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Germany's Short Time Compensation Program: macroeconom(etr)ic insight

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Germany's Short Time Compensation Program: macroeconom(etr)ic insight.

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Abstract

Short Time Compensation [STC] was a key program in Germany to fight the crisis. However, STC is quite an old tool: in the past 100 years it has been used quite often and is very multifunctional. It stabilized employment in every kind of macroeconomic shock. After a brief look into the institutional and quantitative development of STC and at a simple theoretical model, this paper tries to answer the question whether STC prevents Schumpeterian creative destruction and structural change in economic downturns. With the help of a VAR-Model we can analyze interdependencies between the business cycle, STC and unemployment, finding evidence for a bridging function of STC. A closer look at the pro-cyclical average stoppage supports the thesis that most of the enterprises using STC are fundamentally economically healthy, that is, STC does not prevent structural change in downturns.

Key words: Short Time Compensation, VAR, Paradox, structural change
JEL: E24, E32, C32, J38, N44

1 Introduction

The latest financial and economic crisis was the hardest economic downturn in Germany's history. However Germany's labor market is still robust. In 2009 unemployment rates rose only slightly and were in 2010 already decreasing. Germany - formerly starving from high and persistent unemployment - now shows a benchmark performance.

There is a broad consensus that this is also due to enterprises' use of different flexibility instruments, such as working-time accounts and Short Time Compensation [STC]

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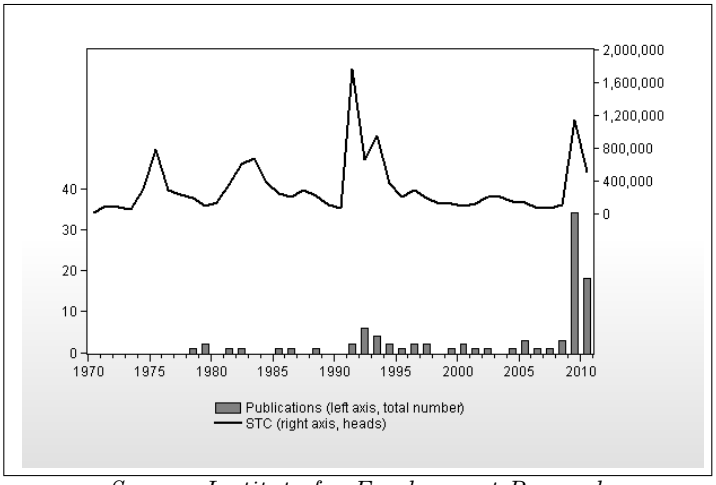
(see i.g. German Council of Economic Experts [Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung - SVR] 2009, Organisation for Economic Co-operation and Development [OECD] 2010). The latter tool of internal numerical flexibility experienced a revival within the last two years and became one of the most important supports for labor market stabilization (Brautzsch and Will 2010). The OECD (2010) now considers STC programs as a useful institutional framework, especially in recessions. However, some economists warn that due to STC measures a healthy Schumpeterian creative destruction within recessions is prevented (Deutsches Institut für Wirtschaftsforschung [DIW] 2010: 26, Eichhorst et al. 2009: 37, Brenke et al. 2010: 12).

Looking at Germany's increasing unit labor costs, the crisis did not pass by without a trace. On the one hand, labor productivity declined (SVR 2009: 263, Herzog-Stein and Seifert 2010: 11); on the other hand, STC does not lower labor costs linearly but degressively ('Remanenzkosten', see Bach and Spitznagel 2009a, 2009b). However, the export's development in 2010 shows that the temporary increase of Germany's unit labor costs did not harm its competitiveness.

Figure 1: Publications in Germany concerning STC



Source: Institute for Employment Research (Institut für Arbeitsmarkt- und Berufsforschung -IAB), own research

Having both a long history and being an important tool in the past, STC is surprisingly not a frequent subject in economic literature, as can be seen in figure 1 (research from November 2011). Only after German reunification and the use of structural STC while restructuring GDR's economy, we can see a remarkable, if small, rise in publications. And even in the actual crisis a macroeconom(etr)ic perspective is almost nonexistent. This paper wants to help to close this gap by concentrating on the question of whether STC harms the structural change in economic downturns by subsidization of non-competitive enterprises, or has just a bridging function. The paper is structured as follows: Section 2 describes the institutional and quantitative development of Germany's STC program. After showing in a small theoretical model that temporary wage subsidies may stabilise

the economy in section 3, I include include STC in a vector-autoregressive model in section 4. With the help of this estimation it can be shown how Germany's labor market reacts to business cycle fluctuations. In this framework there is evidence for a bridging function of STC. Section 5 takes a closer look at the stoppage and its pro-cyclical development. I conclude that the empirical facts contradict the thesis of hampering structural change. Section 6 summarizes the main results.

2 Development of the German STC-program

STC has a long history in Germany. First agreements about a timely working-time reduction were already made in 1881, in some cases connected to pecuniary compensation, the so called 'waiting-payment' (Holzmayer 1989: 6, 8). The Law on Tabac Tax (1909) and the Potash-Law (1910) were the first institutional steps toward compensation for workers by the government (Holzmayer 1989: 9, Brenke et al. 2010: 2, Federal Employment Agency [Bundesagentur für Arbeit - BA] 2009b: 1).[1]

In the Weimar Republic (1918-1933) unemployment and short time benefits were already introduced in 1918. Between 1924 and 1926 STC has not been used. But in 1927, introducing the 'Law of Labor Placement and Labor Administration' ['Arbeitsvermittlungs- und Arbeitsverwaltungsgesetz' - AVAVG], the modern governmental employment agency was founded and STC became a part of their policy tools (Flechsenhar 1979: 373, Kühl 1982: 252, BA 2009b: 1, Holzmayer 1989: 36). In the world economic crisis starting at the end of the 1920s, STC played an important role in the Chancellor Brüning's economic policy (Schmuhl 2003: 187).

After WWII the institutional framework from 1939 was kept until 1956, when AVAVG was amended (Holzmayer 1989: 57). This law was the foundation for the 'Law of Employment Promotion' ['Arbeitsförderungsgesetz' - AFG], which was introduced in 1969. The AFG was not only the old AVAVG with a new name, but also policymakers' answer to the first post-war recession in 1967. Its introduction was influenced by a more Keynesian view of active macroeconomic employment politics (Kühl 1982: 254, Holzmayer 1989: 74, Brenke et al. 2010: 4). In 1997, the 'Social Security Code III' ['Sozialgesetzbuch III ' - SGB III] replaced AFG (Spitznagel and Bach 2000: 507).

The concrete institutional setting of the amount, duration and entrance barriers changed with time, following the changing understanding of labor market regulation, employment and discretionary fiscal policy. Table 1 shows the main steps.

The current regulation differentiates between three reasons for STC. First, if an enterprise is concerned by regular seasonal fluctuations as, for example, in the constructing

[1]Both regulations target a structural dampening of policy measures introducing taxes, tariffs and import quotas. STC as a tool within business cycle fluctuations starts playing a role only later on.

Table 1: Important Steps in the institutional development

Year	Institutional change
1909	Tabac-Tax-Law
1910	Potash-Law
1918	Reich Act about Unemployment Welfare
1924	Reich Act about Unemployment Care
1927	Law of Labor Placement and Labor Administration (AVAVG)
1956	Amendment AVAVG: STC at 62.5 % (up to 80 % if family), maximum duration 14 weeks, maximum 52 weeks in special situations at the labor market, no payment of social insurance contribution.
1959	duration 26 weeks, maximum 52 weeks, introduction of bad weather compensation
1969	Law of Employment Promotion (AFG), 50 % benefits for health care*, 75 % benefits for pension fund contribution*.
1975	Rise of STC up to 68 %, maximum duration 24 month in spezial situations at the whole labor market.
1984	STC and Bad Weather Compensation up to 63 % of wages (68 % if children)
1983	Maximum duration 36 month for steel sector**, 50 % benefits for pension fund contribution*
1988	Introduction of structural STC
1990	Special AFG for GDR
1994	No payment of social insurance contribution (fully paid by firms), lowering STC and Bad Weather Compensation to 60 % (67 % with children)
1995	Introduction of Winter Stoppage Compensation
1997	Extension of structural STC untill 2002
1998	Social Security Code III (SGB III)
2000	Extension of structural STC untill 2006
2004	Transfer STC replaces structural STC (Hartz III-reform)
2006	Seasonal STC replaces Winter Stoppage Compensation
2008	Maximum duration of STC: 18 month[a]
2009	[February] Lowering of 1/3-Regelation to 10 % concerned employees, no minus working time accounts, 50 % payment of social insurance contribution and 100 % if firms provide training, STC also for temporary work agencies, [July] maximum duration 24 month, full payment of social insurance contribution after seventh month STC[a], [November] maximum duration from January 2010: 18 months[b]
2010	[April] extension of social insurance contribution payment until April 2012[b]

Statutory basis: STC compensation: § 121 AVAVG, § 68 AFG, § 178 SGB III; duration: § 119 AVAVG, § 67 AFG, § 177 SGB III.
* following Gagel (2009). Bach and Spitznagel (2009a) deviate.
** following Gagel (2009). Bothfeld et al. (2009) deviate.
[a] part of fiscal impulse: Konjunkturprogramm I and Konjunkturprogramm II
[b] not part of fiscal stimulus package.

Sources: Holzmayer 1989, Bothfeld et al. 2009: 283, Niesel 1997: 480, Wissing et al. 2004: 1323, Gagel 2009: 5, SVR 2009: 262, Crimmann and Wießner 2009: 9, BR 2009, BR 2010, BT 2010, Mares 1996: 21, Schmuhl 2003: 509: 557, Heinelt and Weck 1998: 71., Deeke 2009a: 447

sector, it can request seasonal STC between December and March (§§ 169, 175 SGB III).[2] Second, if an enterprise restructures partly or fully, it can request transfer STC (§ 216b SGB III).[3] Third, a firm can demand cyclical STC (§ 169 SGB III[4]. This is quantitatively the most important form of STC, since seasonal STC only made a minor contribution in winter 2006/2007 and winter 2007/2008. Quantitatively, structural or transfer STC can be ignored (see Deeke 2005: 176).

In downturns and spells of bad weather STC should prevent unemployment by helping firms to keep workers. STC turns lay-offs into a second best solution (Stellmach 2002: 77). This is certainly an important aspect for the German case, which has endured high and persistent unemployment rates for decades. Implementing structural and transfer STC programs, policymakers wanted to prevent stigmatization by unemployment while firms restructured.

Firms may request (cyclical) STC (§ 169 SGB III) for economic reasons, if the management could not prevent this situation and about 1/3 of the workers are affected by more than a 10 % decline in wages (§ 170 SGB III). The STC is 60 % of the difference between a worker's wage in normal times and her actual income, and 67 % if the worker is a parent. The maximum duration is six month (§ 177 Abs. 1 SGB III). In unusual situations, for specific sectors, this can be extended up to 12 months, and if the whole labor market is concerned, up to 24 month by the Federal Ministry of Labor and Social Affairs (§ 182 SGB III).

In the latest crisis, the Federal Government reacted by lowering the STC barriers to save employment. In November 2008 the maximal duration was extended to 18 months from January 2009 on. With 'Konjunkturpaket II', the second fiscal impulse to cushion the downturn, there were several other changes: The Federal Employment Agency (Bundesagentur für Arbeit [BA]) pays 50 % of the social insurance contributions when firms perform training during the STC-period, even up to 100 %. The number of affected workers declined from 1/3 to 10 %. Working time accounts do not need to have negative amounts any longer. Temporary Work Agencies can request STC, too. From July 2009, following the program 'Kurzarbeitergeld plus', the maximum duration is extended up to 24 month; social contributions are generally paid from the 7th month, and even from the 1st month if another part of a bigger enterprise already participates in STC for more than six months. Much of the regulation was limited until the end of 2010.[5]

In November 2009, the Federal Government [Bundesregierung - BR] announced that

[2]Before 2006 this was called Winter Stoppage Compensation ('Winterausfallgeld' - formally § 214 SGB III and §§ 74, 81 AFG) and before 1996 Bad Weather Compensation ('Schlechtwettergeld' - formally §§ 74, 83 AFG and § 143 AVAVG).

[3]In 2004 this replaced the structural STC (formally § 175 SGB III and § 63 Abs. 4 AFG). See Deeke (2005: 179) for further information.

[4]formally § 63 AFG and § 117 AVAVG

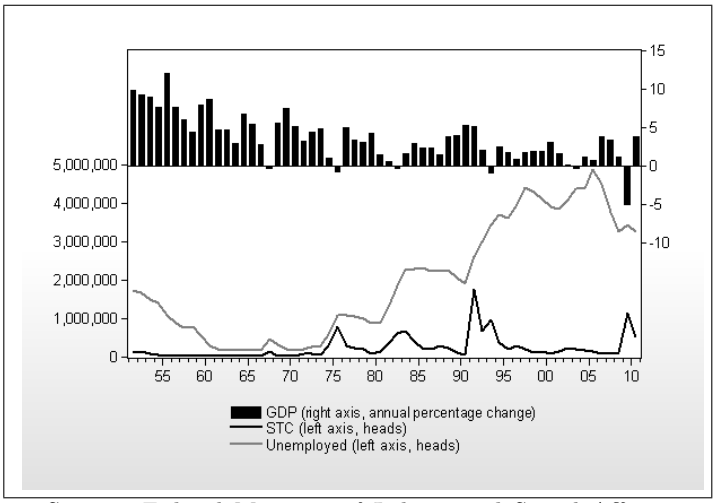
[5]see for more details BA 2009a, Will and Brautzsch 2009: 201, Crimmann and Wießner 2009: 9, Bogedan et al. 2009: 20, SVR 2009: 262, Deeke 2009a: 448, Brautzsch and Will 2010.

the maximal duration from 2010 on will again be 18 months (BR 2009). In April the BR announced that social contributions will be fully paid until April 2010 (BR 2010); the law passed the German Parliament [Bundestag - BT] in July (BT 2010).

Beside the legal framework, collective labor agreements may contain higher compensation amounts. In the chemical sector, STC is about 90 % of the normal wage, in the metal branch up to 80 %, etc. (see for more information Bispinck 2009: I).

After this short look at the institutional historical development and the actual regulation, Figure 2 shows the STC's quantitative behavior compared to unemployment. Especially in economic downturns, as real GDP growth is near zero, STC played a remarkable role. We can see this in the first post-war recession in 1967; the recessions following the burst of Bretton-Woods, the Deutschmark-Appreciation and the Oil-Crisis in 1974/1975 and 1981/1982; in 1993 following reunification; and in the actual financial and economic crisis in 2008/2009. However in 2001-2005 after the burst of the 'dot.com'-/'New Economy'-bubble and 09/11 this is not the case. There may have been different reasons, such as the general deregulation of the labor market, the broader use of working time accounts, rising marginal and fixed-term employment, increasing residual costs because of less compensation for social security contribution, etc. for this little use of STC (Bach and Spitznagel 2009a, 2009b). Moreover, Deeke (2005: 176) considers development from 2001 as stagnatory, and not a surprising downturn causing the reduced use of STC in this period.

Figure 2: GDP, STC and unemployment



Source: Federal Ministry of Labour and Social Affairs, Federal Employment Agency, Bundesbank

Figure 2 shows an important point: The rise of STC in 1991 was for structural reasons following the reunification. This is no fluctuation in the business cycle, as shown by the increase of GDP at this time. The amount of workers in STC for business cycle reasons is the highest since 1950. As the actual crisis was the deepest downturn since 1950, this is reasonable, too.

STC is an instrument for every kind of macroeconomic shock, as demand-shocks (1967, 1993, 2008/2009), supply side shocks (1974/1975, 1981/1982) and even structural shocks (1991). STC could not prevent supply-side and reunification induced hysteresis; but in the demand-side induced shocks especially in 1967 and 2008/2009 it seems that STC fulfilled its aim, and was very effective. Some authors such as Völkel (1997: 144) consider the cushioning effect of STC on unemployment after the unification as a favorable development, even is unemployment could not be prevented in the medium- and long-run. STC is also useful from a theoretical point of view. This will be shown in the next section.

3 A small model

From a macroeconomic and theoretical point of view temporary wage subsidies in general and STC in particular may be quite useful. A simple model helps illustrating this point.

Assume that total output Y negatively depends on interest rates r.

$$Y = Y(r) \tag{1}$$

Taylor-log-linearising around the steady state yields

$$\hat{y} = -\alpha(\hat{r}) \tag{2}$$

with hats indicating deviations from (log) steady states, $\alpha = -Y_r \frac{1}{\bar{Y}}$ and subscripts defining partial derivatives.

Assume further that price development depends negatively on total unemployment U, subsidies for labour cost L and positively on search costs S.

$$P = P(U, S, L) \tag{3}$$

Log-linearising yields

$$\hat{p} = -\beta_U \hat{u} + \beta_S \hat{s} - \beta_L \hat{l} \tag{4}$$

with $\beta_U = -P_U \frac{\bar{U}}{\bar{P}}$, $\beta_S = P_S \frac{\bar{S}}{\bar{P}}$, $\beta_L = -P_L \frac{\bar{L}}{\bar{P}}$.

Deriving the short run aggregate supply curve by using the fact that total output is a product of labour force N and productivity such that $\hat{y} = -\hat{u} + \hat{n} + \hat{\phi}$ in logs and deviations from steady state finally yields

$$\hat{p} = \beta_U \hat{y} - \beta_U(\hat{n} + \hat{\phi}) + \beta_S \hat{s} - \beta_L \hat{l} \tag{5}$$

Inserting a Taylor-rule of the following form

$$\hat{r} = \gamma_{\hat{p}} \hat{p} + \gamma_{\hat{y}} \hat{y} \tag{6}$$

gives the following expression for the output fluctuation:

$$\hat{y} = \frac{1}{1 + \alpha(\gamma_{\hat{y}} + \gamma_{\hat{p}}\beta_U)} \alpha\gamma_{\hat{p}}(\beta_U(\hat{n} + \hat{\phi}) - \beta_S\hat{s} + \beta_L\hat{l}) \tag{7}$$

The policy parameters $\gamma_{\hat{y}}$, $\gamma_{\hat{p}}$ and β_U dampen total output fluctuation caused by the right side variables, since they turn the denominator to greater than one.

If public policy now subsidises wage costs counter cyclically - e.g. by implementing a STC programme - according to the following rule

$$\hat{l} = -\gamma_{\hat{l}}\hat{y} \tag{8}$$

this even strengthens stabilisation since the output equation then takes the form

$$\hat{y} = \frac{1}{1 + \alpha(\gamma_{\hat{y}} + \gamma_{\hat{p}}\beta_U + \gamma_{\hat{p}}\gamma_{\hat{l}}\beta_L)} \alpha\gamma_{\hat{p}}(\beta_U(\hat{n} + \hat{\phi}) - \beta_S\hat{s}) \tag{9}$$

Thus, from this simple theoretical framework I may conclude that there can be a stabilising effect of counter cyclical wage subsidies in general and of STC as a common instrument in Germany. For a more sophisticated model see Will (2010). After these theoretical considerations I now turn to empirical evidence.

4 A simple VAR-Approach

In this section I will for the first time ever include STC in a macroeconometric framework since there is a big gap in existing literature (a broad literature screening can be found in Will 2010). From a pure theoretical consideration enterprises may adjust its labor demand in cyclical downturns in different ways. They may reduce the working volume by lay-offs and a constant per capita working-time or a per capita time reduction via STC and other internal numerical flexibility tools holding the stock of employed persons constant. Wage adjustments seem to be difficult since nominal wages normally are sticky. However, there is a lot of extra payment as Christmas and holiday payments, revenue premiums, provisions etc. that may be cut. In Germany in the last crisis enterprises used a little bit of all.

STC can be evaluated with respect to its bridging function. Consider the following: An enterprise gets into problems due to a macroeconomic slowdown. If the management expects the crisis to be temporary and the firm is fundamentally competitive and health, there is obviously no reason why not to keep employees, for example with the help of STC. There may be other motives such as labor hording due to a lack of specialists etc. that foster this decision. But what is about the end of STC-phase? Will employees get unemployed if the crisis takes too long or if the firm suddenly decides to restructure?

These are quite essential questions. If most STC-workers after the crisis get unemployed, STC is not as useful as it should be and policy-makers may consider abandoning the program. However, if STC-workers stay employed after the crisis the program is certainly quite successful in stabilizing the economy, since the stable employment security should stabilize private consumption more than does automatic stabilizers as unemployment benefits.

To examine the STC's cyclical performance, I will use a vector-autoregressive model [VAR] approach. The latter can be used to analyze interdependencies of various (weakly) stationary time series without any restriction. This may be criticized, especially the fact that a VAR can be computed without a prior theory. However, the analysis is relatively simple and avoids the construction of structural models. A broader and also critical discussion of the chosen tools can be found in Favero ([2001] 2008: 133, 162), Kirchgässner and Wolters (2006: 113), Gaab (2004: 140).

The analysis will concentrate on a key question: does STC in Germany fulfill a bridging-function to stabilize employment or does it hinder Schumpeterian recession's structural change? I include the three series: a business cycle indicator, STC and unemployment.

While having monthly data of the stock of STC and unemployment in Germany from the early 1960s, I cannot use a proper German monthly business cycle indicator since it does not exist on a monthly basis before 1991. Therefore I will use quarterly data starting from 1970 up to 2011 (first quarter) obtaining 165 observations per series.

Data can be found on the internet on the sites of the German statistical office and the Federal Employment Agency as well as in printed publications of the Federal Employment Agency. These are the series used: The ratio of workers getting STC to employed persons [STCR], and of unemployed persons [UE] to employed persons [UER]. These numbers differ from the Federal Employment Agency's numbers, taking employment data from the federal statistics office. This is more convincing, since the Federal Employment Agency's definition changed in time and this analysis wants to include all employed persons not only civil employees.[6] Further the STCR should be adjusted by the unification shock, since the shock was not business cycle induced but a structural increase in times of prosperity with a sociopolitical intention (Deekes 2009a: 447), like a parachute into unemployment (Völkel 1997: 146). Therefore the pure STC-data is adjusted such that between II 1990 and II 1992 the STC follows an artificial linear trend, rising about 45,000 people per quarter, so that we get an adjusted series and an adjusted STC-ratio [STCR_AD]. Further data is real GDP, which can be found at the German statistical office as well.

Including GDP, UER and STCR, this may lead to several problems. Every individual series has different properties. While GDP follows a deterministic trend, STCR is sta-

[6]Formerly, the Federal Employment Agency computed its unemployment rate only as a ratio to civil employees. Therefore, this rate is larger than the rate as a ratio to all employees.

tionary but obviously truncated in its distribution that may lead to estimation problems since the probability of outliers rises. The UER follows an almost stochastic trend[7] and - performing a Dickey-Fuller-Test - is not stationary but integrated of order 1. This is problematic, since differencing following Okun's Law (Okun 1962) would mean including white noise stochastic shocks as explanatory variables. Including time trends - even if they may vary in time - does not lead to satisfactory results. Detrending with the help of the Hodrick-Prescott-Filter with a standard $\lambda = 1600$ may be problematic - however this leads to a stationary series and is used in this analysis - even if estimation with non-detrended raw data would not result in roots of the characteristic polynomials outside of the unit circle and still fulfill VAR's stability requirements. Therefore I include a HP-filtered UER-series [UER_DT] that may be interpreted as cyclical unemployment.

Simplifying I estimate the following model:

$$\mathbf{x}_t = \mathbf{A}_0\mathbf{d}^{struc} + \mathbf{A}_1\mathbf{x}_{t-1} + \mathbf{A}_2\mathbf{x}_{t-2} + ... + \mathbf{A}_5\mathbf{x}_{t-5} + \alpha'\mathbf{d}^{temp} + \mathbf{z}_t \tag{10}$$

Where x is a vector containing the time series, A are coefficient matrices and z is a vector of non systematic, random disturbances. The structural dummy vector (d^{struc}) contains a constant, one structural (d_struc) and seasonal dummies (d_S^I, d_S^{II}, d_S^{III}). Furthermore following Favero ([2001] 2008: 73), I include a dummy catching outliers (d^{temp}). The five lags follow the optimal lag length by the Schwarz-criterion (SC). Tests on residual characteristics were performed using a Lagrange Multiplier for autocorrelation, the White-test for heteroscedasticity and Jarque-Berra for normal distribution. Series' order - GDP_AG $\rightarrow$ STCR_AD $\rightarrow$ UER_DT - for the impulse-response-functions follows a test on Granger causality (see Kirchgässner and Wolters 2006: 122) as well as theoretical reasoning: Firms are confronted with a macroeconomic shock, adjust working-volume via STC and then lay-off if STC does not fulfill the bridging-function. If this is the case, there should be a significant rise of unemployment in the impulse-response-analysis following a STC shock.

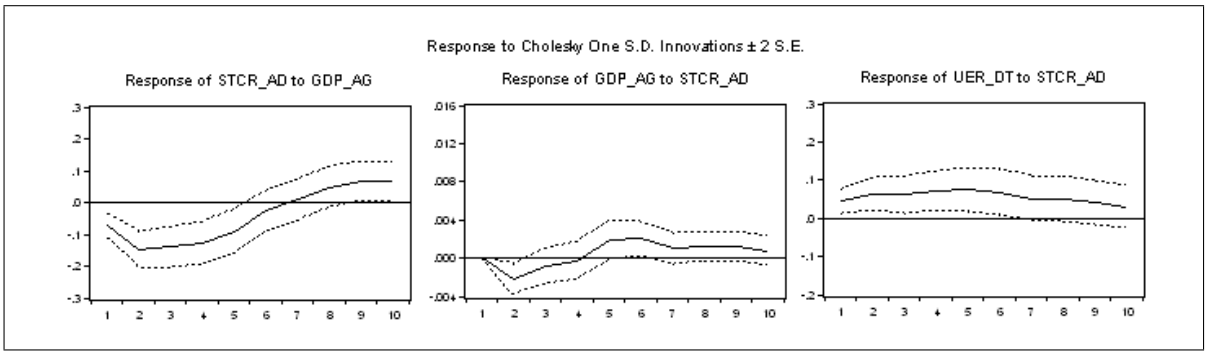
Estimating with $\mathbf{x}' = (GDP\_AG\ STCR\_AD\ UER\_DT)$ and furthermore $\mathbf{d}^{struc'} = (1\ d_S^I\ d_S^{II}\ d_S^{III}\ d\_struc)$ with $d\_struc = 1$ in the stagnation period at the beginning of this millennium (I 02-II 03). For the huge outliers in times of recession I further include dummies in IV 74 (first oil crisis), IV 82 (second oil crisis), I 93 (reunification-hangover-recession), I 05 (Hartz IV[8] and in I 09 (world financial and economic crisis). GDP is transformed in annual growths rates (..._AG).

Figure 3 plots the interesting impulse response functions of the estimated model. STC is negatively connected to GDP. There is a significantly counter-cyclical reaction for the

[7] Simply regressing UER on its lagged variable, its coefficient is less but quite close to 1. This result is quite reasonable considering the long-lasting persistence of unemployment in Germany.

[8] The so called Hartz-Reforms tried to change the German labor market structurally. Hartz IV first of all lead to an enormous rise in unemployed persons in 2005, which is a statistical effect including people getting social benefit in unemployed statistics who were not included before.

Figure 3: Impulse-Responses GDP_AG, STCR_AD, UER_DT



first 5 quarters (left box). Futher, there is a positive impact on GDP from STC, after some periods even significantly. This is quite reasonable since STC is only a transitory situation for employed persons. At the end of a recession after about one and a half to two years, they leave their status as STC recipient while GDP is growing again. Last but not least the third box shows only slight reaction of unemployment to STC. Including other variables that catch even more fluctuations, this reaction would be even smaller. If STC would not be bridging the slowdown, this reaction should greater. So this VAR analysis at least slightly supports the assumption, that STC fulfils the bridging-function.

To control for robustness, there could be other series included, e.g. hours worked. Since this series is highly correlated with GDP (both in growth rates) and because of redundancies, these results are not presented here further. A general problem is the double counting of time reduction: in aggregate data we find the reduction of hours, but STC includes reduction of hours, too. To distinguish between flexibility instruments - lay-offs, STC and time reduction with the help of working time accounts - total hourly volume should be adjusted by the real full time equivalent of workers receiving STC. Due to the given data this is an impossible correction since there is not enough information available.

Some general remarks should be mentioned concerning this framework. German aggregate data suffer from huge structural disturbances, especially because of the reunification. Even with HP-filtered unemployment rates and slightly adjusted STC stocks, estimation problems arise due to a lack of STC-use in 2000-2005 (too low movement). On the other hand, estimation suffers from high outliers in times of crisis. Even if the results are highly satisfying with respect to residual normality and homoskedascity, data-induced autocorrelation is often a problem because of the STCR_AD-series.

From the presented analysis I conclude: Since there is only a short time slight rise in cyclical unemployment, STC certainly fulfills a bridging function and saves employment. To have a look at individual risks following STC there should be adequate microecnometric data. Especially here, there is a lot to do since the only known study for Germany is Büchel and Pannenberg (1992), which is certainly biased by reunification and therefore

not reliable for a 'normal' downswing.

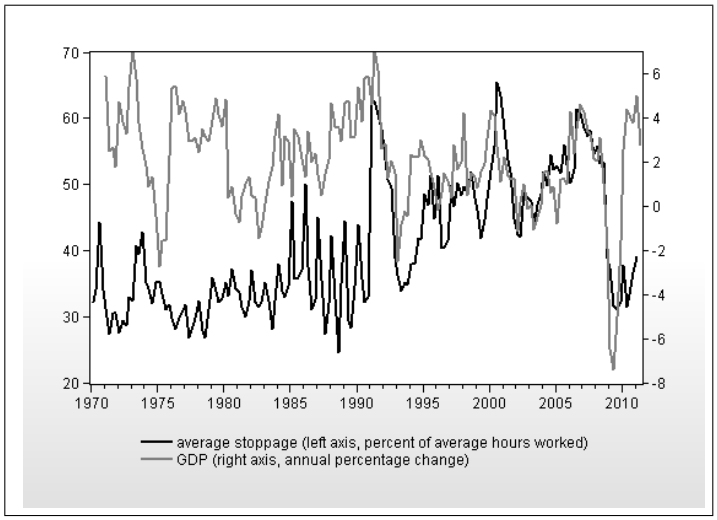
After this analysis on aggregate macroeconomic data I turn now to a special pattern I call 'stoppage paradox'. The next part will have a closer to this question.

5 Stoppage paradox

Some economists say that due to STC measures a healthy Schumpeterian creative destruction within recessions may be prevented, as the DIW (2010: 26, Eichhorst et al. 2009: 37, Brenke et al. 2010: 12) and Crimmann et al. (2010). Deeke (2009b: 11) however sees no empirical relevance, nor does Völkel (1997: 129). Fritsche (2009: 779), Scholz (2009: 5), the IAB (2010: 42) and Bosch (2010: 32) think that this not a relevant question. For policy makers this is quite an essential question: A harsh and short adjustment may be more efficient than a long but smooth period of slow and costly adjustment.

Using data on average stoppage - that is the average share of working time employees in STC do not work - may help to answer the question whether structural change is harmed. Average stoppage is a weighted mean and makes it possible to compute full time equivalents - that is real employment saved by STC. If in 1991 1,760,000 workers got STC and mean stoppage was about 54 %, STC saved about 960,000 full time employed persons. If in 2009 1,140,000 people were on short time and the average stoppage was about 32 %, STC held 370,000 employed in full time equivalents. In other words: If there had not been STC, unemployment would have been about 10 % higher. However, this is just a statistical view and there is no certainty as to how the unemployment rate would have been without STC (see Deeke 2009a: 449 and Flechsenhar 1979: 369).

Figure 4: Stoppage (in %) and real GDP growth, quarterly data



Source: German Council of Economic Experts, Bundesbank

If firms use STC, this gives economists the comfortable situation of getting data on the

personal capacity utilization of these firms in a crisis. Theoretically the average stoppage published by the Federal Employment Agency should show a counter-cyclical behavior, that is: in times of recession stoppage should rise since capacity utilization shrinks, and in times of prosperity the other way round. However, a quick look to the data shows that this expectation is not confirmed. In Figure 4 we first find the expected reaction, e.g. in 1985 and 1986: while GDP decreases, stoppage rises. After reunification however there is a change in data: stoppage gets pro-cyclical. This seems to be a paradox.

From 1971 until 1988 (introduction of structural STC) the correlation coefficient is about -0.15 showing the expected sign. Between 1990 and 2010 this changes; correlation is about 0.43; starting later in 1992 (until 2010) gives 0.57.

Before interpreting this paradox, two exemplary econometric estimations show that we get a quite robust connection. In estimation (1) I will use average stoppage [AST] and the industrial order-index published by the federal statistics office [ORDER]. Using monthly data estimation, the period is from May 1998 until April 2011 (204 observations after adjustment). In estimation (2) I check for cyclicality using the ifo business climate index [IFO], from August 1998 until April 2011 (201 observations after adjustment).

The following both equations are estimated:

$$AST_t = \alpha_0 + \alpha_1 ORDER_{t+2} + \alpha_2 * t + \alpha_3 AST_{t-1} + \alpha_4 AST_{t-2} + \sum_{i=1}^{11} \alpha_{4+i} d_S^i + \alpha_{16} d\_1206 + \alpha_{17} d\_1207 + \alpha_{18} d\_1208 + \alpha_{19} d\_1209 + \alpha_{20} d\_1210 + z_t \quad (11)$$

$$AST_t = \alpha_0 + \alpha_1 IFO_{t-1} + \alpha_2 AST_{t-1} + \sum_{i=1}^{11} \alpha_{2+i} d_S^i + \alpha_{14} d\_1206 + \alpha_{15} d\_1207 + \alpha_{16} d\_1208 + \alpha_{17} d\_1209 + \alpha_{18} d\_1210 + z_t \quad (12)$$

α are the coefficients, d_S^1, d_S^2,...d_S^{11} dummies capturing seasonal development and z the error term. In the data for December 2006 there are quite remarkable outliers. This is certainly due to introduction of seasonal STC in 2006 and therefore dummies are included: d_1206, d_1207, d_1208, d_1209, d_1210. They are equal to 1 in the indicated month and otherwise 0. The estimation takes heteroscedascity-consistent coefficient variance (White). Essential results for interesting coefficient a_1 are shown in table 2.

As already suggested by the descriptive analysis there is a significantly positive, pro cyclical relationship between the two business cycle time series and average stoppage contradicting theoretical expectations.

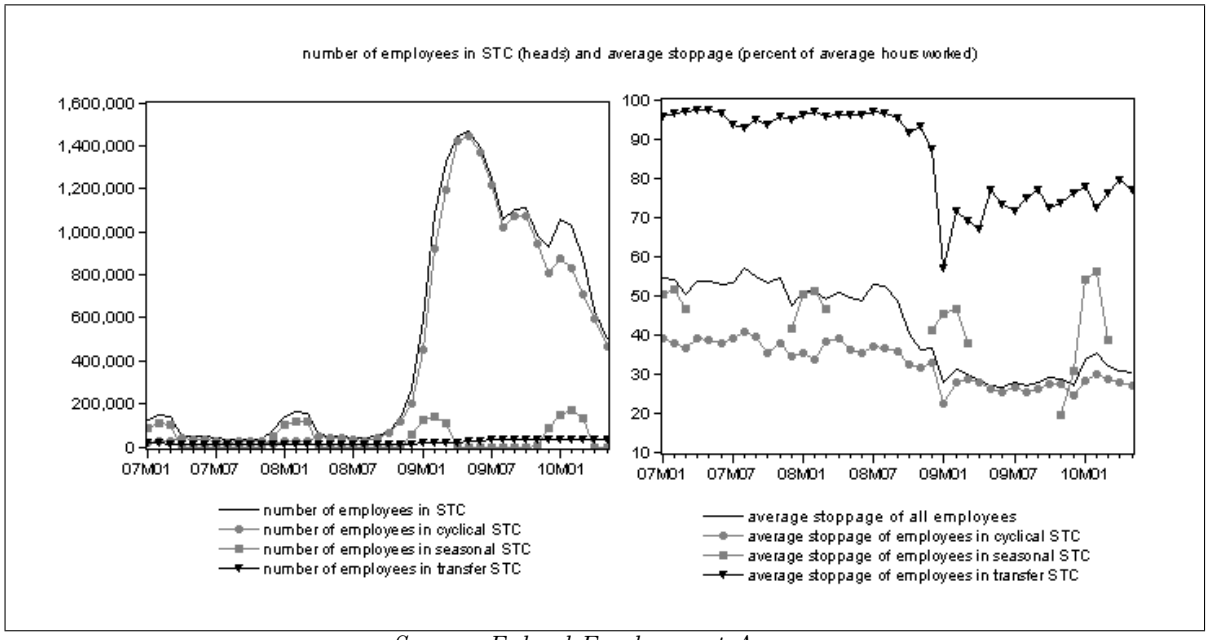
How to interpret this positive relationship? I suggest the following way to read the data: In times of prosperity only small firms are concerned with STC. In summer, the share of structural STC workers rises to 30 %, in winter cyclical STC is only 19 % of

Table 2: Estimation output (Order and ifo Business Climate), stoppage paradox

	(1) Order	**(2) Ifo Business Climate**
...	...	...
a_1	0.10***	0.05***
...	...	...
Adj. R^2	0.88	0.89
N	204	201
Period	May 1998 - April 2011	August 1998 - April 2011

*Significant at * 10 %- level, ** 5 %- level, *** 1 %-level*

Figure 5: Stoppage discriminated between cyclical STC, seasonal STC and transfer STC



Source: Federal Employment Agency

all STC receivers (calculations of 2007 data). In the best case, firms are restructuring - in the worst case a free riding management is just lowering costs in the short run before firing workers. In particular, using STC for structural reasons may lead to high stoppage.

In times of recession there are a lot of firms using STC because of the downturn. Their share rises to 98 % of all firms in 2009. The only consistent story is now that these firms do have unused capacities, but at the same time they are competitive enough not to starve and not to be at the fringe of the market close to bankruptcy. Since the majority of firms use STC only in downturns and their share is especially high, average stoppage decreases. Reaching times of upswing again, these firms are leaving the STC program and therefore the share of other enterprises with high stoppage for structural reasons rises again. In other words: The pro-cyclicality is therefore a statistical effect.

A closer look at non-published data confirms (Figure 5) this story.[9] There is a low

[9]Thanks to the data-service of the Federal Employment Agency for sending these data. In January 2009 there is a sudden decrease in stoppage for structural reasons. This may be due to data revision, effecting in a lower and more seasonally sensitive series. However, the stoppage series for cyclical reasons

stock of structural STC-firms (lef box, lowest black line) with high - time independent high - stoppage (right box, highest black line). In the actual crisis there are many firms entering STC (left box, highest grey line) with relatively low stoppage (right box, lowest grey line) and therefore making the weighted average decrease. Not only the total average stoppage decreases; it seems that - beside data revision - the average stoppage in cyclical STC decreased since the beginning of the crisis, too.

This analysis leads to a quite interesting conclusion: Most of the firms using cyclical STC are not in danger of being uncompetitive any more. They use cyclical STC to cushion the economic downturn. Therefore arguments in a Hayekian tradition, as were mentioned by DIW (2010: 26), Eichhorst et al. (2009: 37) and Brenke et al. (2010: 12) may theoretically be reasonable. Data tell another story in that for most firms using STC there is no real danger of hindering Schumpeterian structural change in downturns. However, this is still no argument against free-riding at the expense of the public budget.

6 Concluding remarks

In the actual crisis, short time compensation [STC] saw a remarkable revival. In Section 2, this paper showed the actual institutional framework and its development. A first descriptive analysis showed that STC was quite often used within former macroeconomic shocks. However there is a lack of scientific analysis. Section 3 included STC in a small model showing that temporary wage subsidies may help to dampen cyclical fluctuations. Using a VAR model, I argued in Section 4 that there is evidence for a bridging-function of STC and a stabilization of private consumption. Discussing the pro-cyclical average stoppage it could be seen in Section 5 that STC does not hinder Schumpeterian structural change, but that most firms just use the bridging function.

The German labour market passed the crisis quite well. How STC is used in the future is not at all clear. In normal economic downturns the most-used internal flexibility tool will be working time accounts. However STC will play a role for unexpected and hard economic downturns, particularly if policymakers lower the entry barriers in recessions (see also the advices by the OECD 2010).

Hopefully, following the recession, the gap in scientific analysis of STC will be filled on the macroeconomic and microeconometric levels.

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shows clearly a kind of time independency and even decreases. This confirms the interpretation above.

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