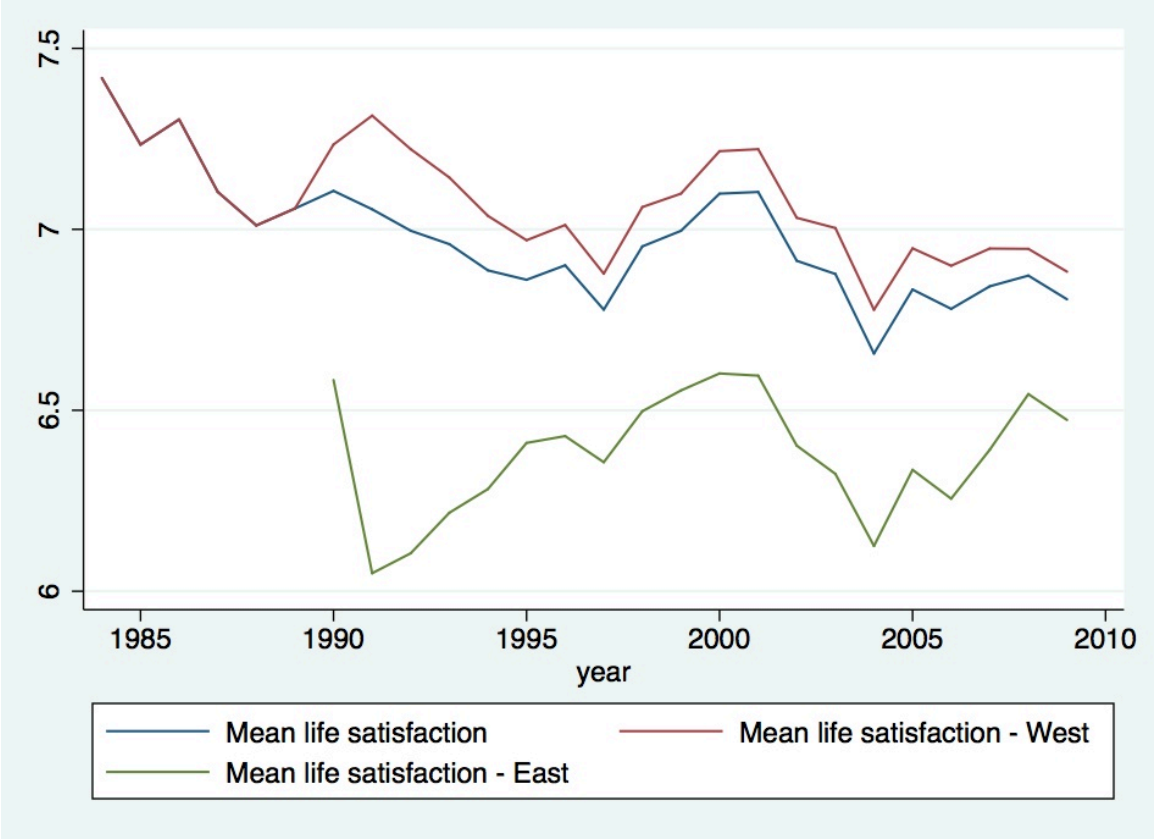


Figure 4. Table of the transition of levels in income rank for Germany as a whole

Levels of income	Table of Transitions in Income rank for Germany as a whole										
rank (1-10)	1	2	3	4	5	6	7	8	9	10	Total observations
1	15,913	4,766	1,656	754	471	261	193	129	93	74	24,310
(% of total observations)	*65.46*	*19.61*	*6.81*	*3.1*	*1.94*	*1.07*	*0.79*	*0.53*	*0.38*	*0.3*	*100*
2	4,005	14,786	6,083	2,081	988	643	435	227	154	98	29,500
(% of total observations)	*13.58*	*50.12*	*20.62*	*7.05*	*3.35*	*2.18*	*1.47*	*0.77*	*0.52*	*0.33*	*100*
3	1,404	5,071	14,771	7,506	2,900	1,343	728	418	241	141	34,523
(% of total observations)	*4.07*	*14.69*	*42.79*	*21.74*	*8.4*	*3.89*	*2.11*	*1.21*	*0.7*	*0.41*	*100*
4	897	1,820	6,078	14,588	8,343	3,323	1,504	810	390	164	37,917
(% of total observations)	*2.37*	*4.8*	*16.03*	*38.47*	*22*	*8.76*	*3.97*	*2.14*	*1.03*	*0.43*	*100*
5	598	1,036	2,319	6,447	14,719	9,135	3,845	1,579	723	321	40,722
(% of total observations)	*1.47*	*2.54*	*5.69*	*15.83*	*36.15*	*22.43*	*9.44*	*3.88*	*1.78*	*0.79*	*100*
6	442	703	1,245	2,647	7,118	14,492	9,532	3,746	1,412	488	41,825
(% of total observations)	*1.06*	*1.68*	*2.98*	*6.33*	*17.02*	*34.65*	*22.79*	*8.96*	*3.38*	*1.17*	*100*
7	370	447	814	1,389	2,911	7,355	16,143	9,911	3,395	870	43,605
(% of total observations)	*0.85*	*1.03*	*1.87*	*3.19*	*6.68*	*16.87*	*37.02*	*22.73*	*7.79*	*2*	*100*
8	348	343	578	808	1,472	2,889	7,323	17,642	10,085	2,184	43,672
(% of total observations)	*0.8*	*0.79*	*1.32*	*1.85*	*3.37*	*6.62*	*16.77*	*40.4*	*23.09*	*5*	*100*
9	336	331	382	520	794	1,381	2,630	7,532	22,398	9,169	45,473
(% of total observations)	*0.74*	*0.73*	*0.84*	*1.14*	*1.75*	*3.04*	*5.78*	*16.56*	*49.26*	*20.16*	*100*
10	478	307	319	446	472	628	988	1,965	7,332	39,858	52,793
(% of total observations)	*0.91*	*0.58*	*0.6*	*0.84*	*0.89*	*1.19*	*1.87*	*3.72*	*13.89*	*75.5*	*100*
Total	24,791	29,610	34,245	37,186	40,188	41,450	43,321	43,959	46,223	53,367	394,340
(% of total observations)	*6.29*	*7.51*	*8.68*	*9.43*	*10.19*	*10.51*	*10.99*	*11.15*	*11.72*	*13.53*	*100*

Figure 5. Table of the transition of levels in income rank for West Germany

Levels of income rank (1-10)	Table of Transitions in Income rank for West Germany										
	1	2	3	4	5	6	7	8	9	10	Total
1	11,793	3,480	1,266	596	394	219	163	111	82	69	18,173
(% of total observations)	64.89	19.15	6.97	3.28	2.17	1.21	0.9	0.61	0.45	0.38	100
2	2,963	10,641	4,313	1,612	753	523	347	190	131	84	21,557
(% of total observations)	13.74	49.36	20.01	7.48	3.49	2.43	1.61	0.88	0.61	0.39	100
3	1,044	3,791	10,456	5,402	2,100	1,044	618	345	211	117	25,128
(% of total observations)	4.15	15.09	41.61	21.5	8.36	4.15	2.46	1.37	0.84	0.47	100
4	694	1,361	4,509	10,759	6,125	2,420	1,172	657	337	132	28,166
(% of total observations)	2.46	4.83	16.01	38.2	21.75	8.59	4.16	2.33	1.2	0.47	100
5	481	790	1,739	4,824	10,797	7,087	3,035	1,266	619	290	30,928
(% of total observations)	1.56	2.55	5.62	15.6	34.91	22.91	9.81	4.09	2	0.94	100
6	349	560	987	2,029	5,616	11,279	7,425	2,987	1,206	407	32,845
(% of total observations)	1.06	1.7	3.01	6.18	17.1	34.34	22.61	9.09	3.67	1.24	100
7	297	381	667	1,078	2,349	5,958	13,164	8,036	2,849	750	35,529
(% of total observations)	0.84	1.07	1.88	3.03	6.61	16.77	37.05	22.62	8.02	2.11	100
8	280	295	457	635	1,234	2,332	6,070	14,636	8,539	1,855	36,333
(% of total observations)	0.77	0.81	1.26	1.75	3.4	6.42	16.71	40.28	23.5	5.11	100
9	274	276	339	455	680	1,151	2,249	6,434	18,951	8,137	38,946
(% of total observations)	0.7	0.71	0.87	1.17	1.75	2.96	5.77	16.52	48.66	20.89	100
10	400	261	287	375	420	563	869	1,712	6,575	36,153	47,615
(% of total observations)	0.84	0.55	0.6	0.79	0.88	1.18	1.83	3.6	13.81	75.93	100
Total	18,575	21,836	25,020	27,765	30,468	32,576	35,112	36,374	39,500	47,994	315,220
(% of total observations)	5.89	6.93	7.94	8.81	9.67	10.33	11.14	11.54	12.53	15.23	100

Figure 6. Table of the transition of levels in income rank for East Germany

Levels of income	Table of Transitions in Income rank for East Germany										
rank (1-10)	1	2	3	4	5	6	7	8	9	10	
1	4,074	1,255	371	151	70	36	22	15	10	5	6,009
(% of total observations)	67.8	20.89	6.17	2.51	1.16	0.6	0.37	0.25	0.17	0.08	100
2	1,022	4,120	1,759	465	227	115	83	32	20	7	7,850
(% of total observations)	13.02	52.48	22.41	5.92	2.89	1.46	1.06	0.41	0.25	0.09	100
3	349	1,267	4,293	2,083	791	297	107	72	29	23	9,311
(% of total observations)	3.75	13.61	46.11	22.37	8.5	3.19	1.15	0.77	0.31	0.25	100
4	187	454	1,551	3,814	2,203	884	325	151	50	28	9,647
(% of total observations)	1.94	4.71	16.08	39.54	22.84	9.16	3.37	1.57	0.52	0.29	100
5	109	240	574	1,604	3,898	2,034	809	313	101	27	9,709
(% of total observations)	1.12	2.47	5.91	16.52	40.15	20.95	8.33	3.22	1.04	0.28	100
6	76	138	252	604	1,494	3,196	2,092	752	195	81	8,880
(% of total observations)	0.86	1.55	2.84	6.8	16.82	35.99	23.56	8.47	2.2	0.91	100
7	64	58	143	310	560	1,383	2,969	1,868	542	114	8,011
(% of total observations)	0.8	0.72	1.79	3.87	6.99	17.26	37.06	23.32	6.77	1.42	100
8	50	43	116	168	232	554	1,247	2,994	1,542	323	7,269
(% of total observations)	0.69	0.59	1.6	2.31	3.19	7.62	17.16	41.19	21.21	4.44	100
9	42	48	37	62	112	227	377	1,089	3,416	1,019	6,429
(% of total observations)	0.65	0.75	0.58	0.96	1.74	3.53	5.86	16.94	53.13	15.85	100
10	53	40	28	60	49	63	119	243	746	3,664	5,065
(% of total observations)	1.05	0.79	0.55	1.18	0.97	1.24	2.35	4.8	14.73	72.34	100
Total	6,026	7,663	9,124	9,321	9,636	8,789	8,150	7,529	6,651	5,291	78,180
(% of total observations)	7.71	9.8	11.67	11.92	12.33	11.24	10.42	9.63	8.51	6.77	100

Figure 7. Cross-sectional variation of mean income in Germany

Figure 8. Cross-sectional variation of Gini coefficients in Germany

Figure 9. Evolution of income discrepancies between the top and bottom income deciles in Germany in ratio form

Figure 10. Evolution of the correlation between income rank and life satisfaction over the years

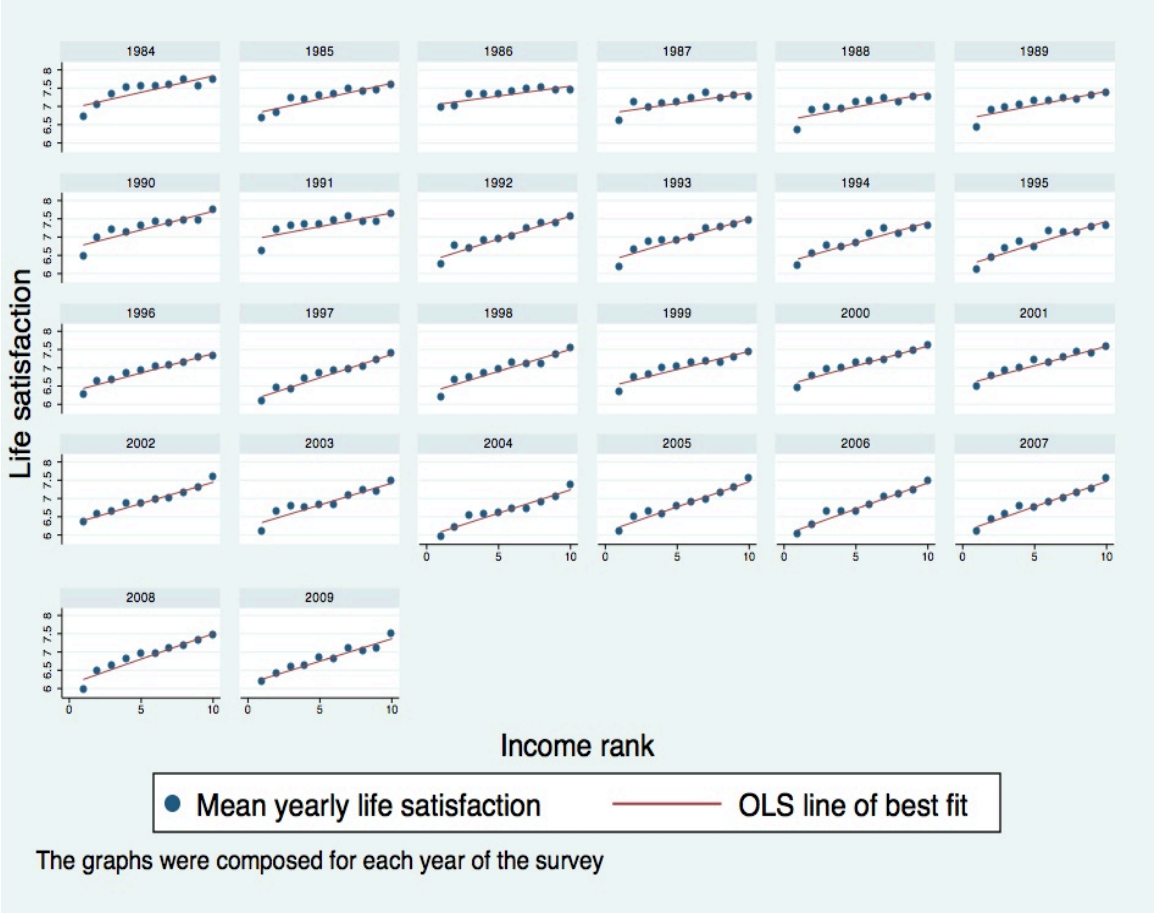


Figure 11. Correlation of income and life satisfaction variables

	Life satisfactio	Income rank	Post-govt income	Log income
Life satisfaction	1			
Income rank	0.1804*	1		
Post-govt income	0.0990*	0.4966*	1	
Log income	0.1635*	0.9029*	0.6033*	1

Note: * p<.0.05, also note that the income rank and log income variables are based on measures of post-government income

Figure 12. Cross-sectional plot of B_q

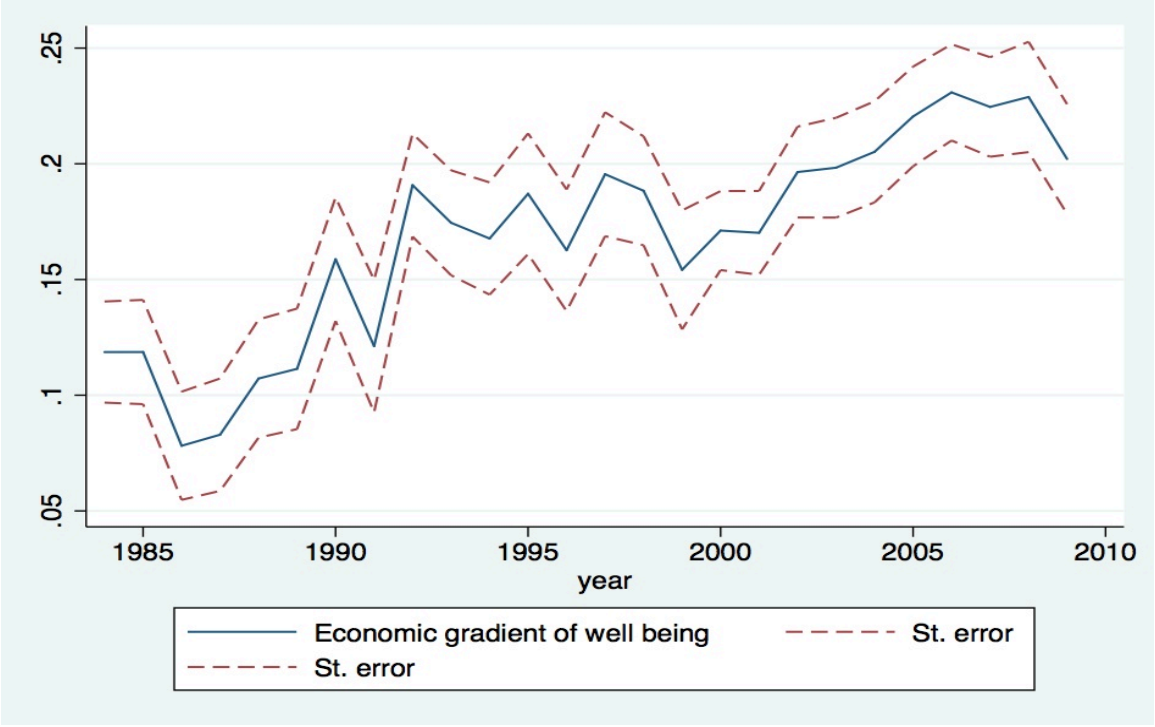


Figure 13. Cross-sectional plot of B_q for West Germany

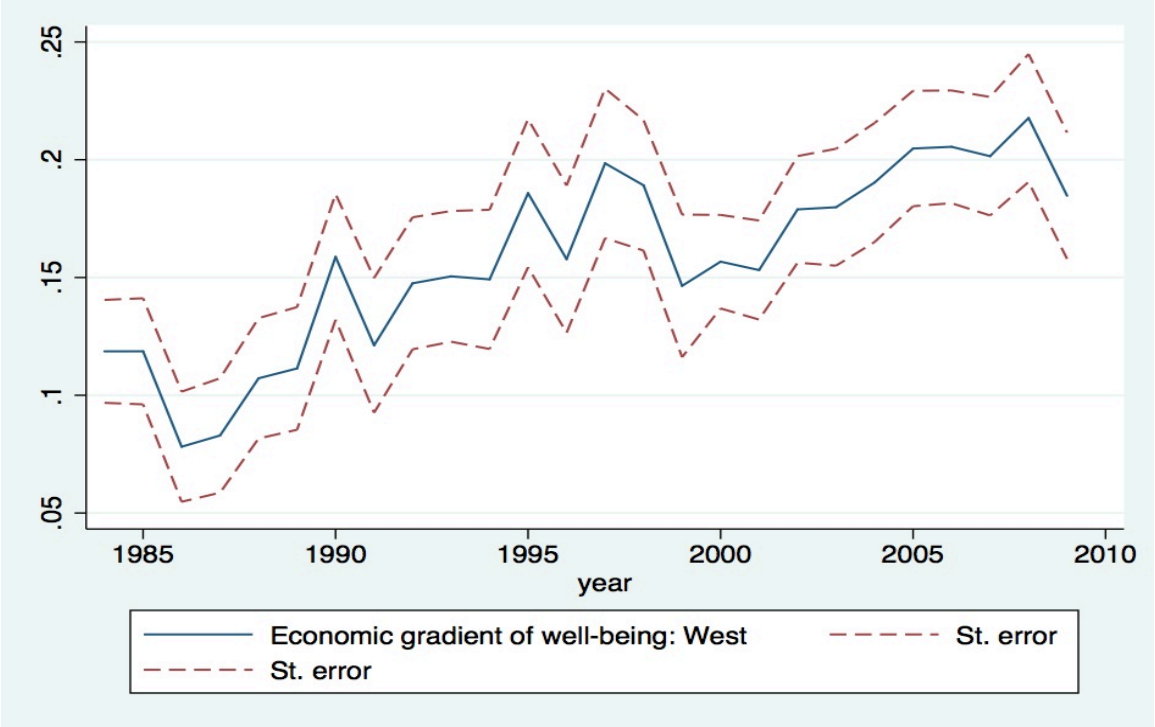


Figure 14. Cross-sectional plot of B_q for East Germany

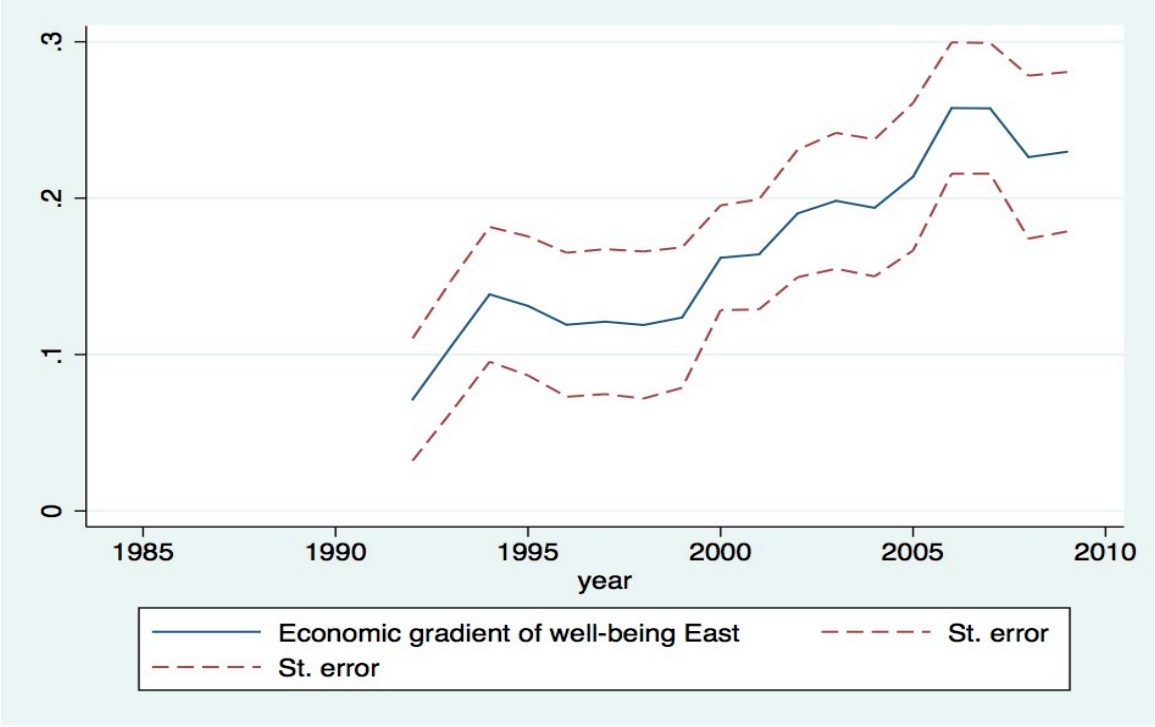


Figure 15. Overlaid cross-sectional plot of B_q for East and West

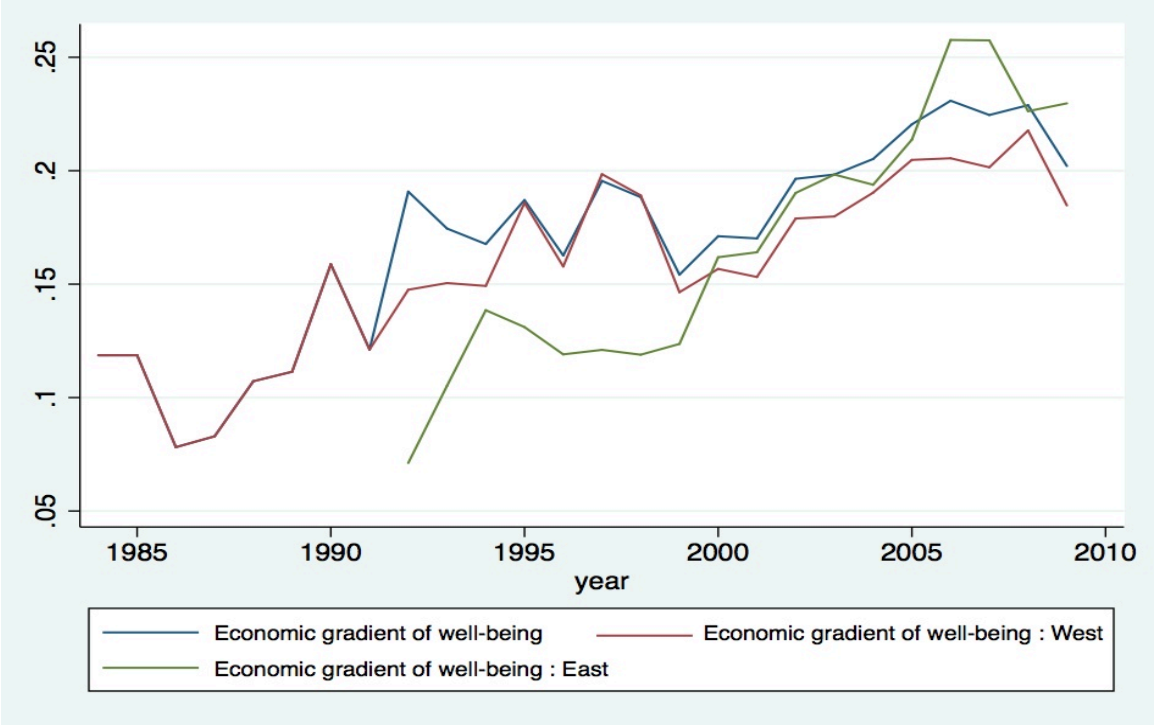


Figure 16. Overlaid panel results of B_q for East and West

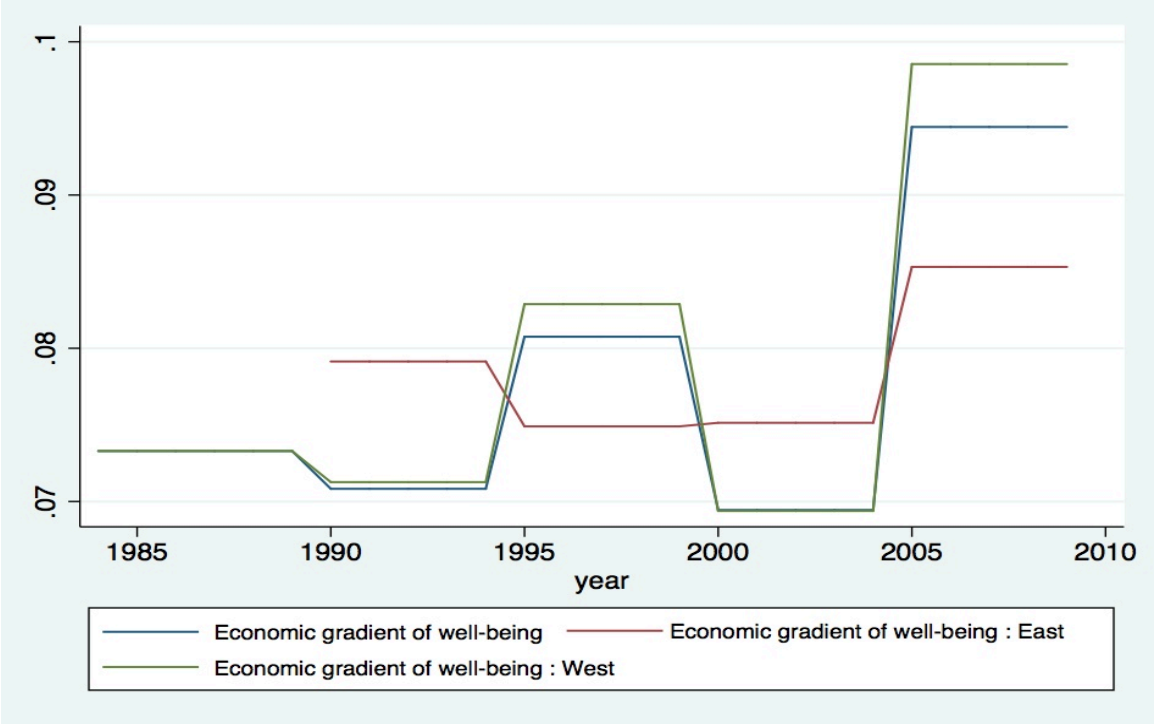


Figure 17. Panel results of B_q including standard errors for Germany as a whole

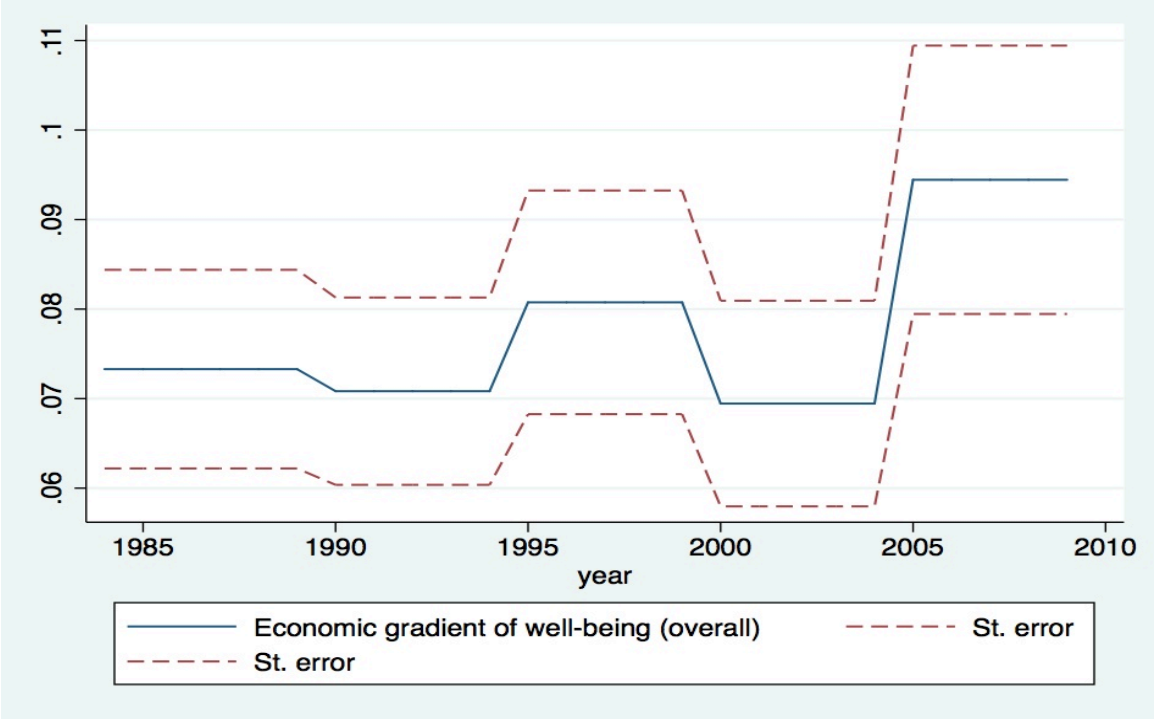


Figure 18. Panel results of B_q including standard errors for West Germany

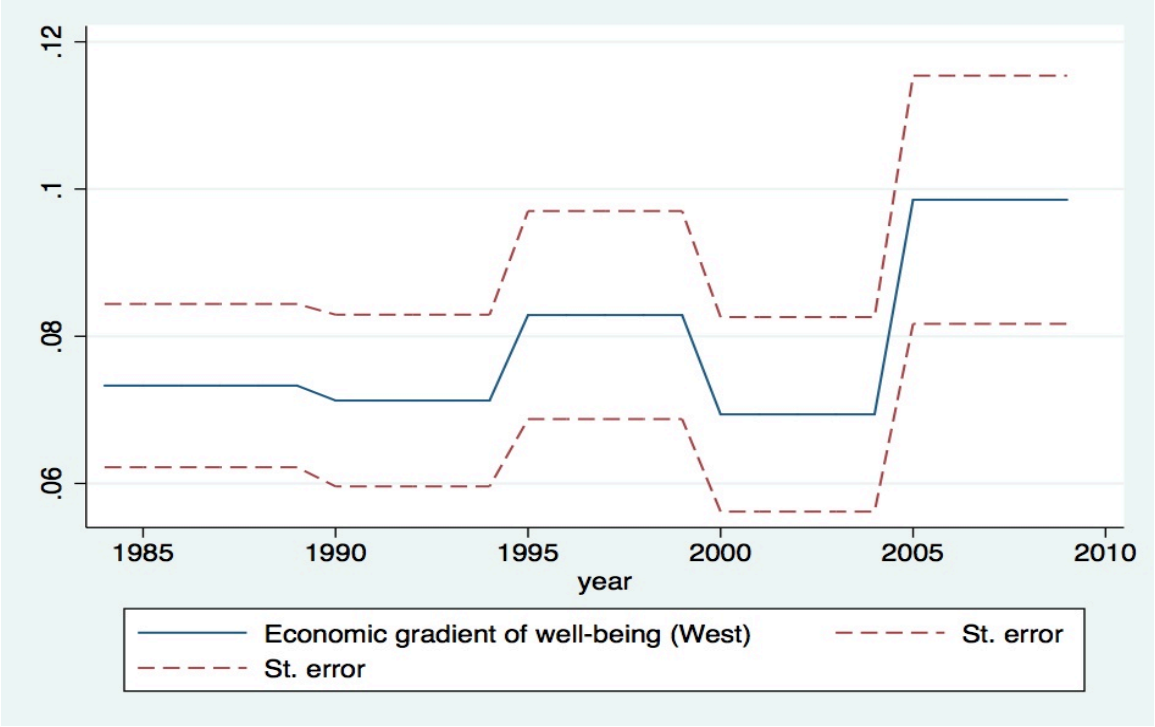
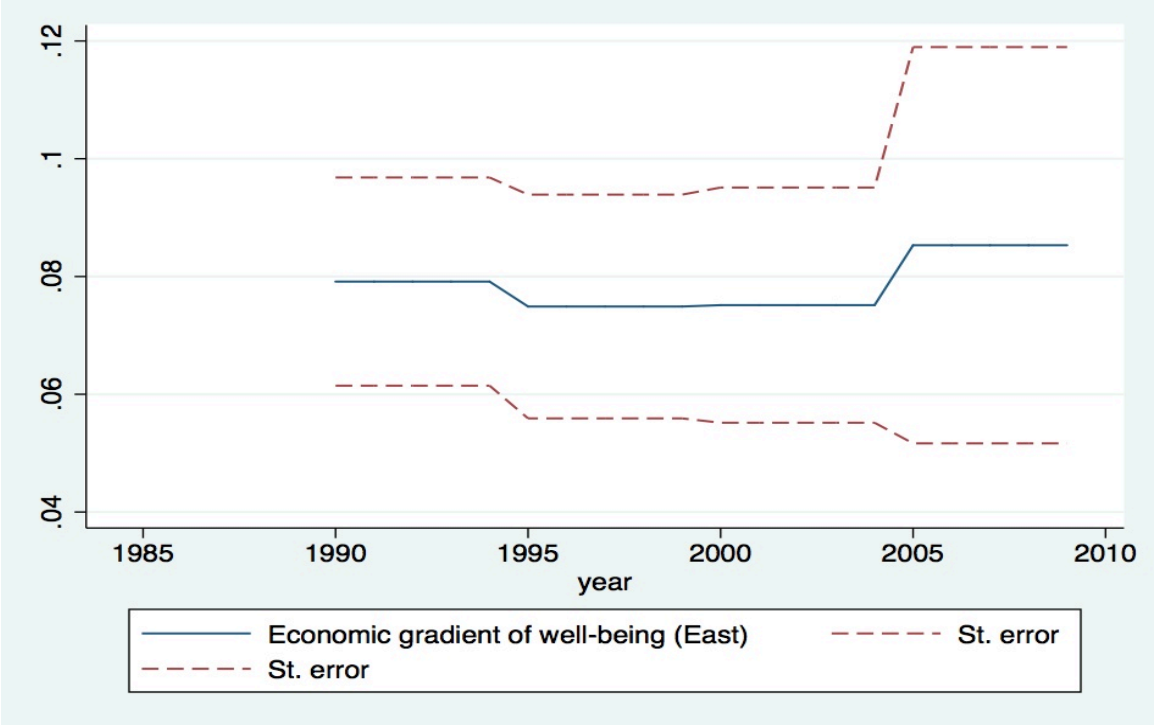


Figure 19. Panel results of B_q including standard errors for East Germany



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