Department Socioeconomics

Personal Insolvency Dynamics in Germany and the UK – A SUR-TAR Approach

Nadja König

Personal Insolvency Dynamics in Germany and the UK - A SUR-TAR Approach[*]

Nadja König[*]

August 4, 2016

Abstract

This paper analyses the dynamics of personal insolvencies in Germany and the UK, focusing on the recent recession. These countries are particularly interesting as they are both member countries of the European Union, yet have completely different approaches to deal with overindebted individuals. In Germany unfortunate households who file on their debt are required to undergo a relatively long restructuring period until they eventually receive debt relief, whereas British debtors can choose proceeding out of many alternatives to manage their debt. Even under the official bankruptcy option, debt gets discharged relatively fast. In line with their different insolvency procedures, the two countries also represent two different financial systems: the German system is rather bank-based and the UK system rather market-based. The underlying financial systems already point to different patterns of lending across countries and hence, also to different structures of debt. Specifically, we are interested in the dynamics of petitions and actual insolvencies during the crisis as well as their reaction to exogenous macroeconomic and financial conditions. The findings suggest that insolvencies are more persistent in the UK than in Germany, i.e. after an external shock it takes longer for insolvencies to return to their previous level in the UK. In both countries, the recent recession has no effect on petitions to default, but it has an effect on actual insolvencies in the UK suggesting that debtors rather opted for official procedures during the recession.

Keywords: Private Household Debt, Personal Insolvency Laws, Recessions

JEL Classification: E44, G01, G21, K49

1 Introduction

During recessionary times indebted households are increasingly exposed to adverse shocks putting their solvency at stake (e.g. Fieldhouse et al., 2012). However, the sustainability of household debt varies greatly across countries. While unemployment and/or events of bad luck such as divorce or health problems are intuitive explanations that can increase the probability of default, they fail to explain existing differences across countries. Theoretical research points to the role of insolvency regulations arguing that there is a link between benevolence towards debtors and the number of insolvencies (e.g. Fay et al., 2002; White, 2007). Indeed, research comparing different insolvency regimes is mostly theoretical (Livshits et al., 2007; Chatterjee and Gordon, 2012). Empirical studies emphasise the role of institutions[1] for debt repayment behaviour. Duygan-Bump and Grant (2009) use micro data, where insolvencies constitute a rare event and therefore focus on repayment difficulties of households instead of actual defaults. And Jappelli et al. (2013) use yearly data to analyse insolvencies. However, both studies neglect cyclical fluctuations and responsiveness of debtors during recessions. The literature on optimal insolvency laws typically takes a static view and has so far greatly neglected the underlying dynamics of insolvencies in different economies.

This paper aims at studying the dynamics of personal insolvencies under different insolvency laws. We examine Germany (DE) and the United Kingdom (UK) as their approaches to dealing with over-indebtedness are fundamentally different and as they can be roughly considered as representatives of two opponent models of financial system architecture within the European Union: Germany has a bank-based system with a long tradition of relationship lending, which is characterised by dominating long-term credit contracts with fixed terms of contract. On the contrary, the Anglo-Saxon market-based financial system relies on the market as a coordination mechanism, where transactional lending dominates. This translates into less favourable credit conditions exposing borrowers to sudden changes of contract terms. Rather short-term creditor-debtor relationships prevail and hence, informational asymmetries are more pronounced. Accordingly, debtors' liquidity problems tend to be more frequent in the UK, which is absorbed through an insolvency regulation that is more lenient towards

---

[1] Duygan-Bump and Grant (2009) account for the time before debt get resolved, the related bureaucracy, the cost to default and public as well as private coverage. Jappelli et al. (2013) focus on creditor rights, judicial enforcement and information sharing policies.

debtors compared to Germany, where borrowers enjoy more reliable contract relationships[2]. We are interested in reactions of personal insolvencies to (macro)economic shocks and other macroeconomic factors under these different institutional frameworks. Specifically, this paper asks how the 2007-2008 financial crisis and the subsequent economic downturn affected sustainability of private household debt measured by the number of insolvencies. There are two main developments which recently increased the importance of this issue. The first refers to growing concerns about the sustainability of private household debt, particularly since the event of the sub-prime crisis and its consequences for the real economy. A larger share of household liabilities in banks' balance sheets[3] turns repayment behaviour into a key variable that poses a threat to financial stability, and via the credit channel, also to the real economy (Bernanke and Gertler, 1995; Bernanke, 2007). The second refers to institutional heterogeneity within the European Union and related discussions about a harmonisation of insolvency laws (e.g. Wessels, 2012).

We conduct a time series analysis for Germany and the UK, using data on personal insolvencies (petitions and actual filings) to detect the dynamics under varying economic conditions. Controlling for key macroeconomic and financial variables, we first apply a factor analysis to consolidate many variables into few main factors for each country. Then we turn to time series regressions, particularly focusing on the event of the great recession in the two countries.

This paper is organised as follows. Section 2 gives an overview of related literature. In Section 3 we provide a theoretical background on the link between financial systems, insolvency laws and private household indebtedness. The subsequent Section 4 gives an overview of the personal insolvency laws in Germany and the UK. Section 5 presents the data and some descriptive statistics. The empirical strategy and results are described in Section 6. Section 7 concludes.

2 Literature on Personal Insolvencies

This section gives a brief overview on previous research. The literature on personal insolvencies is manifold and addresses different yet related questions. Research ranges from literature

---

[2] See also Berkovich and Israel (1999).
[3] See for instance Chmelar (2013); Jappelli et al. (2013).

dealing with distortive incentives of pro-debtor insolvency laws (White, 1998; Fay et al., 2002; White, 2007, to name a few), to a literature dealing with consequences for debtors who previously filed for insolvency (Cohen-Cole et al., 2009; Han and Li, 2011; Jagtiani and Li, 2014) and literature comparing advantages and disadvantages of different insolvency laws (Livshits et al., 2007; Chatterjee and Gordon, 2012).[4] Due to data availability on the one hand, and the relevance of overextended households resulting from the sub-prime crisis on the other hand, most previous empirical studies have continued to investigate developments in the US, whereas literature concentrating on Europe is relatively sparse. Among the few exceptions is research on corporate insolvencies (Kaiser, 1996; Franks et al., 1996; Davydenko and Franks, 2008) and research with a close proximity to jurisprudence and/or research which takes an international but less refined perspective (e.g. Kilborn, 2007; Gerhard, 2009; Niemi, 2012; Heuer, 2014).

Most studies mentioned so far do not account for the link between insolvencies and changing macroeconomic conditions. While the relationship between household debt and macroeconomic stability has previously been covered by the literature (e.g. Debelle (2004); Barba and Pivetti (2009)), resulting defaults have so far not received sufficient attention. This is crucial however, as sustainability of household debt depends on several factors, that are not yet well enough understood. Empirical research typically studies micro factors pointing to sudden unemployment, divorce, health problems or similar unfortunate events as determinants for the probability of default (Sullivan et al., 2000; Gross and Souleles, 2002; Warren, 2003; Himmelstein et al., 2005; White, 2007). In this context, the role of differing institutional settings such as insolvency laws and their relation to macroeconomic developments is also of crucial importance and yet, has been hardly studied. One contribution of this paper is therefore to study the effects on private household vulnerability (focusing on the 2007-2008 financial crisis) under differing insolvency regimes.

Papers that are closest to our research are Fieldhouse et al. (2012) and Garrett and Wall (2014). Using Canadian data, Fieldhouse et al. (2012) investigate the factors which induced an increase of almost 50 % in personal insolvencies filings during the 2008-2009 financial crisis. They use aggregate data as well as a unique micro data set to study which recession-induced

---

[4]Theoretical contributions predominantly focus on the optimality of insolvency laws in light of conflicting interests between creditors and debtors (see for instance Berkovich and Israel (1999); Povel (1999) and Wang and White (2000)).

adverse shocks led to this observed rise and how the characteristics of defaulters changed. Two potential channels are deemed to be responsible for the rise in insolvencies. On the demand side they identify higher income volatility as mirrored in higher unemployment rates and on the supply side, restrictive lending standards as reflected in interest rate changes. They find both channels to be highly significant for cyclical fluctuations of personal insolvencies. Their findings are confirmed also for the provincial and city level for annual data ranging from 1987-2011 and house price data covering the period 1999-2012, which is particularly pronounced at the city level. With respect to the characteristics of defaulters, they identify mostly middle-class households. They report that the typical "middle-class filers" earned a regular income prior to the recession. Due to sudden unemployment they were no longer able to service their debt, hence facing financial difficulties. Surprisingly, however, Fieldhouse et al. (2012) document that cyclical movements in consumer-debt-to-income ratios as well as mortgage-debt-to-income ratios show a slightly negative or no correlation with insolvencies. They conclude that high debt levels do not simply suggest higher insolvency rates and that borrowing is pro-cyclical.

Garrett and Wall (2014) investigate the link between personal insolvencies and economic conditions. They use state-level data for the US, arguing that local economic conditions represent the relevant environment that matters for a household's economic situation. In line with Fieldhouse et al. (2012), they argue that labour market conditions rather than actual GDP growth are relevant for cyclical movement in personal bankruptcies.[5] They find that the length of a recession is key to whether bankruptcies are pro- or counter-cyclical. Longer recessions cause more households to face financial difficulties as they are more likely to suffer from one or perhaps even multiple adverse shocks and have to endure such shocks for a longer period of time.

The subsequent section provides some theory by emphasising the link between an economy's financial system, insolvency laws and household debt.

---

[5]Therefore, they determine their own state-level recessions, as NBER recession dates are deemed to be not appropriate.

3 On the Link between Financial Systems, Insolvency Laws and Household Debt

Petitions in bankruptcy can be filed when debtors are unable to meet their liabilities.[6] The number of petitions per year varies strongly across countries and depends on various factors. While negative shocks such as unemployment or unexpected expenses are unanimously identified as major drivers in the literature (see also Section 2), they are unable to explain prevailing varieties. Previous research has emphasised the role of institutions such as a country's legal origin and related mechanisms of contract enforcement (Berkovich and Israel, 1999; Djankov et al., 2007; Jappelli et al., 2008; Duygan-Bump and Grant, 2009). They determine how informational problems are dealt with in creditor-debtor relationships and thus shape an economy's financial system.

Economic theory categorises financial systems into bank-based and market-based systems (for a survey on the literature see Allen and Gale, 2001). While in bank-based systems credit contracts are typically based on stable long-term relationships between debtors and house banks (*relationship lending*), transactional contracts dominate in market-based systems, relying on the market as coordination mechanism (*arm's length lending*).[7] The underlying contract culture of the respective financial system reflects the relationship among lenders and borrowers and shapes lending practices accordingly, as reflected in the conditions of concluded contracts[8]. Whereas premature termination of relational contracts is generally very costly and, in case of unforeseen contingencies, contract conditions are typically renegotiated, transactional lending implies that contracts are more likely to be changed during its term, but leaving the option to terminate agreements[9]. This translates into comparatively high aggregate short-term debt and comparatively low aggregate long-term debt in market-oriented systems. The reverse holds true for bank-based financial systems which reveal a compar-

---

[6] In technical terms agents are insolvent when they cannot repay obligations on time, i.e. it refers to an agents financial state. Bankruptcy is defined as the legal process that helps to restructure debt. In this paper, we use the terms insolvency and bankruptcy interchangeably.

[7] The US and the UK are usually classified as market-based financial systems, and Germany and Japan as bank-based financial systems (see for instance Allen and Gale, 2001).

[8] That bank lending differs in market-based and bank-based financial systems is also confirmed by Kaufmann and Valderrama (2008).

[9] In the sense of Hischman's differentiation between exit and voice, relational contracts refer to the former and transactional contracts to the latter.

atively high long-term-to-short-term debt ratio.[10] With dominating short-term contracts, households' financial situation becomes more volatile as economic conditions largely dictate new terms and contract conditions. During an economic downturn, debtors face larger difficulties to handle negative shocks, increasing their probability to default (e.g. Bolton et al., 2013).

The type of the financial system can also be identified by means of the external finance premium. Due to informational asymmetries between lenders and borrowers a financing gap arises between the costs of internal and external funds. Unless a loan is fully collateralised, lenders protect themselves against opportunistic behaviour by collecting information about borrowers' creditworthiness (e.g. Rajan, 1992; Boot and Thakor, 1997). This leads to agency costs which appear in loan contracts as a premium. Agency costs decrease with the duration of a creditor-debtor relationship, because lenders gain an informational advantage as opposed to short-term relationships. The external finance premium should therefore be lower in bank-oriented systems. Although research on the latter dominates with respect to firm financing, Bernanke and Gertler (1989) explicitly refer to households in their seminal contribution as well. The significance becomes even more evident in an economy where house prices can be used as collateral to borrow against, as put forward by Aoki et al. (2004) for the case of the UK[11]. In such a setting, lenders mitigate risk by demanding collateral, reducing agency costs and accordingly the external finance premium (e.g. Bernanke and Gertler, 1989).

In case insolvency becomes inevitable, bankruptcy regulations come into play. The link between financial systems and bankruptcy laws has been formalised in a principal-agent framework by Berkovich and Israel (1999). Their analysis suggests that developed countries with a bank-based financial system should have a creditor friendly bankruptcy law, whereas market-based financial systems, should have a pro-debtor insolvency law. For bank-based financial systems, they propose a creditor chapter only because creditor rights are low. For market-based financial systems they propose a dual chapter code which enables both, creditors and debtors to commence bankruptcy, because creditor rights are strong.[12]

---

[10]For the empirical analysis we consider the structure of debt as a proxy for the respective financial systems.
[11]See also Muellbauer and Murphy (1994, 1997)
[12]That creditor rights tend to be low in countries with bank-based and high in market-based financial systems has also been confirmed empirically by LaPorta et al. (1997) (for a more detailed link between law and finance see also LaPorta et al. (1998)).

An objective of bankruptcy laws is to reduce coordination problems between creditors who want to collect debt (Jackson, 1986). A further objective is to set optimal incentives in the ex ante sense, i.e prevent debtors from over-borrowing. Given this, with debtor friendly regulations in place, debtors are more prone to moral hazard. Debtor friendly regulations can be characterised by a relatively fast and unbureaucratic discharge of financial obligations and relatively high exemptions in case of default, whereas the opposite holds true for creditor friendly regulations. In this context, informal values and norms often tend to be related to formal ones, shaping social sanctions of filing for bankruptcy accordingly. Indeed, the social stigma attached to insolvency is a crucial factors determining incentives (Efrat, 2006). The rising number of insolvencies in most economies suggests declining social sanctions throughout the last century, and particularly during the last two decades. Yet, variations remain and informal sanctions, such as loss of reputation, are closely associated with the degree of creditor or debtor friendliness of an insolvency law (see for instance Efrat, 2006; Sousa, 2014). Social punishment remains higher in creditor friendly economies, which additionally shapes decisions of potential defaulters.

Given the institutional background, we hypothesise that debtor friendly laws lead to a higher number of households' petitions to default. These effects should be amplified during recessions as households are more vulnerable and rather exposed to adverse shocks. Put, differently, we expect petitions to file for insolvency to behave pro-cyclical and to be more pronounced in market-based economies with debtor friendly bankruptcy laws.

4 Background on Personal Insolvency Regulations

This section provides background information on personal insolvency regulations. It begins with a short overview of the purpose of insolvency laws and then describes the procedures in Germany and the UK. These countries are interesting as their approaches to deal with private households' over-indebtedness are very heterogeneous. While the German legislation is rather concerned about debt restructuring as expressed in a relatively long-lasting insolvency period, UK legislations are more directed towards a fast discharge of residual debt acting as an insurance for unfortunate debtors. The two countries' traditions can roughly be considered as representative for the continental European and the Anglo-Saxon personal

insolvency systems. Section 3 has discussed the link between the type of financial systems and respective insolvency regulations. Whereas Germany matches the characteristics of a bank-oriented system, the tradition in the UK is based on market orientation (Allen and Gale, 2001).

Until the 1990s, the concept of debt relief did not exist in continental European legal systems (see for instance Niemi, 2012)). However, resulting from the sharp rise in household debt following financial market deregulation, the laws of many European countries have become more forgiving towards default since then. Numerous amendments show that they still struggle with finding an optimal balance between creditor protection and an insurance against the "new social risk of consumer over-indebtedness" (Heuer, 2013, p. 2). The social stigmata connected to the negative perception of personal bankruptcy gets more and more dissolved and is increasingly considered as a social insurance in many countries.[13] That notwithstanding, personal bankruptcy laws still differ strongly, even within the European Union as we exemplify on the basis of the legal systems in Germany and the UK.

The next two sections provide an overview of these countries personal insolvency laws.

4.1 Personal Insolvency Laws in Germany

Resulting from an increase in the number of private households suffering from overwhelming debt, a new insolvency statute for consumers was developed in 1994 and came into force in 1999[14]. As mentioned above, prior to that individuals had not been considered in the insolvency regulation and only firms had the legal right to default on their debt. Compared to firms, legal procedures for household defaults are subject to a more simplified procedure which proceeds in the following steps. Prior to requesting a legal insolvency procedure, it is compulsory for debtors to attempt an *out-of-court settlement* (§305 InsO). In case the settlement was not effective, a *judicial settlement* procedure opens where debtors have to provide a settlement plan listing all debts and assets. If the court and creditors with the highest claims agree to the settlement plan, all other creditors with low claims are voted down. In case there is no agreement, the *insolvency proceedings* open and the debtor's estate

---

[13]In ancient times, bankruptcy had a very punitive character, treating debtors as criminals (Tabb, 1991, p. 8).The word bankruptcy derives from bench-breaking, in latin: "banka" and "rupta", which was the main punishment for merchants that could not repay their debt in the middle ages.

[14]Until1998 the *Konkursordnung* from 1877 and the *Vergleichsordnung* from 1935 were in place.

is liquidated and proceedings are distributed among the creditors. After six years of good behavioural conduct and good faith, debtors can be discharged from residual debt (§§286-303 InsO).

Due to a reform of the personal insolvency law in July 2014, a debtor who has paid at least 35% of total debt can already get discharged of residual debt after three years. The aim of this reform was to facilitate an earlier "fresh start" for unfortunate debtors (see also table 1).

4.2 Personal Insolvency Laws in the UK

In the UK, the *Insolvency Act* and *Insolvency Rules* (1986) regulate personal and corporate bankruptcy. Whereas the insolvency law regulates only companies (*Companies Act 2006*), personal insolvencies are covered by the *bankruptcy law* with separate regional bankruptcy regulations for England & Wales, Northern Ireland, and Scotland. Despite some minor differences, all three regimes are rather debtor friendly, and bankrupt individuals can receive discharge from debt within less than twelve months. However, if the debtor acted strategically (e.g. in the sense of moral hazard or strategic default), restrictions reach up to 15 years before a discharge.

In England & Wales insolvent households have several options to get their debt restructured. Alternatives to filing for bankruptcy include for instance "Debt Management Plans", "Administration Orders" or "Individual Voluntary Arrangements" (IVA) (Part VIII of the Insolvency Act 1986). For all alternatives debt gets restructured through arrangements between the insolvent household and the respective creditors. Moreover, since April 2009, insolvent households whose liabilities remain below a certain threshold (15.000 £) have been given the opportunity to apply for a "Debt Relief Order" (DRO). With the aim to impede social exclusion of households at the lower end of the income and wealth distribution, DROs may work as an insurance against poverty traps: They are only eligible for individuals with very little wealth (<300 £) and low disposable income (<50 £per month) (Chapter 4 of the Tribunals, Courts and Enforcement Act 2007)[15]. Northern Ireland has also introduced DROs in June

---

[15]For more detailed information see also: https://www.gov.uk/options-for-paying-off-your-debts/overview

2011, whereas Scotland has introduced LILAs (in Q2-2008), as a solution for "Low Income Low Asset" households, which are very similar to DROs.

Contrary to the German law, debtors in the UK can choose from these alternatives. The "bankruptcy option" (Part IX of the Insolvency Act 1986) is the one which is closest to German insolvency: insolvent households can either declare themselves bankrupt, their creditors can declare debtors bankrupt or, if debtors do not adhere to a previously arranged IVA, an insolvency practitioner can apply to declare them bankrupt. Once a bankruptcy order by a court is issued against them, the bankrupt individual has to officially explain his or her situation, assets will be governed by a court-appointed trustee and sold to repay the creditors, he or she has to adhere to certain bankruptcy restrictions and the case will be made public in the "Individual Insolvency Register".[16] After twelve months, remaining liabilities and the bankruptcy restrictions are typically released, though, assets from the estate can still be used to pay the remaining debt off. In Scotland and Northern Ireland, insolvency procedures are very similar.[17] Scottish insolvency law uses the term *Sequestration*.

Table 1: Features of consumer insolvency laws across countries

Country	GER	UK		
		ENG & WLS	NIR	SCT
Debt relief	after 6 years §§286ff InsO	12 months	12 months	12 months
Reforms	1 July 2014 Proceeding: 3 years*	DRO (Q2- 2009)	DRO (Q3-2011)	LILA (Q2-2008)
Main Source	German Insolvency Regulation	Part IX of the Insolvency Act 1986	DETI Insolvency Service	Office for the Accountant in Bankruptcy (AiB)

Source: Country Specific Insolvency Laws.

*If 35% of debt has already been discharged.

---

[16]In Germany, data privacy protection prohibits a public register.
[17]For a more detailed description see http://www.aib.gov.uk/debt for Scotland and http://www.nidirect.gov.uk/what-happens-when-you-become-bankrupt/ for Northern Ireland.

4.3   German versus UK Personal Insolvency Procedures

Comparing the German and the British approach to dealing with over-indebted individuals, two main differences can be identified. The first one is the benevolence towards debtors in the UK as expressed for instance in the relatively uncomplicated procedure and short duration before residual debt gets discharged, as opposed to Germany where debtors have to go through a longer and more bureaucratic process to finally get resolved from remaining debt.

The second difference emerges from the variety of options to dealing with over-indebtedness in the UK. Debtors are given the right to choose their own solution when they face difficulties to meet financial obligations. To restrain debtors with assets from opting for official bankruptcy, and hence, debt discharge, authorities in the UK are pursuing the "can pay, should pay" approach, encouraging debtors to repay liabilities by means of informal debt management tools (e.g. McKenzie Skene and Walters, 2006). At the same time overextended households who are living with a subsistence income are given the opportunity to receive relatively unbureaucratic and fast discharge from debt, as also shown by the recent reforms with the amendments of debt relief tools for households with little income and wealth (DROs in England and Wales and Northern Ireland, and LILAs in Scotland). German households on the contrary, have only one possibility namely to default legally. In this process however, an informal debt settlement approach between debtors and creditors is mandatory before going to court.

5   Data and Descriptive Statistics

To empirically investigate how personal insolvencies and insolvency petitions are affected by economic conditions and the role of insolvency laws therein, we build a data-set consisting of Germany and the UK with times series ranging from 2003-2014. All data is quarterly. Both economies were affected differently by the 2007-2008 financial crisis. The economic downturn was not only more severe in the UK, but also more prolonged (see also Figure 3). According

to data from ECRI (European Cycle Research Institute), the great recession in Germany lasted from Q2-2008 until Q1-2009 and in the UK from Q2-2008 until Q1-2010.

Similarly, macroeconomic conditions such as unemployment and inflation are different in both countries during the period under scrutiny. Most macroeconomic variables are drawn from *Eurostat* or the *OECD (Main Economic Indicators)* database (Table 7). Figure 4 depicts unemployment rates: in Germany, unemployment was highest in Q1-2005, with 11,5 %, and constantly decreased thereafter, mainly as a result of the "Agenda 2010", an extensive structural reform of the German labour market and the social system[18]. In the aftermath of the crisis, there was a short but minor increase in unemployment again. Unemployment in the UK behaves in the opposite way, with very low rates before the crisis (4,55 % evidence in Q2-2005), steadily increasing thereafter and reaching a peak in Q3-2011. The more distant the crisis, the more does unemployment decline again. Differences can also be observed for inflation rates (see Figure 5 and Table 2). Whereas time series look similar for both countries before the crisis, inflation rates are higher for the UK thereafter. Overall, inflation is lower Germany, including even a short deflationary period in 2009.

House prices are reported in quarterly changes of house price indices. From Tables 2, we can see that the volatility of house prices in the UK is very high compared to Germany. In particular the spread of house price changes between 2003 and 2009 is exceptionally high in the UK (see also Figure 6). The exceptionally low volatility of house prices in Germany has also been described by Belke (2010). Aoki et al. (2004) provide an explanation of house prices for the UK. They emphasise special characteristics such as their role as collateral to borrow against, rendering credit subject to their volatility. House prices began to decrease sharply end of 2007 until Q2-2009, and then started to increase again. The observed weakness in housing markets has put additional pressure on financially fragile home-owners. Given this, Nielsen et al. (2010) report that the proportion of households with a loan-to-value ratio over 75 % was very high end of 2009 compared to 2007.

These reported different economic developments in particular during the recession are deemed to put additional strain on the sustainability of household debt as they influence

---

[18]In the course of the Agenda 2010, new instruments of labour market policy were introduced and the labour markets and social benefits and unemployment benefits were combined. Moreover, since the reform long-term unemployed are forced to accept any job offer which is deemed to be reasonable for them (Goecke and Schröder, 2013)

credit market conditions. Under adverse economic developments one should expect indebted households to be exposed to possibly even multiple or more severe shocks, inducing them to default earlier.

Data on personal insolvencies for Germany are extracted from the *Statistische Bundesamt (destatis)*. We look at two different variables. First, the numbers of petitions to file for insolvency ($InsolPet$) and actual filings ($Insol$). Because insolvency regulations vary strongly between Germany and the UK (see Section 4), we compare those elements of the insolvency laws that are most similar. Resulting from the different procedures, one has to be very careful and precise with the interpretation. Our definition of petitions to file ($InsolPet$) includes all available data on petitions on both countries.[19] Actual insolvencies ($Insol$) comprise only the cases which appear before a court and no settlement is achieved. Table 7 provides a more detailed description on how the respective variables are composed.[20] Data for the UK is drawn from the *Insolvency Service* by the British government. As described in Section 4.2, personal bankruptcy is regulated in three different regions, England & Wales, Scotland and Northern Ireland. Despite the local separation, the insolvency regulations are qualitatively the same across all regions. As other time series data is only available for the UK as a whole, we sum up the numbers from the respective regions to create the variables for our analysis. From Figure 7 which displays (actual) personal insolvencies in the single regions, one can see that England & Wales account for the largest share, followed by Scotland and Northern Ireland respectively.[21] Figure 8 displays the absolute number of insolvencies as well as petitions since 2004 in both countries. One can see that in absolute numbers both, petitions and actual filings are higher in Germany. However, accounting for the size of the population (approx. 81,1 mio. in Germany[22] and approx. 64,6 mio. in the UK[23]), relative values of petitions to file are slightly higher for the UK than for Germany. Actual insolvencies remain lower, which can be ascribed to the different insolvency procedures in the two countries. This has to be evaluated with care

---

[19] Unfortunately, data for Out-of-Court settlements in Germany is not available. For the UK, data on debt management plans is not available.

[20] Note that, from January - August 2011, courts in the Saarland (the smallest German Bundesland) have reported only low numbers of insolvencies, which were added to the statistics in September 2011. Data during that time period therefore has to be interpreted with care.

[21] Over time some amendments have been made to the single laws, particularly creating advantages for households with little or no wealth: debt relief orders (DRO) (as described in Section 4.2) have been introduced in Q2-2009 in England and Wales, in Q3-2011 in Northern Ireland. In Scotland, LILAs (low-income-low-assets) were introduced in Q2-2008.

[22] Destatis.

[23] ONS.

though, as data exclude Out-of-Court settlements in Germany and debt-management plans as well as administration orders in the UK. Turning now to the development of insolvencies over time, one can see from Figure 8 that insolvency petitions and actual filings are strongly correlated, yet the difference between the two variables is larger for the UK. This may be explained by the different procedures to deal with overindebtedness in the two countries. Note that a careful interpretation is required though, as we define proxies due to restrained data availability on informal procedures[24]. For Germany we observe a sharp increase until mid-2006. This is mostly attributable to the fact that a law regulating personal insolvencies was only introduced in 1999, and households got used to this opportunity to default only gradually over time. Interestingly, during the financial crisis insolvencies decreased again and increased only slightly thereafter. The picture looks different for the UK: from 2003 onwards personal filings increased and fell between mid-2006 until mid-2007, rising thereafter and throughout the great recession, and reaching a peak in mid-2010. Apart from the crisis, this peak could possibly also be ascribed to the introduction of LILAS in Scotland in 2008 and DROs in England and Wales in April 2009 which prevented many households from filing before that date, expecting an easier and less bureaucratic procedure with the amendments. After 2010, the number of defaults dropped steadily (see also Figure 7), and increased only slightly again in 2011, which could also be partially due to the introduction of DROs in Northern Ireland.

Figure 11 depicts interest rates: Short-term interest rates decrease immediately after the crisis, with lowest levels in 2013 in the UK (0,49 %) and Q4-2014 in Germany (0,08 %). Long-term interest rates decrease rather gradually with lowest levels in Q3-2012 in the UK (1,68 %) and in Q4-2014 in Germany (0,7 %). Throughout the whole time period, long-term interest rates in the UK are higher than in Germany; short-term interest rates were also higher in the UK before the crisis, while the opposite is true during 2010 until the end of 2011. Figure 12 displays key ratios related to interest rates: the spread of long-term and short-term interest rates (IR_Spread), the interest rate coverage ratio (IRC) reflecting households ability to service their debt, and a proxy for the external finance premium on long-term/housing debt ($Wedge$), i.e. the wedge between an average of various lending and

---

[24]Due to a lack of data for Out-of-Court settlements in Germany and because petitions and insolvencies are strongly correlated, we attribute a higher meaning to actual insolvencies in Germany

Table 2: Descriptive Statistics, Germany and the UK

Variable	Obs	Mean	Std. Dev.	Min	Max
Insol_DE	48	26981.38	5897.885	12819	33664
InsolPet_DE	48	28602.900	5791.116	14631	35309
GDP_Real_diff_DE	48	1622.039	13125.75	-34181.11	23297
Unempl_DE	48	7.773	2.111	4.770	11.500
Debt_LT_DE	48	1462928	20751.52	1431930	1519615
Debt_ST_DE	48	80028.940	9387.584	65416	102712
i_LT_DE	48	3.019	1.095	0.700	4.34
i_ST_DE	48	1.919	1.458	0.08	4.98
Debt_Inc_DE	48	2.961	0.279	2.520	3.504
HP_Index_Old_DE	48	102.796	4.831	97	113.700
IRC_DE	48	7.5140	3.899	1.022	13.326
IR_Spread_DE	48	1.099	0.863	-0.720	2.520
LTST_Debt_DE	48	18.472	2.101	13.809	22.011
Wedge_DE	48	1.536	1.3123	-1.167	3.867
Infl_DE	48	1.663	0.799	-0.433	3.267
Insol_UK	48	17089.150	5323.729	7421	27027
InsolPet_UK	48	24360.400	7814.845	8232	36299
GDP_Real_diff_UK	48	-74.967	16453.500	-44005.740	18554.600
Unempl_UK	48	6.296	1.333	4.550	8.450
Debt_LT_UK	48	1165762	187843.400	740796	1384942
Debt_ST_UK	48	190656.300	16043.350	152825	216388
i_LT_UK	48	3.767	1.058	1.680	5.210
i_ST_UK	48	2.818	2.155	0.490	6.310
Debt_Inc_UK	48	3.334	0.533	2.359	4.270
HP_Index_Old_UK	48	167.898	19.212	123.400	207.079
IRC_UK	48	10.394	4.160	4.099	18.999
IR_Spread_UK	48	0.949	1.373	-1.520	3.450
LTST_Debt	48	5.949	0.962	4.665	7.972
Wedge_UK	48	-0.255	3.553	-5.124	3.778
Infl_UK	48	2.513	0.988	0.900	4.800

Source: Destatis, ONS, OECD, Eurostat. Own calculations: Debt-to-income ratio (*Debt_Inc*), Interest-rate ratio (*IR_Ratio*), Interest rate coverage ratio (*IRC*), Long-term-to-short-term-debt ratio (*LTST_Debt*), Wedge.

policy rates. For a detailed description of calculations see Table 7. Whereas the debt-to-income ratio behaves the differently for Germany and for the UK (Figure 9), the interest rate coverage ratio increases for both countries prior to the crisis and decreases thereafter, mostly due to the sharp drop in interest rates in both countries, yet, with a higher mean for the UK. The external finance premium is higher for the UK, confirming the dominance of market-based financial system features.

Data on household indebtedness (long-term and short-term debt) is drawn from the OECD Statistics database. Figures 9 and 10 show the debt-to-income ratio ($Debt\_Inc$) and the ratio of long-term-to-short-term debt ($LTST\_Debt$), respectively. Both ratios behave completely contrary for the two countries. The debt-to-income ratio in Germany slightly decreases over time, while we observe a sharp increase in the UK up to 2007, followed by a slight decrease thereafter. This sharp increase prior to the crisis in the UK coincides with a rising number of insolvencies thereafter. One reason might be that prior to the financial crisis, household debt was relatively more sustainable. Another reason might be the above described amendments to the bankruptcy regulation. The long-term-to-short-term debt ratio is substantially lower in the UK than in Germany pointing to different debt structures of market-based and bank-based economies with short-term loans predominating in the UK and long-term loans in Germany. The respective contract cultures are mirrored in high long-term debt in Germany and high short-term debt in the UK. In this respect, it is also interesting to take a more detailed view at the structure of private household debt. According to the bank lending survey of the Bank of England (Banking Statistics, January 2014), only 36 % of households in the UK hold mortgage debt, while 52 % hold unsecured debt of which 35,82 % constitutes credit card debt and 64,17 % are instalment or other personal loans. In Germany, outstanding mortgage debt amounts up to 78,99 % (in March 2014), instalment loans to 13,97 % and other personal loans to 11,30 % (Deutsche Bundesbank, Bankstatistik).

The structure of debt with dominating long-term contracts in Germany and dominating unsecured short-term credit in the UK may reflect the credit conditions in the respective countries. The Bank of England, Banking Statistics (January 2014) also include information about the lenders: while only 67,18 % of unsecured consumer loans are granted by monetary financial institutions, 32,82 % are managed by other, so-called "Consumer Credit Granters" that provide (unsecured) credit to consumers[25]. Whereas usury in Germany is legally regulated (§138 BGB, §291, Abs. 1, 2 StGB), there is no formal regulation in the UK and shadow banks can charge usurious interest rates for credit[26]. This can be particularly harmful for potentially poor debtors who may have no alternative to cover liquidity problems.

---

[25]Data is from the "Monthly Survey of Consumer Credit Grantors" which is conducted by the ONS.

[26]In November 2013 a change in the law (Banking Reform Bill) has been announced. See https://www.gov.uk/government/news/government-to-cap-payday-loan-costs

6 Empirical Analysis

6.1 Factor Analysis

We conduct a factor analysis to minimise the number of independent variables in our model. Many variables that might influence personal insolvencies are naturally correlated. By identifying correlated variables and concentrating them in factors, we circumvent multicollinearity in the regressions. The macroeconomic variables accounted for in the factor analysis are GDP growth, the unemployment rate, inflation, and the house price index (of pre-owned dwellings). Variables representing households' financial status are the interest rate coverage ratio, the ratio of long-term-to-short-term debt and the debt-to-income ratio. Credit conditions consist of the interest rate spread between long-term and short-term interest rates and the wedge between an average of mortgage lending rates and the central bank policy rate as a proxy for the external finance premium (see also Section 5).

We receive three factors with eigenvalues larger than one for both countries[27]. For Germany these three factors cumulatively explain 66,99 % and for the UK, 70,96 % of the total variance. For both countries we get nine factors in total, explaining 100 % of the total variance. However, six factors have eigenvalues below one. The resulting screecharts are displayed in Figure 1, showing a kink after the third eigenvalue, and hence, additionally confirming the extraction of three factors for both countries (Backhaus et al., 2010, p.359).
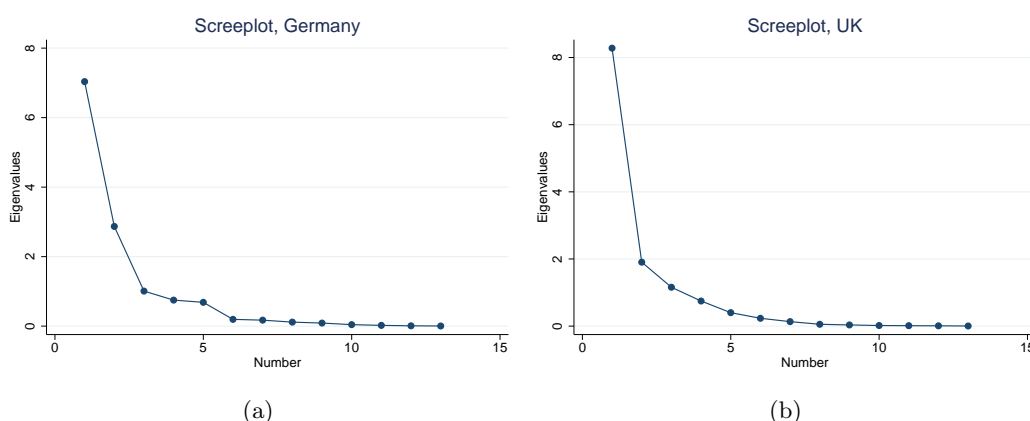

(a) (b)

Figure 1: Screeplot after factor loading of eigenvalues for (a) DE and (b) UK

---

[27]According to the Kaiser criterion, factors with eigenvalues larger than one should be preserved.

The retained three factors are then rotated to facilitate the interpretation.[28] Table 3 and Figure 2 present the rotated factor loadings from an orthogonal[29] varimax rotation.

We begin by describing the factors for Germany and turn to the UK thereafter. As insolvencies are central to our analysis, we make a connection already. Factor 1 for Germany explains 24,67 % of the total variance and reveals a strong positive correlation with the proxy for the external finance premium and the interest rate spread. We refer to this factor as *financial fragility factor* as both variables point to unfavourable credit conditions. Unfavourable changes in credit conditions have adverse effects on those who require external finance and hence affect their financial fragility. An increase in this factor may therefore be associated with an increase in personal insolvencies. Factor 2 explains 22,19 % of total variance and correlates positively with the interest rate coverage ratio, the long-term-to-short-term debt ratio and inflation and negatively with the debt-to-income ratio. It reflects *households' financial situation.* Its components are somewhat ambiguous, though, in particular the strong positive correlation of the interest rate coverage ratio, which reflects the ability to service one's debt, as all other components point to rather favourable credit conditions. One explanation follows from the composition of the interest rate coverage ratio, as can be seen from Table 7. Nominal interest rates are in the numerator, hence inflation enters indirectly (via the Fisher relation). In this respect, higher inflation may very well be linked to a high interest rate coverage ratio. Another explanation follows from the sharp drop in both long-term and short-term interest rates in the course of the great recession which additionally distorts the value of the interest rate coverage ratio (see Figure 11). Factor 3 reveals a positive correlation with the unemployment rate and the house price index (although, relatively weak) and a negative correlation with GDP growth, explaining 20,13 % of total variance. High unemployment and weak growth pose a strain to *macroeconomic stability* and insolvencies may therefore become more likely.

With regard to the UK, factor 1 explains 36,19 % of total variance and correlates positively with the debt-to-income ratio, the interest rate spread and the proxy for the external finance premium, and negatively with GDP growth, the house price index and the interest rate coverage ratio. Like in Germany's factor 2, the interest rate coverage ratio seems to be out of place. Yet, the correlation with this factor is markedly weaker compared to the other variables

---

[28]Note that the rotated factors explain less variance than original factors which are computed to be optimal.

[29]We choose an orthogonal rotation of the axis which leaves the angels and distances unchanged (Harman, 1976, p.290)
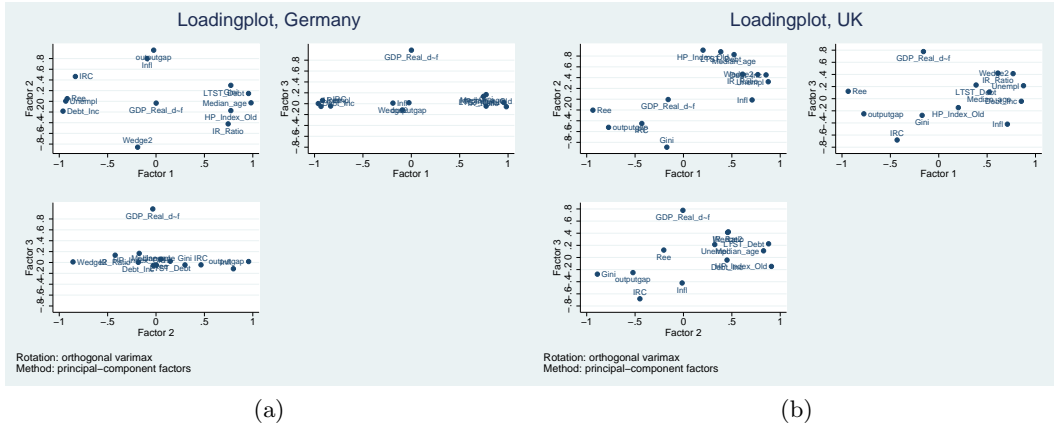
Figure 2: Loadingplots for (a) DE and (b) UK

Table 3: Rotated Factor Loadings

Variable	F 1 (DE)	F 2 (DE)	F 3 (DE)	F 1 (UK)	F 2 (UK)	F 3 (UK)
Unempl	0.1972	-0.1896	**0.8043**	0.0292	-0.0536	**0.8934**
GDP_Real	0.1379	0.1412	**-0.8223**	**-0.7513**	-0.2345	0.2258
Debt_Inc	-0.2053	**-0.6972**	0.2445	**0.7434**	0.0667	-0.4938
HP_Index	0.0432	-0.0474	**0.5300**	**-0.6960**	0.0447	-0.2282
IRC	-0.2014	**0.8000**	-0.1745	**-0.5103**	0.4732	-0.4685
IR_Spread	**0.9552**	0.1006	-0.0027	**0.7673**	0.0112	0.1630
LTST_debt	0.4713	**0.5940**	0.1950	-0.1264	**-0.7456**	0.1482
Wedge	**0.9689**	-0.0614	0.0193	**0.8821**	-0.2736	0.1453
Infl	0.0655	**0.6680**	-0.2816	-0.1089	**0.8809**	0.0015

Strongest correlations of the variables with the respective factors are marked in bold. DE: all factors in differences, except the IR_Spread and Wedge. UK: all factors in differences, except the unemployment rate. The factors which are not in differences exhibit stationary time series. Unit root tests (Dickey-Fuller, DF-GLS, KPSS).

the factor correlates with. Due to the dominance of the other variables, the composition of this factor points to *financial and macroeconomic fragility*. Factor 2 explains 18,83 % of total variance and correlates with variables that may reflect *borrowing conditions and behaviour* in a broad sense. It reveals a positive correlation with the inflation rate and a negative correlation with the long-term-to-short-term debt ratio. A low long-term-to-short-term debt ratio suggests an increase of short-term relatively to long-term debt. In this respect, borrowers benefit from higher inflation as it reduces the real burden of debt. Finally, Factor 3 captures high *unemployment*, explaining 15,93 % of the variance. As negative income shocks act as an additional threat for borrowers, we expect this factor to be positively associated with defaults. Although, the main goal of the factor analysis is the reduction of independent variables, the

result itself is very interesting, as it reflects country specific characteristics. Despite some similarity of the three factors across the two countries, we also observe striking differences. These differences are not surprising, as we have already described in Section 5 that financial and macroeconomic conditions varied strongly for Germany and the UK, in particular during the period under scrutiny.

6.2 Dynamics of Personal Insolvencies

This section presents our estimation strategy and discusses the results. We employ a SUR-TAR model for two reasons: the SUR model allows us to capture shocks hitting both countries. More precisely, it allows for correlation of error terms across countries, while dependent and independent variables remain country-specific. The rationale behind this is that we face growing economic interconnectedness, while being interested in insolvency dynamics in each of the countries. The TAR model (threshold auto-regression) accounts for nonlinearities in time series and is applied as we investigate two differing regimes, namely the dynamics of insolvencies during the crisis period and during "normal" times. Moreover, we allow asymmetric effects by distinguishing between higher and lower levels of insolvencies compared to the previous period. To the best of our knowledge, a combination of the two models has not been applied before.

Thus to analyse the dynamics of insolvencies in Germany and the UK, we test whether a rise in the level of insolvencies compared to the preceding period behaves differently than a drop in the level of insolvencies compared to the preceding period and whether these dynamics change during the crisis. In a first step, we analyse petitions for insolvencies and in a second step, actual insolvencies.[30] We first run the following SUR-TAR model for petitions for Germany

$$
\begin{aligned}
InsolPet_t =& \beta_0 + \beta_1 InsolPet_{t-1}^+ + \beta_2 InsolPet_{t-1}^- + \beta_3 InsolPet_{t-1}^+ * Rec_{t-1} \\
& + \beta_4 InsolPet_{t-1}^- * Rec_{t-1} + \beta_5 Rec_t + \beta_6 Fact1_{t-1} + \beta_7 Fact2_{t-1} \quad (1) \\
& + \beta_8 Fact3_{t-1} + \beta_9 Trend_t + \beta_{10} Trend_t^2 + \beta_{11} Out_i + \epsilon_t.
\end{aligned}
$$

---

[30]Note that both variables are not perfectly comparable for Germany and the UK due to differing procedures to handle insolvencies (see Section 4). Yet, we apply a fairly good proxy as described in Section 5.

and for the UK

$$
\begin{aligned}
InsolPet_t =& \beta_0 + \beta_1 InsolPet^+_{t-1} + \beta_2 InsolPet^-_{t-1} + \beta_3 InsolPet^+_{t-1} * Rec_{t-1} \\
& + \beta_4 InsolPet^-_{t-1} * Rec_{t-1} + \beta_5 Rec_t + \beta_6 Fact1_{t-1} + \beta_7 Fact2_{t-1} \\
& + \beta_8 Fact3_{t-1} + \beta_9 D.Insol_t + \beta_{10} Out_i + \epsilon_t.
\end{aligned}
\tag{2}
$$

And the following for actual insolvency filings for Germany

$$
\begin{aligned}
Insol_t =& \beta_0 + \beta_1 Insol^+_{t-1} + \beta_2 Insol^-_{t-1} + \beta_3 Insol^+_{t-1} * Rec_{t-1} \\
& + \beta_4 Insol^-_{t-1} * Rec_{t-1} + \beta_5 Rec_t + \beta_6 Fact1_{t-1} + \beta_7 Fact2_{t-1} \\
& + \beta_8 Fact3_{t-1} + \beta_9 Trend_t + \beta_{10} Trend^2_t + \beta_{11} Out_i + \epsilon_t,
\end{aligned}
\tag{3}
$$

and the UK

$$
\begin{aligned}
Insol_t =& \beta_0 + \beta_1 Insol^+_{t-1} + \beta_2 Insol^-_{t-1} + \beta_3 Insol^+_{t-1} * Rec_{t-1} \\
& + \beta_4 Insol^-_{t-1} * Rec_{t-1} + \beta_5 Rec_t + \beta_6 Fact1_{t-1} + \beta_7 Fact2_{t-1} \\
& + \beta_8 Fact3_{t-1} + \beta_9 D.Insol_t + \beta_{10} Out_i + \epsilon_t,
\end{aligned}
\tag{4}
$$

where t refers to the time subscript, $t = 1, ..., T$. The models differ slightly for the two countries as described below. The dependent variables $InsolPet_t$ and $Insol_t$ refer to the number of insolvency petitions and actual insolvencies, and $(InsolPet^+_{t,i}/Insol^+_{t,i})$ and $(InsolPet^-_{t,i}/Insol^-_{t,i})$ to previous periods higher and lower levels in the number of petitions and actual insolvencies, respectively. As outlined in the previous section, a range of explanatory variables are bundled in factors retrieved from a factor analysis to resolve the problem of multicollinearity ($Fact_j$ with $j = 1, 2, 3$). It is important to note that they are not the same across countries (see Section 6.1). $D.Insol_t$ is a dummy controlling for changes in insolvency laws, i.e. introduction of DROs in the UK. For Germany, we impose a trend, linear ($Trend_t$) and squared ($Trend^2_t$), to account for the steep increase in insolvencies until 2006. Out_i controls for outliers of the residuals[31]. ϵ_t is the error term. The model includes two interaction terms: increases or reductions in the level of insolvencies (petitions) during the recession (Rec_t).

---

[31]There is one outlier in each country: DE 2006-Q4 and UK 2010-Q4.

Results for Insolvency Petitions: Table 4 displays the estimation results for insolvency petitions as dependent variable. Post estimation, the Breusch-Pagan test confirms the choice of the SUR model as the null hypothesis of no correlation is rejected (see bottom of Table 4). Our test for asymmetry in higher or lower levels of insolvency petitions suggests that there is no statistically significant difference between the two variables. Hence, we can reduce the model by reuniting them in one variable. Therefore, we proceed with the following model for Germany

$$
\begin{aligned}
InsolPet_t =& \beta_0 + \beta_1 InsolPet_{t-1} + \beta_2 InsolPet_{t-1} * Rec_{t-1} \\
& + \beta_3 Rec_t + \beta_4 Fact1_{t-1} + \beta_5 Fact2_{t-1} + \beta_6 Fact3_{t-1} \\
& + \beta_7 Trend_t + \beta_8 Trend_t^2 + \beta_9 Out_i + \epsilon_t.
\end{aligned}
\tag{5}
$$

and the UK

$$
\begin{aligned}
InsolPet_t =& \beta_0 + \beta_1 InsolPet_{t-1} + \beta_2 InsolPet_{t-1} * Rec_{t-1} \\
& + \beta_3 Rec_t + \beta_4 Fact1_{t-1} + \beta_5 Fact2_{t-1} + \beta_6 Fact3_{t-1} \\
& + \beta_7 D.Insol_t + \beta_8 Out_i + \epsilon_t,
\end{aligned}
\tag{6}
$$

Table 5 contains the estimation results of Equation (5, first column) and (6, second column). Again, the Breusch-Pagan supports the SUR estimation. One can see that the coefficients for insolvency petitions in the UK (see column 1) are substantially higher than in Germany (see column 2). This is also confirmed by the post estimation tests, where we cannot reject the hypothesis that petitions in the UK are more persistent than in Germany. The point estimate of the interaction term is not statistically significant, hence, the dynamic behaviour of insolvencies does not change during recessions. The dummy for recessions is not significant in any of the two countries (i.e. there is no level effect).

Regarding the control variables, we find that two factors are significant in the UK, whereas none has an impact in Germany. An increase in Factor 1, which represents financial and macroeconomic fragility in the UK, increases the number of petitions. A rise in unemployment (the third factor correlates only with unemployment) increases insolvency petitions (see column 1, Table 5). The strong effect of unemployment on personal insolvencies is in line with the findings in Fieldhouse et al. (2012) for Canadian data.

Results for Actual Insolvencies: Turning now to actual insolvencies, the estimation results reported in Table 6 deviate from those for petitions in several aspects. First, in contrast to the UK, we find lower levels of insolvencies in the previous period being significantly more persistent than higher ones for Germany. Second, the p-value for the Breusch-Pagan test is relatively high (0.1414), suggesting that the SUR estimation is not an optimal choice. However, for the sake of comparability across countries and as country specific regressions do not alter the outcome, we do not change the estimation strategy.

Apart from that, there are only minor deviations compared to the results for petitions. Defaults are more persistent in the UK than in Germany, which is true for both higher and lower levels as reported at the bottom of Table 6. Surprisingly, the dummy for the recession is highly significant in the UK for actual filings (level effect), i.e. we do observe an increase in actual insolvencies during the recession. In contrast, we do not find an impact of the recession in Germany.

Contrary to insolvency petitions, exclusively the third factor in the UK is significant. Thus, unemployment is a relatively robust factor driving financial difficulties. The results for Germany are in line with those for petitions: neither the recession nor any of the factors affect defaults. The next section provides an interpretation of the results. We begin by analysing the observed persistence of insolvencies and turn to outside (macro)economic influences thereafter.

6.3 Interpretation of Results

Persistence of Insolvencies: Persistence is defined as a tendency to show rather small changes over time. After adverse economic developments that cause a rise in insolvencies, the effects may be either long-lasting or short-lived. Apart from the effect on insolvencies themselves there may be also feedback effects on the economy. Put differently, after an external shock it takes longer for time series to return to their previous level.

That time series in the UK are more persistent than in Germany is not surprising, given the nature of the underlying market-based financial system on the one hand, and the social acceptance of filing for insolvency on the other. The first argument is supported by May et al. (2004) who report that bankruptcies in the UK are mainly caused by unsecured short-term debt which is British households main instrument of consumption smoothing as we

have shown in Section 5. The comparatively high proportion of short-term debt in the UK may explain the observed higher persistence as overlapping short-term credit contracts may induce relatively more households to default on their debt with a higher frequency. This may cause an "avalanche" of insolvencies. Regarding the second point, literature with a close proximity to sociology and jurisprudence emphasises that, as legal benevolence towards debtors increased over time, filing for personal insolvency became increasingly accepted in a society (e.g. Efrat, 2006; Sousa, 2014). Thus, higher persistence in the UK may be also explained by a lower inhibition level to file for bankruptcy, resulting from the long history of insolvency laws compared to Germany. While British households might be more familiar with the instrument of debt relief and dealing with over-indebtedness publicly, German households are less "used" to it, and hence rather back away from their default option, as insolvency for individuals and related debt relief were only introduced in 1999.[32]

Whereas in the UK we find no signs of asymmetries in the dynamics of insolvencies, for Germany we observe that a reduction of actual insolvencies is more persistent. This implies that once the number of insolvencies decreases, it remains relatively longer at a lower level, whereas an increase in insolvencies is less long-lasting. The sharp rise in insolvencies after the enforcement of the regulation in 1999, which constitutes a non-recurring event, was followed by a slight downward movement (see Figure 8). Although we controlled for the observed increase by imposing a trend, this downward movement might not have been (fully) captured. However, we do not find asymmetric effects for petitions in Germany. While our variable for petitions in Germany comprises all applications to default legally, actual insolvencies refer to those cases which enter an official insolvency procedure. The deviations of petitions and actual filings may be ascribed to procedural effects in general and to the authorities who decide about the approval or rejection of an insolvency petition in particular. That judges' lenience matters for the outcome of an insolvency proceeding has also been found by Blazy et al. (2011) (for the case of France though).[33]

---

[32]In the UK, official consumer bankruptcy dates back to 1986, IVAs (Individual Voluntary Arrangements) however existed already in the early nineteenth century (e.g. McKenzie Skene and Walters, 2006).

[33]An alternative force driving the asymmetries in the dynamics may be changes in the assistance for court fees in September 2006 (Judgement by the German Federal Supreme Court of Justice Az. XI ZB 24/06)[34]. Courts were no longer allowed to reject a proposal if an applicant was unable to reimburse the legal costs of the procedure. Debtors have to be given the opportunity to defer their payments (§4a InsO).

Reaction to Business Cycle Developments: Surprisingly, we find no effect of a recession on petitions for insolvencies, neither for Germany nor the UK. For the case of actual insolvencies in the UK, a recession has a significant effect though. While the rather market-based system with dominating short-term debt and the pro-debtor insolvency regulation certainly play a role here, different insolvency procedures hinder perfect comparability. In Sections 4 and 5 we described the respective procedures of filing and the definitions of the two dependent variables. Actual filings comprise those cases which appear before a court and which eventually receive debt relief. British households can choose from a variety of options to deal with their burden of debt, while German households have only the one option of official default.[35] The severity and the duration of the recession, which also may have induced further adverse events, may have driven British households into serious repayment difficulties. The observation that actual filings increased in the UK during recessionary times, while petitions did not, suggests that relatively more households opted for the "official bankruptcy procedure" where residual debt is discharged, while alternative options (which are included in the variable for petitions) aiming to help debtors to manage their liabilities and, ideally, to repay it, were possibly not practicable or insufficient. Indeed, the first factor, representing financial and macroeconomic fragility, and the third factor, representing unemployment, have a significant effect on petitions; the third factor is also significant for the case of actual insolvencies in the UK. Thus, unemployment, which increased sharply during the crisis and remained at a higher level thereafter (see also Section 5), is very robust as a driver for insolvencies.

Moreover, Nielsen et al. (2010) report that British households suffered from tightening credit conditions in 2009, in particular those with high loan-to-value ratios. Lenders tightened particularly unsecured credit, although also for secured debt scoring criteria became tougher. The combination of multiple adverse effects may explain the different reactions during the crisis between petitions and actual defaults in the UK.

In general, (macro)economic conditions tend to influence neither petitions nor actual insolvencies of German households as neither the recession nor any of the factors show a significant effect. This may be explained by less debtor friendly conditions with respect to debt discharge, on the one hand, as households might be rather reluctant to default. On the other

---

[35]This option is subject to a mandatory out-of-court settlement before the petition. Subsequently, the petition might still be rejected, for instance owing to the lack of assets.

hand, in a bank-based financial system, with predominantly long-term relationships between lenders and borrowers, debtors are protected from sudden changes in credit conditions. In this regard, Bolton et al. (2013) find that relationship lenders provide more favourable continuation terms during a crisis. An alternative explanation may be that individuals who are not creditworthy may be refused credit in the first place. This would imply that those owing debt remain able to service it even during the recessionary times. Clearly, the duration and severity of the latter is of crucial importance in this regard, but also the lower incentive to file for bankruptcy due to the creditor friendly insolvency law.

7   Conclusion

In this paper we studied the dynamics of personal insolvencies in Germany and in the UK. The two European economies differ with respect to their financial systems as well as their legal approaches to deal with overindebted individuals.

Our findings can be summarised as follows: personal insolvencies are more persistent in the UK and outside macroeconomic and financial conditions have an effect on the vulnerability of British households, while German households remain largely unaffected by business cycle dynamics. Yet, the financial crisis had solely an impact on actual insolvencies in the UK, leaving petitions untouched. We argued that official bankruptcy was households' preferred instrument to dealing with debt during the recession as they were left with no other option to coping with their debt otherwise than getting it discharged. The severity and the relatively long duration of the recession in the UK compared to Germany may have contributed to this development. Our results further suggest an asymmetric effect of a rise in the levels of insolvencies as opposed to a reduction of the latter, with the reduction being more persistent. This is mostly ascribed to the non-recurring event of the enforcement of the German insolvency regulation which may not have been fully captured by the imposed trend. That asymmetry is rejected for petitions in Germany may be explained by procedural effects at court.

The architecture of insolvency procedures, which is closely connected to an economy's financial system and hence its credit culture, determining not only the amount of aggregate

debt, but also the relation between unsecured short-term and secured long-term loans, are considered as important drivers for both, petitions as well as actual insolvencies.

A drawback of our analysis is, that data across countries is not perfectly comparable due to institutional differences. Nevertheless, analysing these differences is interesting by itself. Future research could focus on these institutional differences in more detail. In particular, the role of judges in the insolvency process could be focused upon as this might explain differences between petitions and actual insolvencies and should be considered more closely, in particular for the case of Germany. Unfortunately, data availability on personal insolvencies in Europe in general is difficult, as respective regulations were only introduced at the end of the 1990s. Other countries could be interesting to analyse in case such data becomes available. Unfortunately for insolvencies in Germany is only available from 2003 onwards and marked by soaring insolvencies until 2006. Longer time series could might be more revealing with respect to insolvency dynamics in general. Another focus could also be to study cross-sectional differences within Germany (and also in other countries of course), not only with respect to insolvencies but also with respect to borrowing behaviour.

References

Allen, Franklin and Douglas Gale, "Comparative Financial Systems: A Survey," Center for Financial Institutions Working Papers 01-15, Wharton School Center for Financial Institutions, University of Pennsylvania April 2001.

Aoki, Kosuke, James Proudman, and Gertjan Vlieghe, "House prices, consumption, and monetary policy: a financial accelerator approach," *Journal of Financial Intermediation*, October 2004, *13* (4), 414–435.

Backhaus, Klaus, Bernd Erichson, Wulff Plinke, and Rolf Weiber, *Multivariate Analysemethoden: Eine anwendungsorientierte Einführung*, 13 ed., Springer, 2010.

Barba, Aldo and Massimo Pivetti, "Rising household debt: Its causes and macroeconomic implications - a long-period analysis," *Cambridge Journal of Economics*, 2009, *33* (1), 113–137.

Belke, Ansgar, "Die Auswirkungen der Geldmenge und des Kreditvolumens auf die Immobilienpreise - Ein ARDL-Ansatz für Deutschland," *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 2010, *230* (2), 138–162.

Berkovich, Elzar and Ronen Israel, "Optimal Bankruptcy Laws across Different Economic Systems," *The Review of Financial Studies*, 1999, *12* (2), 347–377.

Bernanke, Ben and Mark Gertler, "Agency Costs, Net Worth, and Business Fluctuations," *American Economic Review*, March 1989, *79* (1), 14–31.

Bernanke, Ben S., "The financial accelerator and the credit channel: a speech at a conference on The Credit Channel of Monetary Policy in the Twenty-first Century, Federal Reserve Bank of Atlanta, Atlanta, Georgia, June 15, 2007," Speech 2007, Board of Governors of the Federal Reserve System (U.S.) 2007.

Bernanke, Ben S and Mark Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," *Journal of Economic Perspectives*, Fall 1995, *9* (4), 27–48.

Blazy, Rs, Bertrand Chopard, Eric Langlais, and Ydriss Ziane, "Personal Bankruptcy Law, Fresh Starts, and Judicial Practice," EconomiX Working Papers 2011-15, University of Paris West - Nanterre la Dnse, EconomiX 2011.

Bolton, Patrick, Xavier Freixas, Leonardo Gambacorta, and Paolo Emilio Mistrulli, "Relationship and Transaction Lending in a Crisis," Working Paper 19467, National Bureau of Economic Research September 2013.

Boot, Arnoud W A and Anjan V Thakor, "Financial System Architecture," *Review of Financial Studies*, 1997, *10* (3), 693–733.

Chatterjee, Satyajit and Grey Gordon, "Dealing with consumer default: Bankruptcy vs garnishment," *Journal of Monetary Economics*, 2012, *59, Supplement* (0), S1 – S16. Supplement issue:October 15-16 2010 Research Conference on 'Directions for Macroeconomics: What did we Learn from the Economic Crises' Sponsored by the Swiss National Bank (http://www.snb.ch).

Chmelar, Ales, "Household Debt and the European Crisis," *ECRI Research Report*, June 2013, *14*.

Cohen-Cole, Ethan, Burcu Duygan-Bump, and Judit Montoriol-Garriga, "Forgive and Forget: Who get Credit after Bankruptcy and Why?," *Boston Reserve Bank, Working Paper No. QAU09-2*, 2009.

Davydenko, Sergei A. and Julian R. Franks, "Do Bankruptcy Codes Matter? A Study of Defaults in France, Germany and the UK," *Journal of Finance*, 2008, *LXIII* (2), 565–608.

Debelle, Guy, "The Macroeconomic Implications of rising Household Debt," *BIS Working Papers*, 2004, *No 153*.

Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer, "Private credit in 129 countries," *Journal of Financial Economics*, May 2007, *84* (2), 299–329.

Duygan-Bump, Burcu and Charles Grant, "Household Debt Repayment Behaviour: What Role do Institutions Play?," *Economic Policy*, January 2009, *24* (57), 107–140.

Efrat, Rafael, "The Evolution of Bankruptcy Stigma," *Theoretical Inquiries in Law*, 2006, *7* (2).

Fay, Scott, Erik Hurst, and Michelle J. White, "The Household Bankruptcy Decision," *American Economic Review*, June 2002, *92* (3), 706–718.

Fieldhouse, David, Igor Livshits, and James MacGee, "Income Loss and Bankruptcies over the Business Cycle," *OSB Working Paper*, 2012.

Franks, Julian R., Kjell G. Nyborg, and Walter N. Torous, "A Comparison of US, UK, and German Insolvency Codes," *Financial Management*, 1996, *25* (3), pp. 86–101.

Garrett, Thomas A. and Howard J. Wall, "Personal Bankruptcy Cycles," *Macroeconomic Dynamics*, 10 2014, *18*, 1488–1507.

Gerhard, Maria, "Consumer Bankruptcy Regimes and Credit Default in the US and Europe - A comparative study," *CEPS Working Document*, 2009, *218*.

Gross, David B. and Nicolas S. Souleles, "An Empirical Anaylsis of Personal Bankruptcy and Delinquency," *The Review of Financial Studies*, 2002, *15* (1), 319–347.

H., Pimpertz J. Schäfer H. Goecke and C. Schröder, "Zehn Jahre Agenda 2010: Eine empirische Bestandsaufnahme ihrer Wirkungen," *IW policy papers*, 2013, *7*.

Han, Song and Wenli Li, "Household Borrowing after Personal Bankruptcy," *Journal of Money, Credit and Banking*, March-April 2011, *43* (No.2-3).

Harman, H.H., *Modern factor analysis*, Chicago: The University of Chicago Press., 1976.

Heuer, J.-O., "Social Inclusion and Exclusion in European Consumer Bankruptcy Systems," *Presentation at the International Conference "Shifting to Post-Crisis Welfare States in Europe–Long-Term and Short-Term Perspectives" by NordForsk and the Nordic Centres of Excellence NordWel, 4-5 June, Berlin (Germany)*, 2013.

Heuer, Jan-Ocko, "Rules and Norms of Conusmer Insolvency and Debt Relief - A Comparison and Classification of Personal Bankruptcy Systems in 15 Economically Advanced Countries." PhD dissertation, Bremen International Graduate School of Social Sciences 2014.

Himmelstein, D.U., E. Warren, D. Thorne, and S. Woolhandler, "Illness and Injury as Contributors to Bankruptcy," *Health Affairs*, 2005, *24*, 63–73.

Jackson, Thomas H., *The Logic and Limits of Bankruptcy Law*, Harvard University Press, 1986.

Jagtiani, Julapa and Wenli Li, "Credit Access After Consumer Bankruptcy Filing: New Evidence," *Federal Reserve Bank of Philadelphia, Supersedes Working Paper No. 13-24*, 2014.

Jappelli, T., M. Pagano, and M. Di Maggio, "Households' indebtedness and financial fragility," *Journal of Financial Management, Markets and Institutions*, January 2013, (1), 23–46.

Jappelli, Tullio, Marco Pagano, and Marco di Maggio, "Households' Indebtedness and Financial Fragility," CSEF Working Papers 208, Centre for Studies in Economics and Finance (CSEF), University of Naples, Italy October 2008.

Kaiser, Kevin, "European Bankruptcy Laws: Implications for Corporations Facing Financial Distress," *Financial Management*, 1996, *25* (3).

Kaufmann, Sylvia and Maria Teresa Valderrama, "Bank lending in Germany and the UK: are there differences between a bank-based and a market-based country?," *International Journal of Finance & Economics*, 2008, *13* (3), 266–279.

Kilborn, Jason J., "Comparative Consumer Bankruptcy," *Carolina Academic Press*, August 2007.

LaPorta, Rafael, Florencio Lopez de Silane, Andrei Shleifer, and Robert W. Vishny, "Legal Determinants of External Finance," NBER Working Papers 5879, National Bureau of Economic Research, Inc January 1997.

_ , Florencio Lopez de Silanes, Andrei Shleifer, and Robert W. Vishny, "Law and Finance," *Journal of Political Economy*, December 1998, *106* (6), 1113–1155.

Livshits, Igor, James MacGee, and Michelle Tertilt, "Consumer Bankruptcy: A Fresh Start," *American Economic Review*, March 2007, *97* (1), 402–418.

May, Orla, Merxe Tudela, and Garry Young, "British household indebtedness and financial stress: a household-level picture," *Bank of England Quarterly Bulletin*, 2004, *Q4*, 414–428.

Muellbauer, John and Anthony Murphy, "Explaining regional consumption in the UK," Working Papers 199429, School of Economics, University College Dublin December 1994.

_ **and** _ , "Booms and Busts in the UK Housing Market," *The Economic Journal*, 1997, *107* (445), 1701–1727.

Nielsen, M., S. Pezzini, K. Reinold, and R. Williams, "The financial position of British households: evidence from the 2010 NMG Consulting survey," *Bank of England Quarterly Bulletin*, 2010, *Q4*, 333–345.

Niemi, Johanna, "Consumer Insolvency in the European Legal Context," *Journal of Consumer Policy*, 2012, *35*, 443–459.

Povel, Paul, "Optimal "soft" or "tough" bankruptcy procedures," *Journal of Law, Economics, and Organization*, 1999, *15*, 659–684.

Rajan, Raghuram G, " Insiders and Outsiders: The Choice between Informed and Arm's-Length Debt," *Journal of Finance*, September 1992, *47* (4), 1367–400.

Skene, Donna McKenzie and Adrian Walters, "Consumer Bankruptcy Law Reform in Great Britain," *The American Bankruptcy Law Journal*, 2006, *80*, 477–522.

Sousa, Michael D., "Bankruptcy Stigma: A Socio-Legal Study," *American Bankruptcy Law Journal*, February 2014, *87*.

Sullivan, T., Elizabeth W., and J.L. Westbrook, *The Fragile Middle Class: Americans in Debt*, Yale University Press, 2000.

Tabb, Charles Jordan, "The Historical Evolution of the Bankruptcy Discharge," *American Bankruptcy Law Journal*, 1991, *Vol. 65*, 325–71.

Wang, Hungjen and Michelle White, "An Optimal Personal Bankruptcy System and Proposed Reforms," *Journal of Legal Studies*, 2000, *XXXI(1)*, 255–286.

Warren, Elizabeth ., "Financial collapse and class status: Who goes bankrupt?," *Osgoode Hall Law Journal*, 2003, *41(1)*, 115–147.

Wessels, Bob, "On the Future of European Insolvency Law," in "INSOL Europe Academic Forum's 5th Edwin Coe lecture" 2012.

White, Michelle J., "Why it Pays to File for Bankruptcy: A Critical Look at the Incentives Under U.S. Personal Bankruptcy Law and a Proposal for Change," *The University of Chicago Law Review*, 1998, *65* (3), 685–732.

_ , "Abuse or Protection? Consumer Bankruptcy Reform under BAPCPA," *Economie publique, Public economics*, 2007.

Appendix

Table 7: Description of Variables

Variable	Unit	Description & Source
Insol_pet	Levels	DE: includes all cases where out-of-court settlements failed; including settlements reached before court and cases rejected due to lack of assets; sum of monthly data; UK: (composed of England and Wales, Scotland and Northern Ireland) - IVAs+DROs+bankruptcies.
Insol_actual	Levels	Actual insolvencies for DE: cases that are settled at court, UK: without IVAs. Source: Destatis/ Insolvency Service Official Statistics
Unempl	%	Unemployment rate. Source: Main Economic Indicators, OECD.
Infl	%	Inflation rate. Source: Bundesbank (ESZB Zeitreihen)
Debt_LT	EUR/GBP, mio.	Long-term loans (Including Bills of Exchg,) to domestic households. Source: OECD (S.A. by the authors).
Debt_ST	EUR/GBP, mio.	DE: Short Term Loans (Including Bills of Exchg) to Domestic Household, Consumer Credit, Euro, UK: Unsecured Lending, Overdraft Lending, Amounts Outstanding. Source: OECD (S.A. by the authors)
i_LT	%	Long-term interest rates[36]. Per cent per annum. Source: OECD, Monetary and Financial Statistics (MEI).
i_ST	%	Long-term interest rates. Per cent per annum. Source: OECD, Monetary and Financial Statistics (MEI).
HP_Index_Old	Index	House price Index (pre-owned dwellings). Source: Destatis/ONS.
Income	EUR, mio.	Net disposable income; (S.A. by the authors).

Self-constructed Ratios

Variable	Unit	Description & Source
Debt_Inc	Ratio	Debt-to-income ratio (average long-term and short-term debt).
Wedge	Ratio	Wedge between the policy rate and the proxies for lending rates (average of bank lending rates without consumer credit).
LTST_Debt	Ratio	Long-term to short-term debt ratio.
IR_Spread	Ratio	Interest rate spread (Spread between long-term and short-term interest rates).
IRC	Ratio	Interest rate coverage ratio: $interestrate * Debt/disp.income$ (amount of debt paid out of disposable income, measures the ability to repay one's debt).

Mio.=Million.

---

[36]Data refer to the par yield for bonds with a maturity of 10 years. A par yield is the interest rate (coupon) which a hypothetical stock would have to bear for its price to equal its face value. Only conventional dated stocks with a significant amount in issue and having more than one year maturity are used. This excludes index-linked and irredeemable stocks, stocks with existing conversion options and stocks with possible alternative redemption dates.
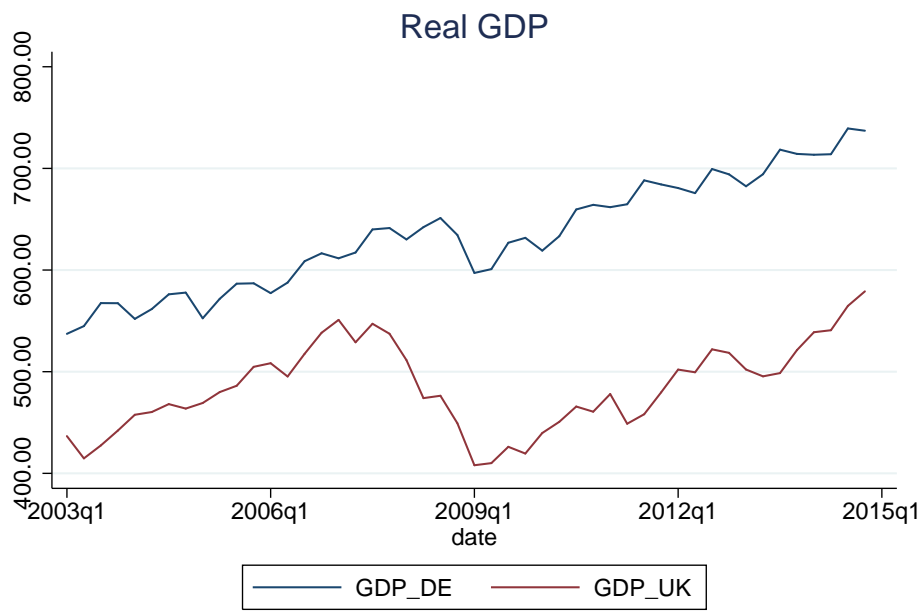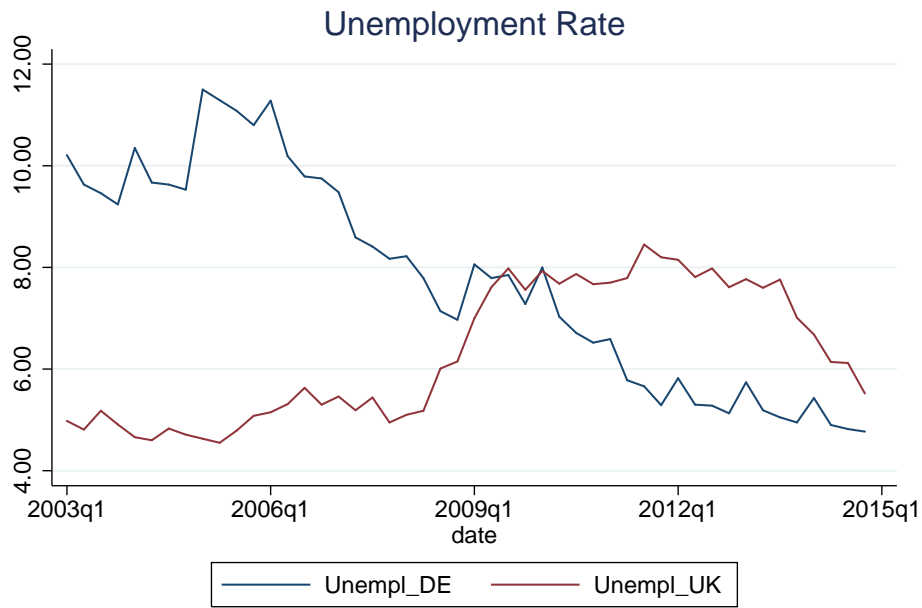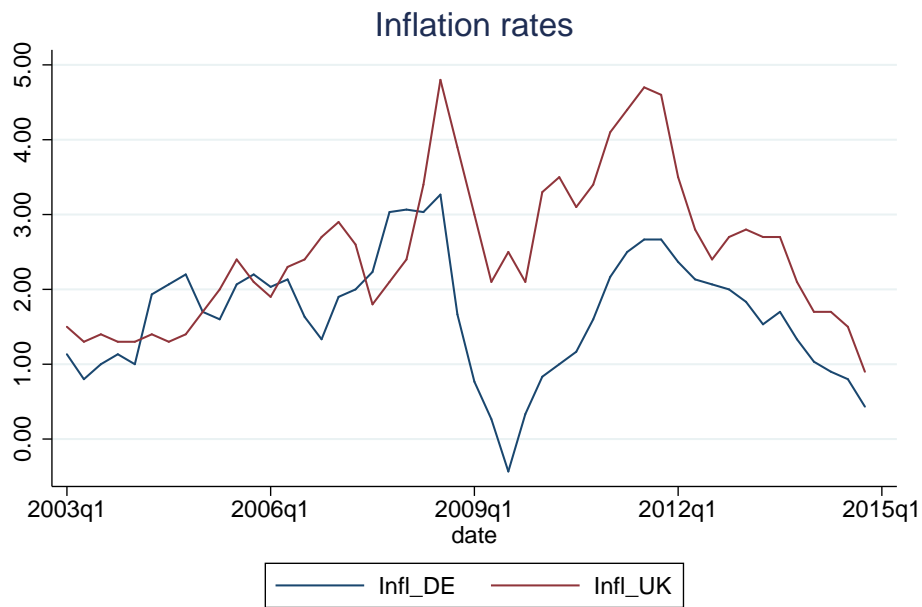
Figure 3: Real GDP

Figure 4: Unemployment Rate

Figure 5: Inflation Rate

Table 4: Model SUR TAR (Insolvency Petitions)

	(1) Insolvency Petitions, UK	(2) Insolvency Petitions, DE
$InsolPet_{t-1}^{+}$	0.9149*** (0.0331)	0.6162*** (0.0902)
$InsolPet_{t-1}^{+} * Rec_{t-1}$	0.9306*** (0.0428)	0.6122*** (0.0923)
$InsolPet_{t-1}^{-}$	0.9013*** (0.0309)	0.6244*** (0.0866)
$InsolPet_{t-1}^{-} * Rec_{t-1}$	0.9183*** (0.0390)	0.6367*** (0.0915)
Rec_{t}	-172.8813 (931.3679)	-297.6867 (776.1812)
$Factor1_{t-1}$	564.1376*** (200.9201)	-269.8749 (338.7104)
$Factor2_{t-1}$	37.5115 (185.5886)	-157.9945 (112.7489)
$Factor3_{t-1}$	787.1635*** (290.694)	572.3173 (358.3942)
Dummy Insol	-1521.584*** (562.1402)	
$Trend$		518.6304*** (156.9716)
$Trend^{2}$		-9.0244*** (2.5351)
Outlier Resid.	-1285.221 (998.0213)	3311.452*** (850.7593)
Constant	3316.585*** (749.5833)	5501.77*** (1081.996)
Observations	46	46
R squared	0.9784	0.9681
Breusch-Pagan (p-value)	0.0039	
$H_0 : InsolPet^{+} = InsolPet^{-}$ (p-value)	0.4803	0.4630

Note: Interaction terms are reported as marginal effects. * p < 0.1, ** p < 0.05, *** p < 0.01. OLS standard errors for the SUR model in parentheses.

Source: National statistics services etc., own calculations.

Table 5: Model SUR TAR (Insolvency Petitions)

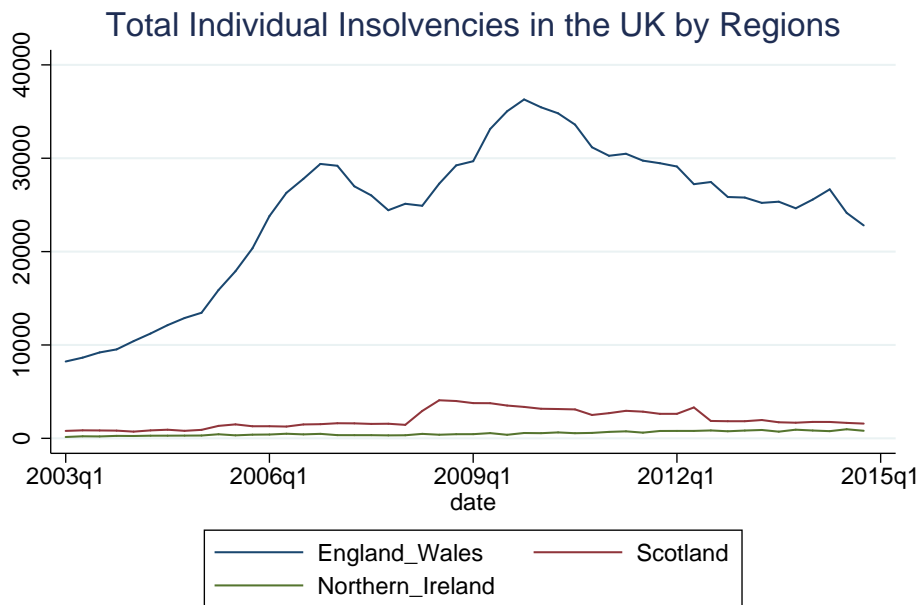|	(1) Insolvency Petitions, UK	(2) Insolvency Petitions, DE
$InsolPet_{t-1}$	0.8989***	0.6563***
	(0.0314)	(0.1043)
$InsolPet*Rec_{t-1}$	0.9243***	0.6274***
	(0.0376)	(0.1053)
Rec_t	-109.7327	246.1669
	(842.5042)	(834.8318)
$Factor1_{t-1}$	533.305**	-37.0138
	(209.0455)	(378.9272)
$Factor2_{t-1}$	13.85372	-23.3731
	(162.7508)	(124.1226)
$Factor3_{t-1}$	802.7183***	141.1905
	(296.3648)	(389.4258)
Dummy Insol	-1600.301***	
	(576.2282)	
$Trend$		469.7064***
		(179.7967)
$Trend^2$		-8.3145***
		(2.9125)
Outlier Resid.	-1146.18	3182.8090***
	(1042.41)	(965.9978)
Constant	3499.107***	4947.566***
	(753.0018)	(1288.735)
Observations	46	46
R squared	0.9778	0.9620
Breusch-Pagan (p-value)	0.0177	
$H_0 : InsolPet^{UK} = InsolPet^{DE}$ (p-value)	0.0186	
$H_0 : InsolPet^{UK} > InsolPet^{DE}$ (p-value)	0.9907	

Note: Interaction terms are reported as marginal effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS standard errors for the SUR model in parentheses.

Source: National statistics services etc., own calculations.

Table 6: Model SUR TAR (Actual Insolvencies)

	(1) Actual Insolvencies, UK	(2) Actual Insolvencies, DE
$Insol_{t-1}^{+}$	0.8996*** (0.0366)	0.6644*** (0.0953)
$Insol_{t-1}^{+} * Rec_{t-1}$	0.8571*** (0.0396)	0.6635*** (0.1000)
$Insol_{t-1}^{-}$	0.9064*** (0.0347)	0.6998*** (0.0961)
$Insol_{t-1}^{-} * Rec_{t-1}$	0.9138*** (0.0376)	0.6839*** (0.0967)
Rec_{t}	2443.178*** (719.9906)	29.6874 (791.1254)
$Factor1_{t-1}$	18.7184 (165.5709)	-341.5436 (437.0277)
$Factor2_{t-1}$	-1.896284 (109.2011)	-114.4499 (124.471)
$Factor3_{t-1}$	451.8393** (211.6719)	599.7476 (375.1325)
Dummy Insol	-1281.916*** (378.706)	
$Trend$		443.7841*** (165.7544)
$Trend^2$		-7.3569*** (2.68047)
Outlier Resid.	-1884.286*** (729.7241)	3613.586*** (918.0354)
Constant	2173.513*** (608.1504)	3105.022*** (1116.5)
Observations	46	46
R squared	0.9810	0.9702
Breusch-Pagan (p-value)	0.1414	
$H_0 : Insol^{+} = Insol^{-}$ (p-value)	0.6622	0.0021
$H_0 : Insol_{DE}^{-} > Insol_{DE}^{+}$ (p-value)	–	0.9989
$H_0 : Insol_{UK}^{+} > Insol_{DE}^{+}$ (p-value)	0.9907	
$H_0 : Insol_{UK}^{-} > Insol_{DE}^{-}$ (p-value)	0.9811	

Note: Interaction terms are reported as marginal effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS standard errors for the SUR model in parentheses.

Source: National statistics services etc., own calculations.

House Price Index
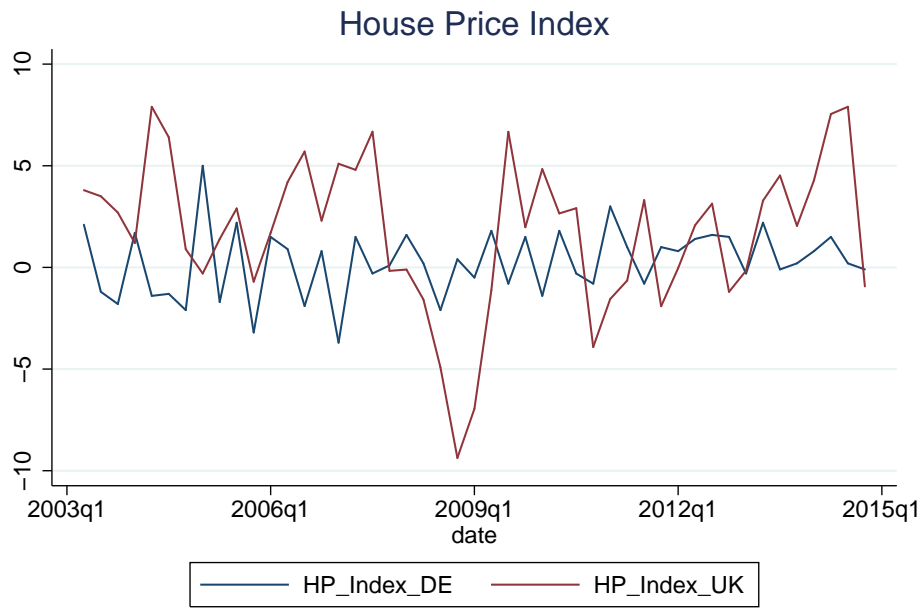
Source: Destatis/ONS, Preowned Dwellings. In differences

Figure 6: HP Index (Pre-owned dwellings), quarterly differences.

Total Individual Insolvencies in the UK by Regions

Source: UK Insolvency Service.

Figure 7: Total Individual Insolvencies in the UK by Regions
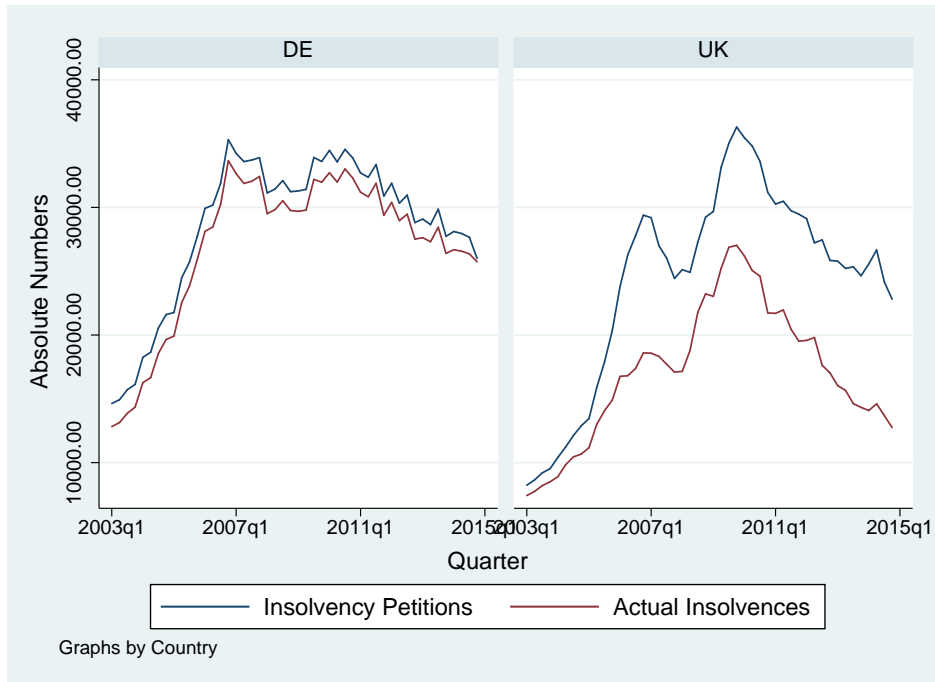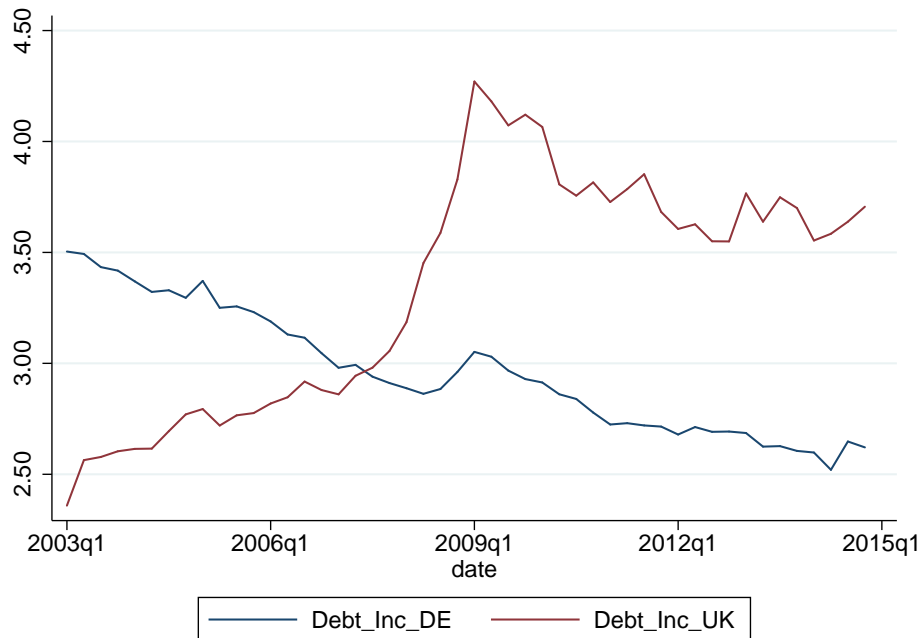
XIII

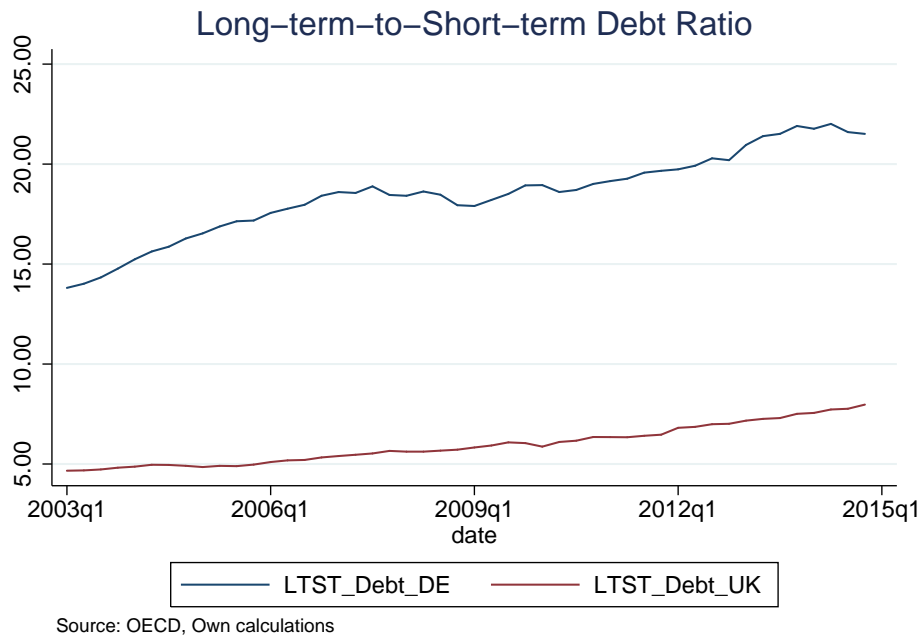Figure 8: Insolvency Petitions, Actual Insolvencies

Figure 9: Debt-to-Income Ratio
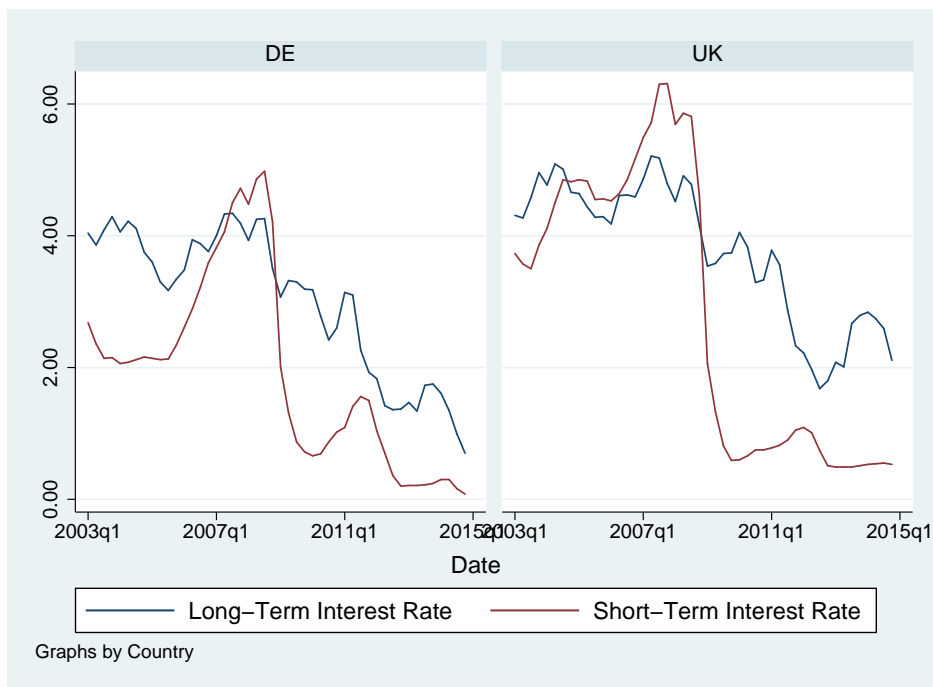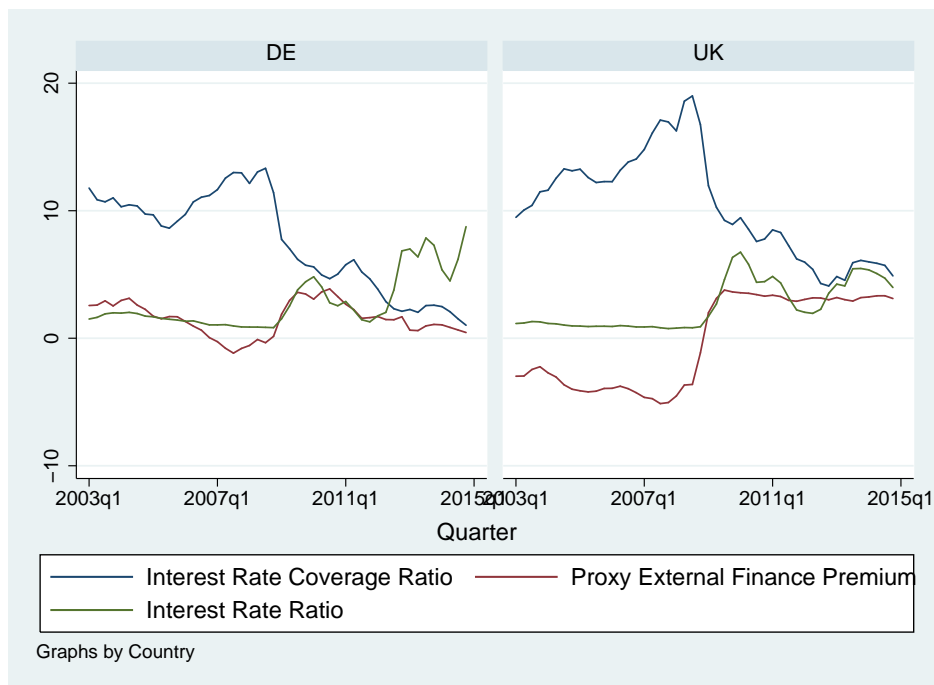
XIV

Figure 10: Long-term-to-short-term Debt Ratio

Figure 11: Interest Rates

XV

Figure 12: Interest Rate related Ratios