The Wounds of Post-Socialism

The Political Economy of Mortality and Survival in Deindustrialising Towns in Hungary

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Abstract
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Background: In this dissertation I examine the political economy of the post-socialist mortality crisis as experienced in deindustrialising towns in Hungary. I develop and apply a relational political economy of health framework, putting emphasis on the economic institutions of post-socialist dependent capitalism in Hungary, as embedded in the semi-periphery of the global economy, their gendered implications and their cultural construction.

Methods: I follow a mixed-method strategy combining quantitative and qualitative analyses. I rely on a novel dataset comprising data on settlement, enterprise, and individual levels. 260 companies and 52 towns were analysed in two waves. I group towns into severely and moderately deindustrialised categories (1989-1995); as well as into dominant state, domestic private and foreign ownership dominated categories (1995-2004). Population surveys in these towns collected data on the vital status and other characteristics of survey respondents’ relatives. I assess the relationship between deindustrialisation, dominant ownership and the mortality of individuals by random intercept multilevel discrete-time survival modelling. I also investigate the health implications of the lived experience of economic transformation in four towns with diverging privatisation and deindustrialisation histories through a qualitative thematic analysis of 82 in-depth semi-structured interviews.

Findings: Severe deindustrialisation is associated with a significantly larger odds of mortality for men between 1989 and 1995 (OR=1.12; 95%CI=1.00-1.26; p=0.042). On the other hand, prolonged state ownership is related to a significantly lower odds of dying among women, compared to towns dominated by domestic private ownership (OR=0.74; 95%CI=0.62-0.90; p=0.002) or towns dominated by foreign investment (OR=0.79; 95%CI=0.65-0.96; p=0.019) between 1995 and 2004. The multi-sited semi-structured qualitative interviews revealed that companies are central institutions in the cognitive maps of workers and that the fates of these companies affected the health of workers in multiple ways, whereas state involvement was perceived as a cushioning mechanism.

Interpretation: Severe deindustrialisation was a crucial factor behind the post-socialist mortality crisis for men, whilst prolonged state ownership was associated with the protection of life chances for women. The indirect economic benefits of foreign investment do not translate automatically into better health. Rapid economic transformations threaten health; they should be avoided where possible, but if this is not possible, strong safety nets should be in place.
Declaration

This dissertation is the result of my own work and includes nothing that is the outcome of work done in collaboration, except as declared in the Preface.

I further state that my dissertation is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. I further state that no substantial part of my dissertation has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text.

This dissertation does not exceed the prescribed word limit set by the Department of Sociology: it is no more than 80,000 words in length, including the footnotes, table of contents, list of illustrations and acknowledgements.
To my parents†
Preface

Arriving to the point when I am writing the Preface to this dissertation was far from a straight path. Although I was enthusiastic to begin my doctoral studies in Cambridge in 2009, soon my life took another turn. My decade long involvement in social movements has landed me into the Hungarian Parliament as a member of a young progressive party. So I had to temporarily withdraw from the University in 2012. I learnt a great deal through my eight years of social movement activism and five years of frontline politics. I admire the strength of my Hungarian friends and the sacrifice they make to keep alive the hope that Hungary could be a better country than it has become in the recent years. I feel a certain pride for being a member of a group of people who stood up for a democratic, inclusive and sustainable Hungary. I hope that this dissertation will not only contribute to our social scientific knowledge on the condition of post-socialism but will have direct policy relevance to start a socially sustainable democratisation.

I feel deeply thankful to Professor Lawrence King not only for supporting my return to Cambridge in 2015 but also for the inspiring intellectual home that he has built for his students. I consider myself exceptionally privileged for having such a mentor. Most things I know about high-impact social research I learnt from him. I am also grateful for the opportunity to work in the PrivMort project financed by the European Research Council (grant number 269036). My journey towards this dissertation would have not begun without the support from the Cambridge European Trust in the form of a full PhD scholarship. I would also like to thank the kind staff at the Department of Sociology, to Fiona Harrison for her enormous project management support, to Karin Haack for her administrative guidance throughout my unconventional PhD-route and to Casey Mein and Dan Jones for their help with my research associate contract. I am also thankful for the research assistance I received from numerous people (Milán Falta, Péter Harsányi, András Kövesdi, Eszter Mátyás, Péter Mátyás, Eszter Turai and Bogi Vincze), as well as to the trade union officials and community organisers for their help in the fieldwork. I am also thankful to János Köllő for his advice on company data collection.

Throughout these years I had the opportunity to meet fellow travellers in Cambridge who both lent joy to everyday work and served as role models for me. I am grateful to my friend and colleague Darja Irdam who not only helped me not to get lost in the sometimes chaotic labyrinth that is Cambridge, but also lent me constant advice and support. I am grateful to Bernhard Reinsberg whose dedication to social research lights the path I am walking and who was always ready to give me feedback and take me to fellows’ lunches in colleges I would never know about. I am also grateful for having had the opportunity to work closely with Aytalina Azarova, Bryant Pui Hung Hui, Katarzyna Doniec and Dénes Stefler, whose
quantitative bravado inspired me to master the statistical skills needed for this project. I am also thankful for the chance to get involved in the work of a group of Cambridge- and Oxford-based political economists, through the workshops coordinated by Alexander Kentikelenis. My thanks also go to Iván Szelényi, Martin McKee, Martin Bobak, Mike Murphy, Adel Daoud, Elias Nosrati, Timon Forster, Don Kalb and Kristóf Szombati for their feedback on various parts of this text.

This dissertation would have been impossible without the reassuring presence of my best friend, best editor, best source of inspiration, and love of my life: my wife. Noémi means light and joy when I stumble, reasoned editorial judgement when I get lost in my sentences and purpose when I am feeling alone. Getting married just a few days after I penned the final words of this dissertation is to me the beginning of the most interesting adventure in my life. A few months ago she accepted it with a smile when, in an act of final desperation, I impulse-bought a sweater with “pain is temporary, doctoral degree is forever” printed on it. That moment was the turning point after which both of us saw the light at the end of the tunnel with an increasing certainty. I am forever grateful for her patience and her presence when this light was just a dim point in the far distance.

I can only write with unease about the fact that this dissertation is in part a story about my own family. My parents, who met as workers in a factory in the industrial suburb of Budapest, were both physical victims of the dramatic changes that happened during the 1990s in Hungary. I can now see that the experience of my parents was an experience of a generation washed aside by the regime change. I met great people throughout my life for whom the new era meant new opportunities. But my sympathy stays with the people whose increasingly precarious lives form the backbone of this dissertation: the silent victims of misguided economic reforms. After being left paralysed by a stroke in 1994, my father gradually lost hope in the transition he so eagerly embraced in 1989 and died in 2011. I am grateful that my mother had the strength to fight her way through multiple illnesses during the last twenty years right until I finished my thesis. She passed away just a few days before I submitted. I know that my parents will always be with me and I can testify that their sacrifice has not been in vain.

***
Chapter 2 of this dissertation forms the basis of an article currently submitted for peer review as a co-authored article: I am the first author of the article, I designed the study, I elaborated the conceptual framework, I created the pool of the reviewed articles, I created the quantitative review tables, I interpreted the results as well as prepared the first and the final draft of the article.

Chapter 5 of this dissertation forms the basis of an article currently submitted for peer review as a co-authored article: I am the first author of the article, I designed the study, I elaborated the conceptual framework, I created the independent variables, I took significant part in data collection and took the lead in statistical modelling, I interpreted the results as well as prepared the first and the final draft of the article.

Chapter 6 of this dissertation forms the basis of an article currently submitted for peer review as a co-authored article: I am the first author of the article, I designed the study, I elaborated the conceptual framework, I created the independent variables, I took significant part in data collection and took the lead in statistical modelling, I interpreted the results as well as prepared the first and the final draft of the article.

Chapter 7 of this dissertation forms the basis of an article currently submitted for peer review as a co-authored article: I am the first author of the article, I designed the study, I elaborated the conceptual framework, I conducted interviews and coordinated the fieldwork, I interpreted the results as well as prepared the first and the final draft of the article.
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Chapter 1) Introduction

With the rise of anti-liberal political movements in Europe, the Brexit vote in the UK and the election of Donald Trump the human consequences of global economic transformations have emerged as central political and scientific topics. Economic globalisation has reduced overall absolute poverty but its effect on the quality of life and the distribution of life chances is much less clear. Well-educated young people in cities have an increased chance to take part in successful global networks, but at the same time, an increasing number of people have to face precariousness (Castells 2000; Della Porta et al. 2015; Standing 2010). In countries that have had large manufacturing sectors there is a growing section of the population that is being left behind, with few prospects and increasingly precarious lives. These recent major political events have made also visible the hitherto hidden economic, social and psychological effects of systematic industrial plant closures, the privatisation of public services and state owned enterprises, as well as of the liberalisation of trade and investment.

Such major economic and social changes are tightly related to health as well. First, lower tariff barriers and trade liberalisation have been associated with increased trade in unhealthy products, including tobacco and energy-dense food (Mendez Lopez et al. 2016; Stuckler et al. 2012). Second, there is accumulating evidence of the ways in which increasing precariousness of employment (Barlow et al. 2015), work (Waters 2014), and housing (Clair et al. 2016), often consequences of global economic forces, impact adversely on health. Third, emerging evidence suggests that those communities experiencing worsening health are more likely to support populist politicians (Rothwell and Diego-Rosell 2016). No wonder that globalisation, power relations and state economic policies have recently emerged as a growth field within social epidemiology and health sociology (Beckfield and Krieger 2009; Coburn 2004; Labonté and Stuckler 2015; Navarro 1999). Signalling the salience of the topic, the World Health Organisation and other international agencies have invested considerable energy into analysing the health impact of global economic transformations since the 2000s (Labonte and Torgerson 2003).

The collapse of “real existing socialism” (cf. Bahro 1977) in Europe in the late 1980s and early 1990s is the prime example of such economic transformations and represents one of the greatest socio-economic disruptions in recent history (McKee 2001). During the transition from socialism to capitalism in Eastern Europe, state owned enterprises were exposed to global markets and those that survived were rapidly integrated into the capitalist economy. The transformation of these economies also brought complex changes to everyday lives of people, in the form of increased uncertainty and polarisation (Burawoy and Verdery 1999; Hann 2002). While the transition to a market economy resulted in an initial decline in economic activity in every country, there were significant differences in
the economic strategies pursued by the countries of the region and the social outcomes that followed (Bohle and Greskovits 2012; King and Szelenyi 2005b).

One of the most striking and unexpected implications of this large-scale economic transformation was the fall in life expectancy in some of the former socialist countries during the transition. While the post-socialist mortality crisis was short lived in some countries, notably in Poland and the Czech Republic, the Baltic states and to a lesser extent Hungary, Romania and Bulgaria underwent a more dramatic downturn in life expectancy; whereas Russia and some other former members of the Soviet Union were affected the most (Billingsley 2011). According to the UNICEF (2001), the increase in mortality in the region over 1990-99 resulted in 3.26 million excess deaths. These are deaths that would not have occurred if mortality rates had stayed at the 1989 levels. The loss of healthy life expectancy had severe indirect costs, as well. For instance, national income loss in Russia has been estimated at 1.8-4.7 per cent of one year’s GDP during the first half of the 1990s, due to illness (Bloom and Malaney 1998). This unprecedented mortality crisis that hit Eastern Europe during the post-socialist transformation represents the largest demographic catastrophe next to HIV/AIDS, outside China, since the Second World War (Eberstadt 2010).

**Figure 1.** Male life expectancy at birth in Hungary and other Visegrád countries 1980-2000

![Graph showing male life expectancy at birth in Hungary and other Visegrád countries from 1980 to 2000.](image)

*Note: Source: Human Mortality Database (2017); Visegrád country average covers the Czech Republic, Poland and Slovakia.*
Among the post-socialist transition countries, the case of Hungary is puzzling for several reasons. The cumulative real decline in GDP was 19 per cent between 1990 and 1993, but the extent of the loss of industrial employment went much beyond that in just a few years (Feenstra, Inklaar and Timmer 2015). However, partly due to its ability to attract foreign investments, the Hungarian economy performed better during the 1990s than most of the former socialist states (Hamm, King and Stuckler 2012). As one of the first former Soviet-style economies to open to global competition, Hungary has attracted a large amount of foreign investment, from the early 1990s onwards. Although some warned of the structural tensions within Hungary’s development model early on (Amsden, Kochanowicz and Taylor 1994; Andor and Summers 1998; Szalai 1999), the country’s transition from socialism to capitalism has most often been characterised as successful. For example, for seven years between 1995 and 2001 Hungary topped the EBRD’s Transition Index ranking measuring reform performance (Pogátsa 2009). However, the consequences of this transformation for many Hungarians were severe. The economic recession that hit the country in the early 1990s not only caused a significant loss in income, but a collapse of the labour market and a worsening of life chances. Superior economic performance during the 1990s proved to be incapable of preventing an unprecedented destruction of productive capacities, with total labour force participation plunging from 82 per cent in 1988 to 48.6 per cent in 1995 (World Bank 2017). While some other Central and Eastern European countries, such as Poland and the Czech Republic, saw a steady improvement in life expectancy during the 1990s, mortality rates in Hungary increased until 1993. In parallel, male life expectancy fell from 66 years in 1988 to 64.7 years in 1993, as figure 1 portrays, compared to the other Visegrád countries (Czech Republic, Poland, Slovakia) where life expectancy improved by 0.7 years during the same period (Human Mortality Database 2017). ¹

The question of the underlying causes of this unprecedented mortality crisis has been intriguing researchers for two decades. Russia’s transition-related mortality crisis of staggering magnitude and proportions has understandably attracted a significant part of scholarly attention, leaving Hungary and other Eastern-European countries in similar situations less investigated. However, there are important differences between the Visegrád-countries and Russia. Understanding Hungary’s puzzling mortality trajectory could shed light on the most important social factors behind increases, decreases as well as inequalities in mortality and elucidate the reasons for the lack of effectiveness of demographic and public health policies and the slow improvement in human development in a transforming society. In this dissertation I seek answers to the following questions: What explains the drop in life expectancy and

¹ There is a large body of empirical research underpinning that in more advanced countries men are more vulnerable to economic turbulence. This was especially the case in Eastern Europe, as I will show both in the literature review as well as in the empirical chapters. Therefore I use male life expectancy to describe the mortality crisis that happened during the post-socialist transformation. The subsequent chapters will explore the gender differences in mortality in more detail.
The increase in mortality in post-socialist Hungary during the early years of the transition? What factors explain the differences in the speed of improvement in longevity in the longer run during the transition? How did rapid socioeconomic change influence mortality? Through which contextual channels do deindustrialisation, economic liberalisation and privatisation impact health? How do perceptions of the economic transformation, the companies, the towns that people inhabit and state social policies influence health? The natural experiment of the post-socialist transformation in Hungary provides a strategic opportunity to study the association between global economic transformation and health. This is what my dissertation sets out to achieve.

There is now an extensive body of research on these phenomena (Bobak and Marmot 1996), precluding the possibility that the post-communist mortality crisis would be a statistical artefact (Leon et al. 1997), or a result of environmental factors (Bobak and Feachem 1995). Behaviourist approaches in epidemiology emphasise individual health behaviour as explanatory factor of health outcomes. Some research has identified the role played by proximal factors, identifying alcohol as a major cause of both the recognised alcohol-related deaths, such as alcohol poisoning, cirrhosis, and intentional and unintentional injuries, but also causes where its role was less well recognised, especially cardiovascular disease (Korotayev 2008; Leon et al. 1997; McKee and Britton 1998; Rehm et al. 2007; Tomkins et al. 2012). The relatively poor dietary patterns of Eastern Europeans compared to their Western European counterparts have been described as another potential factor causing excess mortality (Ginter 1995; Stefler and Bobak 2015), yet their exact role in the mortality crisis is unclear. However, the behavioural theory of inherited lifestyle is incapable of explaining sudden variations in mortality, as most of the traditional risk factors and diets remained unchanged or even improved during the transition (Brainerd and Cutler 2005: 123-124).

Other researchers have focused on distal factors, especially job loss, an event that was especially important given how employment in large enterprises brought a wide range of social benefits (Field and Twigg 2000). This literature has pointed to the importance of the rapidity and the scale of social and economic change, especially in a situation where safety nets were weak or, in many cases, in shreds. Empirical analyses have shown that malnutrition related to absolute poverty and other “diseases of poverty” only explain a very small part of the rise in mortality (Cornia 1994; Paniccia 2000; Shkolnikov et al. 1998), with measures of poverty often insignificant in multivariable regression models (Brainerd and Cutler 2005). The magnitude of the mortality crisis suggests that the social determinants of mortality go beyond absolute deprivation, encompassing broader segments of society through insecurity, stress, unemployment and inequality (Brainerd 1998). Psychosocial mechanisms and stress in particular have been recognised as major determinants of the post-communist mortality crisis early
on (Cornia and Paniccia 1995; Kopp, Szedmák and Skrabski 1998; Marmot and Bobak 2000; Shapiro 1995; Stone 2000).

More recent work has looked further upstream, to what is now often referred to as the political-economic determinants of health and, specifically, decisions by some countries, to open up their economies to international trade and investment, leaving their industries unable to compete, and undertaking privatisation of large state-owned enterprises. Advising on the transformation of former socialist countries, neoclassical economists advocated a policy package referred to as “shock therapy” or “the Washington consensus” that prescribed the rapid transformation of enterprises as a necessary combination of “pain and progress” (Lipton and Sachs 1992), expecting rapid improvements in health with the introduction of markets and the destruction of socialist economic institutions. A more critical stream of research suggested that those countries, and regions within Russia, that experienced the fastest pace of change fared worst in terms of mortality (Azarova et al. 2017; Cornia and Paniccia 1995; Walberg et al. 1998). In a controversial paper Stuckler, King and McKee (2009) used cross-national time-series data to argue that rapid mass privatisation increased mortality in countries that implemented such policies by increasing unemployment and the stress associated with large scale organisational change.

This last body of research has, so far, largely focused on Russia and some of its post-Soviet neighbours. There has been less attention to the situation in Central and Eastern Europe, where the scale of change was much smaller and the adverse health effects of the transition were shorter, with most countries beginning to see a recovery between 1991 and 1993. There is some evidence to link this with trade liberalisation, allowing greater access to healthier food (Bobak et al. 1997), a finding at variance with evidence on trade liberalisation elsewhere (Barlow et al. 2017). However, this is countered by concerns that markets were also opened to harmful products, such as tobacco, aggressively marketed by sophisticated Western corporations (Gilmore and McKee 2004). Research on high income countries has shown that deindustrialisation is associated with worse health (Audureau, Rican and Coste 2013; Mitchell et al. 2000; Riva et al. 2011; Walsh, Taulbut and Hanlon 2009). World-system theorists have also claimed that foreign direct investment would have a harmful effect on the life expectancy of the host country’s population (Hauck, Martin and Smith 2016; Reiter and Steensma 2010; Shandra et al. 2004; Shen and Williamson 1999; Stokes and Anderson 1990; Tausch 2012; Wimberley 1990). Yet, as of today, the role of deindustrialisation, global investment liberalisation and foreign investment in the post-socialist mortality crisis remains largely unexamined. The post-socialist transition in Hungary with divergent health impact across towns with different economic trajectories offers a natural experiment to investigate the health impact of these factors.
The aim of this dissertation is to deepen our knowledge of the political-economic determinants of mortality. Extending the existing political economy of health scholarship I propose a relational political economy approach to the post-socialist mortality crisis in Hungary. Liberalisation, privatisation and stabilisation were the central elements of the Washington Consensus guiding the reforms of policymakers throughout the 1990s. In this dissertation I investigate the health impact of economic investment liberalisation and privatisation. Stabilisation using austerity measures affects the macro-economy as a whole and thus requires a different methodological approach. I utilise the strategic research possibilities offered by the economic experience of former industrial towns, and the potential of a novel multi-level dataset encompassing individual-, company- and town-level data. My dissertation contributes a) to the literature on the post-socialist mortality crisis, b) to the general theoretical literature on the political economy of health, and c) to the broader policy literature on the human dimensions of major economic transformations. I test whether severe deindustrialisation increases the odds of mortality when compared to moderate deindustrialisation. Similarly, I investigate whether reindustrialisation via foreign direct investment impacts death rates. I also analyse whether privatisation towards domestic or foreign capitalist owners made a difference to health, compared to prolonged state ownership. Evaluating the explanatory power of alternative theoretical approaches, I also test whether town- and individual-level confounders affect mortality. Finally, in order to enhance our understanding of the political-economic mechanisms behind mortality, I also present a qualitative exploration of the complex contextual channels that translate economic transformation into individual health outcomes.

Following the introduction, chapter 2 provides a description of long-term mortality trends in Hungary and offers a systematic review and synthesis of the empirical evidence about the social determinants of mortality. This chapter also shows the gaps in the existing literature and establishes a hierarchy of the most important variables leading to changes in mortality patterns during the post-socialist transition in Hungary. Chapter 3 presents an overview of the main theoretical approaches, reviewing the most important alternative explanatory frameworks and introducing my own theoretical approach, the relational political economy approach to health. The chapter concludes with a conceptual model and a set of hypotheses derived from the competing theoretical accounts. Chapter 4 provides a systematic description of data sources and modelling. This dissertation is built on the PrivMort database, collected within a multi-country indirect demographic cohort study comprising of multilevel data at settlement, enterprise, and individual levels. The chapter also discusses the limitations of the data.

2 In this dissertation I will use ‘town’ and ‘settlement’, as well as ‘company’ and ‘enterprise’ interchangeably to avoid repetitions.
Chapter 5 assesses the relationship between deindustrialisation (measured as the change in industrial employment-to-population ratio between 1989 and 1995), re-industrialisation through foreign investors (measured as the significant presence of foreign investors in the largest companies), and consequent odds of mortality between 1989 and 1995. Multilevel discrete-time survival modelling shows that people living in severely deindustrialised towns experienced a significantly larger odds of mortality (OR=1.12; 95%CI=1.00-1.26; p=0.042) compared to people living in moderately deindustrialised towns. Chapter 6 analyses the relationship between dominant ownership of the five largest companies in industrial towns and individual mortality using multilevel discrete-time survival analysis covering the ten year period from 1995 to 2004. After multivariable adjustment, prolonged state ownership was significantly related to lower odds of dying in women compared to towns dominated by domestic private ownership (OR=0.74; 95%CI=0.62-0.90; p=0.002) as well as compared to towns dominated by foreign investment (OR=0.79; 95%CI=0.65-0.96; p=0.019). Finally, chapter 7 presents a qualitative thematic analysis of 82 interviews encompassing 816,118 words and 2000 typed pages. The chapter brings in the perspectives of those who personally experienced these economic transformations revealing the lived experience of deindustrialisation in Ajka, Dunaújváros, Salgótarján and Szerencs, four towns with different deindustrialisation and privatisation histories. The chapter shows that subjects’ lay interpretations of health are tightly interwoven with their labour market trajectories and the economic processes afflicting their companies, towns and society in general. Subjects in severely deindustrialised towns experienced more stress as a result of rapid labour market turnover, and also talk about feelings of abandonment, loss of place-based identity and a massive erosion of company-based communities that further reinforce the negative health implications of deindustrialisation. The interviews also revealed that subjects living in towns with prolonged state ownership talk more about the potential to withdraw from the labour market through early retirement which acts as a cushion against the shock of the transition potentially protecting individual health. Subjects’ accounts also revealed that the new hostilities introduced through the privatisation of social arrangements eroded the moral economy that bound together socialist collectives that might have been a central factor behind the worsening mental health-situation in post-socialist Hungary. Chapter 8 concludes the results of this dissertation, discusses the theoretical implications of the empirical evidence, assesses the limitations, draws attention to the potential for future research, and points out the empirical, theoretical, methodological and policy contributions of the dissertation as well as the broader implications for socially sustainable democratisation.
Chapter 2) Systematic Literature Review

Summary
This chapter presents a) the results of a systematic review of the English language within-country literature on the social determinants of mortality in post-socialist Hungary; and b) a review of the long-term trends in mortality and health behaviour. The chapter begins with a portrayal of the mortality profile of Hungary using long-term data collected from various international institutions as well as from secondary literature. Second, the chapter provides methodological details on how this review was carried out, including search strategies and selection criteria. This review is based on the analysis of 29 peer reviewed articles as a result of a systematic search of scientific databases. A concise overview of the characteristics of the 29 studies is also presented. Third, the chapter provides a detailed review of the studies discussing the findings and the causal mechanisms uncovered in the articles. The chapter analyses the performance of the variables by ranking them based on the number and per cent of the studies that found them significant. Based on the analysis of 29 peer reviewed articles on mortality in Hungary, the chapter finds that the most important social and behavioural determinants of mortality in Hungary were 1) socioeconomic status; 2) mental health; 3) social capital; 4) alcohol; 5) stress; and 6) social integration. Smoking is particularly related to suicide in Hungary. The chapter also points out the gaps in the literature. The proximal causes of the post-socialist mortality crisis in Hungary have been thoroughly analysed. Although economic policies might have played a central role in the rise of mortality, there is no empirical research on the distant, political-economic determinants of health in the context of Hungary. None of the studies on the post-socialist mortality crisis in Hungary attempted to measure the relationship between economic and social policies and mortality. The chapter discusses the Hungarian literature in light of the broader literature on the post-socialist mortality crisis.

Introduction
This chapter presents the results of a systematic review of the English language within-country literature on the social determinants of mortality in Hungary, contextualised by an analysis of the long-term trends in mortality and health behaviour. The goals are to a) determine the gaps in the existing research; b) to evaluate and integrate the results of the literature by establishing a hierarchy of the most important social variables leading to changes in mortality patterns in Hungary; and c) to propose avenues for future research. By so doing I also hope that this chapter raises awareness about the developmental implications of mortality and draws closer the social scientific and epidemiological literatures on post-
socialist change, and also paves the way for the subsequent theoretical, quantitative and qualitative chapters.

The systematic review method is used to identify, evaluate and integrate the findings of a large number of existing studies that address a pre-defined research question in a transparent, systematic and replicable way (Centre for Reviews and Dissemination 2008; Higgins and Green 2011; Petticrew and Roberts 2006). A systematic review is more than a narrative or traditional review that does not involve a systematic and replicable search strategy. A systematic review is thus less prone to bias than traditional reviews. I am reviewing the literature focusing on a broader topic in one country therefore the studies included encompass a heterogeneous set of dependent and independent variables. It is thus not appropriate to further quantify the review, such as in a meta-analysis. However, I go beyond a systematic review by comparing the performance of each set of variables calculating the ratio of significant to insignificant findings for each variable. I measured the performance of each set of variables by calculating the percentage of the studies that found the variable significant among those studies that included that particular variable. Ranking variables by their performance is an accepted methodology in economics, as evidenced by reviews focusing on financial crises and other instances of socio-economic shocks (Frankel and Saravelos 2012; Kaminsky, Lizondo and Reinhart 1998). Adopting this approach to social determinants of mortality research allows us to systematically understand the best performing variables and integrate the findings of the existing literature.

Most of the published literature focuses on causes of mortality rates, analyses on changes are much less frequent. Yet, some causes of mortality are less and others are more likely to change over a short span of time. This review puts special emphasis on those determinants that a) might be implicated in the post-socialist mortality crisis, i.e. the sudden decline in life expectancy during the early 1990s; and b) that might explain longer term deviations from countries in the region.

**Long-term trends in mortality in Hungary**

**Data sources**

Before describing the results of the systematic literature review, I present an overview of long-term data on mortality to portray the health profile of the country and thus contextualise the results of the review and the subsequent empirical chapters. For this purpose I rely on the following institutional databases: 1) data on the long-term trends in life expectancy are collected from the Human Mortality Database created by the Department of Demography at the University of California, Berkeley, and at the Max Planck Institute for Demographic Research in Rostock; 2) data on cause-specific mortality and
individual lifestyle factors are collected from the WHO European Health for All database (HFA-DB); 3) data on real GDP growth are collected from the Penn World Tables constructed by Robert Summers and Alan Heston of the University of Pennsylvania; 4) data on inflation rates and total labour force participation are based on the World Development Indicators created by The World Bank; and 5) GINI indexes are calculated by taking the annual country averages of the multiple GINI indexes, reported in the World Income Inequality Database created by the United Nations University World Institute for Development Economics Research (outlying GINI figures were eliminated to facilitate comparison). The data used to plot the figures in the chapter are available upon request in tabular format.

I use Austria and the average of the Visegrád countries excluding Hungary (Czech Republic [Czechoslovakia until 1992], Poland, Slovakia) as benchmarks. Austria is the nearest Western country with close historical ties to Hungary. Therefore comparing Hungary to Austria will help us to understand the long-term dynamics and the development gap of Hungary (see Lackó 2011 as well). Comparing Hungary to the Visegrád average allows a short term comparison to the geographically and historically proximate block of post-socialist countries particularly useful understanding divergent trends during the transition period. Visegrád countries are the closest to Hungary in economic structure, social indicators, culture and politics. Hungary differs from other regions of post-socialist Europe more. The countries on the Balkans are geographically close but the effect of war during the 1990s makes a comparison misleading. The former member states of the Soviet Union are different on a political and cultural level. The aim of using these benchmark categories is not to present a comparative analysis but to contextualise the Hungarian numbers.

**Trends in longevity and health behaviour**

Just like in most parts of Europe during the first part of the 20th century, the life expectancy of Hungarians underwent a rapid improvement after the Second World War. Heavy investments into infrastructure and health care paid off, as diseases of poverty, such as undernourishment and infections, were significantly reduced (Orosz 1990a: 848), though we have to bear in mind that Hungary still has a higher TBC mortality than Western European countries. Figure 2 portrays the male life expectancy trends from 1959 on. The post-war infrastructural developments were in fact so effectual that Hungary overtook Austria in terms of male life expectancy at birth, for a brief period around 1966. In 1966 an average Hungarian man could expect to live almost a year longer compared to his Austrian counterpart. Yet, from the end of the 1960s the picture started to change. Whereas Western European countries experienced the epidemiological transition expressed through a reduction of chronic disease and cardio-vascular mortality, the countries of Eastern Europe did not, a life expectancy gap opened up
between the East and the West. Increased western life expectancy is explained by the developments in the treatment and prevention of chronic diseases from the 1970s on, mostly as a result of life-saving treatment and prevention based on new knowledge and technology. In contrast, in Eastern Europe, there were no more gains to be made by massive infrastructural developments and the socialist welfare state proved to be less effectual in eliminating chronic and lifestyle diseases, especially cardio-vascular mortality. Death rates continued to increase for a decade. The 1980s brought an improvement in life expectancy again, but as the transition from a socialist to a market economy reached a threshold in 1988, mortality started to rise again. The 1985-1988 Gorbachev Anti-Alcohol Campaign was an important source of improvement in Russia (Chen, Wittgenstein and McKeon 1996), however, its impact on mortality in Hungary is less important, as Central European countries were not subjected to the campaign (Bhattacharya, Gathmann and Miller 2013). As the longevity of Austrians improved by a year between 1988 and 1994 the life expectancy of Hungarians at birth saw an equal decline.

Figure 2. Male life expectancy at birth in Hungary, Austria and the Visegrád countries

Whereas the post-Soviet states as well as the Baltic countries underwent a major mortality crisis during the first half of the 1990s, the Visegrád countries managed the early transition years without any significant increase in mortality, with the exception of Hungary. By 1993 the average Visegrád citizen could expect to live three years longer than the average Hungarian. The difference with Austria grew even stronger over time, with the average Austrian able to expect to live almost six years longer than
an average Hungarian in 2013. Working age men were affected by the increase in mortality the most, with the mortality rate of men aged 40-69 reaching higher levels than in the 1930s. Within this cohort, the death toll was 11,395 men higher in 2005 than in 1960 in Hungary (Kopp et al. 2007, p. 326). This surge in Hungarian mortality rates was unique among the group of Central European post-socialist countries. Average life expectancy grew by more than a year in the Czech Republic, almost a year in Slovenia, and by half a year in Poland and by three months in Slovakia between 1989 and 1993. Today, the life expectancy of Hungarians is worse than could be predicted based on the economic development of the country. Although other countries in Eastern Europe, such as Romania, Bulgaria, the Baltic countries and the majority of post-Soviet republics, suffered a similar or even more severe mortality crisis, Hungary’s divergence from her closest neighbours in the Visegrád-region with similar social, economic and cultural legacies and development trajectories during the transition is a puzzle.

Figure 3. Trends in Cause-Specific Mortality in Hungary, Austria and the Visegrád countries

Source of data: WHO HFA-DB
Figure 3 portrays the trends in cause-specific death rates, revealing some selected causes of mortality. Diseases of the circulatory system are by far the most important cause of death among Hungarians. The increase in cancer-related mortality is also remarkable during the 1970s and the 1980s, as well as the increase in alcohol-related deaths during the turbulent years of the transition. As also pointed out by Leon et al. (1997) in relation to the increase in mortality in Russia, it is not likely that these changes are artefacts or coding errors. Infectious disease-related mortality as well as infant mortality continued to decrease throughout these decades, making it unlikely that the increase would be a result of biases in death certification. Genetic factors can also be ruled out as they cannot explain rapid temporal changes in mortality rates (Kopp, Csoboth and Réthelyi 2004). It is also unlikely that the fluctuations in Hungarian mortality could be explained by quality of the health care provision.

Although mortality amenable to health care is still higher in Hungary than in Western Europe (Nagy et al. 2012), the constant decrease in child mortality and infectious diseases that are most dependent on the state of the health care infrastructure shows that factors that are not directly related to the quality of the health care infrastructure might be behind the long-term changes in mortality, especially the increases during the 1970s and during the transition years in Hungary (Kopp et al. 2007, p. 326). Finally, it is also very unlikely that environmental pollution could be behind the increase in mortality during the transition years. Environmental health actually improved from the end of the 1980s after the industrial collapse (Nell and Stewart 1994, p. 17). As a result, environmental factors explain at most 3 per cent of post-communist mortality (Bobak and Feachem 1995). The unhealthy diet of Hungarians is a significant factor behind the higher rates of mortality in Hungary compared to Europe. However, the decrease in blood cholesterol levels of Hungarians between 1990 and 1995 shows that diets underwent relative improvement, and therefore could only give at best a partial explanation for the increasing mortality of the early transition years (Morava et al. 2000).

As the charts in Figure 3 show non-communicable or lifestyle diseases, i.e. avoidable mortality (cancer, circulatory diseases, and alcohol) played a crucial role in the increase of the mortality of Hungarians in the 1970s and during the early transition years. What explains the trend in lifestyle disease mortality? Alcohol has received the most attention from researchers of the post-socialist mortality crisis (Korotayev 2008; Leon et al. 1997; McKee and Britton 1998; Rehm et al. 2007), with researchers focusing on Hungary also pointing out its importance (Nagy et al. 2013). The relatively poor dietary patterns of Eastern Europeans compared to their Western European counterparts have also been pointed out as a potential mortality determinant (Ginter 1995; Stefler and Bobak 2015), however they are less likely to explain the rise in mortality during the 1990s (Morava et al. 2000). Diets, like many other social determinants, are changing in the long run; therefore new research has to re-assess their role in other time periods. Hazardous drinking patterns and poor health lifestyles have been associated with the
socialist regime (Cockerham 1997). Some researchers connect irresponsible individual behaviour with socialist ideology or the alleged culture of collectivism (Cockerham et al. 2006; Piko 2004). Although drinking and smoking are definitely important sources of the high mortality in Hungary, a path dependency in health behaviour, the alleged inability of the “socialist man” to adapt to the market society, cannot alone explain the rapid change in mortality during the early 1990s. Alcohol consumption is not always understood purely as an individual lifestyle factor even within the medically oriented social epidemiological literature, but often as a reaction to missing other consumption alternatives or a mediating factor between economic stress and mortality.

Figure 4 tracks the long-term trends in key lifestyle factors in Hungary, compared to Austria and the Visegrád countries. Among the four charts, the first showing the increase in alcohol consumption is the only one that shows a significant diverging trend in Hungary and therefore can be considered as a significant factor behind the rise of mortality. The other lifestyle factors portrayed, such as fruit and vegetable consumption, smoking or fat intake are less likely to be significantly related to the increase in mortality. Although the alcohol consumption of Austrians was higher than that of Hungarians until 1976, the rapid increase in Hungarian alcohol consumption rates from 1974 till 1980 led to Hungarians consuming 1.5 times as much alcohol by 1982 as Austrians. We also have to take into account that steep changes in alcohol intake combined with other high-risk behaviour (e.g. cholesterol rich food) might have an additive effect. The average alcohol consumption per capita in Hungary increased 2.2 times between 1951 and 1985 (Orosz 1990a, p. 852). Drinking habits also changed during this period with the consumption of spirits increasing from 6 million litres in 1970 to 22 million litres in 1978 (Compton 1985).

The 1980s show a slight decline both in alcohol consumption and in chronic liver diseases (not shown in the chart) followed by another steep increase between 1986-1990 for pure alcohol consumption and 1988-1994 for chronic liver diseases. At its peak in 1994, chronic liver disease and cirrhosis mortality were three times higher among Hungarians than among Austrians. Alcohol consumption on the whole was rapidly declining since 1990 followed by a rapid decline in chronic liver disease from 1994 onwards. The average alcohol consumption of Hungarians has been similar, or less, to the Austrians since the second half of the 1990s. Although the level of alcohol consumed was historically lower in Hungary than in Austria it could have played a significant role in the mortality increase during the 1970s and during the end of the 1980s.³ The steep increase in alcohol consumption in Hungary also stands out compared to the Visegrád countries. During the transition years the increase in mortality and alcohol-related

³ One should also note that high rates of homemade alcohol production not captured by official statistics might significantly alter the picture of alcohol consumption.
mortality was coupled with an overall decrease in alcohol consumption which suggests that drinking patterns and the quality of alcohol could be at least as important as the quantity of alcohol consumed.

Figure 4. Trends in lifestyle factors in Hungary, Austria and the Visegrád countries

The economic context of mortality trends

Immediate behavioural causes of mortality are embedded in a broader socioeconomic and power context. These background factors influence mortality in a variety of direct and indirect ways (WHO 2010). The heavy investment and intensive modernisation period following the Second World War resulted in a major restructuring of the Hungarian society. Tens of thousands of people left their villages and moved to newly built socialist industrial towns. As a result during the fifties Hungary underwent a major equalisation in life chances, also reflected in a significant narrowing of mortality gaps across occupational classes (Kopp and Réthelyi 2004; Kopp et al. 2007). This trend toward more equality started to change during the 1960s (Orosz 1990a). Mortality rates of non-manual workers remained at the same level between 1940 and 1980 whereas agricultural and industrial workers saw a steep decline, followed by a sharp increase from the 1970s onwards.
During the 1970s and the 1980s excessive work and increasing stress led to an increase in alcohol consumption, both especially high among agricultural and unskilled workers (Molnár 1992). During the 1970s and 1980s increases in mortality in Hungary were highest among men who were widowed, had never married and, in particular, were divorced. On the other hand, as corroborated by many existing studies in different geographical settings, marriage appears to have a moderate protective effect on male mortality (Hajdu, McKee and Bojan 1995). Mortality differentials by education, gender, region and occupational status grew, with the gender longevity gap reaching 8.3 years by 2001, twice the average gender difference in mortality in Western European countries. Hungary is affected with heavy regional health differentials as well (Uzzoli 2008; Uzzoli and Szilágyi 2009), with the gap between regions with the highest and lowest life expectancy reaching 8.1 years for men in 2008 (Gaal et al. 2011).

As it can be observed in figure 5 Hungary’s economic performance was constantly improving between 1970 and 1990, followed by a sharp decline in the early 1990s. The inflation rate was slowly increasing,
staying below the Austrian and Visegrád inflation levels for the most of the 1970s. From the second half of the 1980s the inflation rate skyrocketed and stabilised only by the 2000s. With the gradual liberalisation of the socialist economy, new opportunities emerged to supplement individual earnings and an increasing number of people took on second or third jobs in the shadow economy to offset the impact of inflation. To continue material improvement in the 1970s and to stop an outright fall in living standards during the 1980s as economic conditions worsened Hungarians engaged in an increasing amount of overtime. Time budget surveys conducted by sociologists during the 1980s show that Hungarians generally worked longer hours than citizens of other European countries (see Orosz 1990a, p. 852).

The opportunities provided by the second economy during the 1970s resulted in a decrease in the GINI coefficient at the price of the ever-growing workload of the lower strata. After 1984 with the continuous liberalisation of the economy inequalities grew substantially until the middle of the 1990s followed by a gradual decline. A similar trend with a few years lag could be observed in the Visegrád countries. The most striking trend of the Hungarian economy compared to the benchmark countries is the steep decline in the active labour force that resulted in the lowest employment rate among European countries (EUROSTAT 2015). More than 80 per cent of the working age population was engaged in economic activity before 1987. During the transition 1.5 million jobs were lost resulting in a total labour force participation rate below 50 per cent by 1996. The decline in the labour force participation rate in the post-socialist Visegrád region was much smaller suggesting that these countries could better cushion against the economic shock of the transition.

This analysis of the long-term economic context of health behaviour suggests a correlation between the increasing mortality that started in the 1970s and high levels of social stress induced first by overtime work in the 1970s and 1980s, and then by growing inequality, as well as the labour market shock during the early transition years in Hungary. To help disentangle the relationship between direct behavioural and indirect socioeconomic factors influencing life chances, the next section provides a systematic analytical review of the literature on the social determinants of mortality in Hungary. The central question of the analytical review is if the existing literature on the social determinants of mortality in Hungary has offered any robust contextual explanations of mortality that take political-economic factors into account.

**Methods of the systematic review**

I collected English language articles from social science, public health and epidemiology journals that explicitly focus on the social dimension (gender, age, culture, socioeconomic status, as well as other macrosocial, and policy variables) of mortality in Hungary. Purely biological studies were excluded, with
the exception of articles that focus on smoking and alcohol, as these have been shown to be directly related to social stress and mental health. I also excluded analyses of the health care system as it would require a different analytical strategy. I carried out systematic keyword-based searches of major medical and social science databases, including PubMed, Science Direct, Scopus, Sociological Abstracts and Web of Science as well as Google Scholar. The following search terms were used: Hungary mortality, Hungarian mortality, Hungary suicide, "social determinants of health", "social determinants of mortality", "social determinants of life expectancy", "welfare state" mortality, "mortality and transition". Hungarian language articles were excluded from the current review to ensure the international replicability of the analysis and the comparability of the results with studies in other contexts.

Several inclusion and exclusion criteria were applied to identify the appropriate studies through multiple rounds. Articles were first narrowed down based on their title and abstract to include studies that focus on Hungary and include at least one measure of social determinants. I extended this pool by looking for further articles that cite them in Scopus and included further missing articles. I also carried out additional search for similar articles in PubMed and Scopus using the built in “similar articles” functions. After the first round, I checked the bibliographies of all articles on the social determinants of mortality in Hungary and included further missing studies.

Within-country studies focusing upon Hungary were included in the review (a focus on within-country analyses), while multi-country studies were excluded. The focus on within-country studies was warranted by the aim of the review to compare the methodology, study design and the theoretical concepts of the articles. Including articles employing a cross-country comparative methodology would increase the number of studies, to the extent that a systematic review could not be carried out. We provide a separate review of the social determinants of the post-socialist mortality crisis in Eastern Europe using cross-country studies elsewhere in part to compensate for excluding cross-country studies from the current analysis (Scheiring, Irdam and King 2017). At the end of this chapter I briefly compare the literature on Hungary with the cross-country evidence on Eastern Europe.

Articles were sorted based on the dependent variable: analyses using some measure of mortality as a dependent variable were included in the literature review. Those articles that did not include at least

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4 Some of the studies included in the review also show that health care provision is not the most important explanatory factor of mortality rates. This is not to suggest that access to health care would not be of crucial importance for social wellbeing, but the literature suggests that tackling social determinants of health, such as inequalities and labour market shocks, could yield even higher health benefits.

5 I only use articles published in English. I am aware that the addition of further Hungarian language articles would increase the richness of the review. However, the main concern is methodological. I am targeting an international audience that is interested in the social determinants of mortality in Eastern Europe and the relationship between economic change and health. I want to ensure easy access to the literature analysed which allows the falsifiability of the findings. Restricting the review to English language articles does not entail a judgement about the importance or superiority of English language publications. Additional Hungarian articles should be reviewed in the future targeting the Hungarian audience in specific.
one social determinant of mortality were excluded, except for the most important behavioural determinants of mortality (smoking and alcohol consumption), as well as studies on mental health. The reason for including smoking, alcohol and mental health-related studies is that there is increasing evidence in the literature on the association between smoking, drinking, mental health and mortality. A relatively large number of studies have been published in non-peer reviewed books or in the form of working papers, reports and manuscripts (Elekes and Paksi 1999; Gaal et al. 2011; Józan 1996; Lackó 2015; Szilágyi and Uzzoli 2014). I excluded papers that were not published in peer reviewed journals, with the only exception of the chapter by Kovács (2014) that appeared in a peer reviewed book-series published annually. After several rounds of iterative search a comprehensive list of 29 studies investigating the social determinants mortality in Hungary was compiled. The search process was closed on 31 January 2016.

**Figure 6.** Years of publication of within-country studies on mortality

![Years of publication of within-country studies on mortality](image)

Table B1 in the Appendix provides an overview of the studies and their major characteristics. Due to the large differences in methodology, study design and independent variables used, it was not viable to carry out a quantitative meta-analysis of the social determinants of mortality in Hungary. However, the chapter provides a structured assessment of the importance and significance of different measures of social factors of mortality, establishing a hierarchy among the causal determinants. I found one article published before 1990. Since then, the number of studies on mortality in Hungary is increasing, as portrayed in figure 6. This might both reflect the increasing attention paid to the topic, as well as the increasing frequency of high impact research that fits the editorial policy of English language journals and the increasing availability of data to explore mortality trends. 17 per cent of the articles were published during the 1990s, 17 per cent between 2000 and 2004, 24 per cent between 2005 and 2009 and a further 38 per cent appeared during the 2010-2014 period.
The majority of studies (52%) use all-cause mortality rates in general or by gender as the dependent variable, whilst cause-specific mortality is used in one third (31%) of the studies and suicide as a special cause of mortality received also a relatively large attention (17%), as portrayed in figure 7. Suicide has been historically high in Hungary, which might explain the amount of attention attracted by this topic. However, suicide as a mortality factor differs from other types of mortality in several aspects; therefore explanatory variables that are often significant in other causes might be less relevant for suicide. In terms of study design almost half of the articles (48%) use time series data but the majority provide only a description of the trends. One third of the studies use cross sectional data, and 21 per cent of the articles are survival analyses based on follow up of baseline study populations.

Figure 7. Dependent variables and study designs in within-country studies on mortality

Table 1. Levels of analysis and methodologies in within-country studies on mortality

<table>
<thead>
<tr>
<th>Description</th>
<th>Nation</th>
<th>County</th>
<th>Subregion</th>
<th>Municipalities</th>
<th>Individuals</th>
<th>Total</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of trends</td>
<td>9 (75%)</td>
<td>2 (33%)</td>
<td>1 (20%)</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>41.4</td>
</tr>
<tr>
<td>Correlation or linear regression</td>
<td>3 (25%)</td>
<td>4 (67%)</td>
<td>4 (80%)</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>37.9</td>
</tr>
<tr>
<td>Other regression(s)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3 (100%)</td>
<td>3 (100%)</td>
<td>6</td>
<td>20.7</td>
</tr>
<tr>
<td>Total</td>
<td>12 (41%)</td>
<td>6 (21%)</td>
<td>5 (17%)</td>
<td>3 (10%)</td>
<td>3 (10%)</td>
<td>29 (10%)</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As portrayed in table 1, the majority of the studies (41%) use aggregate data at the national level and within this category the majority of studies only offer description of trends. There are only a few studies with data collected at the individual or municipality level (10.3% each), but these studies all use some form of regression analysis. A large number of studies use county- (20.7%) or subregion-level (17.2%) data offering either description of trends or mostly linear regression analyses. Altogether 6 out of the 29 studies use some form or other of regression analyses, including Cox and Poisson regressions. The
high proportion of ecological analyses (23 out of 26) shows the limitations in data availability as well as the difficulties in securing enough resources for large population surveys. I have found no contemporary qualitative or ethnographic account related to health or mortality in Hungary published in English, despite the rich tradition of qualitative sociology (‘sociography’) in Hungary.

There is a large heterogeneity in terms of methodology, variables used and time frame among the studies included in the review. The literature focusing on the crisis period in Hungary between 1989 and 1993 is scant, and most of the articles focus on a longer timeframe or offer a static explanation of differences in mortality.

Social determinants of mortality

Table 2 provides an overview of the different explanatory variables across the 29 studies I have reviewed with a count of the number of studies that found the particular group of variable significant or insignificant. The table only reports those studies that explicitly included a test of significance. The results of other studies that provide a description of trends without statistically measuring associations are reported in the table B2 in the Appendix. One also has to bear in mind that the small number of studies also means that there are several groups of variables that were only investigated in one or two articles. More research is needed to establish robust associations among different social factors and mortality outcomes.

Table 2 shows that socioeconomic determinants of mortality were at the centre of the attention of the researchers. Eleven studies found a measure of socioeconomic status (SES) significant with only one study (Kopp, Csoboth and Réthelyi 2004) reporting no significant association. However, Kopp, Csoboth and Réthelyi (2004) relied on cross sectional county-level data that might hide a large part of the individual-level variation in SES. Studies that found a significant relationship between SES and mortality report a strong effect, particularly in relation to personal income, and even more so for education. Kopp et al. (2007) report that the odds ratio of death for men with low levels of education, compared to men with education higher than secondary, was 2.39, adjusted for age. Skrabski, Kopp and Kawachi (2004) found that education alone explained two thirds of the variation in middle aged male mortality at the level of subregions in a cross sectional linear regression (adjusted $r^2 = 0.618$). Cross-national comparative studies also report that mortality differentials for males by education in Hungary are among the highest in Europe (Leinsalu et al. 2009; Mackenbach et al. 1999). Other measures of SES, such as the lack of a car in the family, or blue collar worker status, were also found to significantly increase the hazard of dying by around two times (Kopp et al. 2011). Generally, SES variables are the
most important predictors of mortality differences for all causes of death, except for suicide, where mental health and social capital variables play a leading role (Almasi et al. 2009).

As Table 2 portrays, mental health was found to be significant in six studies, a larger number than in cross-country empirical work focusing on Eastern Europe (Scheiring, Irdam and King 2017). The Hungarostudy health survey series (1988, 1995, 2002, 2005 and 2013) led by Maria Kopp stands out for its depth and coverage among health-related research projects in Hungary. Kopp and her research team recognised the role of mental health, depression, hopelessness, low self-efficacy and anxiety in mortality in Hungary and included relevant questions in their surveys from 1988 on. Using cross-sectional linear regression at the level of counties Kopp, Csoboth and Réthelyi (2004) found that variations in average GDP levels, depressive symptom severity and income inequality together explained 78.6 per cent of the variance in mortality among men, but women seemed to be protected against an increased incidence of mortality resulting from depression. Comparing the 1988 and 1995 samples, Kopp, Csoboth and Réthely found that the depression score increased, whilst feelings of control at work decreased substantially between 1988 and 1995, in parallel with an increase in alcohol consumption. Men appear to be significantly more vulnerable to status loss then women. Using data from a 2006 follow-up study of the 2002 Hungarostudy survey, Kopp et al. (2007) confirmed again that severe depression and anxiety were significant predictors of mortality among Hungarians. They report that the odds ratio of death for men reporting severe depression was 3.68, compared to those living without depression adjusted for age. However, depression was not significant among women. Kopp et al. conclude that the negative health consequences of low education among men work through depression and hopelessness, induced by chronic stress as a result of work-related factors.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Significant</th>
<th>Insignificant</th>
<th>Sig#</th>
<th>Insig#</th>
<th>Sig%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic status (education, income, standard of living, occupational class, household income, car ownership, personal computer ownership, deprivation index [composed of income, qualification, unemployment, one-parent families, large families, density of housing and car ownership])</td>
<td>Kopp et al. (2007); Skrabski, Kopp and Kawachi (2003); Kopp et al. (2004); Skrabski, Kopp and Kawachi (2004); Kopp et al. (2005); Kopp et al. (2006); Almasi et al. (2009); Juhász et al. (2010); Kopp et al. (2011); Nagy et al. (2012); Nagy et al. (2013)</td>
<td>Kopp, Csoboth and Réthelyi (2004)</td>
<td>11</td>
<td>1</td>
<td>91.7%</td>
</tr>
<tr>
<td>Mental health (depression, hopelessness, hostility, suicide of relative, mental illness, depressive symptoms, not been out socially, self-efficacy, low cheerfulness, hospital anxiety score)</td>
<td>Kopp et al. (2007), Kopp, Csoboth and Réthelyi (2004); Kopp et al. (2006); Almasi et al. (2009); Döme et al. (2011); Kopp et al. (2011)</td>
<td></td>
<td>6</td>
<td>0</td>
<td>100.0%</td>
</tr>
<tr>
<td>Smoking (cigarettes per day, national averages of tobacco use)</td>
<td>Lackó (2011); Skrabski, Kopp and Kawachi (2004); Kopp et al. (2006); Almasi et al. (2009); Döme et al. (2011); Kopp et al. (2011)</td>
<td>Skrabski, Kopp and Kawachi (2003); Kopp et al. (2007)</td>
<td>6</td>
<td>2</td>
<td>75%</td>
</tr>
<tr>
<td>Alcohol (spirit consumption, drinking frequency)</td>
<td>Skrabski, Kopp and Kawachi (2004); Kopp et al. (2006); Almasi et al. (2009)</td>
<td>Döme et al. (2011); Balint et al. (2014)</td>
<td>5</td>
<td>2</td>
<td>71.4%</td>
</tr>
<tr>
<td>Social capital (distrust, mistrust, reciprocity, help from associations, collective efficacy, competitive attitude, membership in civic organisations, support from friends, parents, partner, civic organisations, social support from colleagues, social engagement)</td>
<td>Kopp et al. (2007); Skrabski, Kopp and Kawachi (2003); Skrabski, Kopp and Kawachi (2004); Kopp et al. (2006); Kopp et al. (2011)</td>
<td></td>
<td>5</td>
<td>0</td>
<td>100.0%</td>
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<tr>
<td>Variable</td>
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<td>N</td>
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<td>-------------------------------------------------------------------------</td>
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<tr>
<td>Social integration (religious involvement, religion, political participation, anomie)</td>
<td>Kopp et al. (2007); Skrabski, Kopp and Kawachi (2004); Kopp et al. (2006); Balint et al. (2014); Almasi et al. (2009)</td>
<td>5</td>
<td>0</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Stress (control at work, dissatisfaction with the job, job security, week-day work hours, weekend work hours, concerns over work prospects, excessive work in the second economy proxied with inflation)</td>
<td>Kopp et al. (2007); Lackó (2011); Kopp et al. (2006); Döme et al. (2011); Kopp et al. (2011)</td>
<td>5</td>
<td>0</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Subjective social status</td>
<td>Kopp et al. (2004); Kopp et al. (2005); Kopp et al. (2006); Kopp et al. (2011)</td>
<td>4</td>
<td></td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Economic performance (GDP, real GDP growth, aggregate income)</td>
<td>Kopp, Csoboth and Réthelyi (2004); Lackó (2011); Skrabski, Kopp and Kawachi (2003); Döme et al. (2011)</td>
<td>3</td>
<td>1</td>
<td>75.0%</td>
<td></td>
</tr>
<tr>
<td>Unemployment (unemployment rate, employment)</td>
<td>Skrabski, Kopp and Kawachi (2003); Kopp et al. (2006); Lackó (2011)</td>
<td>3</td>
<td>1</td>
<td>50.0%</td>
<td></td>
</tr>
<tr>
<td>Family status (relationship status, living alone, child)</td>
<td>Almasi et al. (2009); Kopp et al. (2011)</td>
<td>2</td>
<td>0</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Income inequality (SD of personal income)</td>
<td>Kopp, Csoboth and Réthelyi (2004)</td>
<td>1</td>
<td>0</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>Medical services (travel time accessibility of psychiatric services, total number of man-hours worked per year by psychiatrists, antidepressant use, relative number of doctors)</td>
<td>Lackó (2011); Balint et al. (2014)</td>
<td>0</td>
<td>2</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>
Social capital appears to be a crucial health-protective factor for Hungarians, with five out of five studies including a measure of social capital reporting a significant association with mortality. Using county-level cross-sectional regressions based on the data from the 1995 Hungarostudy Skrabski, Kopp and Kawachi (2003) found that all of the social capital variables were significantly associated with middle age mortality with general mistrust to society showing the strongest association, although county-level GDP, unemployment and education were all more strongly correlated with mortality. These results were confirmed with later data using subregion-level ecological regressions: Skrabski, Kopp and Kawachi (2004) found that social capital, collective efficacy, as well as religious involvement were each significantly associated with middle age mortality. Using data from the 2002 Hungarostudy survey Kopp et al. (2007) confirmed that low social support from co-workers (age adjusted odds ratio = 2.03) and low social support from spouses (age adjusted odds ratio = 4.03) were significant predictors of male mortality but not of female mortality. Using a follow up study of the same survey Kopp et al. (2011) again found that both self-efficacy and social support were significantly lower among the deceased than among the surviving group of the sample.

The traditional behavioural risk factor of smoking was found significant in 6 studies out of the 29 and insignificant in one study. Using Pearson correlation Skrabski, Kopp and Kawachi (2003) found no significant association between smoking and mortality in middle aged men at the level of counties. However, in a linear regression setting, smoking became significant for both men and women. In a follow up study with subregion-level data from 2002 and 2006 Kopp et al. (2007) found no significant relationship between smoking and mortality in age adjusted models. The other traditional risk factor, alcohol consumption was significant in 5 studies and insignificant in 2. Using a time series regression model with national level aggregate data Lackó (2011) found a strong association between smoking and alcohol consumption and mortality. The author also points out that smoking in Hungary has been decreasing since the mid of the 1980s, so it is less likely that is was implicated in the increase in mortality during the early transition years. Some researchers elevate the behavioural factors to the level of ultimate cause. For example, based on a review of long-term trends, Józan (2002) argues that the increase in mortality between 1970 and 2000 in Hungary is solely a result of alcoholism and smoking. Józan questions the importance of stress and other socioeconomic background factors in explaining mortality change and argues that hazardous individual behaviour is a result of the socialist culture that supposedly encourages a patriarchal relationship with the state, where citizens rely on public provision of goods and services and are not used to being in charge of their own needs.

Stress has often been pointed out as an important mediating factor between adverse social change and behavioural patterns considered detrimental to health (Brainerd and Cutler 2005). Using inflation as a proxy for overtime work (based on other empirical analyses that showed that Hungarians reacted to an
increase in prices with more time spent on working) Lackó (2011) showed that stress induced by excessive work has been an important background variable for mortality change. Lackó concludes that alcohol and tobacco was used to alleviate the stress induced by excessive work as a response to decreasing real incomes. The 2006 follow up study by Kopp et al. (2007) reports extensive significant links between various measures of stress and mortality. The odds ratio of death among men experiencing work insecurity was 3.6 compared to the control group adjusted for age. Low work control and low employment status were also significantly related to mortality. Confirming Marmot’s (2004) theory of the status syndrome Kopp et al. (2007) conclude that it is not the difficult social situation in itself, but the subjective experience of relative disadvantage, with chronic stress as the most important risk factor. Measuring the relationship between hopelessness, anomie and mortality, Kopp et al. (2007) also point out that a sense of meaning of life can help to counterbalance negative economic experiences.

Based on cross-sectional linear regression at the level of subregions, Kopp et al. (2006) found that weekend work hours, and the lack of social support at work together explain 14.7 per cent of middle aged male cardiovascular mortality. The role of work-related stress was much less important in explaining mortality variations among women. This gender difference might be explained by the different coping strategies across genders with men more likely to engage in hazardous behaviour to alleviate stress. Comparing data from the 1988 and 1995 Hungarostudy survey using self-rated health as a dependent variable Kopp, Skrabski and Szedmák (2000) point out that during the transition years there was a significant decrease in perceived control in work and in perceived social support from co-workers and friends, especially in the lowest socioeconomic groups, which also underpins the unified chronic stress theory approach to explaining the mortality increase during the transition. Kopp, Skrabski and Szedmák (2000) found that depressive symptom severity mediates between relative socioeconomic deprivation and higher self-rated morbidity rates, especially among men. Low control at work, low perceived social support and emotional coping strategies are also strongly correlated with depressive symptoms. Therefore, the researchers conclude that social deprivation, increased work or unemployment-related stress, lack of active and positive coping strategies among the lower social classes and depressive symptomatology represent the vicious circle that explains the decreasing health of Hungarians during the transition years. Non-quantitative studies on the long-term trends in mortality also underpin the centrality of overtime work and stress on mortality (Molnár 1992).

The importance of imparting a meaning to life and participation in political or religious activities, i.e. social integration, has been established by several empirical papers included in this review. As can be seen in Table 2, four studies found a measure of social integration to be significantly associated with mortality. In a recent paper using a spatial autoregressive model Balint et al. (2014) found significant
association between mortality, the lack of political involvement and the lack of religious involvement. Skrabski, Kopp and Kawachi (2004) found significant associations between mortality and a lack of religious involvement, social mistrust and low collective efficacy, using ecological level linear regressions. Kopp et al. (2007) found that the odds ratio of early mortality among men who reported no meaning in life was 2.62 adjusted for age. Hopelessness was strongly associated with female mortality. Conversely, people with higher levels of hope and increased meaning in life were protected against mortality. Thus both ecological and individual-level measures of social integration seem to be significant protective factors against mortality. These ecological and individual-level measures of social integration are in strong correlation with social capital, stress and mental health problems. As Kopp, Skrabski and Szedmák (2000) and Skrabski, Kopp and Kawachi (2004) pointed out positive coping strategies, individual signs of social integration and social capital, friends’ support, civil society organisations and colleagues can be important mediating and protective factors between social change and health outcomes.

Unemployment was found to be a significant predictor of mortality in three studies (Kopp et al. 2006; Lackó 2011; Skrabski, Kopp and Kawachi 2003), and insignificant in one study (Balint et al. 2014). Studies that did not include a significance test, but provide a long-term review of trends, also pointed out the strong association between ecological level unemployment and mortality (Uzzoli 2008; Uzzoli and Szilágyi 2009). Ecological level unemployment might be strongly correlated with the income inequalities that were also found to be significantly associated with mortality (Kopp, Csoboth and Réthelyi 2004) corresponding to aggregate indicators of economic performance (Lackó 2011; Skrabski, Kopp and Kawachi 2003). Balint et al. (2014) did not find a significant association between unemployment and suicide, whereas Dőme et al. (2011) reported the lack of significant association between economic performance and suicide. This divergence from other studies can be both explained by the ecological level study design of Bálint et al. and Dőme et al., or by the fact that suicide is more strongly correlated with mental health than with socioeconomic factors, as also confirmed by Rihmer et al. (2013).

It is worth mentioning that the two studies that measured the impact of medical services on mortality found no significant correlation (Balint et al. 2014; Lackó 2011). One of the studies uses suicide as the outcome variable, the other uses national level aggregate data on the number of doctors as a proxy for the quality of health infrastructure – these methodological decisions might explain the lack of significant impact. However, the ambiguity of the role of medical services in alleviating mortality in economically developed societies is also reflected in the cross-country empirical literature (Scheiring, Irdam and King 2017). The role of broader social factors increases in explaining mortality changes and mortality differentials as infant mortality and infectious diseases are successfully combatted through infrastructural developments, investments in health care and immunisation. This is in line with the
finding of Stuckler, Basu and McKee (2010), who reported that general welfare spending or austerity are more important predictors of mortality than levels of health care spending.

Discussion: Research on Hungary in the post-socialist context

In this chapter I provided a systematic review of the literature on the social determinants of health in Hungary, a rapidly changing post-socialist country. The chapter’s goal was to establish a hierarchy of the most important social determinants of mortality, as well as to identify the possible gaps in the literature. I reviewed 29 within-country peer reviewed empirical studies on mortality in Hungary and analysed the performance of the variables by ranking them based on the number and percentage of the studies that found them significant.

Based on a systematic review 29 within-country studies on the social determinants of mortality in Hungary this chapter has found that the literature put most emphasis on 1) socioeconomic status; 2) mental health; 3) social capital; 4) alcohol; 5) stress; and 6) social integration as social determinants of mortality. Medical services seem to have been less influential in affecting mortality outcomes. SES variables are the most important predictors of mortality for all causes of death, both in terms of explanatory strengths and the number of studies with significant results, except for suicide where mental health and social capital variables play a leading role. Mental health was found significant in six studies, a larger number than in cross-country empirical work on Eastern Europe. Several studies found that the negative health consequences of low education among men emerge through depression and hopelessness induced by chronic stress as a result of work-related factors. There are also important gender differences in the ways of coping with difficulties during sudden social changes and men appear to be significantly more vulnerable to status loss than women. Social capital was ranked number three among the variables significantly affecting health and longevity, with trust, help from colleagues, organisations and spouses representing other important protective factors. In the literature on Hungary, work-related factors emerge as important determinants of mortality associated with mental health, depression, social stress and mortality.

We have provided a review of the cross country empirical evidence on the social determinants of mortality in post-communist Eastern Europe elsewhere (Scheiring, Irdam and King 2017), so we can compare the results of Hungarian and international analyses. There are important similarities and differences in the two strands of literature. Measures of economic performance have been found significant in a large number of studies on post-socialist Eastern Europe similar to Hungary (Arinaminpathy and Dye 2010; Brainerd and Cutler 2005). Unemployment and labour market turnover
have also been established as important divers of social stress, increased alcohol consumption and cardiovascular mortality (Cornia and Paniccià 1996; Walberg et al. 1998). Similarly, several comparative studies have also found an association between perceived loss of control and mortality (Marmot and Bobak 2000).

However, there are certain factors that have received little or no attention in the Hungarian literature that were significant factors in studies in the international context. Although work-related factors, social cohesion, social capital, sense of control, excessive work and hopelessness have been thoroughly analysed in the literature on Hungary, and although alcohol and smoking have also been linked to social stress, the broader political-economic determinants of these factors remain completely unexamined in the context of Hungary. There is no quantitative research on the nature of transition, neither on the health impact of social and economic policies in the context of Hungary. Comparative studies have found the speed of privatisation, the change in the private sector share in employment and shock therapy in Russia to be significant predictors of mortality (Brainerd 1998; Minagawa 2013; Stuckler, King and McKee 2009). However, some researchers questioned the robustness of the association between shock therapy and mortality, arguing that the result was prone to ecological fallacy (Earle and Gehlbach 2010; Gentile 2012). A recently published article has shown that the association between mass privatisation and mortality was real, confirming the detrimental health effect of rapid privatisation using multilevel, i.e. individual, company and settlement-level data (Azarova et al. 2017).

There are also key studies on the effect of liberalisation on mortality that show that liberalisation and democratisation might contribute to the increase in mortality in the short run, but that these can be offset by long-term beneficial impacts (Mackenbach, Hu and Looman 2013). Participating in an IMF program was also found to be associated with increased tuberculosis incidence, prevalence, and mortality rates (Stuckler, King and Basu 2008), also evidenced in post-socialist countries. In contrast to the cross-country literature I have also found that some articles analysing mortality in Hungary overemphasise individual lifestyle and individual health behaviour, elevating these factors to the status of the ultimate cause. These behaviourist researchers in essence argue that the survival of the socialist culture explains drinking, unhealthy eating and lack of health consciousness which in turn is responsible for Hungary’s mortality crisis (Cockerham, Snead and DeWaal 2002; Józan 2002; Piko 2004).

Another striking difference compared to cross-country empirical studies is the relative importance of social capital in explaining mortality differentials in Hungary. Although a single-country study using Russian ecological level data convincingly showed the protective effect of social capital during the transition (Kennedy, Kawachi and Brainerd 1998), we found only a small number of cross-country peer reviewed studies investigating the impact of social capital on mortality in post-communist Eastern
Europe, with mixed results (Scheiring, Irdam and King 2017). In contrast, in the articles focusing on Hungary, social capital was a variable found significant third most often. Due to the very small number of studies we cannot draw any robust conclusions. More cross-country comparative work is needed to establish whether there is a difference in the role of social capital in Hungary and other countries, or we are only witnessing an increased focus of Hungarian researchers on social capital.

**Conclusion**

Hungarian mortality diverged from other Central European countries during the early transition years. Men lost 1.6 years in life expectancy between 1989 and 1993 in Hungary. Yet, this review of the literature on the social determinants of mortality in Hungary has shown that we still know very little about the contextual background factors of this major mortality crisis. There is evidence in the literature that overtime work during the 1970s and 1980s, followed by drastic labour market upheaval during the 1990s were important background factors directly associated with mortality, mostly through hazardous health behaviour. The experience of relatively poor socioeconomic position, status loss and hierarchy disruption during social change leads to chronic stress, depression, hazardous behaviours and increased mortality. This effect can be counteracted by better individual coping strategies, higher social cohesion and higher levels of social capital as several studies included in this review have also shown.

However, the distal economic determinants remained unexplored in the literature on Hungary. Although the economic context of health behaviour and mortality has been analysed at the level of trends, there are no statistical studies about the exact associations regarding Hungary. Despite the theoretical and empirical relevance of economic policies and macroeconomic cycles these factors have not received enough attention in the context of Hungary. Thus we still know very little about the determinants of social determinants, about how the transformation of socialist companies and the restructuring of the economy translated into individual health outcomes in Hungary.

Although the link has been rarely made, the social science literature on the post-socialist transformation has pointed out several features of the development trajectory of these countries that are relevant for explaining trends in longevity. First, the question of the speed of reforms has been thoroughly discussed from the perspective of economic and political theory (Boycko et al. 1993; Murrell 1992; Stark and Bruszt 1998; Stiglitz 1999). Research outside of the context of Hungary has also shown that shock-therapy type reforms have detrimental health consequences (Azarova et al. 2017; Irdam, Scheiring and King 2015). Hungary has adopted a mixture of gradualism and shock-therapy, opening up the possibility to analyse the potential positive and negative implications of this policy mix, paying special attention to
the combination of rapid liberalisation and prolonged state ownership of companies. Second, the literature on post-socialism has also analysed the social implications for international economic integration, such as the extensive deindustrialisation, the dramatic shock to people’s everyday lifestyles and the accumulation of experiences of rising uncertainties, increasing inequalities as well as the informalisation and re-feudalisation of social arrangements (Böröcz 1999b; Burawoy and Verdery 1999; Kalb 2015a). However, even critical analysts of the semi-peripheral dependent development model followed by Hungary often characterised the country as successful compared to other Eastern European countries (Bohle and Greskovits 2007; King and Váradi 2002). The debate surrounding the success or failure of dependent integration into the global economy can be further enriched by analysing the health and mortality implications of this particular development model.

Social scientists have much to learn from social epidemiologists who have designed robust methodologies and complex theoretical frameworks for analysing the political-economic determinants of health. As it has been noted before, social scientists and area specialists should focus more on the mortality crisis in Hungary (Haynes 2013). No critical analysis of post-socialism can be complete without assessing the human costs of economic transformation. Although the foundations of a critical political economy approach to mortality exists in the literature on Hungary in the form of analyses on the health impact of social stress, loss of control, hopelessness and unemployment, much remains to be done to understand how the economy was implicated in the post-socialist mortality crisis.
Chapter 3) The Relational Political Economy of Health

Summary

In this chapter I provide an overview of competing theoretical approaches as well as a brief summary of my theoretical approach – the relational political economy of health. I will first provide an overview of alternative explanations: the behavioural approach, the neoclassical approach, the inequalities approach and the world-system approach. Next, I turn to elaborating my own theoretical framework, the relational political economy of mortality, unpacking its meta-theoretical content and its roots in institutionalism, gender stratification theory and cultural political economy. Extending the literature review on the social determinants of mortality in Hungary provided in Chapter 2, this chapter also provides a theory-driven analytical review of the literature on the social determinants of the post-socialist mortality crisis encompassing Eastern Europe more broadly. Finally the chapter presents a middle range conceptual framework and derives empirically testable competing hypotheses.

Alternative approaches

The biomedical approach to mortality puts emphasis on biological risk factors, linking characteristics of the body or genes to chronic diseases. Social approaches in contrast analyse the role of health behaviour, economic conditions, inequalities in income, race or occupational class, globalisation, economic institutions, social class and culture. In my dissertation I focus only upon different social approaches to health and mortality, whilst purely bio-medical approaches are not part of the analysis. Within these social approaches there are some potential explanations of the post-socialist mortality crisis that can be ruled out based on the available evidence. As I mentioned in the review chapter, existing research has precluded the possibility that the post-communist mortality crisis would be a statistical artefact (Leon et al. 1997), or a result of environmental pollution (Bobak and Feachem 1995; Nell and Stewart 1994: 17).

Some researchers have argued that the collapse of the socialist health care system might be an important contributing factor to the post-communist mortality crisis (Budhdeo et al. 2015; Ellman 1994; Velkova, Wolleswinkel-van den Bosch and Mackenbach 1997). Yet, there are several studies that report no significant association between health care services and mortality casting doubt on the importance of healthcare expenditure in explaining the post-socialist mortality crisis (Brainerd 1998; Brainerd and Cutler 2005; Cornia and Paniccià 1996). Marmot and Bobak (2000: 133) estimate that deaths amenable to health care explain 10 to 20 per cent of excess deaths maximally. The improvement in child mortality
(largely dependent on the healthcare infrastructure) also shows that the relationship between healthcare and mortality is ambiguous (Adeyi et al. 1997). In contrast to healthcare spending, social welfare spending seems to be more important in protecting people from the negative health effects of economic crises (Stuckler, Basu and McKee 2010). Thus, there appears to be a weak link at best between the amount of healthcare provisions and the mortality crisis of the early transition years (King, Hamm and Stuckler 2009).

Finally, empirical analyses have also shown that malnutrition and other diseases related to absolute poverty only explain a very small part of the rise in post-socialist mortality (Cornia 1994; Paniccià 2000; Shkolnikov et al. 1998). Different measures of absolute poverty are often insignificant in multivariable regression models (Brainerd and Cutler 2005). Research has also shown that the magnitude of the decline in life expectancy was higher among the economically more developed former socialist countries (Russia, Hungary) and less pronounced in some of the less developed countries (Armenia, Albania), with a negative correlation between country level income per capita and life expectancy among post-socialist countries (Adeyi et al. 1997). This is not to say that poverty did not increase during the transition and this did not have a detrimental health effect. Yet, the magnitude of the mortality crisis suggests that the social determinants of mortality go beyond absolute deprivation, encompassing broader segments of society calling for more complex explanations. This section will review the most important alternative theoretical approaches, the behavioural, neoclassical, inequality centred and world-system approaches, before elaborating my theoretical perspective.

**Behavioural approaches**

Until the breakthrough of the inequalities paradigm (Kawachi and Kennedy 1997; Marmot et al. 1991; Navarro 1998; Wilkinson 1997), the dominant approach in epidemiology focused on individual health behaviour (alcohol, smoking, drug use, personal hygiene, lack of exercise, unhealthy diets) as the main explanatory factor of health outcomes (Mokdad et al. 2004). Individual health behaviour is certainly a crucial explanatory factor of mortality. However, this focus on individual health behaviour has also introduced an individualist ethic itself. As Lomas (1998: 1181) argued, by the 1990s the practice of public health and epidemiological research “has become colonised by the individualistic ethic of medicine and economics”. We can differentiate between two versions of the behavioural approach: a weak and a strong. The weak version of the behavioural approach maintains that individual behavioural factors are crucial determinants of mortality, yet also accepts that individual behaviour might be driven by broader social or contextual factors. Thus, the weak version of the behavioural approach is broadly compatible with the inequalities approach as well as with the political economy approach. In this dissertation I take
issue with the second version, i.e. the strong formulation of the behavioural approach that maintains that individual lifestyle factors are the only or dominant determinants of mortality. The strong formulation of the behavioural argument has two difficulties that I contest in this study: a) denying the relevance of social structures as determinants of individual health behaviour and only blaming individuals for their health, or b) or connecting individual health behaviour to social institutions in a functionalist way, arguing that a breakdown of social regulation leads to dysfunctional individual health behaviour. The first form of essentialist behaviourism is rare, but present especially among medical epidemiologists. For example Józan (2002) argued that the increase in mortality between 1970 and 2000 in Hungary was solely a result of alcoholism and smoking. The second problem, functionalism, is a more common phenomenon. For example, the literature on the health effect of unemployment was dominated for decades by Jahoda’s (1982) latent functions model. Jahoda argued that the most important mental health consequence of job loss was the loss of time structuring function of the institution of employment. In general terms, Elster provided a powerful critique of functionalist reasoning (Elster 1994). In relation to health, it has been pointed out that the functionalist connection between health behaviour and social structure denies the role of individual agency, perceptions of injustice, loss of control, feeling of self-efficacy, as well as the broader contextual implications of plant closures (Fryer 1986; Fryer and Stambe 2014).

In the context of the post-socialist mortality crisis this functionalism was tangible in arguments about the health effect of socialist culture or socialist ideology. Carlson (1998), for example, argued that as a result of socialist culture, the tradition of the active citizen is underdeveloped in Eastern Europe, which leads to health problems. Carlson and Hoffmann (2011) argue that the peak in mortality around 1995 in Eastern Europe is a result of the latent effect of state socialist development policies. They argue that state socialism produced an imbalance in the employment structure by channelling large segments of a formerly agricultural population into industrial jobs. They connect state socialist industrialisation to the breakdown of rural social cohesion and village community regulations and relate this to the state socialist mortality syndrome. Carlson and Hoffman conclude that the collapse of state socialist industrial policies should lead to an increase in life-expectancy as it produces “rapid corrections in labour force structure after 1990” (Carlson and Hoffmann 2011: 355).

Cockerham’s lifestyle theory also questions the relevance of broader societal change for health during the transition, and attempts to explain the acceleration of mortality rates by linking the legacy of socialist ideology to drinking, unhealthy eating and lack of health consciousness (Cockerham 1997; Cockerham 2000; Cockerham, Snead and DeWaal 2002). As defined by Cockerham (1997: 124), “the health lifestyles explanation lays the blame for poor health upon unhealthy practices”. Cockerham hypothesises that the rapid introduction of markets should lead to rapid improvements in health as
socialist lifestyles are wiped out. Even if this might increase social stress, the stress impact of market transition will be offset by its healthy lifestyle promoting impact. Citing Carlson and Rychtaríková with regard to the Czech Republic, Cockerham questions that rapid transition to market society would increase mortality: “rapid declines in nearly all causes of death for all age groups after 1990 has coincided with rapid social transformation, economic insecurity, stress, unemployment, new freedom in the marketplace to buy and sell an unprecedented variety of foodstuffs, and in general, an acceleration of the sort of 'westernisation' that was supposed to be producing rising death rate” (Cockerham 1997: 124).

Unhealthy lifestyles such as smoking, excessive drinking and binge drinking are indeed prevalent in former socialist countries (Cockerham 1997). Alcohol has often been pointed out as a major factor behind mortality by within-country studies (Leon et al. 1997; McKee and Chenet 1995). However, whilst investigating drinking among women, Hinote, Cockerham and Abbott (2009) found that women who do not wish to return to socialism are more likely to drink in eight post-Soviet republics, thus effectively questioning a central premise of health lifestyle theory. In contrast to the assertions of lifestyle theorists, it has also been shown that alcoholism especially among working class males was related to broader social developments, such as the shock of the abrupt and severe economic transition (McKee and Shkolnikov 2001; Shkolnikov et al. 1998; Watson 1995; Weidner 2002). Some studies also found poor diets implicated in the post-socialist mortality crisis (Connor et al. 2004; Stefler et al. 2015), yet, the general dietary pattern has been stable or even improved during the transition (Brainerd and Cutler 2005: 123-4). It has also been shown that increases in death rates went far beyond historical trends during the early years of the transition (Cornia 2000). None of the traditional risk factors directly related to health behaviour (obesity, cholesterol, smoking, high blood pressure) changed enough to explain the dramatic increase in cardiovascular mortality (Brainerd and Cutler 2005: 115-8) during the early 1990s.

**Neoclassical economics and the shock therapy approach**

The behavioural approach to health is also often adopted in social and economic policy discourses, as it is compatible with the individualism of neoclassical economics creating a “lifestyle drift” in health policy (Katikireddi et al. 2013; Mackenzie et al. 2016; Smith 2013). The behavioural approach, focusing on individual health choices, also propelled the World Bank (2005) to advocate increased efforts to change the lifestyle behaviours of Russians to protect health, whilst neglecting the broader social context. Health behaviour interventions (HBIs) have taken off since 2006. These policy interventions aim to change individual health behaviour informed by psychological and economic theories of behaviour change. Holman, Lynch and Reeves (2017) performed a systematic co-citation analysis of HBI studies.
published in peer reviewed journals, finding that the share of HBI studies with references to disciplines that offer a deeper understanding of the social context, such as sociology, anthropology or human geography, has been decreasing since 2006.

Advising on the transformation of former socialist countries, neoclassical economists advocated a policy package referred to as “shock therapy” or “the Washington consensus” that prescribed the rapid transformation of enterprises as a necessary combination of “pain and progress” (Lipton and Sachs 1992). Although, these neoclassical economists rarely formulated an explicit theory of mortality, they believed that the introduction of markets and the destruction of socialist economic institutions will “get prices right” adjusting them to their correct levels, and this would, in turn unlock growth potentials, increase social wealth and as the fruits of growth trickle down, market reforms will lead to improvements in health and increasing life expectancy (Pritchett and Summers 1996).

Throughout the early 1990s the mainstream of economists and policy advisors, as well as international institutions, advocated for the rapid privatisation and liberalisation of former socialist economies, arguing that reforms “must all be completed as soon as possible” (Summers 1994: 253). According to the advocates of shock therapy, the varieties of western capitalism are irrelevant for transition economies: social democratic regimes and liberal market models are supposed to be the same from the perspective of inefficient socialist institutions (Sachs 1990). Advocates of shock therapy did not oppose privatisation through foreign investors, but conceptualised mass privatisation as a superior alternative to FDI (Lieberman et al. 1995: 3). The reason was political, as it was believed that there was a lack of interest from the side of foreign capitalists to invest in large socialist enterprises as well as a lack of domestic political viability. Privatisation through FDI was also believed to be too slow as it relied on a case-by-case negotiation with investors and could have led reformers to miss the “window of opportunity” for reform (Lieberman and Kopf 2007: 12). Advocates of rapid reforms also argued that the maintenance of state ownership would lead to slower growth and an increase in poverty (Mitev, Tomova and Konstantinova 2001), and thus potentially to worse health outcomes. A few studies find that shock therapy was positively correlated with economic growth (Bennett, Estrin and Urga 2007)

The neoclassical argument for shock therapy resembles early modernisation theory that hypothesised a direct causal relationship between the emulation of western social models, the elimination of capital scarcity through privatisation, economic growth and reduced mortality (Rostow 1960). Although economic development is certainly an important factor behind improvements in mortality (Evans and Stoddart 1990; McKeown 1979; Pritchett and Summers 1996), there is widespread evidence that economic growth does not necessarily trickle down and bring forth social development and improved welfare for all without investment into public services (Biggs et al. 2010; Sen 1999; Stiglitz 1999). Health-
promoting investments into public services are, in turn, dependent on political processes and struggles (Kavanagh 2016; Szreter 1988). Some advocates of rapid reforms still argue that the poor performance of some post-socialist countries might be explained by the lack of sufficient reforms (Aslund 2007) emphasising corruption as a main factor behind the failure of shock therapy in Russia (Gould 2003; Hellman 1998).

Although some sociologists and institutional economists criticised the neoclassical economic approach (Dewatripont and Roland 1992; Murrell 1990; Stark 1992) it dominated policy making until the end of the 1990s (Wedel 2001). The bulk of the empirical evidence suggests that shock therapy was costly in terms of human development indicators (Gerber and Hout 1998a). Empirical research has shown that radical reforms have negative health implications (Brainerd 1998; Brainerd and Cutler 2005; Hertzman and Siddiqi 2000; Irdam, Scheiring and King 2015; Mackenbach, Hu and Looman 2013; Minagawa 2013). The increase in mortality in Russia was strongly associated with labour market upheaval. The regions that lost the highest number of employees saw the steepest increase in mortality (Cornia and Paniccià 1996; Walberg et al. 1998).

Cross-country regressions on mass privatisation showed that it has had a detrimental effect on health and life expectancy (Irdam, Scheiring and King 2015; Stuckler, King and McKee 2009). This approach was questioned, however. Gerry (2012), for example, argued that cross-national nature of the article by Stuckler et al. lead them to commit ecological fallacy, failing to establish an individual-level linkage between mass privatisation and mortality. The debate on mass privatisation and mortality attracted a great deal of attention (see for example Earle and Gehlbach 2010; Gerry, Mickiewicz and Nikoloski 2010a; Gerry, Mickiewicz and Nikoloski 2010b; King, Stuckler and Hamm 2006; Sachs 2009a; Sachs 2009b). In answer to criticisms, a recent multilevel analysis using individual-, town- and company-level data has confirmed the detrimental health effect rapid of mass privatisation in Russia (Azarova et al. 2017).

The empirical research on the health impact of the other elements of the shock therapy package in post-socialist Europe, such as rapid economic liberalisation (Brainerd 1998) and drastic rapid social structural change (Minagawa 2013), underpins the negative impact of shock therapy on health, especially comparing Eastern Europe to gradual reforms in Asia (Hertzman and Siddiqi 2000). Mackenbach, Hu and Looman (2013) have also found that, in the 1960-1990 period, current democracy was strongly associated with higher life expectancy, yet in the 1987-2008 period, current democracy was associated with lower life expectancy, concluding that short term, rapid changes in Eastern Europe might have had a negative effect on health.
The inequalities approach

In contrast to the behavioural and the neoclassical approaches, the inequalities approach attempts to go beyond the focus on the individual and puts emphasis instead on how broader social structures influence health. There are three central theoretical pillars to the inequalities approach (Elstad 1998): first, it goes beyond individual determinants of health by applying the relational concept of income inequality; second, it emphasises the centrality of social stress as a result of unequal social arrangements as a crucial driver of health outcomes; third it emphasises social cohesion or social capital as an attribute of communities that can help to offset against negative social influences on individual health.

By treating income inequality as a major determinant of health, the inequalities approach puts emphasis on a social factor that cannot be reduced to the level of individuals. Research has shown that among the most developed countries there is no statistically significant association between income and health, however, within countries, income and health are strongly correlated (Subramanian and Kawachi 2004; Wilkinson 1997; Wilkinson and Pickett 2006). Pioneering work in studying the British civil service has also shown that occupational status creates a gradient in health all through the social ladder (Marmot et al. 1991; Marmot 2004). These studies have established the knowledge that inequalities are more important than absolute income levels – at least, in the most advanced countries. There is also evidence that inclusive social policies in less advanced countries also lead to higher human development and better health, such as in the state of Kerala in India or in Cuba (Sen 1999).

A second major implication of the focus on income inequalities as opposed to the absolute level of income is that it has led to the recognition that social stress is a crucial determinant of health. Stress might be related to negative health outcomes both directly, affecting disease development, and indirectly, through amplifying health-damaging behaviour (Elstad 1998). Several crucial sources of social stress have been identified, such as status loss, downward mobility, unemployment, fear of job loss, precarious employment, low self-efficacy or lack of control among others (Brunner 1997; Cooper and Marshall 2013; Greenwood et al. 1996; Leon and Shkolnikov 1998). In relation to the research question of the current dissertation a strand of quantitative as well as qualitative studies have analysed the social stress induced by individual labour market shocks and the health impact of plant closures (Burgard, Brand and House 2007; Hamilton et al. 1990; Newman 1985; Newman and Massengill 2006). Place has also emerged as an important contextual factor shaping individual health. Social epidemiologists, human geographers and health sociologists have developed a substantive body of research on the independent contextual effect of area-level characteristics, such as unemployment, deprivation, racial segregation or area inequalities, both in quantitative and qualitative studies (Chaix, Merlo and Chauvin 2005; Curtis and Rees Jones 1998; Davidson, Mitchell and Hunt 2008; Diez-Roux 2004; Macintyre, Ellaway and Cummins 2002; Malmström, Johansson and Sundquist 2001; Mitchell et al. 2000; Popay et
al. 2003; Sooman and Macintyre 1995; Subramanian, Acevedo-Garcia and Osypuk 2005). Studies that focus on area level deindustrialisation go beyond the inequalities approach by pointing out the importance of macro-structural change in the economy induced by liberalisation and technological development (Audureau, Rican and Coste 2013; Riva et al. 2011; Walsh, Taulbut and Hanlon 2009).

Finally, a third important implication of the inequalities approach is that the quality of social relations, social capital or social cohesion might offset the health impact of social stressors. Researchers have analysed the role of individual differences in available resources to allow coping with social and economic stress (Hraba et al. 1994; Thoits 1995). There is also a large body of literature underpinning the notion that social capital and social cohesion is protective of health (Kawachi, Kennedy and Glass 1999; Kawachi and Berkman 2000; Lomas 1998).

Several studies measuring the impact of inequalities on health in post-socialist countries found significant associations. Huisman and Oldehinkel (2009), for example, found that in former communist countries income inequality is correlated with violence-related deaths. Muntaner et al. (2012) found that labour market inequality is associated with worse health in lower income countries. Sengoelge et al. (2013) found that country-level income inequality and GDP is associated with child mortality. Direct evidence linking psychological stress with health and mortality is limited, but existing studies seem to establish a coherent trend. Perceived control and weak sense of mastery (Appels et al. 1996; Bobak et al. 1998; Bobak et al. 2000; Gilmore, McKee and Rose 2002; Lundberg et al. 2007), work stress as measured by effort-reward imbalance (Pikhart et al. 2001), economic pressures on families and especially male manual workers’ reactions to uncertainties (Carlson and Vägero 1998; Watson 2006), job strain and poor coping skills in the face of elevated levels of psychological stress (Kristenson et al. 1998) have all been linked to health deterioration in post-communist countries.

Economic downturn and rapid change often wreak havoc in the labour market, and this has been shown to be particularly relevant in explaining individual health outcomes by increasing social stress (Falagas et al. 2009; Stuckler et al. 2009). For example, the increase in mortality in Russia was strongly associated with labour market upheaval: the regions that lost the highest number of employees were to see the steepest increase in mortality (Cornia and Paniccià 1996; Walberg et al. 1998). Rapid social change, large scale unemployment and loss of status has been also shown to be associated with stress and mortality in post-socialist countries (Cornia and Paniccià 2000). Research has also shown that in times of crises resulting in high unemployment, public social protection might act as a buffer against increasing mortality (Bambra and Eikemo 2009; Stuckler, Basu and McKee 2010).
The world-system theory perspective

World-system theory refers to a body of work within development economics and sociology that has been so far largely neglected by social epidemiologists. However, world-system theorists outside the field of public health research have formulated and tested several hypotheses on health. World-system theory looks further upstream to the global economy to analyse the determinants of health. It maintains that external, global factors are more important than domestic factors to understand local development outcomes such as economic growth, human development, health or mortality. A strong formulation of the world-system theory predicts economic and social decline as countries become increasingly intertwined with the capitalist world-system (Bornschier and Chase-Dunn 1985; Frank 1966; Wallerstein 1974). A weaker formulation is also known as the theory of dependent development (Cardoso and Faletto 1979; Evans 1979) that suggests that development is possible in the global capitalist economy but the world-system distorts this development process. This distortion might result in structural imbalances of the economy (economic disarticulation or economic dualism), increasing inequalities or the absence of “trickle down” effect. The dependent development perspective is close to the institutionalist perspective that I will discuss in the next section of this chapter, as part of the relational political economy of health.

According to world-system theory, the negative effect of the global economic system might be transmitted through the channels of trade dependence (Ragin and Bradshaw 1992), debt dependence (Bradshaw and Huang 1991) or investment dependence (Kentor and Boswell 2003). Investment dependence refers to property changes and foreign capital penetration of the economy. According to the advocates of the world-system perspective, transnational corporations promote resource and surplus extraction that could otherwise be invested locally, obstruct health and other social programs, and force countries to engage in a race to the bottom for attracting foreign investors (Amaro and Miles 2006), resulting in a constant decrease of capital taxation and a lowering of health and social standards (Drahokoupil 2008).

World-system theorists criticise the shock therapy implemented in post-socialist countries, most notably in Russia. Shock therapy privatisation made the former socialist countries vulnerable to global capitalist forces which led to a rise of merchant capital, the collapse of state capacity and public services such as health, the rise of speculative activities, the concentration of wealth and power in the hands of a few capitalists and the inevitable informalisation and oligarchisation of the economy and the polity (Böröcz 2000; Burawoy 1996; Harvey 2004). “Global ethnographers”, mostly following a world-system perspective, have investigated the impact of the market transition on the lived experience of local communities, providing crucial qualitative insights into how post-socialist transformations might affect health (Burawoy and Verdery 1999; Burawoy, Krotov and Lytkina 2000; Kideckel 2008).
The empirical evidence on world-system theory is mixed. Some studies report a harmful effect of foreign investment on economic development (Dixon and Boswell 1996; Kentor and Boswell 2003), on inequality (Evans and Timberlake 1980), on infant mortality (Crenshaw and Ameen 1993; Jorgenson 2009; Yoo 2014), on life expectancy (Herzer and Nunnenkamp 2012; Tausch 2012; Wimberley 1990), on maternal mortality (Shen and Williamson 1997; Shen and Williamson 1999), as well as on the physical quality of life (Breedlove and Armer 1996; London and Williams 1988). Some studies report a positive health effect of foreign investment that disappears in wealthier developed countries (Nagel, Herzer and Nunnenkamp 2015). However, a large segment of these studies was based on a misinterpretation of the statistical relationship between foreign investment penetration (the ratio of foreign capital stock to total capital) and development outcomes (Firebaugh and Beck 1994). Yet, some recent studies, using foreign investment flows as a measure of economic dependence, instead of foreign capital penetration, also find a harmful mortality effect (Gray, Kittilson and Sandholtz 2006; Rudra and Haggard 2005), or show that there is no effect of foreign investment on health or quality of life (Bradshaw et al. 1993; Frey and Field 2000; Hauck, Martin and Smith 2016; Shen and Williamson 2001).

The relational political economy of health

Meta-theoretical framework

Just like the world-system and the inequalities approaches, the political economy of health approach also goes beyond individual health behaviour and situates it in the economic and political structures of contemporary global capitalism. The relational political economy approach does not question the relevance of health behaviour and inequalities but offers a sociologically more nuanced understanding of the distal political and economic determinants of the proximate causes of health. The meta-theoretical framework of the relational political economy approach to health that I follow in this dissertation is influenced by Polányi’s analysis on the tensions of commodification (Polanyi 2001[1944]), by critical realist social theory and epistemology (Archer et al. 1998; Emirbayer 1997; Jessop 2005), and by Marxist revisionism6 (Esping-Andersen 1990; Korpi 1983). The direct theoretical precursor of this framework is the political economy of health approach as it has been developed by Poland et al. (1998), Navarro (1999), Muntaner and Lynch (1999), Scambler and Higgs (1999), Coburn (2004), Labonté and

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6 Marxist revisionism was a term first used to describe the ideas of Bernstein and his followers who advocated for a democratic version of socialism around the end of the 19th century. Later, various forms of neo-Marxist and post-Marxist theories followed this tradition of questioning the idea of the universal laws of history and emphasising the importance of democratic struggle and relative autonomy of the state. I use the term to differentiate between essentialist or economic Marxism and social theories that allow for a relative autonomy of the political, economic and cultural spheres.

Empirical research has underpinned several hypotheses formulated by scholars following the political economy of health approach. Research has shown that neoclassical policies increase health problems and mortality (Coburn 2000; De Vogli 2011); that social democratic welfare regimes have the ability to protect against some of the psychosocial risks induced by global markets (Bambra 2007; Coburn 2004; Jäntti, Martikainen and Valkonen 2000; Navarro and Shi 2001; Olafsdottir 2007); that rapid privatisation increases mortality (Azarova et al. 2017); and that structural adjustment and austerity are associated with health problems (Karanikolos et al. 2013; Kentikelenis et al. 2014; Kentikelenis 2017; Stuckler and Basu 2013). There is also accumulating evidence of the ways in which consequences of neoclassical economic transformations such as increasing precariousness of employment (Barlow et al. 2015), work (Waters 2014) housing (Clair et al. 2016) and the liberalisation of food (Hawkes 2006; Schrecker and Bambra 2015) impact adversely on health.

However, the emergent political economy of health paradigm has some limitations that I seek to address in this dissertation. First, the overwhelming majority of studies following the political economy of health approach concentrate on the most developed Western and Northern countries, with semi-peripheral states receiving much less attention (Beckfield and Krieger 2009). Second, the institution that has received the most attention from political economists is the welfare state (Beckfield et al. 2015). Studies that analyse the interactions between state policies, power structures and companies as economic institutions and their implications for health are much less frequent (King, Hamm and Stuckler 2009; Stuckler, King and McKee 2009). This dissertation adds to the growing field of the political economy of health by focusing on companies as economic institutions, on economic and social policies and their interactions with the social structures of post-socialist dependent capitalism in producing health outcomes. The relational prefix is meant to emphasise the embedded and dynamic nature of economic institutions that have to be analysed to understand the impact of post-socialist economic change on health. The relational prefix to political economy can be unpacked at a meta-theoretical level through defining its implications for class and international economic embeddedness.

First, the central analytical concept of the relational political economy approach is class, which is defined not in individual terms but as structural, dynamic and relational (Muntaner and Lynch 1999; Scambler and Higgs 1999). By assuming social fields as interrelated but also relatively autonomous from each other with their own laws of functioning, the relational political economy approach overcomes the rigidity of the classic Marxist notion of structure and agency (Archer et al. 1998; Emirbayer 1997; Jessop 2005). In this, it substantively differs from world-system theory that treats global economic structures
as final causal determinants. The relational theory of class conceptualises class as an emergent “bundle of unstable, uneven, contradictory and antagonistic relational interdependencies” (Kalb 2015b: 14) and thus opens up an analytical scope for politics and varieties of capitaisms as a result of divergent political constellations. The relational theory of class treats the field of politics and hence democratic class struggle as relatively autonomous, spatially and historically contingent, though constrained and constituted by the field of economic structures (Eyal, Szélényi and Townsley 2003; King and Szelenyi 2006). The relational theory of class conceptualises the state as capable of integrating, though not eliminating, class conflicts (Offe 1991; Streeck 2014). Increases in life expectancy are neither delivered automatically through economic development nor through the institutionalisation of abstract liberal values, but through historically contingent class conflicts, institutionalised in various mechanisms to promote health and protect citizens from market shocks (Szreter 1988). From this premise it follows that inequalities in health, social stress or detrimental health behaviour are embedded in relations of class and thus cannot be analysed separately. Yet, in contrast to world-system theory, these class relations are open to political contestation and are influenced by local socio-cultural path dependencies, thus local manifestations cannot be solely explained through their positions in the world-system. In this perspective, class is thus an overarching term but not fully determinative, bringing closer Marxian and Weberian analyses of class (Wright 2009).

Second, the relational political economy approach agrees with world-system theory that economic structures do not exist in self-contained nation states. The position a country occupies in the international division of labour is central to the relational political economy of health. Segments of the society that are able to participate in global economic networks might have much better life chances than segments that are excluded from these networks. As globalisation concentrates capital in the regional centres of production, the inequalities between those who can participate in global networks and those who cannot increase (Castells 2000). Yet, in contrast to world-system theory, the relational approach to political economy conceptualises the global economy as instituted through local political action. Analysts have pointed out that Central and Eastern European countries institutionalised globalisation as a normatively desirable development strategy through attracting foreign investment (Bandelj 2009; Böröcz 1999b). In contrast to the structural determinism of world-system theory, relational political economy emphasises that the internationalisation of domestic economies through

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7 Inclusion in the global economy does not necessarily mean better life chances. Slaves growing sugar cane or cotton for global capitalism in the 18th century were integrated in the global economy but were arguably less well-off than segments of the petty bourgeoisie producing for the local markets in developed. Similarly, in today’s globalised capitalism there are several forms of exploitative employment well integrated into the global economy, such as manufacturing garments in sweatshops. Yet, integration into the global economy is one of the strongest dividing lines in today’s economy, with those left out of global networks being the biggest losers.
foreign investment opens up possibilities for development and creates tensions at the same time (Cardoso and Faletto 1979; Evans 1995). Divergent constellations of social movements, status groups, class forces, as well as inter- and intra-class struggles affected the strength and organisation of state bureaucracies, the allocation of crucial material and symbolic resources, the openness to foreign capital and thus the path taken by each country during the post-socialist transformation.

Relying on this meta-theoretical framework, this dissertation analyses the post-socialist mortality crisis in Hungary putting emphasis on the economic institutions of post-socialist dependent capitalism in Hungary as embedded in the semi-periphery of the global economy, their gendered implications and their cultural construction. The following sections elaborate these theoretical building blocks of relational political economy in more detail.

**Institutionalism and health**

*Social epidemiologists have thus far put little emphasis on companies as economic institutions especially in the context of semi-peripheral dependent development. This dissertation adds to the literature by developing the health implications of institutionalist economic theory and economic sociology.*

Institutionalism is a theoretical approach within economic and social theory (Chang 2002a; Chang and Evans 2005; Chang 2002b; Crouch 1998; Evans, Reuschemeyer and Skocpol 1985; Fligstein 1996; Murrell 1991; Polanyi 1957; Rodrik, Subramanian and Trebbi 2004; Roland 2002; Stiglitz 1999; Streeck 2011). Institutionalists argue for the centrality of state regulations, norms as well as robust property rights and governance structures in economic development. In contrast to neoclassical economists who use equilibrating markets as key explanatory and evaluative criteria, institutionalists maintain that the nature and operation of companies is central to the type of capitalism emerging in a country, as well as to the type of social contract or social legitimacy underpinning democratic capitalist arrangements (Bruszt 2006; Crouch and Streeck 1997; Crouch 1998). The institutionalist approach has also been theoretically applied to health research by Evans (2009). Evans argues that turning focus upon institutions and capabilities in development studies provides a powerful theoretical foundation for public health research, by pointing out the relevance of “societal support” mechanisms. This encompasses the provision of collective goods by public institutions and mobilised engagement by civil society groups to demand improved health outcomes from the state. Institutionalists thus see the role

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8 By institutionalism I refer to theories that are in the social sciences most often labelled as ‘historical institutionalism’, ‘structural institutionalism’, ‘neo-institutionalism’, or ‘sociological institutionalism’, as opposed to ‘rational choice institutionalism’. To avoid an unnecessary proliferation of adjectives I use the term institutionalism.
of the state, civil societies and norms as central to successful human development. Yet, in his paper Evans does not put much emphasis on companies as institutions.

A central issue pertaining to companies and economic transformations is the question of deindustrialisation or the emergence of post-industrial economies (Block 1990; Bluestone and Harrison 1982; Strangleman, Rhodes and Linkon 2014). Neoclassical economists see global markets as leading to optimal equilibrium outcomes, and maintain that the reduction in industrial employment or output is mainly a result of technological development that induces beneficial structural change in the economy (Rowthorn and Ramaswamy 1999). This structural change would offset deindustrialisation with the rise of high value added services (banking, IT) and knowledge intensive industries. Neoclassical economists and behavioural health researchers argued that the destruction of inefficient socialist companies would free resources that can be allocated more efficiently, thus boosting growth, welfare and improvements in life expectancy (Carlson and Hoffmann 2011). The reorganisation of socialist institutions would also lead to the abandonment of unhealthy behavioural practices, such as drinking and unhealthy eating as people take responsibility for their own lives.

In contrast to neoclassical economists, institutionalists argue that premature deindustrialisation entails dangers for economic growth (Rodrik 2016). As opposed to technology-driven deindustrialisation in advanced economies, low and middle income countries are experiencing a deindustrialisation as a result of globalisation and trade, as Rodrik shows. These countries start to deindustrialise at lower levels of income compared to early industrialisers. This reduces the potential for growth, as industrialisation represented a “quintessential escalator” for developing countries: it spurred the employment of low and semi-skilled workers; it increased exports and increased the demand for local goods and services. Low value-added services, that very often take the place of manufacturing production, are less beneficial for development according to Rodrik. As opposed to neoclassical economists who maintain that labour markets would naturally react to the new demand for skilled labour, institutionalists maintain that deindustrialisation leads to labour market dualisation, as those with lower skills fail to catch up with the new growth sectors of the economy and become outsiders, as opposed to the insiders who can cope with the demands emanating from global networks of production (Emmenegger et al. 2012). Existing quantitative public health research concentrating on Western countries has demonstrated that deindustrialisation is associated among others with decreases in health insurance (Renner and Navarro 1989), reduced physical activity (Rind, Jones and Southall 2014), increased mental health problems (Hamilton et al. 1990), increased mortality (Walsh, Taulbut and Hanlon 2009), increased susceptibility to drug use (McLean 2016) as well as suicide (Kubrin, Wadsworth and DiPietro 2006). However, the research on the human implications for deindustrialisation in emerging economies is scant.
Institutionalists also point out that without proper guidance from the state the rapid introduction of market forces will lead to massive company failures in post-socialist countries, thus potentially undermining health (King, Hamm and Stuckler 2009). Institutionalists argue that without establishing the rules of the game, without building institutions to promote the functioning of markets and to guard against predatory behaviour of entrepreneurs, rapid privatisation would cause a massive fiscal shock to the state, lead to slower growth and further reduce state capacity to intervene into the economy and promote human development (Hamm, King and Stuckler 2012). Institutionalists agree with world-system theorists that rapid privatisation led to a rise of a new oligarchy in Russia, which was responsible for the failure of transition by the end of the 1990s (Hoff and Stiglitz 2004; King 2002; Reddaway and Glinski 2001).

However, in contrast to world-system theorists, institutionalists maintain that strategic state intervention and a robust institutional structure may promote development in parallel to economic globalisation (Evans 1995). They emphasise the role of education in spreading the gains of growth evenly and bringing down mortality (Lena and London 1993). Institutionalists also emphasise that effective state bureaucracies could negotiate better deals with strategic foreign investors that would lead to superior governance structures, superior growth, and superior health outcomes in the long run, compared to rapid mass privatisation (Bruszt 2002; Crouch 2004a; Crouch and Keune 2005; Evans and Rauch 1999; Keune et al. 2009; King and Váradi 2002; Stuckler, King and McKee 2009). Institutionalists also argue that the state is in a position to overcome structural disarticulation and promote the upward mobility of domestic enterprises in global value chains, and thus the distribution of costs and benefits of global integration will depend on the niches that workers, firms and states are able to carve out in these global value chains (Evans 1989; Gereffi 1989; Gereffi and Fonda 1992; Labonté and Schrecker 2007). As opposed to shock therapists, institutionalists also see democracy as a precondition of successful economic and social development (Eichengreen and Leblang 2008; Gould 2003). Democracies are more open to the needs of society and are able to correct previous policy mistakes as opposed to closed authoritarian regimes and therefore are better in promoting health and welfare (Orenstein 2001; Rodrik 2016; Sen 1999).

The literature supports several hypotheses formulated by institutionalists. There is evidence for the positive role of democracy and strong state institutions in promoting human development in post-socialist countries (Fidrmuc 2003). Debating the empirical findings of world-system researchers a few studies have also found that foreign investment reduces infant mortality and promotes health (Chuang et al. 2013; Dawson 2010; Frey and Song 1997; Sharma and Gani 2004a). There is also evidence that privatisation to foreign investors resulted in significantly better improvements in productivity and firm performance than privatisation to domestic investors in Central and Eastern Europe (Brown, Earle and
Some studies found that foreign investment only promotes human development in democratic countries (Shandra et al. 2004; Shandra et al. 2005) or in countries with strong activist industrial policy (Reiter and Steensma 2010), whereas it increases mortality in authoritarian or corrupt regimes. There is also strong evidence that state capacity, a social democratic welfare state and higher amounts of social spending reduce mortality (Muntaner et al. 2011; Stuckler and Basu 2013).

However, some structurally inclined institutionalists also emphasise the structural tensions inherent to the dependent development model followed by post-socialist countries. Investments were concentrated in the technology and capital-intensive manufacturing export sector with little connections to other segments of the economy. This economic structure, with weak forward and backward linkages of the high performing, technology-intensive, transnational dominated sector of the economy, has been described by development sociologists and structuralist economists several decades ago as structural disarticulation (Breedlove and Armer 1996; De Janvry and Sadoulet 1983; Hirschman 1978; Stokes and Anderson 1990). Researchers have shown, that in Hungary, as a result of structural disarticulation, the total share of foreign companies in export revenues was more than 70 per cent during the 2000s (Pitti 2010: 55), with the leading 50 foreign affiliates accounting for 45 per cent of Hungarian exports in 2000 (Fink 2006: 61). By 2010 49.9 per cent of actually functioning enterprises were located in Budapest or Pest-county, the central region of Hungary (Pitti 2010: 65). Comparing European countries in terms of the regional dispersion of GDP per capita Smith and Timár (2010) found that by 2006 Hungary was by far the regionally most unequal economy in the EU, surpassing regional inequalities in Romania and Bulgaria, two highly unequal societies.

Structurally inclined institutionalists also pointed out that the transformation and global integration of socialist economies has altered domestic power relations fundamentally (Bohle and Greskovits 2012; Eyal, Szelényi and Townsley 1998; King and Szelényi 2005a; King and Szelenyi 2006). The working class, previously to some extent integrated into the socialist state, had a modicum of control over work relations, and was recipient of a host of welfare and community services, lost its former privileges. The labour code and the social policy regime of the county were modified several times throughout the transition, increasing the precariousness of workers and eroding social rights whilst moving toward a neoliberal direction (Ferge and Tausz 2002; Ferge and Juhász 2004). During the first years of the transition, a generous unemployment insurance scheme was installed, based on the German model. However, as this proved to be hard to finance under the new regime, the duration and the value of unemployment benefits was lowered on several occasions during the 1990s. Early retirement, disability

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9 That is registered and operating companies. There are a large number of companies that are registered but are not operating or are under termination.
retirement and old age retirement were the most important channels out of the labour market during the 1990s (Kolosi and Tóth 2008). However, retirement policies were also tightened throughout the transition, increasing retirement age and tightening the possibilities for early retirement. Despite the move towards the neoliberal model during the 1990s and 2000s Hungary still maintained a welfare state that cushioned against the most extreme social and economic risks. Political economists therefore labelled the Hungarian model as an embedded neoliberal model as opposed to the pure neoliberal model of the Baltic states in post-socialist Eastern Europe (Bohle and Greskovits 2007).

**Gender and health**

The relational political economy of health also takes the gendered nature of economic transformations into consideration, utilising the insights of gender stratification theory. Gender stratification theory emphasises the disparities in access to economic and political resources between men and women. Although some argue that economic globalisation in the form of transnational companies might bring new opportunities to women and improve their economic status and independence (Apodaca 1998), gender stratification theory maintains that a large number of women in developing and transition countries are not winners but victims of development (Boserup 2007[1970]). The products and services provided by women might be eroded through globalisation and replaced by poor quality jobs often at the lower ends of the service sector or in the informal sector of the economy (Fernandez-Kelly and Sassen 1995). The rise of flexible forms of production leads to an increase in insecure part time jobs, in parallel to the feminisation of employment (Standing 1999). Although men might be particularly vulnerable against sudden loss of status in times of rapid economic restructuring, as during the post-socialist transition (Watson 1995; Weidner and Cain 2003), they might also be able to gain more in the long term by being able to find better paying jobs in the high performing internationalised sectors of the economy. Economic globalisation might also induce structural adjustments of the economy and a reduction of public service jobs that are often disproportionately held by women (Elson 1992).

Another strand of gender theory emphasises the role of patriarchal socio-cultural structures in relation to the post-socialist change (True 2000; Watson 1995). In societies more pervaded with traditional patriarchal values, such as post-socialist Eastern European countries (Verdery 1994), men are supposed to be the breadwinners, therefore women were often the first to withdraw from the labour market as former socialist companies collapsed (Lobodzinska 1996). This increased women’s dependency on men as breadwinners. However, withdrawing to the household and accepting the traditional role of the housewife also created an alternative source of identity as opposed to holding a paid job. According to this approach, women were therefore less vulnerable to sudden economic changes as they had more
cultural repertoires available to cope with job loss and social stress, whilst men suffered more as they failed to fulfil the role of the breadwinner. Men who thought that they are unable to fulfil their roles dictated by patriarchal societies were likelier to engage in riskier, less healthy behaviours to cope with the social stress induced by rapid post-socialist change.

Empirical research on the role of gender in transition confirms the differential development trajectories of men and women. Women under socialism were locked into low-prestige jobs in the service sector that nonetheless represented a significant equalisation of chances for women, compared to the traditional division of labour. Women were also helped by a relatively generous welfare state in socialist Hungary, with a wide coverage of nursery schools and kindergartens. As marketisation proceeded in post-socialist Central and Eastern Europe a marked gender gap emerged in poverty (Emigh, Fodor and Szélényi 2001). In contrast, Jolliffe and Campos (2005) found that the transition has significantly reduced gender pay differences adding that a large part of this difference stems from the reduction of wage differences in public and large firms. Brainerd (2000) found that women’s relative wages in Russia have declined substantially whereas they increased in Central and Eastern European countries. Fodor (1997) has also found that women were less likely to be unemployed during the early years of transition than men in Hungary, protected by their experience in service sector jobs. However, there is also evidence that, in the long run, foreign investment inflows in Central Eastern Europe were associated with a larger gender-poverty gap (Fodor and Horn 2015). Empirical research has also shown that men were more vulnerable to the economic shock of the 1990s compared to women, leading to higher cardiovascular mortality, more severe drinking and alcohol-related deaths among men (Jukkala et al. 2008; McKee and Shkolnikov 2001); findings that underpin the role of patriarchal culture in aggravating the negative health effect of rapid post-socialist economic transformations.

**Culture, economy and health**

The final theoretical building block of the relational political economy of health adds culture symbolic processes to the analytical scope. The need to move beyond methodological individualism and to incorporate broader social context in general, and culture in particular, into health research has been long recognised (Cummins et al. 2007; Hall and Lamont 2013; Williams 1995). Several strands of qualitative health research have attempted to incorporate culture. Constructivist studies on health mostly focus on individuals ignoring the interactions of semiotic process and the broader context (Conrad and Barker 2010). Health behaviour researchers building mostly on the agency theory of Bourdieu (1990), the structuration theory of Giddens (1984) and the capabilities approach of Sen (1999) have analysed the role of everyday life experience, habitus, social practices or social identities in health
behaviour as opposed to conscious and rational individual choice (Abel and Frohlich 2012; Cockerham 2005; Delormier, Frohlich and Potvin 2009; Frohlich, Corin and Potvin 2001; Lindsay 2010; Maller 2015; Veenstra and Burnett 2014; Williams 1995). Context (i.e. structure and culture) is present in Bourdieusian health research conceptualised as layers of practices upon practices (Maller 2015). Qualitative studies on lay perceptions of area inequalities and spatial stigma added further elements to the existing knowledge on the contextual determinants of health (Frohlich, Corin and Potvin 2001; Graham et al. 2016; Popay et al. 2003; Wacquant 2007).

However, as pointed out by Peacock, Bissell and Owen (2014), the majority of social epidemiology and medical sociology research still offers only a thin theoretical conceptualisation of political-economic processes. Bourdieuian health theory in social epidemiology and health sociology has mostly neglected the deep political-economic implications of Bourdieu himself, reducing his theoretical legacy to health-related practices embedded in social norms. The research that combines a focus on culture and a robust approach to political economy is scant. Only a few qualitative studies exist that show the complex contextual ways in which macroeconomic and political processes are translated into individual health outcomes (Castro and Lindbladh 2004; Collins and McCartney 2011; Davidson, Mitchell and Hunt 2008; Gallin 1989; Graham et al. 2016; Parsons 2014; Peacock 2012; Scambler 2009). Following the definition of Sum and Jessop, this strand of literature might be characterised as the cultural political economy of health. Cultural political economy “combines the analysis of sense- and meaning-making with the analysis of instituted economic and political relations and their social embedding” (Sum and Jessop 2013: 1). This dissertation seeks to contribute to the development of this new strand in social epidemiology and health sociology.

The cultural political economy approach emphasises the interactions among economic institutions (such as companies or state institutions), social structure (relations of power) and symbolic processes as apparent in the lived experience of economic change. The nature of domestic relations of power influences the way institutions change and this is reflected in the way people’s everyday experience and health behaviour is constituted. This way the cultural political economy approach unpacks the social context that is hidden in the concept of habitus and various forms of capital. Thus the cultural political economy approach to health goes beyond Bourdieusian health theory as currently practiced in health sociology, adding further political-economic detail into the contextual determinants of health behaviour also bringing health sociology closer to the approach of Bourdieu himself. Cultural political economy is firmly rooted in post-Marxism and is built on the relational concept of class, capital, institutions and place (Cummins et al. 2007; Emirbayer 1997; Harvey 2005; Veenstra and Burnett 2014).
Class, capital, space, institutions and related semiotic processes are not phenomena that can be captured independently but are constituted by layers of relations among individuals. There is no economic determinism in cultural political economy, and equally, no constructionist relativism. Class relations are central to understanding health outcomes. A relational theory of class does not conceptualise class as an individual attribute but as a relational phenomenon, where the control of productive capacities and the interests and behaviour of dominant classes are crucial to understand the structural position of dominated classes (Scambler and Higgs 1999; Wright 2009). Culture and economic structure takes shape through interactions in particular places. In contemporary capitalist societies the relationship between dominant and dominated classes are not constituted in national economies, but in an increasingly global economy. Globalisation also transforms the flows of cultural symbols and the increasing material inequalities and the symbolic reactions to these global asymmetries are inseparable from globalisation (Appadurai 2006; Kalb 2005).

The way Central and Eastern European countries institutionalised globalisation as a development strategy through attracting foreign investment (Bandelj 2009) and how the process of global integration of the Hungarian economy contributed to the transformation of local productive capacities is thus crucial for the relational political economy of health. There are a few pioneering anthropological studies on the health impact of post-socialist transformations that also provide a robust conceptualisation of political-economic factors. Burawoy, Krotov and Lytkina (2000) have provided an ethnographic analysis of individual survival strategies within the context of the collapse of the Soviet economy and the increase in mortality in a Russian town. They show how formal economic planning and institutions retreat and informal economic practices emerge, both in the form of barter and criminal activities, as well as in the form of household production. Burawoy et al. also show that people with better inherited assets had better chances to survive what they call “capitalist involution”. Walker (1998) has provided an ethnographic account of town and individual-level survival strategies in a deindustrialising town in East Ukraine. Similar to Burawoy et al, Walker has also found that a return to household production, the use of gardens (dachas) and a profound informalisation of economic practices was the most important survival strategy in the highly uncertain post-socialist context.

Kideckel (2008) provides an ethnographic analysis of the embodied effect of post-socialist economic transformations among coal miners and chemical workers in Romania. Kideckel’s primary focus is on working class identity and the way in which post-socialist change has marginalised workers. Kideckel shows that, as experienced by workers, factory closures and buyouts have contributed to constituting heavy industry workers as part of the post-socialist problem, inviting blame from publics and policymakers. Another important attribute of post-socialist change is the erosion of communities. Kideckel presents a powerful ethnographic account on how this political isolation and the loss of
communities led to mental and physical illnesses among workers. Finally, Parsons (2014) also analyses the ways in which the lived experience of post-socialist change leads to worse health outcomes in Russia. Her central analytical concept is based on the experience of being unneeded, echoing Kideckel’s focus on isolation and marginalisation. This sense of loss of positive social identity, being unneeded, is a central phenomenon that mediates the health impact of post-socialist economic change, “serving as bridge between political economy and mortality” (Parsons 2014: 10). Prime and old age men appear to be particularly prone to losing their positive social identity during post-socialist change, underpinning the notion the health impact of post-socialist change was gender and age specific.

These studies form the foundation of the cultural political economy analysis that I present in this dissertation. I will extend their conceptualisation of contextual effects through the theoretical framework elaborated by Bernard et al. (2007). Bernard et al. propose four social domains to analyse the interactions between the context of specific neighbourhoods and individual health: the economic domain (e.g. companies and markets), the community organisations domain (e.g. NGOs), the institutional domain (e.g. public services) and the local sociability domain (informal networks). They argue that these domains constitute resources available to individuals that shape their health behaviour and health. I will use Bernard’s conceptual framework to extent the existing cultural political economy literature on the post-socialist mortality crisis by focusing on the material and symbolic meaning of economic institutions (companies), their role in local neighbourhoods, the perceptions of injustice in relation to post-socialist change. I will also show how state social policies (unemployment benefit, pensions) might be crucial factors that mitigated the impact of deindustrialisation and privatisation in Hungary.

The closing section of this chapter will draw on the theoretical insights gained through the analytical literature review and presents competing, empirically testable hypotheses.
Model and hypotheses

The conceptual model

Figure 8. The relational political economy model of the post-socialist mortality crisis
Summarising the theoretical propositions formulated in the previous section, figure 8 gives a schematic overview of the causal mechanisms linking upstream economic and policy factors to individual health outcomes. Instead of providing a complex overview of every potential causal channel from structural determinants to individual health, the model extends existing approaches with a focus on those economic and institutional factors that had a direct impact on health during transition and the global economic integration of post-socialist countries. Boxes represent theoretical concepts that can be operationalised as variables in empirical research presented in this dissertation. Arrows represent causal linkages. Concepts in circles are theoretically relevant for the analysis, but are not directly measured in the empirical data I am using.

The model identifies two interrelated upstream structural processes that are the driving factors of health outcomes: privatisation and deindustrialisation. Economic liberalisation and the increase in service sector employment are other crucial upstream economic factors that influence the health impact of deindustrialisation and privatisation. Economic liberalisation (such as the opening of the local economy to foreign investors and other international capital flows) might exacerbate deindustrialisation through the destruction of local productive capacities that fail to withstand global market pressures. The growth of employment in the service sector might offset the impact of deindustrialisation. Economic liberalisation might attract new innovative companies that, in turn, increase the overall competitiveness of the economy, drive economic modernisation and help to reindustrialise the economy. Finally, privatisation also increases pressures on former state owned companies. Depending on the type of privatisation, it might lead to successful company restructuring or company termination, thus contributing to the destruction or modernisation of local productive capacities.

State social policies represent a final upstream element in the model, reflecting the welfare regime of the state. These social policies influence the ways in which town level factors are translated into individual-level health-related processes. Stronger social policies might protect social capital and social cohesion and thus alter the health impact of macroeconomic and institutional change. State social policies interact with individual class positions, as social safety nets might cushion against downward social mobility. On the other hand, class organisation of society has a long-term impact on the availability of state social policies as represented by the arrow pointing in both directions. Strong civil society and class mobilisation might be crucial for the public provision of health improving public goods. Finally, state social policies might alter the social stress impact of economic change, decreasing the stress resulting from rapid social change such as deindustrialisation or privatisation.

Following institutionalism, the model puts special emphasis on companies at the level of towns, both as providers of jobs as well as stability, community, cohesion and identity. Town-level plant restructuring
or closure, driven by privatisation and economic liberalisation, has wide ranging implications, both at
the level of neighbourhoods and individuals. Most directly, company restructuring might increase town
level unemployment through the destruction of firms. Successful company restructuring on the other
hand might lead to efficiency gains offsetting the impact of short term destruction. Privatisation and
liberalisation also changes the occupational environment. Employees of former state owned companies
might retain their jobs, but the new economic context might result in more work, less stability, fewer
company-level family policies (such as holiday programmes, childcare), and fewer communal activities
at the workplace. Privatisation of companies and economic liberalisation might also alter town level
income. Increased global economic pressures could lead to net or real decreases in salary. In the long
run, the superior efficiency of market based companies as opposed to state owned enterprises might
lead to increases in remuneration. Real wages might change through increasing or eroding the tax base
of the state and thus changing the financial capacity of the welfare state both at the level of the towns
and the state. Finally, economic change might also affect town level migration, influencing how
structural change is translated into individual health outcomes (for example younger, healthier people
leave the towns negatively affected by economic change).

Social cohesion and the availability of social capital, in particular, also influence one’s ability to cope
with the social stress arising from economic change. These factors represent bridges between the town
and individual levels. With the help of communal resources, one might be able to better control the
source of the stress, fight company closure with the help of the trade union, find new jobs via the
neighbourhood communal networks, or find solace in belonging to a community of people with similar
fate. Privatisation and liberalisation might lead to social polarisation, the destruction of social capital
(such as company collectives, brigades, trade unions or neighbourhood communities related to
particular companies) and social cohesion (the destruction of place-based identities and the rise of
spatial stigma).

At the individual level of the analysis, social class, i.e. the individual’s role in the social division of labour,
her access to key resources such as financial or cultural capital, influences health in multiple ways: it
interacts with individual labour market status (those higher up the social ladder have more change to
gain through the commodification of socialist institutions), it interacts with identity (people in lower
classes might, for example, experience more injustice and less control) and also with stress. Depending
on the availability of resources and personal characteristics, individuals respond differently to stressful
situations resulting in different forms of health behaviour. They might cope with stress in active or
passive ways. Passive coping is dominant in situations where subjects feel they are helpless, which might
lead to depression, social withdrawal, alcoholism or other substance use, cynicism or even to suicide.
Active coping refers to efforts to control the stressful situation through either changing the cause of the
stress or actively adapting to it, such as increased social engagement, activism, political activity, self-education, entrepreneurship or health-conscious behaviour. Those in lower class positions find it harder to cope with unemployment and the general social stress related to economic transition.

Gender might also be a crucial intermediary variable that might change the impact of privatisation, liberalisation and deindustrialisation. In the short run, men might be more severely hit by unemployment and loss of status. Conservative family values attach the role of the breadwinner to the men. Losing one’s job or experiencing a decrease in income is socially less acceptable for men, leading to more stress and worse health outcomes. In the context of conservative family values, women might be better able to withdraw from the labour market, focusing on child care and household management. Unemployment therefore might represent a smaller shock to women. However, in the long run, men might be better able to reap the benefits of the new private economy through their gender specific resources: they tend to have more political connections, tend to have more technical skills, have more experience with entrepreneurship – thus, might be better able to find new jobs or other economic opportunities. Identity is therefore strongly influenced by gender. Loss of social identity might also be an important independent factor. Marital status might be another crucial individual-level factor of the health impact of economic change. Married people might be more protected, whereas unmarried or divorced men might be particularly vulnerable to increasing social stress. The role of these individual-level factors influencing health cannot be properly analysed without adding town and macro-social-level processes to the framework. The relational political economy of health provides a robust conceptualisation of these various levels of the social determinants of health, allowing for both quantitative and qualitative analyses.

Hypotheses
Based on the theoretical model presented above, I formulate the following hypotheses. I treat the inequalities approach as broadly compatible with the political economy approach, where inequalities and social stress are on the causal pathway identified by the political economy approach. Therefore, I do not present hypotheses derived from the inequalities approach.

**Hypotheses based on the strong version of the behavioural approach**

- $H_0$: Upstream economic factors (privatisation, economic liberalisation and deindustrialisation) have no significant impact on mortality; mortality is primarily driven by behavioural factors.
- $H_1$: As capitalist reforms erode the cultural and institutional legacy of socialism, health behaviour improves, and thus mortality is reduced.
Hypotheses based on the neo-classical approach

- $H_2$: Privatisation might lead to a short term decline, but after a few years it leads to better health and lower mortality through increased company efficiency, increased real incomes and improvement of general welfare.
- $H_3$: Economic liberalisation in the form of foreign investment might lead to a short term decline, but after a few years it leads to better health and lower mortality through creating new jobs, increasing company efficiency and creating spill-over effects for domestic enterprises.
- $H_4$: Deindustrialisation decreases harmful economic activities and industrial pollution, wipes out inefficient firms and opens up the space for the development of globally competitive companies which leads to increases in welfare and thus improves health and reduces mortality.

Hypotheses based on the world-system approach

- $H_5$: The capitalist transformation of former socialist economies leads to economic underdevelopment. Privatisation and economic liberalisation (foreign direct investment) are economically and socially harmful and thus lead to higher mortality.
- $H_6$: Employees can adapt to the new economic environment only very slowly (labour market rigidities) therefore deindustrialisation results in worse health and higher mortality. Men are particularly vulnerable to short term labour market shocks.

Hypotheses based on the relational political economy approach

- $H_7$: Gradual privatisation and prolonged state ownership allows time to restructure companies, allows people to adapt to the new economic context and protects them from the shock of the transition and thus reduces mortality.
- $H_8$: Economic liberalisation in the form of foreign direct investment has a positive economic and health effect but this might be offset by the shock of privatisation and by the concentration of capital; there might be no impact or a negative health impact of foreign investment.
- $H_9$: Men and women experience economic transition differently: in the short run men are hit worse by upstream economic factors compared to women but in the long run they can better reap the advantages of the new economic system and are better off than women in terms of health.
- $H_{10}$: Employees can adapt to the new economic environment only very slowly (labour market rigidities) therefore deindustrialisation results in worse health and higher mortality.
- $H_{11}$: The experience of privatisation and deindustrialisation goes beyond the labour market channel and encompasses broader economic institutions, services and community structures affected by economic change. Individual semiotic and evaluative processes interact with the
broader context in producing health outcomes. State policies and the fate of companies are crucial mediators of macro-economic change and health outcomes.

**Conclusion**

The theoretical controversies and the existing empirical research on the human dimension of post-socialist transformations yielded conflicting results. The early, strong claims of the world-system perspective regarding the health-deteriorating impact of investment dependence seem to be exaggerated. Yet, the opposing alternative of rapid integration into global markets, as proposed by the strong version of the behavioural approach and by the neoclassical approach, also to carries health risks. Economic globalisation might improve life chances but might also lead to uneven development and a concentration of wealth and health in the most successful regions of the host country. The studies focusing on Hungary in particular lack a broader, political-economic focus. There is no research that would address the relationship of economic transformation and health outcomes using multilevel data, combining information on individual mortality with information on transition strategies measured at the company or settlement-level. The relational political economy approach to health has the potential to overcome the limitations of alternative theories and provides a robust and deep understanding of the role of the economic context and institutions in the post-socialist mortality crisis. Applying the relational political economy framework in this dissertation I analyse the post-socialist mortality crisis in Hungary, putting emphasis on the economic institutions of post-socialist dependent capitalism in Hungary as embedded in the semi-periphery of the global economy, their gendered implications and their cultural construction. The cultural sensitivity of the relational political economy approach will also allow me to unpack the narrower and the broader economic contextual content in the intersubjective experience of the post-socialist transformation and its implications for health.
Chapter 4) Data and Methods

Summary
This chapter provides a general description of the data used in this dissertation, as well as a general discussion of the analytical strategies applied. The chapter first introduces the Brass method, the indirect cohort study approach that formed the backbone of the data collection. Then individual-level data are described, including the interview process, sampling and the participant characteristics as well as the questionnaire. Further sections provide details on the settlement-level data and on the company-level data used in this dissertation. The dissertation is based on a mixed-method approach, combining quantitative and qualitative methods, so this chapter also provides a general discussion of the multi-sited qualitative in-depth interviews and the sampling strategy of the towns. The description of the data is concluded with a discussion of the limitations of this empirical strategy. The final section of this chapter provides a general discussion of the statistical modelling used in the two quantitative chapters. Complementing the general methodological discussion provided in this chapter, the subsequent empirical chapters will provide further detail on the analytical procedures and the data included into the analyses.

Data
The source of empirical data for this dissertation is the ‘PrivMort: Privatisation and Mortality in Post-Communism: A Multi-Level Indirect Demographic Analysis’ project, funded by The European Research Council and led by Professor Lawrence P. King. PrivMort is a multi-disciplinary research project in the subfield of the Political Economy of Public Health with the aim to conduct an in-depth investigation into the post-communist mortality crisis using multi-level data. PrivMort, a multi-country indirect demographic cohort study, collected data at settlement, enterprise, and individual levels in Hungary, Russia and Belarus. At the level of individuals, surveys were conducted in 30 settlements in Russia, 20 in Belarus and 52 in Hungary. At the level of settlements, annual time series data were collected covering the period 1990 – 2010 for 539 settlements in Russia, 96 settlements in Belarus, and 52 settlements in Hungary, which include the settlements that the sample surveys were conducted in. In addition to the individual-level survey data, detailed company information was also collected about companies in the selected settlements.

Using the PrivMort database allows me to test the impact of different privatisation strategies, foreign investment and deindustrialisation based on company information and controlling for major individual
and settlement-level confounders. The database also allows me to test the impact of foreign investment and state ownership in a multilevel setting for the first time, representing a major added value to the existing literature. This way, the methodological shortcomings of cross-country regressions can be overcome and the impact of privatisation and deindustrialisation on mortality can be tested in a robust setting. The PrivMort database thus represents a unique opportunity to investigate the empirical puzzle of the post-socialist mortality crisis, to analyse the research questions and to test the hypotheses presented in the previous chapter.

In my dissertation, I rely on the data collected in Hungary. PrivMort is a large multi-centre research project with the involvement of several junior and senior researchers, with several members of the team involved in data collection and analysis. As a member of the PrivMort project\textsuperscript{10} I was responsible for settlement- and company-level data collection in Hungary and for qualitative interviews in four selected towns. From September 2014 to January 2017 I collected detailed information on companies in the 52 settlements, collected town level time series economic, social and demographic data and conducted qualitative fieldwork in four towns doing semi-structured interviews and collected information on the economic history of the towns and the largest companies in them. I also took part in the preparation of the survey data for analysis, created the major independent variables measuring the impact of the theoretical concepts specified in the previous sections, conducted the statistical analysis, prepared the results for presentation and evaluated the theoretical implications of the results.

**Individual-level data**

**The Brass method**

The collection of the survey data rests on the Brass method named after William Brass and colleagues who developed this technique originally in the framework of UN sponsored demographic analyses. The surveys form the backbone of the retrospective convenience cohort study at the centre of the PrivMort project. This demographic method was originally developed to make it possible to estimate mortality in countries that have no vital registration system (Graham, Brass and Snow 1989; Hill 1977; Merdad, Hill and Graham 2013). In the absence of official mortality statistics the Brass method collects information from informants in sample surveys about the survival status of the relatives of the respondents. This way it is possible to estimate mortality in the past controlling for a wide range of individual-level variables.

\textsuperscript{10} I was working as an external fieldworker between September 2014 and November 2015 collecting data in Hungary. I have been employed as a research associate at the Department of Sociology between December 2015 and August 2017 to continue collecting quantitative and qualitative data, to conduct the analyses and write up the results.
covariates. The Brass method has some limitations that I will discuss separately at the end of this section. However, with some reservations, this technique offers a unique opportunity to study subjects living in different settlements and experiencing different deindustrialisation, privatisation and economic liberalisation strategies during the transition.

The retrospective method of collecting mortality information was originally used in countries with low levels of literacy where only very simple questions could be used. The approach has been validated and is recommended by the United Nations for use in censuses (United Nations 1983). The information collected on subjects’ relatives may then be used to produce standard indicators of mortality. Given the fact that the mortality information was collected retrospectively and not directly, the method is often referred to as “indirect estimation”. This indirect method can also be used in countries that have vital registration systems to collect information on further characteristics of respondents’ relatives that could not be obtained otherwise. In countries with higher rates of literacy, more complex questions can be also asked, collecting information on topics such as individuals’ employment histories, smoking and drinking. Two pilot studies conducted in Russia have already validated the method in more developed countries. The first pilot collected information on the survival of spouses and the resulting mortality estimates were similar to official data and were consistent with the literature (Bobak et al. 2002). In the other pilot study researchers tested questions on socio-economic circumstances, smoking and drinking habits of siblings of the subjects. This project has also confirmed the usefulness of the retrospective methodology, as the results were consistent with the existing literature (Bobak et al. 2003).

**Sampling and participants**

Individual-level data were collected between January 2014 and December 2015 in all 52 towns in Hungary, as part of the PrivMort project. I describe the selection of towns in the next section. TÁRKI Social Research Institute – an independent research organisation – was in charge of collecting the survey data in Hungary, as well as of managing the surveys in the two other countries. TÁRKI was also responsible for the methodological design of the surveys and the final control of the data obtained. All individual data that I am using in my dissertation are anonymised preventing any potential identification of individual respondents, and the study has been approved by the University of Cambridge Department of Sociology ethics committee.

In each selected town, 20-45 starting points were identified, and interviewers executed a random walk procedure, visiting randomly selected addresses and inviting face-to-face interviews. Settlements were divided into clusters that were then distributed among the interviewers of the polling agency, using a random number method. Each route could generate up to 25 interviews. Interviewers interviewed only
one respondent from each household regardless of the size of the family. In cases when more than one family shared the same house, only one respondent was interviewed. If more than one person in the household matched the selection criteria, the person whose birthday was closer to the date of the survey was selected for the interview. If the subject of the interview was temporarily unavailable, interviewers made four attempts at interviewing the person.

The basic selection criteria for participation in the interviews was based upon subjects being older than 42 years of age; and that his/her parents, or siblings or male partners (for females) lived in the same settlement between 1980 and 2010. Respondents provided information on their socio-economic circumstances, employment history, lifestyle and health. In addition to reporting on themselves, respondents also answered questions about three types of relatives (parents, siblings and partners of female respondents). Data on the vital status of these relatives, including the year of birth and death (if not alive) were also collected. In the case of siblings, a maximum two siblings who survived to at least the age of 20 entered into the study, further siblings were dismissed. Theoretically, members of larger families have more chance to be interviewed, therefore excluding third, fourth, etc. siblings minimises the overrepresentation of subjects coming from large families. Finally, the third type of relative is partners, but information was only collected about partners of female respondents. To avoid the exclusion of men who died early during the transition, thus biasing the results, interviewers collected data on the first partners of the respondents.

The chance of inclusion in the study is not uniformly distributed across the population; therefore the sample does not directly represent the whole Hungarian population or a well-defined sub-population. I am going to discuss the limitations of the empirical data in detail at the end of this section. Generally, the survey collects information from a range of different types of individuals and includes a large number of people, ensuring that only few types of people are excluded systematically. For example, an only child of an unmarried woman whose parents are dead has no chance of entering the study. However, there is no evidence in the literature that this composition bias would lead to distortions that would invalidate the findings. Existing pilot studies also confirm that retrospective convenience cohort studies using information on relatives produce results consistent with the literature for adult mortality especially (Timaeus 1986).

To ensure the quality of the data, background checks for at least 10 per cent of the interviews in each settlement and 15 per cent of unsuccessful interview attempts were conducted by the polling agencies responsible for conducting the interviews. In some cases the regional supervisors carried out the background checks by visiting individual households, but most of the back-checks were carried out randomly by phone. In Hungary, there were overall 24,076 complete interviews in 52 towns, yielding a
total of 144,456 subjects, with an 85 per cent response rate. All respondents were born before 1972, to ensure that they and their relatives were of working age in 1991, and hence could potentially be affected by the transition. Table 3 provides an overview of the Hungarian dataset.

Table 3. Descriptive statistics for the Hungarian individual survey dataset

<table>
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<tr>
<td>Mother</td>
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<td></td>
<td></td>
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</tr>
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<tr>
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<td>24,076</td>
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<td>54,151</td>
<td>27,470</td>
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</table>

The questionnaire

The questionnaire was developed by a multidisciplinary team of researchers at the beginning of the PrivMort research project. After the initial questions were worded the items underwent cognitive testing on respondents sampled from industrial towns. These cognitive tests were used to check the consistency and applicability of the questions; in particular, to identify problematic wording and sensitive questions. Based on the results of the cognitive tests, survey questions were modified to ensure that participants can easily follow the interview, feel comfortable and confident. Existing research showed that in Russia people appreciated the opportunity to talk about their relatives, including their health behaviour (Tomkins et al. 2008). Cognitive tests during the early phase of the PrivMort project have also shown that sensitivity of health-related questions is less of a problem. This careful approach ensures that responses to the questions in the PrivMort questionnaire are reliable and accurately measure the intended items.

The questionnaire covered characteristics of the respondents and their relatives in several dimensions: residency history, international and domestic migration; education; marital status; religious affiliation; vital status, year of death (only for relatives); lifestyle habits such as smoking and alcohol consumption; labour market position and employment history as well as information on subjects’ socio-economic conditions. The sections containing questions on alcohol consumption are particularly detailed. Alcohol-related questions contain measures and estimations of the frequency and the amount of drinking, of the character of drinking, and on the consumption of hazardous spirits. The questions on alcohol are slightly different for Hungary as the types and amounts of alcohol consumed and are perceived as “normal” differ in Hungary, Russia and Belarus. The questions on labour market status and employment
history cover whether the subject was economically inactive for more than six months during the 1980s, 1990s or the 2000s, and what the reason for economic inactivity was (unemployment, retirement, etc.). There is a question about the level of the subject, whether he or she was responsible for managing other people. The occupational status of the subjects is also collected and is coded in four digit ISCO codes.

Table 4 gives an overview of the items in the questionnaire.

Table 4. Main domains covered by the questionnaire

<table>
<thead>
<tr>
<th>Domain</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic information</td>
<td>Date of birth; gender; marital status; religion</td>
</tr>
<tr>
<td>Residential history</td>
<td>Residence places for the last 3 decades; reasons for moving</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>Position; occupation; number of subordinates</td>
</tr>
<tr>
<td>Labour market history</td>
<td>Employment history for the last 3 decades; ISCO</td>
</tr>
<tr>
<td>Education</td>
<td>Highest level of education obtained</td>
</tr>
<tr>
<td>Health behaviours</td>
<td>Smoking; drinking (frequency; binge drinking; hazardous drinking)</td>
</tr>
<tr>
<td>Material deprivation</td>
<td>Absolute poverty proxies</td>
</tr>
<tr>
<td>Ownership</td>
<td>Ownership of material resources</td>
</tr>
<tr>
<td>Social capital</td>
<td>Communication with relatives</td>
</tr>
</tbody>
</table>

Source: Irdam et al. (2016: 4)

Settlement-level data

First, the PrivMort project collected statistical information on settlements from the Central Statistical Agency. Hungarian settlements between 5,000 and 100,000 inhabitants with an industrial employment exceeding 30 per cent were selected in the first round (N=110). Towns close to Budapest were eliminated, together with settlements where data on the largest companies could not be obtained from the Ministry of Justice responsible for the management of the central company registry system. This was necessary to eliminate bias related to the high concentration of economic activity in Budapest that differs from other parts of the country. This has resulted in a list of 83 settlements, out of which 52 were selected randomly for practical reasons: in the second stage, individual-level interviews were carried out in each town, and the budget of the project did not allow more interviews to be carried out in Hungary. The geographical, size and age-structure distribution of the settlements represents medium sized towns outside the proximate vicinity of Budapest. The location of the 52 settlements in the map of Hungary is portrayed in figure 9. Settlement-level data were collected from the Hungarian Central Statistical Office and a variety of other state institutions. Information is available for a number of indicators, including population size, unemployment rate, income per capita, dependency ratio, number of general practitioners and number of deaths in the 15-64 years age group, for each year between 1990 and 2006. Table 5 gives an overview of settlement-level information available for Hungary.
Figure 9. Map of the 52 towns included in the sample

Table 5. Overview of available settlement-level information

<table>
<thead>
<tr>
<th>Domain</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic information</td>
<td>Number of inhabitants, Natural increase in population, Number of people above age 60, Outmigration, In-migration, Dependency ratio, Number of completed divorces, Number of marriages, Number of induced abortions, Number of live births by mothers, Fertility rate</td>
</tr>
<tr>
<td>Socio-economic indicators</td>
<td>Number of persons employed in industry, Number of industrial parks, Number of employed (censi), Income per capita, Unemployment rate</td>
</tr>
<tr>
<td>Religious and ethnic composition (censi)</td>
<td>Percentage of Roma, Percentage of Roman Catholics, Percentage of Calvinists</td>
</tr>
<tr>
<td>Mortality information</td>
<td>Child mortality rate, Total number of deceased persons, Number of deceased persons by age groups, Number of deceased persons by gender, Number of deceased persons by age groups and gender, Rate of deceased due to major reasons of mortality</td>
</tr>
<tr>
<td>Public services</td>
<td>Number of teachers in primary education, Number of pupils in primary education, Number of kindergarten places, Number of general practitioners, Number of hospital beds, Number of practicing physicians</td>
</tr>
<tr>
<td>Social capital</td>
<td>Number of non-profit organisations</td>
</tr>
</tbody>
</table>
**Company-level data**

The largest companies in the selected settlements, based on the average number of employees between 1992 and 2004 and by the value of registered capital in 1989, were identified through the Company Information Service of the Ministry of Justice, with some additional data collected from the Hungarian Privatisation Agency’s Privatisation database available on a CD. I collected data on the number of employees, ownership structure and profitability from the non-digital archives of the local courts of registry and from various private digital company information archives with the help of two research assistants trained for the purpose of the project. We visited each court of registry in Hungary in the 19 counties covered by the PrivMort dataset and made electronic scans of the relevant pages of the physical company files. Data on the ownership structure of the companies was then extracted from the archival material. Within-year changes in ownership structure were aggregated to the year by taking the last relevant information into account closest to the end of the year.

In some cases the files were missing from the physical archives of the registries. We attempted to find further information on these companies through other private company information systems as well as on the internet. In case we could not find reliable data on these companies they were eliminated from the list. Altogether this affected a small number of companies (N=10) out of the total pool. In eight cases the files of the original companies were migrated to the Budapest registry as the company was reorganised during the early years of the transition and we could not access these files. The files of two other companies from Győr-Moson-Sopron and Szolnok counties were lost. Co-operatives were reorganised in 1992 in Hungary, effectively delegating the ownership and management of these companies to the members. We treated these co-operatives as state owned companies before 1992 and as domestic private owned companies from January 1993, in the absence of an indication of investment by a foreign owner or significant control by the state, as recorded in the company documents. If relevant, we attempted to collect information on second or third tier owners (owner of owners), within reasonable limits.

Most of the companies that existed in 1990 changed their names or their legal form. For analytical purposes, I treated the original parent company and their successors as a single company. In cases where there were multiple successors I included the biggest company that was the closest to the original parent company in its economic profile. As a result, the Hungarian PrivMort database contains information on 324 enterprises plus their successors for a total of 684 companies. For the analyses presented in this dissertation, I reduced the sample to the five largest companies in each town, measured by their average number of employees between 1992 and 2004. Where the difference between dominant ownership categories was less than 3%, I used the six largest companies to improve the information base. Overall, ownership data from 260 companies was used in the analyses presented.
in this dissertation, or 550 companies counting the successors and parents separately. To ensure the quality of the company-level data collection, I also consulted the Institute of Economics of the Hungarian Academy of Sciences. Due to the limitations in the availability of electronic data and the problems with the local registries, company-level data collection took two years, altogether. These difficulties were also the reason for limiting data collection for the five largest companies.

The average company size in the sample is 564 employees per company between 1992 and 2004, ranging from 17 to 3,829. Employment rates or total employment figures at the settlement level are not available in Hungary. However, the number of people employed in industry is available from 1989 to 1997, allowing me to test the share and importance of the companies for each town. The total number of employees (in the period of 1992-2004) in the five largest companies per town represents 57.9 per cent of the town-level industrial employment in 1989 in average (ranging from 17.9 to 139.8). Thus, the five largest companies on average capture the majority of the pre-transition industrial labour force. In four cases the number of employees in the period of 1992-2004 exceeds the industrial labour force of 1989. This could reflect the arrival and growth of new companies in these towns. An example is Flextronics in Sárvár manufacturing equipment for transnational companies like Lenovo, employing 2,200 people on average between 1992 and 2004; the majority of these new employees arrived after 1999.

However, we have to bear in mind that company reporting on the number of employees was not mandatory in Hungary in the period analysed, which casts some doubt on the reliability of the branch-level employment figures. Therefore I am not using the company-level employee figures directly for analyses. To analyse deindustrialisation, I use data on settlement-level industrial employment provided by the Hungarian Central Statistical Office. The figures on registered capital and ownership shares have been mandatory parts since the establishment of the company registry system in the country. Therefore the primary purpose of the company-level data is to calculate ownership changes. I also use the employee numbers to weight the ownership data, but I also present robustness checks without weighing the assets.

**Qualitative fieldwork**

**Sampling of towns**

Extending the quantitative data collected at the individual and settlement levels, I have carried out qualitative fieldwork in selected Hungarian towns to gain a deeper understanding of the mechanisms that link deindustrialisation, economic liberalisation, privatisation and health. The fieldwork offers insights into the interplay of national and global economic processes and individual fates, helping us to understand how people make sense of economic uncertainty, deindustrialisation and job loss – how, in
other words, privatisation and deindustrialisation “gets under the skin”. The fieldwork yielded qualitative material about how members of the working class in deindustrialising towns made sense of the transition, how they perceived change, how they maintained and lost hope, and how they tried to control the process and lost control over their lives.

I have chosen four different towns that represent different economic trajectories during the transition. The key selection criteria for the towns were their size and the key explanatory variables of my dissertation (privatisation strategies and deindustrialisation). All of these towns can be conceptualised as successful examples of socialist industrial modernisation in the second half of the 20th century. All four towns underwent a degree of deindustrialisation, seeing major plants shut down over the course of a few years, but the degree of deindustrialisation and the type of capital they attracted differed, and their fates took different turns during the 1990s. These towns offer an opportunity to compare and contrast the human dimension of privatisation and deindustrialisation during the transition.

Ajka is a town in Northwest Hungary in the county of Veszprém. Ajka and its surroundings have a long tradition in coal and bauxite mining. The town emerged as an industrial centre in North-West Hungary after the Second World War, through the unification of four villages. The new town more than doubled its population between 1960 and 1990, reaching 34,000 in 1989. Its population declined since then reaching around 29,000 inhabitants by 2010. The crude death rate showed a slight increase during the early 1990s but remained the lowest among the four towns. A textile plant and a plant assembling electronic appliances were closed down first during the 1990s, followed by the closure of coal mines in the early 2000s. However, Ajka managed to attract new investors and to retain its privatised glass factory and its alumina factory – though the later has been re-nationalised after a major industrial accident in 2010. The unemployment rate reached a high in 1992 at 10.5 per cent (ca. two per cent below the national average) and then decreased throughout the following years until the financial crisis. Previous analysis revealed that the town has been dominated by domestic private ownership during the 1990s and 2000s, combined with moderate deindustrialisation (36.1% decrease in industrial employment between 1989 and 1995).

Dunaújváros is a town South from Budapest in the county of Fejér. It is the youngest of the four towns, established in 1951 under the name ‘Sztálinváros’ replacing the village of Dunapentele and renamed to Dunaújváros after the 1956 revolution. The town is the home of the last major ironworks operating in Hungary. The number of its population underwent an explosion from 3,949 in 1950 to 65,533 in 1989, and experienced a decline during the transition years, reaching 48,187 by 2010. The crude death rate has slightly grown during the 1990s but remained much below the national average. Unemployment has increased during the early 1990s as in everywhere in Hungary, but remained the lowest among the
four towns. The average income in Dunaújváros has also been the highest among the four towns. The town underwent a moderate deindustrialisation (27.6%) as its smaller factories were closed. The state has remained the dominant owner in the town with some participation of American, and later Russian, investors.

Salgótarján is a town in the north of Hungary in the county of Nógrád. The development of Salgótarján started in the 19th century with the opening of several coal mines in the region, followed by a steelworks, a glass factory and a plant assembling mining machinery. Coal mining stopped during the 1970s followed by the glass industry and machinery plants during the 1990s. The last and biggest blow to the town was when the Salgótarján Steelworks was shut down in 2002. The population of Salgótarján grew from 32,000 in 1949 to 48,500 in 1989. The number of its inhabitants has substantially declined during the transition shrinking to around 36,000 today, a loss of 26 per cent. The crude death rate showed a substantial increase during the early 1990s. The unemployment rate reached 12.7 per cent by 1994. Salgótarján has been dominated by state ownership until the privatisation and subsequent closure of its steelworks in 2002 coupled with severe deindustrialisation (50% loss in industrial employment between 1989 and 1995).

Szerencs is a town in Eastern Hungary in the county of Borsod, the smallest town in the sample. Unlike Dunaújváros, Szerencs has a long history; it was the host of the 1605 parliament where István Bocskai was elected the Governor of Transylvania. The end of the 19th century saw the establishment of the greatest sugar factory and refinery at that time of Europe, followed by a chocolate factory in 1923 and other industrial and agricultural plants after the Second World War. The population of Szerencs grew from 7,800 to 10,300 between 1950 and 1989 and declining to 9,321 by 2010. The unemployment rate saw a rapid increase during the 1990s, as an agricultural cooperative and a major plant assembling agricultural machinery was shut down. The sugar and chocolate factories were among the first major companies sold to transnational companies in 1991. The new investors restructured the companies, also trimming their labour force. Finally, Nordzucker closed the sugar factory in 2008 which represented another major blow to the town. Szerencs underwent severe deindustrialisation already during the 1990s (51.2 per cent decrease in industrial employment between 1989 and 1995) and has been dominated by foreign investors since 1991. Szerencs has the worst mortality rates among the four towns.

**Individual interviews**

The first wave of interviews in the four towns was conducted by the author, followed by further interviews conducted by research assistants trained by the author on site between September 2016 and
January 2017. Firstly historical, economic and political information on the towns were collected to facilitate the smooth flow of conversation. I tested the interviews in each town during multiple interviews in the presence of the research assistants. The interview questions were refined after the first answers were received to ensure the smooth flow of the conversation. Interviews are anonymised and every subject consented to the use of audio-recording devices.

The subjects were identified through a snowball methodology. The goal was not to have a representative sample, but to have a reasonable variation in individuals’ demographic and economic characteristics. I aimed to include people who were working age adults in 1989, who were living and working in the interview towns during the transition years. I faced substantial difficulties in gaining access to interview subjects. There is a very high level of mistrust in Hungary, and respondents tend to be wary when expressing their opinion on social issues. We tackled this issue by establishing contact with interview subjects through interpersonal networks, mainly using the snowball method. The starting pool of subjects was identified through the author’s networks, through local trade unions, civic associations and political parties. The subjects were asked to recommend further interviewees at the end of the interviews. Occasionally further subjects were randomly solicited at local markets and interviewed later in their homes. This methodology resulted in a pool of subjects with higher than average affinity to participate in social organisations (altogether 54 per cent of the subjects reported to have some form of social involvement).

**Table 6.** The structure of qualitative interviews

<table>
<thead>
<tr>
<th>Domain</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>basic personal information</td>
<td>Where did they live? What was their employment history? What happened to the company they were working for, was it privatised, who were the owners? What was financial situation of the family?</td>
</tr>
<tr>
<td>health status</td>
<td>Did they have any health problems? Did they use any social assistance to cope with their condition? What was their health behaviour like (drinking and smoking habits)?</td>
</tr>
<tr>
<td>Perceptions about the transition</td>
<td>Did they like their job, how was the community life at the company? How was the community life in the town? Did they have a say in the management of the company during different periods? How did they feel when unemployed, how did they try to cope with economic problems?</td>
</tr>
<tr>
<td>Perceptions about society</td>
<td>What do they think who was responsible for the fate of their company? What do they think about the process of privatisation? Did they have a say in the fate of the country? Were they members of any social organisations? Did they participate in any kind of social action to shape the process of privatisation? How was their experience mediated by the family or friends?</td>
</tr>
<tr>
<td>General perceptions about the transition</td>
<td>Did they feel belonging to any larger social category (such as class or nation) or was the transition predominantly an individual experience? Did they believe that things could get better? Did they experience loss of hope? What do they think about foreign investors? Do they think anyone represents the interests of everyday people? What do they think about major political actors?</td>
</tr>
</tbody>
</table>
The interviews were based on a semi-structured questionnaire. The questions were grouped into five sections as described in Table 6. The conversations did not follow a strictly preordained pattern but allowed a free flow of conversation and encouraged the interviewees to recollect their experience and life histories freely. Occasionally, on the recommendation of the subjects the conversations took place in cafes or pubs in the towns. Interviews lasted 120 minutes on average and were mostly conducted in the homes of the interviewees. The total corpus of the 82 interviews is 816,118 words long encompassing 2000 typed pages.

**Table 7. Descriptive statistics of in-depth interview subjects**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Gender</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Ajka</td>
<td>34.1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Dunaújváros</td>
<td>37.9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Salgótarján</td>
<td>36.4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Szerencs</td>
<td>33.9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>35.6</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 7 provides an overview of subjects’ demographic characteristics. Altogether, 82 interviews were conducted; the average age of the subjects was 35.6 in 1989, including 3 people below 20. The majority of the respondents were between 31 and 40 years old in 1989. 43 males and 39 females participated, the overwhelming majority reported to have a general or vocational secondary degree (52 subjects), 4 people had a primary school degree and 26 had a college or university degree. Subjects are better educated and have higher than average social capital compared to the national population average which means the results are conservative estimations, as less educated and more isolated people were likely much more affected by the shock of the transition.

**Limitations of the data**

The PrivMort database has some limitations that need to be taken into consideration when analysing the data and evaluating the results. The convenience cohort study that formed the backbone of the database relied on the Brass method. Although this methodology results in a higher number of interview participants, due to the nature of questionnaire, which also collects information on relatives, the resulting dataset is not directly representative. The chance of inclusion is not uniformly distributed and might be influenced by the size of the family and the type of the relatives that were included. However, multiple techniques were used to tackle the issue of selection bias. Due to the large number of
interviews conducted in each town, the project collected information from a range of different types of individuals. The grid method and random walk warranted equal chance of inclusion, but parents of many children had slightly higher chances to be reported on than parents of one or two children. However, the sampling of every fourth household minimised the possibility of biased selection. This implies that only a very few types of individuals could be theoretically excluded from the sample, such as an older only child unmarried woman, whose parents are dead. Although, some questions have been raised regarding the indirect cohort approach to measure infant mortality (Gakidou and King 2006), there is no evidence that this would lead to biases for adult mortality rates in a developed country using siblings and spouses as source of information (Bobak et al. 2002; Bobak et al. 2003).

Migration could also introduce a potential bias to the indirect estimates on mortality. Relatives who migrated away from the surveyed towns were excluded from the study. For the family level mortality effect to affect the estimations between the main independent variables and mortality, it would need to vary across towns by the type of privatisation and the extent of deindustrialisation. The effect of migration on the association between privatisation, deindustrialisation and mortality might both result in an underestimation and an overestimation of the effect of the independent variables (Azarova et al. 2017). If healthy people left the towns that were deindustrialised or privatised, this could result in an overestimation of the effect of privatisation or deindustrialisation. If families who lost their fathers left the town, this would contribute to underestimation of the effect of privatisation or deindustrialisation on mortality. Indirectly, I was able to control for this effect, by including town level outmigration into the models as a town level control variable. Although this technique in itself does not rule out the potential of selection bias, it allows controlling for it. Future research should look into the migrant differentials at settlement level to account for these potential effects.

Recall bias can also have an influence on the reliability of the dataset. All the data were obtained from relatives covering a long time period which could potentially introduce distortions (Kruijshaar et al. 2005). This is an issue that has to be taken into account when evaluating the results, warranting caution. The large size of the sample (N=144,456 in Hungary) partially compensates for this potential source of bias. To further rule out potential misclassification, only male spouses were included from female respondents, female spouses of male respondents were not included. Although this results in an overrepresentation of men in the sample, it also reduces a potentially important source of bias, as men are less likely to remember their first partners and to exclude non-residential partners. On the other hand women have been reported to provide more accurate information on non-residential and first partners (Murphy et al. 2006; White 1998). Cognitive tests were also carried out at the beginning of the project to increase the clarity and efficiency of the questionnaire. Introductory sentences before question sections were also used during the interviews, and this technique has been reported to
significantly increase the recall precision of respondents (Coughlin 1990). Several other questioning techniques were used to improve the accuracy of the answers (Eisenhower, Mathiowetz and Morganstein 2004): indirect proxy questions were used for questions related to alcohol use, memorable life events and historical events were used to recall events in the distant past; for complex questions response cards were used which depicted the response options or outlined the time periods in question. Nevertheless, these techniques cannot fully ensure the complete accuracy of individual-level data especially regarding retrospective health behaviour. Yet there are no other data available, pending further developments in sampling techniques. The current database remains the best available data source that can be used to connect information on mortality with other individual and settlement-level characteristics.

Information on parents’ mortality might be also underreported if it concerns adoptive parents instead of natural parents (Timaeus 1986). This type of bias was addressed through explicitly asking questions if the respondents were raised by adoptive parents, and to provide information on their biological parents if relevant. People with children deceased before the interview date have also no chance of entering the dataset which could potentially bias the estimates (Graham, Brass and Snow 1989). However, the mortality differentials according to the number of children, are small in developed countries, so this type of selection bias is likely not to affect the robustness of the estimates (Irdam et al. 2016). Children from larger families with more siblings also have a higher chance to be included in the sample, which could influence child mortality estimates in developing countries, but there is no evidence for a strong sib-ship size effect on adult mortality in more developed countries (Irdam et al. 2016).

The dataset resulting from an indirect cohort approach thus has certain limitations that have to be taken into account. However, some of these limitations could be addressed during data collection, whilst other limitations can be addressed during statistical modelling. We investigated the on the association between rapid privatisation and mortality in Russia using the PrivMort dataset, and the results proved to be coherent with the previously published findings on the same association at the cross-national level (Azarova et al. 2017). This also underpins the reliability of the database.

**Statistical methods**

The models fitted in the present dissertation are multilevel survival models. In the next two sections I provide a general discussion of the two pillars of this analytical approach, multilevel modelling and survival analysis.
Multilevel modelling

The structure of the data makes it possible to simultaneously analyse the impact of variables at different levels. The main outcome variable of interest in the context of the dissertation is always at the individual level, the death of the subjects. However, the main independent variables are at the level of settlements: deindustrialisation and different ownership scenarios. There are further individual and settlement-level control variables that will be taken into account, such as individual health behaviour, education, marital status, town level unemployment, town level income, town level death rates or town level mortality rates. The basic structural feature of the dataset is that individuals are nested in 52 settlements. This implies that several assumptions of the general linear model are violated: observations are not independent, errors are not independent and units in different clusters may have different variances. The subjects included into the analysis are more similar to each other than people randomly sampled from the entire population because they live in the same settlement. To put it differently, subjects are not randomly assigned to the 52 settlements making the subjects living in a given settlement more homogenous compared to a random sample. Statistical analyses that do not account for the nested, multilevel structure of data will lead to a higher probability of rejecting the null hypotheses (i.e. Type I error) than if an appropriate statistical analysis were performed (Osborne 2000).

The multilevel structure of the data can be taken into account in several ways; I will only discuss the two most prominent methods briefly. The first option would be to account for the clustering of the data in 52 settlements through robust standard errors. Another way to account for the hierarchical structure of the data is to use hierarchical or multilevel modelling. Clustering on settlements equals to a statistical correction to the standard errors to account for the homogeneity of the subjects within the settlements. In contrast, multi-level modelling is a statistical approach designed to explicitly model the clustering effect instead of treating it as a bias to the standard error that has to be corrected. There are two basic ways to develop multilevel estimations. One approach allows the intercept to differ across the settlements but not the regression slopes (or coefficients). The other approach also allows the slopes of the regression to differ across the settlements. Based on the structure of the data we can easily rule out variation of the slopes across the settlements, as our main variables of interest are all at the settlement level. It is not appropriate to include random coefficients or random slopes for a covariate that does not vary at a lower than the random coefficient itself. Deindustrialisation and privatisation strategies do not vary within settlements. Therefore the appropriate modelling strategy is to use random intercept estimation. The categorical individual-level confounders also necessitate random intercept modelling (Rabe-Hesketh and Skrondal 2012b).
**Survival analysis**

In the two quantitative empirical chapters of this dissertation on the mortality impact of foreign investment, state ownership and deindustrialisation, the outcome variable of interest is the death of the subject during the analysis period. The analysis periods cover the two phases of the transformation. First, the crisis period from 1989 to 1995 is analysed to account for the health impact of deindustrialisation and whether rein industrialisation through foreign investment helped to offset the mortality crisis of the early transition years. This focus on the short- to medium-term impact of deindustrialisation allows me to provide a new explanation for the post-socialist mortality crisis focusing on the years with increasing mortality rates. Second, the restoration period from 1995 to 2004 is analysed, when the economy was growing, accounting for the health impact of different ownership scenarios (dominant state, dominant foreign and dominant domestic private) in the long run. This will allow me to provide a robust test of the long-term mortality implications of different privatisation strategies. The current section provides a general discussion of statistical models used and subsequent empirical chapters will provide further detail.

Given the binary nature of the outcome variable, logistic regression is the type of function that fits the data well. We could omit time from the analysis and run a logistic regression to test the hazard of dying for the subjects meeting the inclusion criteria. However, this way we would lose important information regarding the time spent in treatment. Survival analysis is recommended in cases where the occurrence of the outcome variable (i.e.: death) is measured during a time period (the treatment) as opposed to a fixed point in time. In the case of this dissertation the “treatment” will be deindustrialisation as well as different ownership scenarios. PrivMort surveys only contain a coarse measure of time (year of death), with several ties among subjects years of deaths, therefore survival analysis methods for continuous time (Cox regression) is not recommended. Discrete-time survival models are specified in terms of the discrete-time hazard, in our case this is defined as the conditional probability of the subject’s death occurring at a time point given that the subject has not died before (Rabe-Hesketh and Skrondal 2012a; Singer and Willett 1993). The point estimate of discrete-time survival analysis is an odds ratio (OR). The value of the Odds Ratio might be close to the value of the Relative Risk, if the Odds Ratio is close to 1; however, in the case of larger differences in the relative chances, the value of the Odds Ratio and Relative Risk will differ (Sackett, Deeks and Altman 1996). In my dissertation I refer to these estimates as odds of mortality, or relative chance of mortality between the main “treatment” groups (categories of deindustrialisation or privatisation).

For discrete time survival analysis the data needs to be expanded by the years the subject spent in the analysis period. As a result of data expansion the data is recreated in person-year format, with separate rows for each year in the analysis period for each subject. To give two examples: if a hypothetical subject
A survives throughout the whole analysis period, then the subject will have ten separate rows in the dataset for each year of the analysis period; if hypothetical subject B dies during the analysis period, then the subject will have separate rows corresponding to each person-year while the subject is alive, then missing data for the consecutive years following death. During the expansion a response variable y is also created that takes the value 0 if the subject was alive during the analysis period and 1 in the year the subject dies. Once the data is transformed into person-year format, the hazards of dying for each year can be calculated.

I am not interested per se in how the population-averaged hazard of dying evolves over time; my main purpose is to test the effect of different privatisation strategies and deindustrialisation on the odds of dying during the analysis period, taking survival time into account. This can be achieved through a logistic regression, including each year as a dummy variable into the regression, and thus controlling for the time spent in treatment. The specification of the logistic regression depends on the types of variables we use, the level of variables and the time component of the variables. The main independent variable is a time-constant variable at the level of the settlement. Taking the above into consideration the general model for the logistic regression with multiple levels can be written as follows based on Rabe-Hesketh and Skrondal (2012a: 758):

\[
\text{Logit}\left[\Pr(y_{tis} = 1|D_{tis}, x_{is}^{a,b})\right] = \alpha_1 + \alpha_t d_t + \beta_1 IV_{is}^b + \beta_2 x_{2is}^a + \beta_3 x_{3is}^b
\]

In the equation \(y_{tis}\) represents the indicator for the event (in our case death) occurring at time \(t\) for person \(i\) nested in settlement \(s\); \(d_t\) represents the dummy variables for each years of the analysis period, \(\alpha_t\) are the coefficients for the dummies, and \(D_{tis}\) represents a vector of all the dummies. The key independent variable is \(IV_{is}\) with covariate \(\beta_1\) measuring the main theoretical concepts (the impact of different dominant ownership categories weighted by the number of employees; the extent of deindustrialisation). The first part of the equation, \(\alpha_1 + \alpha_t d_t\) determines the baseline hazard, i.e. the hazard when the covariates \(x\) as well as \(IV_{is}\) are equal to zero. In the second part of the equation, \(x_{2is}^a\), \(x_{3is}^b\) represent different control variables for person \(i\) nested in settlement \(s\) and at different level of analysis, whereas \(\beta_2, \beta_3\) are the coefficients for the covariates. The superscript indicates the level of analysis (\(a\) designates individual-level, \(b\) designates settlement-level variables).

**Conclusion**

This dissertation applies a mixed-method strategy, combining innovative quantitative and qualitative data collected over several years as a result of a multi-disciplinary project. The database encompasses information at multiple levels allowing for hierarchical modelling to investigate the association between
micro-level data with meso-level variables in a robust way. This methodological strategy allows me to overcome the limitations of cross-country studies that are prone to ecological fallacy, and, at the same time, go beyond the individualist bias of solely survey-based estimations of the social determinants of health. The qualitative in-depth interviews provide valuable exploratory insights that will allow me to further corroborate the findings and to provide details on the socio-emotional and contextual mechanisms that translate deindustrialisation and privatisation into health outcomes. To my knowledge this dissertation represents the first project that investigates the health impact of foreign direct investment using a mixed-method multi-level analysis, the first research project that analyses the health impact of prolonged state ownership using quantitative company information, as well as the first quantitative assessment of the health impact of deindustrialisation during the post-socialist mortality crisis. This mixed method strategy ensures that the dissertation has a substantial methodological added value to the existing literature.
Chapter 5) Deindustrialisation and Mortality

Summary
Deindustrialisation has been linked to increased mortality in developed countries. Using individual data from the PrivMort retrospective cohort survey covering 24,377 males and 18,423 females as well as ownership data on 260 companies and settlement-level data for 52 towns in post-socialist Hungary, this chapter assesses the relationship between deindustrialisation, measured as the change in industrial employment-to-population ratio between 1989 and 1995, re-industrialisation through foreign investment, measured as significant presence of foreign investors in the largest companies, and consequent mortality between 1989 and 1995. Multilevel discrete-time survival modelling shows that people living in severely deindustrialising towns experienced a significantly larger relative chance of mortality (OR=1.12, 95% CI [1.00-1.26], p=0.042) compared to people living in moderately deindustrialising towns. Foreign investment does not moderate the health impact of deindustrialisation, whereas unemployment benefits seem to offset it partially.

Introduction
The introduction and the review chapters have shown that we know still very little about the upstream economic determinants of the post-socialist mortality crisis in Hungary. We know that the cumulative real decline in GDP was 19 per cent between 1990 and 1993 but the extent of loss of industrial employment went much beyond that in just a few years (Feenstra, Inklaar and Timmer 2015). I have also shown previously that, in part because of its ability to attract foreign investments, the Hungarian economy performed better during the 1990s than most of the former socialist states (Hamm, King and Stuckler 2012). I have also argued that this global integration strategy was incapable of preventing an unprecedented destruction of productive capacities and jobs, with mortality rates in Hungary increasing until 1993.

Existing research has shown that job loss was an important driver of mortality in the region, an event that was especially important, given how employment in large enterprises brought a wide range of social benefits (Field and Twigg 2000). Job loss was associated with countries’ decisions to open up their economies to international trade and investment, leaving their industries unable to compete, and undertaking privatisation of large state-owned enterprises. Although there are several studies on other Eastern European countries that link transition strategies to mortality outcomes; the role of deindustrialisation in the post-socialist mortality crisis has been neglected by researchers. Yet,
deindustrialisation might be a crucial upstream determinant of adverse health outcomes in the region. Deindustrialisation cannot be equated with individual labour market status, as it is a process affecting communities as a whole. Neither cannot it be equated with unemployment, as official unemployment statistics only capture a small segment of the population affected by the collapse of socialist companies. Furthermore, deindustrialisation might have a contextual impact on health outside of the labour market channel, through eroding town-level social capital, cohesion and identity, and increasing stress, alienation and the sense of abandonment. Therefore, the implications of deindustrialisation might be more far-ranging than that of town level-unemployment or individual-level job loss.

Research on high income countries has shown that deindustrialisation is associated with reduced physical activity (Rind, Jones and Southall 2014), increased susceptibility to drug use (McLean 2016) and worse health (Audureau, Rican and Coste 2013; Mitchell et al. 2000; Riva et al. 2011; Walsh, Taulbut and Hanlon 2009), and its adverse health effects may be exacerbated by the policy context (Collins and McCartney 2011; Garnham 2017). Social scientists have analysed the emergence of poverty, exclusion, the rise of new elites and the segmented internationalisation of post-socialist societies, yet, as of today, the role of deindustrialisation in the post-socialist mortality crisis remains largely unexamined. Although transnational companies played an important role in re-industrialisation in post-socialist Central and Eastern Europe, and there are a few papers analysing the relationship between foreign direct investment and health outside the post-socialist context (Burns, Jones and Suhrcke 2016), its association with mortality in Eastern Europe has also been neglected so far.

The excess deaths described previously cannot be treated as “natural” or as a result of lifestyle legacies: the post-socialist mortality crisis is a sociological phenomenon, calling for sociological explanations. Addressing the gaps in the existing literature and seeking to offer a better understanding of the post-socialist mortality crisis, in this chapter I test whether severe deindustrialisation increased the odds of mortality when compared to moderate deindustrialisation. As I have described in the previous chapters, the economic strategy of Hungarian policymakers involved foreign investments as tool to modernise the economy. To test if this economic restructuring and reindustrialisation through transnational companies had a significant health effect, I investigate whether town-level foreign direct investment penetration is associated with mortality. Finally, to eliminate observed heterogeneity I test the effect of relevant town and individual-level confounders.
Theoretical framework and hypotheses

As I have described in Chapter 3, researchers following the strong formulation of the behavioural approach assumed that the destruction of inefficient socialist companies would free resources that would then be allocated more efficiently, thus boosting growth, welfare and improvements in life expectancy (Carlson and Hoffmann 2011). They also hypothesised that the reorganisation of socialist institutions would similarly lead to the abandonment of unhealthy behavioural practices (Cockerham 1997). Neoclassical economists also predicted that the introduction of a global market would lead to optimal equilibrium outcomes, and maintained that the reduction in industrial employment or output is mainly a result of technological development that induces beneficial structural change in the economy (Rowthorn and Ramaswamy 1999). These neoclassical economists believed that the destruction of socialist economic institutions will “get prices right”, this would in turn unlock growth potential, increase social wealth, and, as the fruits of growth “trickle down”, market reforms would lead to improvements in health and increasing life expectancy (Pritchett and Summers 1996).

As opposed to behavioural and neoclassical researchers, analysts following the world-system perspective argued that transnational corporations promote resource and surplus extraction that could otherwise be invested locally, obstruct health and other social programs, and force countries to engage in a race to the bottom to attract foreign investors (Amaro and Miles 2006), resulting in a constant decrease of capital taxation and a lowering of health and social standards (Drahokoupil 2008). They argued that the insertion of former socialist economies into the capitalist world economy leads to collapse of the state capacity and public services, such as health, the rise of speculative activities, the concentration of wealth and power in the hands of a few capitalists, and the inevitable oligarchisation of the economy and the polity (Burawoy 1996; Harvey 2004).

Finally, I have shown that institutionalists also criticised the shock therapy perspective promoted by neoclassical economists. They pointed out that without proper guidance from the state, the rapid introduction of market forces will lead to massive company failures in post-socialist countries, thus potentially undermining health King, Hamm and Stuckler (2009). However, they also argued that the global integration of Central and Eastern European countries through foreign direct investment will offset the destruction of socialist companies. They argued that states could negotiate better deals with strategic foreign investors that would lead to superior governance structures and superior health outcomes in the long run, compared to rapid mass privatisation (Keune et al. 2009; King and Váradi 2002; Stuckler, King and McKee 2009).

Based on these competing accounts I formulated the following hypotheses about the relationship between deindustrialisation and health:
The strong formulation of the behavioural approach:

- **H₀**: Upstream economic factors (privatisation, economic liberalisation and deindustrialisation) have no significant impact on mortality; mortality is primarily driven by behavioural factors.
- **H₁**: As capitalist reforms erode the cultural and institutional legacy of socialism, health behaviour improves, and thus mortality is reduced.

The neoclassical approach

- **H₃**: Economic liberalisation in the form of foreign investment might lead to a short term decline, but after a few years it leads to better health and lower mortality through creating new jobs, increasing company efficiency and creating spill-over effects for domestic enterprises.
- **H₄**: Deindustrialisation decreases harmful economic activities and industrial pollution, wipes out inefficient firms and opens up the space for the development of globally competitive companies which leads to increases in welfare and thus improves health and reduces mortality.

The world-system approach

- **H₅**: The capitalist transformation of former socialist economies leads to economic underdevelopment. Economic liberalisation (foreign direct investment) is economically and socially harmful and thus leads to higher mortality.
- **H₆**: Employees can adapt to the new economic environment only very slowly (labour market rigidities) therefore deindustrialisation results in worse health and higher mortality. Men are particularly vulnerable to short term labour market shocks.

The relational political economy approach:

- **H₈**: Economic liberalisation in the form of foreign direct investment has a positive economic and health effect but this might be offset by the shock of privatisation and by the concentration of capital; there might be no impact or a negative health impact of foreign investment.
- **H₁₀**: Employees can adapt to the new economic environment only very slowly (labour market rigidities) therefore deindustrialisation results in worse health and higher mortality.

Data and methods

I used the PrivMort database as described Chapter 4. The following sections provide further details on the data and the variables used in the analyses presented in this chapter.
Settlement-level data
As described in Chapter 4, the PrivMort database contains extensive information on 52 towns with at least 30 per cent of the workforce in industrial employment in 1989. I used this dataset to derive the main independent variable (deindustrialisation), the secondary independent variable (reindustrialisation measured as the significant presence of foreign investment), as well as further control variables (average outmigration in 1989-1994, average number of inhabitants in 1989-1994, average dependency ratio in 1989-1994, average number of GPs per 100,000 inhabitants in 1989-1994, pooled town-level death rate per 100,000 inhabitants in 1989, average unemployment in 1990-1994, average income per capita in 1990-1994). Table 8 presents descriptive statistics for the settlement-level variables included in the analysis.

The current analysis focuses on the period from 1989 to 1995, covering the beginning of post-socialist transformation (1989) and the subsequent severe economic recession (1992-1993). The main independent variable is town-level deindustrialisation, measured as the change in the industrial employment-to-population ratio from 1989 to the average industrial employment-to-population ratio between 1994 and 1996. For example, 50 per cent deindustrialisation means that the industrial employment to population ratio in 1994-1996 is 50 per cent of the industrial employment to population ratio in 1989. A three-year average of the upper end of the analysis period was used to smooth annual fluctuations, thus increasing the robustness of the estimates.

As opposed to the registered unemployment rate, that only measures the number of people without a job who are actively looking for new employment opportunities and register with the employment agency, the measure of deindustrialisation used in this chapter captures the total decrease in the number of employees specifically in the industrial sector. Therefore, deindustrialisation is a better variable to analyse the health impact of the collapse of former socialist companies. Preliminary analyses revealed that the relationship between deindustrialisation and mortality is non-linear (see figure 10). Therefore, towns were grouped into two categories: those where deindustrialisation exceeds 50 per cent and those where it is below 50 per cent. Subsequent robustness checks examined the impact of dividing towns into tertiles and quartiles on the basis of deindustrialisation variables. I also created a secondary independent variable measuring foreign investment penetration by aggregating company-ownership information to the settlement level. The following section describes this procedure.

Company-level data
Chapter 4 also provided general details on the company-level data. I used this dataset to test the health effect of re-industrialisation through foreign investment, the second main independent variable. For the
current analysis, I reduced the sample to the five largest companies in each town, as measured by their average number of employees between 1992 and 2004. Where the difference between dominant ownership categories was less than 3%, I used the six largest companies to improve the information base. Overall, ownership data from 260 companies was used, 550 companies counting the successors and parents separately. I measured the share of foreign ownership in the total assets among the five biggest companies. In the first step, I calculated the proportion of company shares owned by foreign investors, on average between 1989 and 1995. In the second step, I calculated employment-weighted averages of the proportions under foreign ownership across the five companies in each town. I measured the significant presence of foreign investment by creating a categorical variable indicating if the share of foreign ownership in the assets of the companies included in the analysis exceeds 25 per cent. I also did a robustness check measuring the presence of foreign investment with a 10 per cent cut off. I checked the robustness of the association using non-weighted ownership categories, solely based on asset structure between 1989 and 1995.
### Table 8. Summary statistics for town level covariates 1989-1995

<table>
<thead>
<tr>
<th>Extent of deindustrialisation (1989-1995)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Industrial employment in '95 as per cent of '89</td>
<td>68%</td>
</tr>
<tr>
<td>Average unemployment rate in 1990-1994 in per cent</td>
<td>7.78%</td>
</tr>
<tr>
<td>Average income per capita in 1990-1994</td>
<td>106.64</td>
</tr>
<tr>
<td>Death rate 1989</td>
<td>1155.07</td>
</tr>
<tr>
<td>Average dependency ratio 1989-1994</td>
<td>72.07%</td>
</tr>
<tr>
<td>Average outmigration in 1989-1994</td>
<td>1174.51</td>
</tr>
<tr>
<td>Average number of inhabitants in 1989-1994</td>
<td>29141</td>
</tr>
<tr>
<td>Average age in 1989</td>
<td>50.93</td>
</tr>
</tbody>
</table>

**Note:**

Unemployment: The average number of those willing to work but unable to find a job divided by the total number of economically active between 1990 and 1994 expressed as percentages.

Income per capita: Average personal income tax base per 1 permanent inhabitant in thousand forints (change not adjusted for inflation) between 1990 and 1994.

Death rate: Total number of deceased men and women divided by the size of the population in 1989 per 100,000.

Dependency ratio: The average number of dependents (aged zero to 14 and over the age of 65) divided by the working age population (aged 15 to 64) between 1989 and 1994 expressed as per cent.


Number of GPs: Total average number of general practitioners registered in the town between 1989 and 1994 per 100,000 inhabitants.

Age in 1989: The average age of the subjects included into the analysis in 1989.
Individual-level data

Chapter 3 provided general details on the individual-level data used in this dissertation. I used this dataset to derive the outcome variable (death of subjects), as well as crucial individual level control variables (age, gender, smoking, alcohol consumption, and marital status).\textsuperscript{11} Tables A1 and A2 in the Appendix provide descriptive statistics of individual-level variables presented by the extent of deindustrialisation. For the current analysis, respondents were excluded from the analysis, and only those relatives were included who lived in one of the towns from the sample during the 1980s or 1990s (N=43,532). Those who left the interview towns or only moved to the interview towns later during the 2000s were eliminated from the sample. The sample was further reduced by only including those who had a complete record on gender. In total 42,800 people met these criteria; 24,377 men and 18,423 women. The average number of subjects per town was 881 (range: 304-1194). In the main models, no age restrictions were used, but further robustness checks were carried out excluding subjects below age 20 in 1989 and above 70 in 1989. Ethics approval was obtained from the University of Cambridge Department of Sociology ethics committee and ERC ethics advisers. The data were anonymised to prevent any potential identification of individual respondents.

Statistical analysis

I examined the relationship between deindustrialisation at the town-level and individual-level mortality using multilevel discrete-time survival analysis method. Chapter 4 presented the general arguments for this methodology and provided a general formula for the regressions. The outcome variable in the present analysis was death (all causes) of subjects between 1989 and 1995. The time in years since 1989 was used as the underlying time variable. The main independent variable measures the extent of deindustrialisation as the percentage change in industrial employment-to-population ratio. The extent of deindustrialisation does not vary within towns, the appropriate multilevel modelling strategy is to use random intercept estimation (Rabe-Hesketh and Skrondal 2012b). The categorical individual-level confounders also necessitate random intercept modelling.

\textsuperscript{11} Although the PrivMort survey collected data on participants’ and their and their relatives’ labour market status, this data could not be used for the present analysis. The coding of the labour market status variable refers to a whole decade (for example indicating if a subject was employed in the 1990s or was a pensioner in the 2000s). The current analysis period only covers half of the decade thus the timing of the main independent and the outcome variables do not match that of the labour market status variable. The missing values for this variable also represent a significant proportion (12,532/42,800, i.e. 29.3\%) further reducing the statistical usability of the variable. The fact that I cannot robustly control for individual labour market status means that I cannot establish if the health impact of industrialisation runs through the labour market channel, or if it affects health also otherwise. However, this does not affect the robustness of the association between town-level deindustrialisation and mortality.
The association was examined in four models. In model 1, I tested the effect of deindustrialisation, adjusting for time spent in treatment, i.e. how long each subject survived the analysis period 1989-1995, age in 1989, and for the relative’s relationship to the respondent, i.e. whether they were fathers, mothers, siblings or partners. It was important to adjust for the latter factor in order to eliminate information bias related to the way data on relatives were collected and to control for generational differences. In model 2, the relationship was adjusted for all variables in model 1 and individual-level covariates: education, smoking, drinking frequency and marital status. In model 3 I included further town level control variables: average number of inhabitants in 1989-1994, average outmigration in 1989-1994, average dependency ratio in 1989-1994, average number of GPs per 100,000 inhabitants in 1989-1994, average unemployment rate in 1990-1994, average income per capita in 1990-1994 as well as initial mortality (pooled town level death rate in 1989 per 100,000 inhabitants) to control for initial differences in mortality between towns (see Table 8). Female mortality rates are not available for 1989; therefore it was not viable to include gender-specific town level death rates, only pooled death rates. I have carried out more robust checks for potential selection bias by measuring individual-level pre-treatment odds of mortality across the towns – these I will describe in detail in the robustness check section.

Finally, to increase the parsimony of the modelling and to reduce the risk of overfitting, I excluded town level covariates, following a stepwise backward deletion strategy (Greenland, Daniel and Pearce 2016). I checked the significance of each covariate both in model 3 and running separate regressions, only including the given settlement-level variable into the baseline model 1 without the main independent variable. Outmigration, population size and average number of GPs were not significant either in model 3 or in model 1, and thus were removed from the model one by one. As a categorical variable (comparing people living in towns with income above the average to towns with income below the average) income was significantly positively associated with reduced odd of mortality in model 1 (OR=0.91, 95% CI [0.82-1.00], p= 0.042). However, in model 3 the income variable was not significant, neither as continuous nor as categorical variable (2 and 4 categories). Due to high correlation between average unemployment and average income (r= −0.782) I decided to remove income from the final model 4, aiming for the most parsimonious model, but this did not influence the results. The main model is model 4 which includes the same controls as in model 2, plus average town unemployment (1990-1994) and initial mortality (pooled town level death rate in 1989 per 100,000 inhabitants). Individual-level results are presented separately for males and females. All statistical analyses were carried out using STATA 13.0 (StataCorp, Texas, USA).
Results

Table 8, presented above provides an overview of town level economic characteristics broken down by the extent of deindustrialisation. The extent of deindustrialisation ranges from 93 to 0 per cent; the average is 41 per cent, 67.5 per cent in severely deindustrialised towns and 38.5 per cent in moderately deindustrialised towns. Unemployment on average was 9 per cent in this period in the 52 towns. The correlation between initial industrial employment and deindustrialisation is weak (r=-0.04), thus the initial level of industrialisation does not explain differences in deindustrialisation. Correlation between initial income and deindustrialisation is moderate (r=-0.3829) suggesting that economically disadvantaged regions were more severely hit by deindustrialisation.

Table A1 and A2 in the Appendix present individual characteristics for men and women living in towns broken down by the extent of deindustrialisation. Both men and women in towns with moderate deindustrialisation appear, on average, to be better educated and smoke less than their counterparts from severely deindustrialised towns.

Table 9. Deindustrialisation and foreign investment by regions between 1989 and 1995

<table>
<thead>
<tr>
<th>Regions</th>
<th>Deindustrialisation</th>
<th>Foreign Direct Investments</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate (0-50%)</td>
<td>Severe (50-100%)</td>
<td></td>
</tr>
<tr>
<td>North West</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>66.67%</td>
<td>33.33%</td>
<td></td>
</tr>
<tr>
<td>South West</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>88.89%</td>
<td>11.11%</td>
<td></td>
</tr>
<tr>
<td>North East</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>54.55%</td>
<td>45.45%</td>
<td></td>
</tr>
<tr>
<td>South East</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>70.59%</td>
<td>29.41%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>16</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>69.23%</td>
<td>30.77%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>78.85%</td>
<td>21.15%</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values in each cell are frequencies above and row percentages below

Table 9 shows the number and proportion of towns by the extent of deindustrialisation and the presence of foreign investment in the country, divided into four geographical regions. Both the extent of deindustrialisation and the presence of foreign investors from 1989 to 1995 are higher in North West and North East Hungary than in the southern parts of the country, where agriculture has traditionally been more important. The simultaneous presence of foreign investment and deindustrialisation in the 52 towns allows us to ask whether re-industrialisation, driven by transnational corporations could offset the health consequences of deindustrialisation.

The multivariable adjusted multilevel association between the extent of deindustrialisation and individual-level mortality in the period from 1989 to 1995 is shown in table 10. To filter out initial
differences in mortality, I controlled for town level mortality rates in 1989. Men living in towns experiencing a collapse in industrial employment of greater than 50 per cent had a 12 per cent higher odds of dying compared to men living in towns where deindustrialisation was below 50 per cent (OR=1.12, 95% CI [1.00-1.26], p=0.042). The effect grew in strength and significance with inclusion of potential town and individual-level confounders. I found no statistically significant association between deindustrialisation and female mortality.

Table 10. Deindustrialisation on mortality between 1989 and 1995
(Random intercept multi-level survival models)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Model</th>
<th>The extent of deindustrialisation (1989-1995)</th>
<th>N=36</th>
<th>N=16</th>
<th>OR (95% CI)</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Moderate (0-50%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>N=16,659</td>
<td>N=7,718</td>
<td>1.11</td>
<td>1.00-1.23</td>
<td>0.040*</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>1.07</td>
<td>0.97-1.18</td>
<td>0.188</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>1.13</td>
<td>1.01-1.26</td>
<td>0.028*</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>1.12</td>
<td>1.00-1.26</td>
<td>0.042*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N=12,248</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>N=7,718</td>
<td>N=6,175</td>
<td>0.96</td>
<td>0.86-1.07</td>
<td>0.500</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>0.97</td>
<td>0.86-1.09</td>
<td>0.576</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>1.01</td>
<td>0.89-1.16</td>
<td>0.847</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td></td>
<td></td>
<td>1.00</td>
<td>0.88-1.16</td>
<td>0.902</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age and relationship to the respondent
Model 2: adjusted for all variables in model 1 plus individual-level covariates (smoking, alcohol intake, education and marital status)
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994)
N_t refers to number of towns, N_s refers to the number of subjects.
*p < 0.05; **p < 0.01, ***p < 0.001 (two tailed tests)
Figure 10. Predicted probability of mortality by the extent of deindustrialisation, 1989-1995

Note: To calculate predicted probabilities standard logistic regression with robust standard errors was used. Towns were divided into deciles (number of towns in each category was between 5 and 6). Model adjusted according to the specification of model 4: individual-level covariates (smoking, alcohol intake, education and marital status) plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994.

The probability of dying in the 1989-1995 period, as predicted by the extent of deindustrialisation, using industrial employment change deciles is shown in figure 10, adjusted according to the specification of model 4. The association between deindustrialisation and mortality is non-linear. There is no significant change until deindustrialisation exceeds 50 per cent. The difference in the predicted probability of mortality between the highest and the lowest deindustrialisation categories is 38 per cent.

Including registered unemployment into model 3 and 4, I found that unemployment is negatively correlated with the odds of dying among men (OR=0.98, 95% CI [0.97-1.00], p = 0.093) using standard logistic regression clustered on the settlements, suggesting that a 1 per cent increase in registered unemployment, controlling for industrial employment loss, might be associated with a 2 per cent lower odds of mortality among men – however, the association is not significant at the 5% level.

Finally, the association between foreign direct investment and health is presented in table 11. The outcome variable is the same, death of subjects between 1989 and 1995. The independent variable was a measure of foreign investment penetration aggregated from company-ownership data as described in the methods section. Using a 25 per cent cut off rate for company assets owned by foreign investors I found no significant association between FDI and health, neither among men (OR=1.07, 95% CI [0.95-1.20], p=0.240) nor women (OR=1.04, 95% CI [0.90-1.19], p=0.612).
Table 11. Foreign investment and mortality between 1989 and 1995
(employment-weighted ownership assets, random intercept multi-level survival models)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Model</th>
<th>Foreign Investment in Town Total Assets</th>
<th>Below 25%</th>
<th>Above 25%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N_t=41</td>
<td>N_t=11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR (95% CI)</td>
<td>p-value</td>
<td>p-value</td>
</tr>
<tr>
<td>Males</td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.10</td>
<td>0.98-1.24</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>1.08</td>
<td>0.96-1.21</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>1.08</td>
<td>0.96-1.21</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.07</td>
<td>0.95-1.20</td>
</tr>
<tr>
<td>Females</td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.08</td>
<td>0.96-1.22</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>1.05</td>
<td>0.92-1.21</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>1.00</td>
<td>0.87-1.14</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.04</td>
<td>0.90-1.19</td>
</tr>
</tbody>
</table>

Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994)

N_t refers to number of towns, N_s refers to the number of subjects.
*p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)

Robustness checks
To examine the robustness of the results to different model specifications, I estimated the association between mortality and deindustrialisation, operationalising the latter as a categorical variable with four categories. Using the highest level of deindustrialisation as baseline, all three remaining categories are significantly associated with mortality, as portrayed in table A3 in the appendix. People living in towns with the lowest level of deindustrialisation have a 16 per cent lower odds of mortality than people living in towns with the highest level of deindustrialisation (OR=0.84, 95% CI [0.72-0.97], p=0.017). The two middle categories are also significant, but do not follow a linear trend. Using the lowest level of deindustrialisation as baseline, I found that people living in towns with more than 52 per cent of deindustrialisation have a 19 per cent higher odds of mortality, compared to people living in towns with lower than 30 per cent of deindustrialisation (OR=1.19, 95% CI [1.03-1.38], p=0.017), as reported in table A4. I found similar results when splitting towns into three equal sized categories based on the extent of deindustrialisation.
I further tested the potential impact of foreign investment on mortality as reported in table A5 in the appendix. Using a less restrictive definition of foreign investment (10% cut off rate of company asset ownership weighted by the number of employees) I found no statistically significant health effect. By weighting asset ownership by the number of employees, I focus on the employment channel of the FDI-health association. However, FDI might have a beneficial impact on domestic companies by creating demand and other spill-over effects locally. Therefore, I also tested the health impact of foreign investment using non-weighted ownership measurements, but again I found no significant results either.

Introducing a lower age limit of 20 increases the statistical significance of the association (OR=1.13, 95% CI [1.01-1.26], p=0.036). Introducing an age cap at 70 decreases the strength and the significance of the association between deindustrialisation and mortality. The association remains significant in the fully controlled model 4 for men using logistic regression with cluster-robust standard errors (OR=1.11, 95% CI [1.00-1.23], p= 0.047), but becomes insignificant (OR=1.09, 95% CI [0.95-1.25], p= 0.211) in the multilevel survival model.

To check for endogeneity, I used multiple stepwise checks to determine whether initial conditions affected mortality differentials. I included income in 1990 into model 4 but it only made the association between deindustrialisation and mortality stronger (OR=1.13, 95% CI [1.00-1.26], p=0.035). I checked whether initial industrial employment influences mortality differentials. I found that a 1 per cent higher industrial employment in 1989 decreased the odds of mortality between 1989 and 1995 by 1 per cent and the association between deindustrialisation and mortality grew in significance after controlling for initial industrial employment (OR=1.14, 95% CI [1.02-1.27, p=0.022). Similarly, initial differences in the age structure of towns do not explain mortality differences between severely and moderately deindustrialised towns: controlling for dependency ratio in 1990 only increased the mortality impact of deindustrialisation (OR=1.15, 95% CI [1.03-1.28], p=0.015).

I also controlled for potential selection bias by checking initial mortality differentials in two ways. First, I asked whether town level death rates in 1989 are significant predictors of individual mortality between 1989 and 1995, but found no significant association either in model 4 or in model 1. I kept this variable in the final model 4 throughout, to eliminate the possibility of selection into high deindustrialisation through high mortality. Second, I constructed a separate dataset using subjects who lived in the 52 towns during the 1980s and investigated individual-level odds of mortality for the period from 1985 to 1988 between the severely and moderately deindustrialising towns. As table A6 in the appendix reports, I found no significant mortality differences for men or women in the pre-treatment period.
Finally, I analysed the robustness of the multilevel survival models using a dataset only containing town level time series data on the 52 towns covering the 1989-1997 period. I used male mortality rates (including all ages) as outcome and deindustrialisation percentages as main independent variable. The average increase in town level male mortality was 48.04 deaths per 100,000 (7.61 per cent) in the 52 towns between 1989 and 1993, the years of severe deindustrialisation. Table A7 in the appendix reports the results of town level fixed effects panel regressions showing that a 10 per cent deindustrialisation increases the town level male mortality rate by 7 deaths per 100,000, controlling for population size, dependency ratio, unemployment and income per capita (Coef.=0.698, p=0.005). The predicted mortality increase in a town experiencing the average level of deindustrialisation was 28.62 deaths per 100,000 (4.53 per cent). The predicted average increase in mortality as a result of deindustrialisation accounts for 59.5 per cent of the average observed increase in mortality.

The results of survival models reported are all based on a dataset with complete cases for education, smoking and drinking. Including subjects with missing values on individual covariates into the models resulted in almost identical results.

Discussion

Researchers following the behavioural tradition emphasised the role of individual health behaviour such as alcohol and smoking in the post-socialist mortality crisis. Some scholars have even emphasised that these individual lifestyle factors were the sole determinants, debating the importance of the social stress resulting from the shock of the transition. The results presented in this chapter contradict hypothesis H0. The increase in mortality during the early years of the transition is not only a result of smoking or alcohol. Whilst applying controls for these variables in the models presented in this chapter the effect of deindustrialisation remained statistically significant. The shock of deindustrialisation was not completely mediated by smoking and alcohol, but was independently associated with the odds of mortality in Hungarian towns during the early years of the transition. Some behaviourists also maintained that “socialist over-industrialisation” was responsible for negative health lifestyles and thus the shift of employment from socialist industry to other sectors of the economy would improve health. However, the results as presented contradict hypothesis H1: instead of improving health, deindustrialisation was associated with increased mortality.

Neoclassical economists advocating rapid restructuring of former socialist enterprises also argued that the transformation would quickly result in superior economic and social performance with “enormous scope for increases in living standards in a few years, particularly as resources are shifted out of the
military-industrial complex into other sectors” (Lipton and Sachs 1992: 214). They argued that through the “creative destruction” of inefficient local productive capacities, resources would be freed for more efficient investment leading to higher productivity and higher social welfare in a few years. Using mortality as a measure of development, as suggested by Amartya Sen (1998) the findings contradict the arguments of shock therapists: in human terms there was nothing creative in this destruction. Hypothesis $H_3$ derived from the neoclassical approach stated the foreign investment would lead to improvements in welfare and thus health. However, the results presented contradict this hypothesis: foreign investment was not associated with reduced mortality. Similarly to behaviourist health researchers, neoclassical economists also maintained that deindustrialisation would lead to more efficient allocation of resources, and thus would increase welfare and improve health, as formulated in hypothesis $H_4$. The results contract this hypothesis.

Existing research suggests that the sudden collapse of the former socialist internal market (COMECON) and the rapid integration into the global capitalist economy put extreme pressure on former state owned companies to restructure their production technologies and their distribution (Andor and Summers 1998; Brada, Singh and Török 1994; Ellman 2005; Szelenyi 2014). Hungarian policymakers rejected active industrial policies, unlike the Czech Republic (Vanhuysse 2006) or Poland (King and Sznajder 2006), thus companies that could not withstand increased global competition were wiped out, resulting in a massive destruction of local productive capacities. As a result, in Hungary, 16,000 companies were terminated by 1995 (Allison and Ringold 1996: 19). The results presented in part contradict the predictions based on the world-system perspective: the evidence does not support that economic dependence through transnational companies would increase mortality (hypothesis $H_5$). However, hypothesis $H_6$ based on the world-system perspective regarding the negative health effect of deindustrialisation is supported by the results.

This chapter presented robust evidence that the post-socialist mortality shock was significantly associated with the wave of deindustrialisation that hit between 1989 and 1993, in accordance with hypothesis $H_{10}$. I also presented empirical reasons to rule out potential selection bias, showing that the negative health impact of deindustrialisation cannot be explained by pre-transition mortality differentials. Based on this test of pre-existing mortality differentials it is not likely that towns “selected into” deindustrialisation by their levels of health. There appears to be no significant association between the health of the inhabitants in the towns during the early 1990s and their level of subsequent deindustrialisation. A potential limitation of the analysis is that the allocation of settlements to different categories of deindustrialisation was not random, leaving some potential for unobserved heterogeneity to influence the association. There could be some characteristics of the towns that underwent severe deindustrialisation that could have influenced mortality. Although I accounted for major confounders,
such as differences in town level differences in age structure, income, initial level of industrial employment, as well as town-level unemployment, there might be further relevant ecological factors influencing mortality, therefore it is not clear to what extent deindustrialisation explains mortality.

Consistent with hypothesis H$_9$, I found that men appear to be more vulnerable to deindustrialisation compared to women which might be related to the short- to medium-term psychological effects of losing the status of the breadwinner (Watson 1995). Hypothesis H$_8$, based on the relational political economy perspective outlined in the theoretical chapter of this dissertation, was also supported by the data: although there is evidence that foreign investment is associated with superior economic performance, this is not translated into lower mortality rates. The high regional concentration of foreign investment and the resulting uneven economic development might be a factor in the absence of positive health spill-over of FDI (Fink 2006). The results also showed that the association between deindustrialisation and mortality is not linear. The non-linearity of the relationship is in line with the literature on the negative health impact of social and labour market shocks: rapid and large scale social transformations are strongly associated with negative health outcomes, whereas gradual changes less so (Gerber and Hout 1998b; Stuckler, King and McKee 2009).

The results underpin my claim that the reduction in industrial employment provides a better measure of the labour market impact of the collapse of former socialist companies compared to registered unemployment. In fact, if any, registered unemployment appears to be negatively correlated with mortality. Further analysis is needed to establish if a higher registered unemployment rate in combination of a measure of deindustrialisation is indeed associated with lower relative chance of mortality. The week negative association might reflect the cushioning impact of unemployment benefits (Coutts, Stuckler and Cann 2014; O’Campo et al. 2015). Countries with more generous unemployment benefits have higher rates of registration of the unemployed (Vodopivec, Wörgötter and Raju 2005), therefore registered unemployment might be interpreted as a proxy for the social cushioning effect of unemployment benefits. The maximum duration of unemployment benefit in Hungary between 1989 and 1993 was 24 months, with the unemployed receiving 70 per cent of their previous gross earnings during the first six months of unemployment (Vodopivec, Wörgötter and Raju 2005). Unemployment benefits accounted for more than 2 per cent of GDP in 1992 and, as a result, the poverty reduction brought about by unemployment benefit was 53.28 per cent during the early 1990s. Therefore, registered unemployment might both encompass a negative health effect of job loss and positive health effect of unemployment benefits. Yet, the results are not robust and not significant enough to substantially underpin these theoretical claims. Future research could look at this puzzle in more detail.
The robustness checks with the age cap suggested that, in the current sample, working age men might not be more severely affected than the elderly by the negative health impact of deindustrialisation. In Hungary, retirement, especially early retirement and the disability-pension have been the most important channels out of employment in the 1990s. Old age has been a prime factor behind job loss: the labour force participation rate among pension-age Hungarians dropped by 22 per cent between 1993 and 1995, compared to the 8 per cent of prime age and the 7 per cent of young workers (Allison and Ringold 1996: 13). People above 50, and especially above 60, suffered the highest increase in depression and hopelessness from 1988 to 1995 (Kopp et al. 1999). In the sample used in this dissertation Hungary appears to differ from Russia, where working age men were most affected by the mortality crisis during the transition (Tomkins et al. 2007).

**Conclusion**

In this chapter, I presented evidence that deindustrialisation is a major factor behind the post-socialist mortality crisis. I found no evidence that reindustrialisation through foreign direct investment helped to moderate the impact of deindustrialisation. Although transnational companies might bring some additional indirect positive health effects in the long run, this might be observed only at the national level. The results suggest that unemployment benefits can moderate the impact of deindustrialisation as a cushioning mechanism in times of economic shocks. Employing a time sensitive multilevel survival analysis technique I was able to control for the most important individual-level and ecological confounders, as well as for initial heterogeneity and selection bias. The results presented contradict the hypotheses formulated based on the behavioural and the neoclassical economic approaches and corroborate the hypotheses based on the relational political economy approach. The results also confirm the world-system approach with regard to deindustrialisation, but contradict it concerning the hypothesised negative impact of transnational companies. The individual-level data are reported by proxy informants which raises questions about the precision of individual data, however, the PrivMort database represents currently the best available source of information for the type of analysis presented here.
Chapter 6) Globalisation, Privatisation and Mortality

Summary
This chapter presents the results of a multilevel study on the health impact of prolonged state ownership and foreign investment in the long term during the post-socialist transformation in Hungary. Using ownership data from 260 companies in 52 settlements towns were grouped into three categories: dominated by state ownership, domestic private ownership and foreign ownership. The relationship between dominant ownership and mortality of 26,779 individuals between 1995 and 2004 was assessed by a discrete-time survival analysis method. After multivariable adjustment, prolonged state ownership was significantly related to lower odds of dying in women compared to towns dominated by domestic private ownership (OR=0.74; 95%CI=0.62-0.89; p=0.001) as well as compared to towns dominated by foreign investment (OR=0.80; 95%CI=0.67-0.96; p=0.018). Prolonged state ownership was beneficial for improving life chances during the post-socialist transformation for women. The indirect economic benefits of foreign investment are not translated automatically into better health without proper industrial and social policies.

Introduction
As I described in the previous chapters, Hungary was one of the first former Soviet-style economies to open to global competition, and thus managed to attract a large amount of foreign investment. Hungarian policymakers were committed to building up the institutions of a market economy but they also maintained state ownership in several sectors of the economy to cushion the impact of rapid economic change. Yet, as I have shown in the previous chapter, this was not enough to offset the negative health effect of deindustrialisation during the early years of the transition. An obvious objection to this finding could be that the beneficial impact of capitalist transformations on life chances can only be felt in the long run. This objection accepts that in the short run the shock of the transformation might increase social stress, but maintains that this negative effect will be offset over time. This chapter aims to answer the question: how did economic policies, the privatisation of state companies and the arrival of transnational companies affect mortality in the long run?

Rapid mass privatisation was shown to be associated with increased male mortality (Azarova et al. 2017; Stuckler, King and McKee 2009) in post-soviet states. In their original paper, Stuckler, King and McKee (2009) suggested that the lack of a rapid mortality increase in countries that did not implement shock therapy type privatisation, such as Hungary, stemmed from the beneficial effects of gradual privatisation.
and foreign direct investment (FDI) resulting in the emergence of strategic investors facilitating successful firm restructuring (King 2000; King and Sznajder 2006). However, Stuckler et al. did not test the effects of slow privatisation or FDI. Another strand of research has shown that although men were initially more vulnerable to rapid socioeconomic change, they could later reap the advantages of globalisation to a greater extent that women, who were discriminated against in the new foreign owned firms in post-socialist countries (Fodor and Horn 2015).

Outside of the context of the post-socialist countries, world-system analysts presented empirical research that claimed that foreign direct investment extracts resources from host countries by destroying domestic production networks, repatriating profits and relying on exploitative low skilled jobs, and as a result, has a harmful effect on the life expectancy of the host country’s population (Hauck, Martin and Smith 2016; Reiter and Steensma 2010; Shandra et al. 2004; Shen and Williamson 1999; Stokes and Anderson 1990; Tausch 2012; Wimberley 1990). Some more recent empirical studies found that foreign investment has a beneficial health effect (Firebaugh and Beck 1994; Frey and Song 1997; Nagel, Herzer and Nunnenkamp 2015; Sharma and Gani 2004b).

The existing empirical research on the human dimension of shock therapy, gradual privatisation, and foreign investment yielded conflicting results and has certain methodological limitations. The vast majority of this research was carried out at a cross-country level, constraining the ability to draw robust causal conclusions. To the best of my knowledge there is no research that has analysed the association between mortality and gradual privatisation and foreign investment using multilevel, that is individual-, company-, and settlement-level data simultaneously. I test the hypothesis that prolonged state ownership decreases the relative chance of premature death relative to those areas experiencing rapid privatisation. Similarly, I investigate whether foreign direct investment impacts upon death rates. In this way, this chapter also contributes to the wider understanding of the health effects of global economic integration.

**Theoretical framework and hypotheses**

Chapter 3 presented several hypotheses derived from the competing theoretical perspectives. Behavioural approaches maintain that health lifestyles are the dominant factors behind the mortality crisis, denying the role of factors related to political economy (hypothesis H_0). They also maintain that socialist “over-industrialisation” was harmful for health, and therefore prolonged state ownership in former socialist companies would be associated with higher mortality (hypothesis H_1). Neoclassical economists also suggested that privatisation would lead to higher growth and through this would reduce
mortality (hypothesis H_2). Although some neoclassical economists were initially sceptical about FDI, as they thought it would be a too slow form of privatisation, they also hypothesised that it would improve life expectancy (hypothesis H_3). In contrast, world-system theorists predicted that the global integration of former socialist enterprises would lead to economic involution, thus FDI would lead to the worst mortality outcomes (hypothesis H_5). Finally, the relational political economy approach predicted that gradual privatisation would be superior to rapid privatisation and that state ownership would allow the restructuring of companies, whilst allowing time for employees to adjust to the demands of the new capitalist labour market (hypothesis H_7). The relational political economy approach is ambivalent with regard to FDI, emphasising both the positive modernisation and the negative wealth concentration effects of it (hypothesis H_8).

The strong version of the behavioural approach:

- H_0: Upstream economic factors (privatisation, economic liberalisation and deindustrialisation) have no significant impact on mortality; mortality is primarily driven by behavioural factors.
- H_1: As capitalist reforms erode the cultural and institutional legacy of socialism, health behaviour improves, and thus mortality is reduced.

The neo-classical approach:

- H_2: Privatisation might lead to a short term decline, but after a few years it leads to better health and lower mortality through increased company efficiency, increased real incomes and improvement of general welfare.
- H_3: Economic liberalisation in the form of foreign investment might lead to a short term decline, but after a few years it leads to better health and lower mortality through creating new jobs, increasing company efficiency and creating spill-over effects for domestic enterprises.

The world-system approach

- H_5: The capitalist transformation of former socialist economies leads to economic underdevelopment. Privatisation and economic liberalisation (foreign direct investment) are economically and socially harmful and thus lead to higher mortality.

The relational political economy approach:

- H_7: Gradual privatisation and prolonged state ownership allows time to restructure companies, allows people to adapt to the new economic context and protects them from the shock of the transition and thus reduces mortality.
- \( H_8 \): Economic liberalisation in the form of foreign direct investment has a positive economic and health effect but this might be offset by the shock of privatisation and by the concentration of capital; there might be no impact or a negative health impact of foreign investment.

### Data and methods

Chapter 4 presented a general overview of the data used in this dissertation; without repeating the methods chapter, the following sections provide further detail on the data and the variables that were used in the analyses presented in this chapter. The present analyses concentrate on the 1995-2004 period. This is a ten year period after the initial recession during the first years of the transition that will allow me to test the medium to long-term effects of divergent settlement-level ownership scenarios. This view on the long-term impact of privatisation, economic liberalisation and state ownership is particularly useful to account for the dynamic elements of privatisation theories, as formulated in \( H_2 \) and \( H_3 \).

#### Settlement-level data

The analysis uses data on 52 settlements with industrial employment exceeding 30 per cent. Chapter 4 described the dataset. I used this dataset to derive control variables at the settlement-level (average number of inhabitants in 1995-2004, average dependency ratio in 1995-2004, average number of GPs per 100,000 inhabitants in 1995-2004, average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average unemployment rate in 1995-2004, average outmigration in 1995-2004). The change in unemployment rate and income per capita between 1995 and 2004 in a specific town were used as town-level indicators of economic performance. In order to take into account the annual fluctuation of these indicators, the change was calculated as the average value in 2002, 2003 and 2004, minus the average value in 1995, 1996 and 1997. Towns were categorised into four quartiles and the relationship with dominant company-ownership of the towns were assessed by ordered logistic regression models. Different ownership scenarios were also measured at the settlement level, by aggregating company-level ownership data to the settlement level, as described in the next section.

#### Company-level data

For the current analysis, I reduced the sample to the five largest companies in each town, as measured by their average number of employees between 1992 and 2004. Where the difference between
dominant ownership categories was less than 3%, I used the six largest companies to improve the information base. Overall, ownership data from 260 companies was used, 550 companies counting the successors and parents separately. The main exposure variable in the analysis was the dominant form of company ownership in a particular town between 1995 and 2004. Three categories of this variable were specified: (1) towns dominated by foreign ownership; (2) towns dominated by domestic private ownership; and (3) towns dominated by state ownership. In order to determine which category a specific settlement belongs to data from the town’s five largest companies by number of employees were used.

In the first step, I calculated the proportion of company shares owned by foreign/private investors or the state between 1995 and 2004 on average. In the second step, weighted averages of the foreign-, private- and state-ownership proportions across the five companies were calculated in each town. Weighting was based on the average number employees between 1992 and 2004. Finally, the dominant type of ownership in each town was decided by comparing the town-level foreign-, private- and state-ownership proportions with each other, and identifying the one which was largest of the three. Foreign investment might have important economic spill over effects (Javorcik and Spatareanu 2005) beyond the employment channel, by creating local demand, or via transferring advanced production technology managerial techniques to firms. Therefore, in the appendix, I also present results using non-weighted company ownership data.

**Individual-level data**

Chapter 4 presented a detailed overview of the individual data and the survey techniques used to collect them. The individual-level analyses of the present chapter use data on relatives only, the respondents themselves were excluded. Respondents’ relatives were included in the analyses if their age was between 20 and 70 years in 1995, lived in the same town during the 1990s and 2000s where the questionnaire was completed by the respondent, and had no missing data regarding covariates of gender, smoking, alcohol intake, education and experience of material deprivation. There were 26,779 people (15,773 men and 11,006 women) who fulfilled these criteria. The average number of individuals per town was 515 (range: 182-746). I used this dataset to create the main outcome variable (death of the relatives between 1995 and 2004), as well as further individual-level control variables (smoking, alcohol intake, education, experience of material deprivation and marital status). Table A8 in the appendix presents an overview of individual characteristics.
Statistical analysis

In chapter 4 I provided a general description of statistical modelling. Here I provide further details about the models presented in this chapter. The individual-level outcome variable was the death (all causes) of the relative between 1995 and 2004. The main independent variable is the form of dominant ownership over 1995-2004, as described in the previous section. I examined the relationship between the dominant company-ownership status of town and individual-level mortality rates, using discrete-time survival analysis method. The time in years since 1995 was used as the underlying time variable, and individuals who died after 2004 or were still alive at the date of the questionnaire (2014 or 2015) were censored in 2004. Taking into account the clustering of participants in the 52 settlements, random intercept multilevel modelling was used.

The association was examined in three models. In model 1, I tested the core privatisation strategy variable, adjusted for age in 1995, and also for the relatives’ relationship to the respondent, i.e. whether they were fathers, mothers, siblings or partners. The latter factor was important to adjust for in order to eliminate information bias related to the nature of the relation. In model 2, the relationship was adjusted for all variables in model 1, plus individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status. In this chapter I am including a measurement of material deprivation and marital status. In this chapter I am including a measurement of material deprivation, because the models that measured the association between town level income growth and ownership category showed a significant association in the ordered logistic regressions. Although the PrivMort database does not contain a measure of individual income, the variable measuring the experience of material hardship might be used as a proxy for individual socio-economic status. In model 3 I adjusted for all variables in model 2 plus town-level socio-economic- and health-related variables: average number of inhabitants in 1995-2004, average dependency ratio in 1995-2004, average number of GPs per 100,000 inhabitants in 1995-2004, average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average unemployment rate in 1995-2004 and average outmigration in 1995-2004.

Finally, similarly to the approach followed in the previous chapter, to increase the parsimony of the modelling and to reduce the risk of overfitting I excluded town level covariates following a stepwise backward deletion strategy. I checked the significance of each covariate both in model 3, and running separate regressions including only the given settlement-level variable into the baseline model 1 without the main independent variable. Unemployment and average number of GPs were not significant either in model 3 or in model 1 and were therefore removed from the model, one by one. Average number of inhabitants in 1995-2004 and average outmigration in 1995-2004 were significantly associated with mortality. However, when including both variables, only the outmigration variable remained significant, so I kept this variable in the final parsimonious model 4. The average number of
gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994 was not significant but I also kept this variable in the final model, to control for potential selection bias. I also carried out another, more robust testing of selection bias that I will present in the robustness check section. The main model is model 4, which includes the same controls as in model 3 except for the difference that the number of town level control variables is reduced and only average out-migration and average gender-specific death rates for the pre-treatment period (1990-1994) are kept. Individual-level results are presented separately for males and females. All statistical analysis was carried out using STATA 13.0.

Results

Table 12 shows the number and proportion of towns in the three ownership categories across the country’s geographical regions over the period from 1995 to 2004. A majority of the examined towns were dominated by privately owned companies (48%), with a moderate presence of foreign investment dominated towns (33%) and relatively few with prolonged state ownership (19%) during the 10-year period. The proportion of foreign ownership dominated towns was particularly high in Southern Transdanubia (50%) and Western Transdanubia (50%). The presence of foreign investment in the East, especially in the South-East is significantly lower. The Southern and Eastern part of the country has been historically less industrialised compared to the Western and Northern part of the country.

Table 12. Ownership by geographical region 1995-2004

<table>
<thead>
<tr>
<th>Name of region</th>
<th>Dominant company-ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
</tr>
<tr>
<td>Western Transdanubia</td>
<td>4 (40)</td>
</tr>
<tr>
<td>Central Transdanubia</td>
<td>4 (50)</td>
</tr>
<tr>
<td>Southern Transdanubia</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Northern Hungary</td>
<td>2 (29)</td>
</tr>
<tr>
<td>Northern Great Plain</td>
<td>9 (60)</td>
</tr>
<tr>
<td>Southern Great Plain</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Overall</td>
<td>25 (48)</td>
</tr>
</tbody>
</table>

I investigated the relationship between dominant company-ownership and changes in unemployment rates between 1995 and 2004 (table 13). Foreign ownership dominated towns were more likely to experience larger declines in unemployment than private or state ownership dominated settlements, although this relationship is statistically not significant. Using employment-weighted company ownership data there is no particular difference among private and state dominated towns. Using the
non-weighted company ownership data, the impact of foreign investment is the same. However, in this coding, prolonged state ownership appears to be significantly higher in regions where the reduction in unemployment was lower, even after baseline unemployment rates were taken into account (table A9 in the appendix). The state thus appears to be a more important economic actor in regions where the decline in unemployment rate was slower and the new private economy failed to produce new jobs.

Table 13. Ownership and change in unemployment rates between 1995 and 2004

<table>
<thead>
<tr>
<th>Dominant company-ownership</th>
<th>Quartiles of towns according to change in unemployment rate</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>Private</td>
<td>7  (28)</td>
<td>8  (32)</td>
<td>5  (20)</td>
</tr>
<tr>
<td>Foreign</td>
<td>3  (18)</td>
<td>4  (24)</td>
<td>4  (24)</td>
</tr>
<tr>
<td>State</td>
<td>3  (30)</td>
<td>1  (10)</td>
<td>4  (40)</td>
</tr>
</tbody>
</table>

Ordered logistic regression

Model 1: crude
Model 2: adjusted for baseline unemployment rate (average in 1995-1997)

Table 14. Ownership and change in income per capita between 1995 and 2004

<table>
<thead>
<tr>
<th>Dominant company-ownership</th>
<th>Quartiles of towns according to change in income per capita (personal income tax base in thousand forints)</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>Private</td>
<td>9  (36)</td>
<td>10 (40)</td>
<td>4  (16)</td>
</tr>
<tr>
<td>Foreign</td>
<td>3  (18)</td>
<td>1  (6)</td>
<td>5  (29)</td>
</tr>
<tr>
<td>State</td>
<td>1  (10)</td>
<td>2  (20)</td>
<td>4  (40)</td>
</tr>
</tbody>
</table>

Ordered logistic regression

Model 1: crude
Model 2: adjusted for baseline income per capita (average in 1995-1997)

The relationship between dominant company ownership and changes in the town’s income per capita between 1995 and 2004 is presented in table 14. I found that a large increase in income per capita during the observed 10-year period was significantly more likely to occur in foreign ownership dominated towns than in the domestic private ownership dominated ones. The strength of this
association weakened somewhat when baseline economic development of the towns was adjusted for. Using the non-weighted company ownership data we can observe similar trends (table A10 in the appendix). It is also remarkable that state owned companies appear to be contributing more to income growth than domestic private ownership. Again, using the non-weighted data, we can observe similar trends.

Table A8 in the appendix shows the proportion of males and females in the various socio-economic and lifestyle categories, across the three types of towns. Both men and women were better educated in towns dominated by foreign or state ownership, compared to those where private investments were dominant. Although the differences were not large, the prevalence of smoking in men as well as alcohol intake in both genders was highest in towns with prolonged state ownership.

The multivariable-adjusted association between dominant ownership and individual-level mortality in the period of 1995 and 2004 is shown in table 15. Prolonged state ownership is associated with better health among women. Prolonged state ownership during the 1995-2004 period is associated with a 26% lower chance of dying for women (OR=0.74; 95%CI=0.62-0.90; p=0.002) compared to women living in domestic private capital dominated towns in the fully specified model 4. The effect grew in strength and significance as I eliminated town and personal level potential confounders but all models turned out to be significant. I found no significant differences in mortality rates between foreign ownership dominated and domestic private ownership dominated towns.
### Table 15. Ownership and mortality between 1995 and 2004

(Random intercept multilevel survival models using weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td>Model 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td></td>
</tr>
<tr>
<td>males</td>
<td>3,851/15,773</td>
<td>private</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>foreign</td>
<td>0.97 [0.88,1.07] 0.533</td>
<td>1.01 [0.92,1.10] 0.872</td>
<td>1 [0.91,1.10] 0.953</td>
<td>1.01 [0.93,1.10] 0.831</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>state</td>
<td>0.97 [0.87,1.09] 0.613</td>
<td>1 [0.90,1.11] 0.988</td>
<td>0.99 [0.88,1.10] 0.822</td>
<td>1 [0.90,1.11] 0.963</td>
<td></td>
</tr>
<tr>
<td>females</td>
<td>1,809/11,006</td>
<td>private</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>foreign</td>
<td>0.97 [0.83,1.13] 0.699</td>
<td>0.99 [0.83,1.18] 0.912</td>
<td>0.93 [0.79,1.10] 0.382</td>
<td>0.94 [0.81,1.10] 0.445</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>state</td>
<td>0.84 [0.70,1.01] 0.061</td>
<td>0.84 [0.69,1.03] 0.099</td>
<td>0.74** [0.61,0.90] 0.003</td>
<td>0.74** [0.62,0.90] 0.002</td>
<td></td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent and sex (in pooled sample)
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average outmigration in 1995-2004)

*p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Robustness checks

To check the robustness of the results I re-estimated the regression models using non-weighted ownership data. Disregarding the size of the company decreased the number of foreign investment dominated towns from 17 to 10, and state towns from 10 to 7, indicating that domestic private ownership is over-represented among smaller companies, whereas foreign investors concentrated on the largest companies.

Table A11 in the appendix shows that, in the non-weighted models, foreign-dominant towns are associated with a lower chance of dying, although the association is statistically weak. Men had a 10 per cent lower chance of mortality in foreign ownership dominated towns compared to men living in towns dominated by domestic private companies (OR=0.90; 95%CI=0.81-1.00; p=0.045) in the final parsimonious model 4. Prolonged state ownership remained significant in the non-weighted models: women had a 21 per cent lower chance of dying in state ownership dominated towns, compared to towns dominated by domestic private ownership (OR=0.79; 95%CI=0.63-0.98; p=0.031).

To analyse the effect of foreign investment I did a robustness check using a less demanding definition of FDI-dominated towns measuring significant foreign investment presence by using a 10 per cent cut-off rate for company assets owned by foreign investors. This is often used in economic research to measure the economic impact of FDI (Kang and Lee 2011). Foreign investment was not associated with mortality in any of the models (see table A12 in the appendix). I received similar results using a 25 per cent cut off rate (results not shown).

To test the protective effect of the state I also measured it against foreign investment dominated towns, as well as against privatised towns combining foreign and domestic private ownership. Prolonged state ownership is associated with a lower chance of dying in these models as well (see table A13 and A14 of the appendix). Adjusting for town and individual-level factors, the association between prolonged state ownership and dying for women was significant, with a 27 per cent lower chance of dying in towns with prolonged state ownership, compared to privatised towns (OR=0.73; 95%CI=0.58-0.91; p=0.005). State ownership dominated towns were also associated with lower mortality when compared to foreign investment dominated towns (OR=0.79; 95%CI=0.65-0.96; p=0.019). I found similar associations using non-weighted ownership data (results not reported).

To check for endogeneity, I used multiple stepwise checks to determine whether initial conditions affected mortality differentials. I included income in 1994 into model 4, but it left the association between prolonged state ownership and reduced mortality among women unaltered (OR=0.74; 95% CI=0.60-0.91; p=0.004). I checked whether initial unemployment rates interfere with the association.
between ownership and the odds of mortality. Again, including the unemployment rate in 1994 did not change the association between prolonged state ownership and reduced mortality. Similarly, initial differences in the age structure of towns do not explain mortality differences between towns with different dominant owners, with the association between prolonged state ownership and mortality remaining unchanged.

I also controlled for potential selection bias by checking initial mortality differentials among the towns with different dominant owners in two ways. First, I asked whether town-level gender specific death rates between 1990 and 1994 are significant predictors of individual mortality between 1995 and 2004, but found no significant association in any of the models. Controlling for initial town-level mortality by including it into the regression models did not change the significance of the main independent variables. Second, similar to the method in Chapter 5, I constructed a separate dataset using subjects who lived in the 52 towns during the 1980s, and investigated individual-level odds of mortality for the 1989-1995 period predicted by the town-level ownership categories measured for the 1995-2004 period. As table A15 and A16 in the appendix reports I found no statistically significant differences in the pre-treatment period for women. For men, there appears to be a very weak association between state ownership and reduced mortality in the employment-weighted models, however, the association does not go below the 5 per cent threshold. In the non-weighted models there appears to be a very weak association for foreign investment among men, but in the final parsimonious model 4, the association does not even go below the 10 per cent threshold. I also checked if there were significant mortality differentials in the pre-treatment period using the combined category of privatised towns (domestic and foreign) as the reference category against state ownership. I did not find a significant association for women, as reported in table A17 in the appendix, whilst for men, there is a weak association in model 1, but not in the adjusted models.

Discussion

Behaviourist scholars maintained that upstream economic factors would be irrelevant for the mortality outcomes. The results contradict hypothesis H₀, with the impact different ownership scenarios being significantly associated with mortality, even after controlling for individual health behaviour such as smoking and alcohol consumption. Scholars advocating the strong version of the behavioural approach and neoclassical economists also claimed that privatisation would be superior to gradualism in the long run, with “enormous scope for increases in living standards in a few years” (Lipton and Sachs 1992). The findings contradict hypothesis H₁ and H₂ about the beneficial health effect of privatisation. Women living in towns dominated by prolonged state ownership had a significantly lower chance of dying between
1995 and 2004, compared to women living in towns dominated by domestic private or foreign ownership. State ownership was also associated with higher income growth compared to domestic private ownership. The results suggest that, compared to Russia, which implemented mass privatisation, the lower mortality rates of Hungary are attributable, at least in part, to a more active state involvement during the transition, supporting hypothesis H7, based on the relational political economy approach. The security and quality of job in state enterprises, their lower level of stress and better remuneration might be the most relevant health protective mechanisms related to prolonged state ownership.

The results do not support the claims of world-system theorists about the negative health impact of foreign capital penetration (Wimberley 1990). The results did not show a large negative impact of a dependence upon foreign investment on health, compared to domestic investment. In fact, domestic private ownership appears to be less beneficial than foreign private ownership, both for income growth, unemployment reduction and mortality. The positive association between state or foreign ownership and income compared to domestic private ownership that I found is consistent with the empirical results reported in the literature previously for Hungary (Earle and Telegdy 2008). However, the positive health effect of FDI appears to be also constrained. In the basic weighted models I did not find any significant effect. In the non-weighted model I found significant effect for men. Hypothesis H3 about the clearly superior implication of foreign investment as based on the neoclassical economic perspective, and hypothesis H5 about the clearly inferior health implication of foreign investment, as based on the world-system theory perspective, can be rejected based on the results. The data support the ambiguous association between foreign investment and health, as hypothesised in H8 by the relational political economy approach.

It is puzzling that although FDI-dominated towns seem to be economically superior to both state and domestic private investment dominated towns, this economic effect does not translate into health gains. The economic benefits of foreign investment might be counter-balanced by the stress and social shock of privatisation in general. The weakness of the FDI effect might also be related to regional concentration of foreign investment in the historically wealthier and healthier parts of the country (Fink 2006). However, the design of the study may not capture some of the important indirect effects of foreign investment, such as the impact on macro-economic stability and cultural change. More analysis is needed to measure precisely the scope of the protective effect of foreign investment.

The results also strongly support the gendered perspective on transition and globalisation (Fodor and Horn 2015; LaFont 2001; Watson 1993; Weiner 2005), as formulated in hypothesis H9. The finding is in accordance with the proposition in the existing literature that transnational companies offer better employment opportunities for men than women (Fernandez-Kelly and Sassen 1995). Prolonged state
ownership appears to be significantly more beneficial for women than for men. Former socialist enterprises had several emancipatory gender implications, such as increased female employment, lower gender pay gap, better career chances for women, and generous family policies (Fodor 2004). The results suggest that the preservation of former socialist enterprises carried some of these emancipatory effects further throughout the transition and thus helped to reduce the shock of privatisation. The estimates are conservative, as I have excluded public service companies such as hospitals or schools from the sample – sectors that are dominated by state ownership, and usually have a heavily feminised labour force.

The importance of female employment in former socialist state companies might be amplified by occupational gender segregation: in the sample, the towns that are characterised by a higher per cent of prolonged state ownership host companies in industries that, most likely, have a feminised labour force, such as textile or food industry. There might be other mechanisms that could explain the gender differences in mortality. Men gained more experience in the emerging private economy during the 1980s in Hungary, and therefore they might have been better able to gain from privatisation and through self-employment in the long run (Fodor 1997; Róbert and Bukodi 2004). Existing research also shows that men were better connected to the Communist Party compared to women, that might have given them gender-specific advantages in the new private economy, as political capital was transformed into economic capital (Szelenyi 1987). Although initially men were more vulnerable to rapid socioeconomic change, as shown by previous research (Kopp, Csoboth and Réthelyi 2004; Kopp et al. 2011), the research suggests that, through their gender specific assets men might have been able to better reap the advantages of globalisation than women in the long run.

I also checked for selection bias and found that the association between forms of ownership between 1995 and 2004 and mortality is real, and not a result of pre-existing mortality differentials. For women I found no significant mortality difference in the pre-treatment period. For men I found a very weak statistical association when not eliminating all confounders, but the main model 4 is far from statistical significance in two out of the three pre-treatment tests for men. The modest protective effect that appears in the robustness checks for men, but not for women, is coherent with the gendered perspective on post-socialist economic development. If slow privatisation was protective for men, it could have been in the short term, during the 1989-1995 years, when state ownership could act as buffer against the shock of rapid economic transformation. The protective effect of prolonged state ownership for women only appears in the period from 1995 to 2004, and not during 1989-1995. Overall, the robustness checks about potential selection bias underpin the claim that the association between mortality and prolonged state ownership for women in the long run is real, and is not a result of pre-existing mortality differentials among the towns.
This approach has some limitations. Although I could check if towns were “selected into” different privatisation strategies by their pre-existing mortality differentials, there could be other factors that influence the decision to privatisate. The allocation of settlements to the treatment categories is not random. There could be other characteristics of the privatised companies that were important for health that I could not control for. If such enterprises were privatised for example because they were loss-making, then any subsequent effect on mortality cannot be completely attributed to the privatisation. However, existing research on Hungary shows that there was no such strategy to privatisate loss-making companies first. In the lack of a comprehensive privatisation strategy the first post-socialist governments followed multiple goals when implementing privatisation policies. Securing state revenues to pay off debts was an important element, leading to a significant share of large companies privatised to foreign investors hoping for large one-off budgetary incomes (Mihályi 1993), such large incomes could not have been obtained by privatising mainly bad-performing companies. Existing research using company level data also suggests that privatisation resulted in productivity-improvements in Hungary, both in the case of domestic and foreign owners (Brown, Earle and Telegdy 2006). The PrivMort dataset also shows that privatisation was associated with higher productivity.

Another limitation that might lead to selection bias is that the PrivMort database does not have data on where the people actually worked; so at least part of the observed mortality effect may be due to some community-level characteristics that I could not control for, rather than resulting from privatisation or foreign direct investment. However, I included the most relevant town-level characteristics that are accepted to be important factors of mortality in the literature, such as unemployment, income, outmigration, or age-structure. A measure of town-level inequality is not available in Hungary, representing perhaps the most important unobserved variable. Altogether, although the possibility of selection bias and the influence of unobserved heterogeneity cannot be completely ruled out, the analysis presented has dealt with the most important factors given the limitations of official data in Hungary. Improvements in data availability could allow for more robust checks on selection and endogeneity in the future.

The availability of information on company ownership has been curtailed in recent years in Hungary, making it hard to obtain data. To overcome this limitation, I spent two years collecting ownership information from non-digital archives. I also discovered some faults in the Company Information System of the Hungarian Ministry of Justice, so I checked every company on a case-by-case basis to correct for errors using multiple sources. Official aggregate settlement-level employment information could help to improve the robustness of the estimates; however, such data is currently not available for Hungary. There are also disadvantages of the retrospective convenience cohort approach, discussed in detail in chapter 4. Perhaps the most important of these is the reduced precision of individual-level data, as these
are reported by a proxy informant. Although the individual estimations might be imprecise and using
proxy informants might be a severe impediment that should be addressed in future research. Yet, the
PrivMort database represents currently the best available data that allows analyses linking mortality to
other town and individual characteristics.

The most important strength of the present study is the combination of an unprecedented scope of
company ownership, individual health and settlement-level data. This allowed me to carry out statistical
analysis of the mortality effect of foreign investment and prolonged state ownership using data from
multiple levels for the first time. I was able to eliminate the most important individual and ecological
level confounders. I employed a time sensitive survival analysis technique, particularly designed to
capture the long-term impacts of different settlement-level privatisation strategies. The results
represent a significant contribution to the literature on the political economy of health and human
development. This approach has the potential to be replicated in other countries experiencing rapid
integration into the global capitalist economy and has a direct potential to improve evidence based
policies to secure human development and health for all.

**Conclusion**

The strongest finding of this chapter is that the new private economy failed to improve life chances in
some parts of the country, whereas prolonged state ownership helped to reduce the negative impact
of transformation. The statistical associations suggest that the prolonged presence of the state helped
to protect the health of women in the long term, shielding them against the stress of privatisation. State
ownership was also associated with higher income growth, compared to domestic private ownership.
Without protective mechanisms, the social stress introduced by privatisation overshadows the potential
gains through economic globalisation. Foreign investment is also concentrated in the historically
wealthier and healthier parts of the country, and in the largest companies, that might explain why the
economic benefits of FDI did not translate into health gains. Although transnational companies might
have some additional indirect positive health effects in the long run, this might only be measured at the
national level.

Prolonged state ownership not only allows time to effectively restructure state owned enterprises but
also helps to preserve health and higher levels of human capital; that are, in turn, important factors for
successful economic development, and that are also valued by foreign investors. These results
contradict the hypotheses based on the strong version of the behavioural approach and on the
neoclassical approach, and lend support to the relational political economy approach. Although alcohol
and smoking are significantly associated with mortality, these behavioural factors are not the only relevant explanatory factors of mortality. Macro-level economic change is independently associated with health. The results also contradict the predictions based on the world-system theory, about the overwhelmingly negative impact of foreign investment. Yet, some world-system researchers were right in pointing out that foreign investment increases the structural imbalances in the economy, which might explain why the economic benefits of transnational companies are not translated into health gains.
Chapter 7) The Cultural Political Economy of Health

Summary

This chapter provides a thematic analysis of 82 semi-structured qualitative interviews conducted in four towns with divergent privatisation and deindustrialisation trajectories. The premature collapse of former socialist companies represents an extensive social, cultural and economic shock that reverberates through neighbourhoods over a long period of time. Subjects in severely deindustrialised towns experience more stress and talk about feelings of abandonment, loss of place-based identity and a massive erosion of company-based communities. Privatisation is generally viewed in negative terms. The accumulating experience of injustice related to privatisation increases subjects’ sense of loss of control and hopelessness that feeds into depression. Yet, there are some crucial differences in the health impact of different privatisation scenarios. Subjects living in towns with prolonged state ownership talk more about the potential to withdraw from the labour market through early retirement, which acts as a cushion against the shock of the transition. Subjects living in towns with more private companies report about new opportunities, especially educated interviewees with higher social capital working for foreign owned companies. Yet the arrival of the new private economy is also associated with increased insecurity, higher workload, more stress and more exploitation, as well as new hostilities, as the moral economy that bound together socialist collectives dissolves under the pressure of competition. Finally, people often talk about state social and industrial policies that can mitigate the risks arising from the new private economy. Through providing a cultural political economy of mortality in post-socialist towns in Hungary this chapter represents a) a significant contribution to our knowledge on the upstream economic determinants of health and how economic transformations were translated into health outcomes and b) also increases our existing general knowledge about the health implications of deindustrialisation and privatisation.

Introduction

The previous chapters have shown that deindustrialisation and privatisation were associated with worse health outcomes both in the short run and in the long run. Establishing statistically significant associations allows us to generalise across contexts. Yet, by reducing social reality to a narrow set of
variables, such quantitative analyses are not best fit for answering broader, contextual research questions regarding the complexities of the mechanisms behind the statistical associations. In my mixed-method dissertation I combine the strength of quantitative and qualitative methodologies. This chapter applies the approach of cultural political economy to understand the embodiment of deindustrialisation in post-socialist Hungary, focusing on the contextual determinants of health that go beyond the individual. Through what contextual channels do deindustrialisation and privatisation impact health? How are individual labour market trajectories embedded in the broader economic context and how do they influence health? How do subjects’ perceptions of economic transformation, the role of companies, the towns they live in and state social policies influence health? How are cognitive evaluations about the post-socialist transformation related to health-related meaning-making and health outcomes?

In this chapter I present the results of multi-sited qualitative in-depth interviews. I exploit the strategic research opportunity offered by the economic experience of four former industrial towns with different deindustrialisation and privatisation histories in Hungary, using thematic analysis of 82 semi-structured qualitative interviews conducted in Ajka, Dunaújváros, Salgótarján and Szerencs. The chapter presents results about how people experience deindustrialisation and privatisation. The chapter shows that transformation of economic institutions affects health both through increased stress, abandonment and injustice and exploitation, as well as through affecting the communities and neighbourhood that people inhabit by destroying communal fabrics, shrinking company services and eroding place-based identities.

Theoretical framework and hypotheses

In Chapters 2 and 3 I have argued that the literature that links the political economy approach and cultural approaches to analyse the health implications of economic change is scant. I have shown that there is a body of quantitative literature focusing on developed countries that has demonstrated that deindustrialisation is associated among with worse health using various measures. However, as pointed out by Peacock, Bissell and Owen (2014), the majority of social epidemiology and medical sociology research still offers only a thin theoretical conceptualisation of the economic context. The natural experiment of the post-socialist transformation provides a strategic opportunity to expand our knowledge on the association between deindustrialisation and health.

There is a large body of social anthropological literature on the human dimension of post-socialist transformations that does not directly analyse health or mortality. Questioning the teleological assumptions of neoclassical economists, ethnographers have analysed how economic transformations
are re-articulated in the everyday lives of Eastern Europeans, resulting in new forms of uncertainties, the ineffectiveness of trade unions, the rollback of socialist modernisation and the emergence of informal, neo-feudal and often criminal ways of coping with the post-socialist condition (Burawoy and Verdery 1999; Burawoy 2000; Dunn 2000; Dunn 2004; Ghodsee 2011; Humphrey 2002; Müller 2007; Pine 1998; Pine 2002; Platz 2000; Stenning 2005; Stenning et al. 2011; Verdery 1996; Walker 1998; Wielecki 2015; Woodruff 1999). Intellectuals of the region installed a liberal discursive hegemony that stigmatised critical reflections on post-socialism as “uncivilised” or “undeserving” (Böröcz 1999a; Buchowski 2006; Eyal, Szélényi and Townsley 1997; Haney 2000; Szacki 1995), which first led to the marginalisation of workers and other subaltern groups from mainstream publics (Ashwin 1998; Ashwin and Lytkina 2004; Bartha 2013; Keskula 2012; Kideckel 2002; Pittaway 2005; Potkonjak and Škokić 2013; Vodopivec 2010); later the representation of the disenfranchised victims of the transition took an increasingly anti-liberal nationalist form (Bartha 2011; Kalb 2009; Kalb and Halmai 2011; Kalb 2015a; Ost 2006). Although there is small but growing literature focusing on developed countries that combines a political-economic and cultural approach to health (e.g. Collins and McCartney 2011; Gallin 1989; Graham et al. 2016), the qualitative literature on post-socialist countries has neglected the issue of political economy of health, with very few exceptions.

Burawoy, Krotov and Lytkina (2000) have shown how the retreat of formal economic planning and socialist institutions paved the way for the emergence of informal economic practices, including a return to household production, a rise in barter and the development of patron-client ties as survival strategies amidst the post-socialist chaos. Walker (1998) has also found that a return to household production, the use of gardens (dachas) and a profound informalisation of economic practices were the most important survival strategies in the highly uncertain post-socialist context. The two qualitative studies that directly focus on the political economy of health in the post-socialist context are that of Kideckel (2008) and Parsons (2014). In her detailed interview based account Kideckel (2008) shows how the political isolation of workers and the loss of communities led to mental and physical illnesses among post-socialist workers. Parsons (2014) also analyses the ways in which “being unneeded”, that is, a sense of loss of positive social identity, mediates the health impact of post-socialist economic change, “serving as bridge between political economy and mortality” (Parsons 2014: 10). Although these authors recognise the importance of companies and occupational identities, they do not offer a systematic analysis of the institutional background of the mortality crisis. In this chapter, I add to this sparse literature on the cultural political economy of health by providing a multi-sited qualitative analysis of the lived experience of the post-socialist economic transformation.

In chapter 3 I formulated the following hypothesis based on the cultural political economy approach to health:
- H11: The experience of privatisation and deindustrialisation goes beyond the labour market channel and encompasses broader economic institutions, services and community structures affected by economic change. Individual semiotic and evaluative processes interact with the broader context in producing health outcomes. State policies and the fate of companies are crucial mediators of macro-economic change and health outcomes.

This chapter provides a theoretically informed exploration of this hypothesis by analysing semi-structured interviews. The contours of the theoretical framework were laid out in chapter 3. I extend our existing knowledge on the post-socialist mortality crisis by expanding the notion of companies as economic institutions. As Kalb has pointed out, work is never about being employed and earning a living, but rather the cultural crux around which whole ways of life become maintained and organised (Kalb 1997). A relational political economy of class focuses on the economic institutions of companies and unpacks class as a “bundle of unstable, uneven, contradictory and antagonistic relational interdependencies” (Kalb 2015b: 14). I will analyse the contextual effects of changing relations of class and the implications of changes to the economic institution of companies by utilising the theoretical framework elaborated by Bernard et al. (2007). Bernard et al. propose four social domains to analyse the interactions between the context of specific neighbourhoods and individual health: the economic domain (e.g. companies and markets), the community organisations domain (e.g. NGOs), the institutional domain (e.g. public services) and the local sociability domain (informal networks). Using Bernard’s conceptual framework, this chapter provides an analysis of the material and symbolic meaning of companies as economic institutions, their role in local neighbourhoods, and the perceptions of injustice in relation to post-socialist change and also point out how these are associated with health. I will also show how state social policies (unemployment benefit, pensions) mitigated the impact of deindustrialisation and privatisation in Hungary. The chapter first describes the data and the methodology, followed by the analysis of the narrower context of health-related discourses focusing on subjects’ labour market trajectories. The chapter then expands the scope to companies, localities and the state and how these interact with subjects’ cognitive evaluations in producing health and illness.
Data and methods

The towns

Figure 11. Qualitative fieldwork map

Chapter 4 provided a description of the fieldwork strategy. Four former socialist industrial towns were identified based on their economic trajectories. A map is provided in figure 11 and table 16 gives an overview of the socio-economic characteristics of the towns. All of these towns can be conceptualised as successful examples of socialist industrial modernisation in the second half of the 20th century. However, the fate of the four mid-size towns took a different turn during the 1990s, offering an opportunity to compare and contrast the experience of privatisation and deindustrialisation. Ajka is a town that experienced moderate deindustrialisation combined with the dominance of domestic private ownership during the first two decades of the transition. Ajka managed to attract new investors and to retain its privatised glass factory and its alumina factory. The crude death rate in Ajka showed a slight increase during the early 1990s but remained the lowest among the four towns. Dunaújváros is a town that also experienced moderate deindustrialisation, combined with prolonged state ownership. The town is the home of the last major ironworks operating in Hungary. The crude death rate has slightly grown during the 1990s but remained much below the national average. Salgótarján had been dominated by state ownership until the privatisation and subsequent closure of its steelworks in 2002,
coupled with severe deindustrialisation. The crude death rate showed a substantial increase during the early 1990s. Finally, Szerencs underwent severe deindustrialisation already during the 1990s and has been dominated by foreign investors since 1991 and was plagued by the worst mortality rates among the four towns.

Table 16. Socio-economic characteristics of the four interview towns

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ajka</td>
<td>Moderate (36.1%)</td>
<td>domestic</td>
<td>7.9</td>
<td>944</td>
<td>34,502</td>
<td>29,419</td>
</tr>
<tr>
<td>Dunaújváros</td>
<td>Moderate (27.6%)</td>
<td>private prolonged</td>
<td>7.8</td>
<td>1,027</td>
<td>62,533</td>
<td>48,187</td>
</tr>
<tr>
<td>Salgótarján</td>
<td>Severe (50%)</td>
<td>state</td>
<td>12.7</td>
<td>1,410</td>
<td>48,538</td>
<td>37,632</td>
</tr>
<tr>
<td>Szerencs</td>
<td>Severe (51.2%)</td>
<td>foreign</td>
<td>10.8</td>
<td>1,748</td>
<td>10,381</td>
<td>9,321</td>
</tr>
</tbody>
</table>

Note: Source of data: Hungarian Central Statistical Office; PrivMort database
Deindustrialisation is measured as the percentage change in industrial employment to population ratio from 1989 to 1994;
Ownership structure: measured as dominant owner of the assets of the five largest companies in the town between 1994-2005;
Mortality: total crude deaths per 100,000 inhabitants

Individual interviews
Chapter 4 provided a detailed description of sampling and the thematic outline of the semi-structured interviews. The goal of the qualitative fieldwork was not to have a representative sample but to have a reasonable variation in subjects’ demographic and economic characteristics. I included subjects who were working age adults in 1989, who were living and working in the interview towns during the transition years. The non-random sampling of interviewees resulted in a pool of subjects with above-average affinity to participate in social organisations, as well as a higher share of subjects with university or college degree compared to the official statistics provided by the Hungarian Central Statistical Office regarding the number of people per town with primary, secondary and tertiary degrees. Since I am interested in the health implications of economic transformations, this composition of the sample makes the analysis conservative, as the people who were included are likely to have better health and experience less stress due to their higher level of social and cultural capital. Al together, this chapter relies on a corpus of the 82 interviews encompassing 816,118 words and 2000 typed pages.

Analysis
Interviews were recorded and transcribed in Hungarian. Interviews were explored through thematic analysis (Guest, MacQueen and Namey 2011) following the six-step guide elaborated by Braun and
Clarke (2006: 87), combining elements of qualitative and quantitative content analysis using NVivo 11 Pro. The analysis proceeded in iterative waves. First, I randomly selected 10 interviews and read them carefully to gain an understanding of the inner context of the texts. Second, I coded all interviews for basic labour market, demographic and vital information – these numeric and categorical data being recorded in separate spreadsheets. In the third wave, I coded every interview for health themes. I coded the paragraphs where interviewees talked about health using health and mental health-related subthemes. I also recorded health-related information about the interviewees and their spouses in a separate spreadsheet. I only coded chronic and major diseases. All of the health-related codes are based on the interviewees’ lay interpretations. Subjects’ and their spouses’ health problems reported in the interviews are consistent with the official mortality data provided by the Hungarian Central Statistical Office: the most health problems were reported in Szerencs, the least in Dunaújváros. This underpins the reliability of the data and the coding, however, the sample is non-representative.

In the fourth round, I thoroughly read again every interview and coded them according to emerging themes based on the research questions. Health codes were updated, and further themes relevant to the research questions were identified. In the fifth wave of the thematic analysis, upon subsequent formulation and reformulation of the codes, I identified five large thematic clusters: the company theme cluster, the locality theme cluster, the state theme cluster, cognitive evaluations theme cluster and the health theme cluster. To further the consistency and reliability of the codes several rounds of text searches were carried out looking for frequently used words and their synonyms identified through the Hungarian Dictionary of Synonyms.

Finally, thematic frequencies (number of theme nodes and number of interviewees referring to the theme) were identified for all themes and sub-themes, and the weight of each theme was identified as the percentage of interviewees referring to the theme. Utilising the multi-sited nature of the data results are presented broken down by interview towns. Quotes are also presented to provide a deeper understanding of the underlying processes. The quantitative cross-tabulated overview of the responses presented below serves exploratory purposes, and it is neither meant to nor should be interpreted akin to representative survey results. Because of the large number of interviews that were carried out and because of the depth of the qualitative material it is efficient to provide tables about types of responses to connect contextual economic factors and health-related experience. The thematic percentages serve to underpin that the textual quotes are not random outliers but represent significant tendencies in the whole corpus.
Results

The narrower context of health

The meanings that subjects associate with health are not produced in a social vacuum. The context of individual health-related discourses is defined by subjects’ labour market experience in a narrower context; and by national and town level social and economic policies, histories of privatisation and deindustrialisation in a broader context. This section looks at the narrower context of health as reflected in the total pool of 82 interviews.

Figure 12. General health problems word cloud

![General health problems word cloud](image)

Note: Most frequently used 100 words in interview paragraphs discussing interviewees’ or relatives’ health problems; filler words were eliminated and synonyms were grouped together. Size of the words represents frequency.

The interviews revealed that the subjects’ interpretations of health and mental health are tightly linked to their labour market experience which in turn is interwoven with the fates of the companies, the towns, as well as with broader socio-political changes. Figure 12 presents the most frequently used 100 words in sections of the interviews where subjects talk about health generally. Besides words such as ‘illness’, ‘feelings’, ‘trouble’, ‘home’, or ‘died’, subjects also often use words in relation to the labour market, such as ‘work’, ‘worker’, ‘boss’, ‘job’, ‘jobless’, ‘fired’, ‘nightshift’ or ‘pension’. Mental health-related words are also frequent, including words such as ‘hurts’, ‘stress’, ‘trauma’, ‘shame’, ‘desperate’, ‘nervous’, ‘humiliating’ or ‘horrible’. When subjects talk about health they also frequently talk about the
companies and the broader economic background, as revealed by the frequent use of words such as ‘regime change’, ‘state’, ‘privatisation’, ‘shut down’ or ‘factory’. Health and mental health themes often occur in parallel, with several interviewees interpreting physical illnesses through the lens of mental health, especially stress. A typical life trajectory is reported by the widowed wife in the severely deindustrialised town of Salgótarján:

You know, this came with the regime change. A lot of families experienced the same story as us. My man was real good at his job. He knew a lot. You know, he was intelligent. Then came the privatisation, and he was fired. He stayed home. You know, when he lost his job, he could not handle it. He was totally beaten mentally. He drove himself into the ground. His ulcer perforated.

Table 17. Labour market trajectories by towns

<table>
<thead>
<tr>
<th>Town</th>
<th>Ever unemployed</th>
<th>Reason for leaving '89 parent company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N %</td>
<td>Yes</td>
</tr>
<tr>
<td>Ajka</td>
<td>9</td>
<td>45.0</td>
</tr>
<tr>
<td>Dunaújváros</td>
<td>11</td>
<td>84.6</td>
</tr>
<tr>
<td>Salgótarján</td>
<td>13</td>
<td>54.2</td>
</tr>
<tr>
<td>Szerencs</td>
<td>9</td>
<td>36.0</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>40</td>
</tr>
</tbody>
</table>

Table 17 presents interviewees’ labour market trajectories, revealing important differences among the four towns. The quantitative large N surveys conducted in the framework of the PrivMort project do not allow us to track the labour market histories of subjects at such a detailed level. The results of the qualitative interviews provide exploratory details to the experience of inhabitants in the four towns. Ajka hosts the highest share of interviewees who report being laid off from the companies they worked at, before the transition began (40%). The most subjects in Dunaújváros report to have retired from their parent company, 53.8 per cent through regular retirement and 15.4 per cent through early retirement. The interviewees in Salgótarján, a severely deindustrialised town with prolonged state ownership, report plant closures as the main reason for leaving their company (41.7%). The interviewees in Szerencs report layoff and plant closure as their main reason for leaving their 1989-era companies. Szerencs underwent severe deindustrialisation; a major agricultural machine factory was shut down in 1993, followed by the termination of a hundred year old sugar factory.

Table 18 looks at subjects’ and their spouses’ health by their labour market trajectories. Interviewees report that long-term unemployment is especially burdening mentally, contributing to alienation and separation from friends, as shame engulfs subjects. As, for example, a former manager at the Szerencs Sugar Factory told about his hardships after the plant was shut down:
It didn’t matter that I had lot of friends and acquaintances, I told several of them, asked for help, but I felt it doesn’t work out. So I left it. And then after some time I didn’t tell anyone, I didn’t want to embarrass anyone, I didn’t want them to say “I can’t help”. This doesn’t make any sense.

Table 18. Subjects’ or spouses’ health problems by labour market trajectories

<table>
<thead>
<tr>
<th>Labour market trajectories</th>
<th>Physical Health problem</th>
<th>Mental health problem</th>
<th>No health problem</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever unemployed</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
</tr>
<tr>
<td>No</td>
<td>12 28.6%</td>
<td>15 35.7%</td>
<td>23 54.8%</td>
<td>42 100.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>23 57.5%</td>
<td>26 65.0%</td>
<td>6 15%</td>
<td>40 100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>35 42.7%</td>
<td>41 50%</td>
<td>29 35.4%</td>
<td>82 100.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reason for leaving `89 parent company</th>
<th>N %</th>
<th>N %</th>
<th>N %</th>
<th>N %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layoff</td>
<td>12 63.2%</td>
<td>11 57.9%</td>
<td>3 15.8%</td>
<td>19 100.0%</td>
</tr>
<tr>
<td>Plant Closure</td>
<td>11 52.4%</td>
<td>12 57.1%</td>
<td>5 23.8%</td>
<td>21 100.0%</td>
</tr>
<tr>
<td>Retirement</td>
<td>6 35.3%</td>
<td>6 35.3%</td>
<td>8 47%</td>
<td>17 100.0%</td>
</tr>
<tr>
<td>Another Job</td>
<td>2 33.3%</td>
<td>4 66.7%</td>
<td>2 33.3%</td>
<td>6 100.0%</td>
</tr>
<tr>
<td>Early Retirement</td>
<td>3 42.9%</td>
<td>4 57.1%</td>
<td>3 42.9%</td>
<td>7 100.0%</td>
</tr>
<tr>
<td>Not applicable</td>
<td>1 8.3%</td>
<td>4 33.3%</td>
<td>8 66.7%</td>
<td>12 100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>35 42.7%</td>
<td>41 50%</td>
<td>29 35.4%</td>
<td>82 100.0%</td>
</tr>
</tbody>
</table>

Note: Data in the first two columns are not mutually exclusive: people can report physical and mental health problems in parallel, just one of them, or no health problems at all – therefore the columns are not supposed to add up to the total. Percentages reflect the per cent of people in the given labour market category in each row with physical or mental health problems compared to the total number of subjects belonging to the given labour market category.

Looking at the details of labour market trajectories, subjects who still work at their 1989-era company report the least health problems, whereas subjects who were laid off, and those who experienced plant closure report the most physical problems. Retirement seemed to be a safe way out of employment for most of the interviewees. 66.7 per cent of subjects who left their original companies for another job report some kind of mental health problem, which might be related to the experience of insecurity and precarious jobs in the new private economy. As an example, a former skilled worker at the Ajka Alumina Factory, who left his company and started to work as a self-employed entrepreneur said the following:

Before the regime change life was better (laughs). Much better. We could have a rest. Things were steady. You knew you had a safe job, secure income, a way to make a living. You knew you could go on holidays; you could raise your kids. You weren’t indebted. You could live a decent normal life. You were healthy, you were not stressed. Nowadays we’re under huge stress. Huge-huge stress. My legs and my arms are torpid, numb. I am telling you. We are totally stressed out. With the turnover we had today I make less than 5000 forints a day. And my employee earns 6000 a day. And where is my own salary then? I can hardly get any sleep these days.
The jobs after the regime change are often perceived as more precarious, with a less predictable rhythm and more stress by the interviewees, and some respondents felt that these were affecting their health status. A worker at a privatised telecommunications company whose job was installing mobile phone base stations reported the following:

I had rectal cancer. I was under lot of stress. At the company, I worked at numerous posts. At my previous company we had a system, a rhythm, we had our lunch or breakfast together. After it we didn’t eat together. And I stopped eating regularly. I had a yogurt and two rolls in the morning, and that was it for the whole day. And we drove a hundred kilometres a day. And I had an apple and some water. I missed the community, I missed eating hot food regularly, and I missed our joint breakfasts.

Figure 13. General health themes by town

Analysing interviewees’ general discourses about health reveals that subjects talk about health-related problems differently across the four towns, as portrayed in Figure 13. The next section will provide
details about the textual content of these discourses, with the thematic frequencies represented in the figure serving to underpin the claim that there are differences to subjects’ experience across the four towns. Subjects in Szerencs (heavily deindustrialised, foreign private ownership dominated) talk about circulatory problems and cancer the most. Subjects in Ajka (moderately deindustrialised, domestic private ownership dominated) and Salgótarján (severely deindustrialised, state ownership dominated) talk more about circulatory problems and regular drinking. Subjects in Dunaújváros (moderately deindustrialised, state ownership dominated) talk the least often about illnesses. The distribution of circulatory problem themes is consistent with the amount of stress, precariousness and work intensity subjects report to have experienced.

**Figure 14.** General mental health themes by town

Figure 14 reports the frequency of mental health-related themes across the four towns. The same caveat applies about thematic frequencies which only serve to underpin the claim about the differences in subjects’ experience across the towns, and should not be interpreted as quantitative survey results. Again, the severely deindustrialised town of Szerencs fares the worst, with the highest percentage of
subjects referring to depressive symptoms and stress. Subjects living in moderately deindustrialised private ownership dominated Ajka also often refer to stress which might be related to the precariousness of the new jobs created in the private economy, as well as to work intensity. Shame also emerged as the most frequently mentioned theme in severely deindustrialised Szerencs, suggesting that long-term unemployment and bad health might be related to a low self-esteem and negative self-image.

The broader context of health
This section looks at the details of subjects’ experience with the broader economic context, going beyond employment. It analyses what companies and their closure means to people, how this affects subjects’ home towns, and how state policies are perceived to influence these processes. Subjects’ experience regarding the economic transformation was grouped in four multi-level thematic clusters as represented in table 19: companies, localities, state and cognitive evaluations.
### Table 19. Multi-level thematic clusters associated with the economic transformation

<table>
<thead>
<tr>
<th>company theme cluster themes</th>
<th>sub-themes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community (78%)</td>
<td>belonging</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>brigade movement</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>culture &amp; sport</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>identity</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>‘kaláka’</td>
<td>15%</td>
</tr>
<tr>
<td>Employment (35%)</td>
<td>intra-firm unemployment</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>relocate within company</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>second economy</td>
<td>22%</td>
</tr>
<tr>
<td>Privatisation (65%)</td>
<td>asset stripping</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>mismanagement</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>precarious work</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>socialist market</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>work intensity</td>
<td>35%</td>
</tr>
<tr>
<td>Security (56%)</td>
<td>redundancy pay</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>sick-pay</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>stability</td>
<td>46%</td>
</tr>
<tr>
<td>Services (63%)</td>
<td>factory doctor</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>holidays</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>housing</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>training</td>
<td>23%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>locality theme cluster themes</th>
<th>sub-themes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesion (63%)</td>
<td>crime</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>culture &amp; sport</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>loss of community</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>place-based identity</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>shrinkage</td>
<td>24%</td>
</tr>
<tr>
<td>Companies (59%)</td>
<td>commuters</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>developments</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>plant closures</td>
<td>43%</td>
</tr>
<tr>
<td>Social participation (54%)</td>
<td>faith group</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>NGO</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>politics</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>trade union</td>
<td>27%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>cognitive evaluations theme cluster themes</th>
<th>sub-themes</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (88%)</td>
<td>society</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>work</td>
<td>71%</td>
</tr>
<tr>
<td>Hardships (62%)</td>
<td>deprivation</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>fear of job loss</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>hostilities</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>inflation &amp; debts</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>vulnerability</td>
<td>32%</td>
</tr>
<tr>
<td>Hope (55%)</td>
<td>early 90ies better</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>loss of hope</td>
<td>26%</td>
</tr>
<tr>
<td>Injustice (52%)</td>
<td>abandonment</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>colonisation</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>dispossession</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>undeserving poor</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>unfair treatment</td>
<td>23%</td>
</tr>
<tr>
<td>Opportunities (59%)</td>
<td>job market</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>connections</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>education</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>housewife</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>self employed</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>work abroad</td>
<td>12%</td>
</tr>
</tbody>
</table>
Companies

An overwhelming majority, 78 per cent of subjects, report positive associations regarding communities at the companies they used to work for before 1989. Subjects very often described the companies or their smaller collectives as families, where people could trust each other, count on each other. ‘Kaláka’ is a Hungarian expression referring to voluntary self-help among friends and acquaintances, who would typically help each other building their homes. These company-based communities were in part spontaneous circles of friends, in part were facilitated by the socialist state through various feasts, cultural events, and community activities through the socialist brigades. People joined these brigades and renovated schools, organised holidays, company competitions, etc. The companies were a source of pride. As a former worker at the Szerencs Sugar Factory told:

We had the Sugar Factory and the Chocolate Factory here. The Sugar Factory has been here since 1880. The working class in Szerencs, the people who used to work in the Sugar Factory, they were gentlemen.

Interviewees often report that services offered by the companies included holidays, housing, schooling and factory doctors. Companies and trade unions owned outlets at the most famous recreational spots in the country that people could visit each year free of charge or at a heavily reduced price. Several subjects also admit that these companies had intra-firm unemployment, with some subjects recalling having nothing to do during the nightshift, or having plenty of time to do the crosswords during work. However, most subjects appreciated the security and stability associated with employment in these companies. Everyone was covered by social insurance, thus people could go on sick leave if they were ill.

Another problem that emerges in relation to the companies from the interviews is the association between working class communities and drinking. Alcohol is often reported as a source of ill health. However, in interviewees’ narratives, drinking habits go back a long time, connected to the companies. I have found no subject who reported frequent or unhealthy drinking habits as a newly developed result of unemployment. A worker recollects his memories about pubs near the plant of the Dunaújváros Ironworks:

People working with hot steel, they get thirsty. They want a beer or two after work with one or two schnapps. We used to call it “Left One”; the pub was just five steps away from the side gate of the plant. That was the first pub. “Left Two” was 150 meters away. Then came the market, there were three more pubs, they were open till midnight. Not the foremen and the managers, but the regular workers came here daily. It went like this in Ózd, or in Diósgyőr and in Salgótarján, all the major steel mill towns.

Figure 15 presents overview of the details of the privatisation sub-themes across the four towns.
As companies were privatised, company services were cut, and non-core activities, such as sports and culture, were shut down. These mechanisms were explored in a quantitative manner in Chapter 5 with regards to deindustrialisation, and in Chapter 6 with regards to the long-term implications of privatisation and prolonged state ownership. The former security of employment vanished and new forms of precarious employment emerged. Subjects experienced an increase in work intensity in every town. Precarious work was most often referred to by subjects in severely deindustrialised, foreign ownership dominated Szerencs, the town in the worst socio-economic condition, where the share of subjects referring to some kind of problem with privatisation was the highest. 15 per cent of the subjects living in moderately deindustrialised, domestic private ownership dominated Ajka also reported precarious work after privatisation. Subjects in moderately deindustrialised state ownership dominated Dunaújváros seemed to recollect the least negative experience. As many interviewees told, the new
jobs emerging in Ajka could help to keep unemployment low in the town, but many subjects report that the price was reduced remuneration and increased hours, or lack of health insurance coverage:

There was this small private company I was working for, and I thought I was you know working legally, registered. And you know they sort of forgot to pay my health insurance. And I got pneumonia, and I went to the doctor, and the dear doctor told me: “what should I do with you now, how should I assign you to sick leave?” He told me, I don’t have health insurance. And I was like: “whaaat, that cannot be true, what the hell?”

Subjects report that as state owned companies were privatised they mostly abandoned their previous personnel training activities, except for subjects living in severely deindustrialised foreign investment dominated Szerencs, who often mentioned that the new transnational owners invested heavily into training their personnel, especially the managers and experts. Factory doctors were cited by some interviewees as important because they checked on their health, and as factory doctors were dismissed, or as employees moved to a new company not providing such extensive services, they no longer went to the doctor:

Back in those days, there was the factory doctor, we visited him every year. Nowadays I don’t dare to go to the doctor, I don’t dare to go on sick pay, you know, not to get fired.

**Localities**

As portrayed in table 19, the locality theme cluster consists of three themes and twelve sub-themes. Plant closure is by far the most important subtheme, as the process is seen to afflict the community as a whole. As the towns lose their attractiveness, their hotels and other recreational facilities were abandoned. Interviewees recall the shrinkage of these towns with vivid memories and lively metaphors about the lack of playing children, about emigrated sons and daughters seen only on Skype. As a former worker at the Salgótarján Steelworks in the severely deindustrialised town of Salgótarján put it:

There were children playing here, kids used to play football or hide and seek. You could hear the children playing. Now there is only silence.

The products the companies produced are tightly bound with local pride, with the town of severely deindustrialised, foreign ownership dominated Szerencs identifying itself as the town of chocolate. As Nestle restructured its companies on a global scale, production was reorganised among plants in Eastern Europe, thus Szerencs ceased to produce chocolate which the locals experienced as a blow to their pride:

Just look around here. There is nothing here. One or two, there are these little shops, but nothing else. OK, Nestle has stayed, but they took away the chocolate, what Szerencs was renowned for, you know what they left here, they left here the production of dog food.
The closure of the sugar factory in Szerencs is often recalled as a traumatic event, with words reflecting the embodied pain of jobless workers:

When they shut down the plant it was like if someone cut my neck artery.

The closure of the plant it totally ruined everyone mentally in the town. A more then 100 years old Sugar Factory, and they demolished it to the ground, and this freaked everyone totally out, whether they had anything to do with the plant or not.

As the towns shrink and young people leave those who stay behind are enmeshed in a feeling of abandonment and a kind of spatially induced depression:

This town is dead. It’s totally dead.

Despite the massive destruction of local productive and cultural capacities, some subjects also experience new developments, especially those living in moderately deindustrialised, domestic private ownership dominated Ajka mention that the town could attract new investors. Several subjects also mention that they are active in local civic networks or associations. They very often describe their experience with social participation as a mental relief. A former clerk at the Salgótarján Steelworks told happily about her involvement in various local clubs, and the activities they organise. She reported that she enjoys this community work and she thinks this helps to enrich the town’s life. She is 68 years old, and her daughters worry about her health and want her to stop, but she enjoys her voluntary work so much that she wouldn’t stop:

I love it [organising the club]. My daughters, they tell, mom, you should now relax a little bit. But, I tell them, Mari, are you mad? It recharges me. Literally recharges me.

**State**

A third thematic cluster as subjects recollect their experience with the transition is related to the state. As summarised in table 19, subjects mention the state when they talk about company subsidies, about retirement, or about unemployment benefit or social assistance. Subjects facing trouble, the prospect of layoff or even the layoff of the spouse were also actively seeking ways to retire early or to go on disability retirement. As a former manager of a hospital in the state ownership dominated town of Salgótarján recollects with regard to the early 1990s:

Not that they were ill, but they were escaping, escaping toward sick pay or disability retirement. People who would have been under normal circumstances not considered ill. They tried to live with the possibilities, tried to win some time through sick pay or disability pension.
The state provided a generous unemployment benefit, lasting for two years that helped to avoid the worst consequences of deindustrialisation in the early 1990s. As a former skilled worker of the Ajka Alumina Factory, who was laid off in 1992, described the state’s role:

I accepted the layoff because back then you were entitled for unemployment benefit for two years. I knew that if they fired me later than the duration and the value of the benefit would be both lower.

Finally, the state is not only seen to intervene into the labour market, but into the fate of companies as well. Sometimes subjects recollect that the state has invested into the company to modernise it before privatisation. But most often what subjects mention is the subsidies that go to foreign investors in the form of tax holidays. Most subjects refer to this practice critically often adding that the state should instead promote domestic companies, helping them to survive and avoid shutting down plants.

Cognitive evaluations

Opportunities

Subjects’ experiences of the economic transformation are filtered through their cognitive evaluations and these cognitive evaluations are linked to subjects’ mental health in the longer run (Diener, Oishi and Lucas 2003). To start with, not all subjects saw themselves as victims of the transition. The most important source of opportunity that subjects mention is connections. Connections were important assets in an increasingly informal economy, as also pointed out by anthropologists of the post-socialist economic transformation cited in the introduction to this Chapter. Even less-educated subjects report using their connections to find new jobs. As a former worker in the moderately deindustrialised, domestic private ownership dominated town of Ajka at the Ajka Glass Factory who was laid off in 2002 told in his interview:

In the sense, you know, I didn’t make a fuss of it, I was paid my redundancy pay, and I became unemployed, but I knew I could find some work. So I didn’t collapse. I stayed home for a week. Then I phoned my cousin, he worked as an entrepreneur, and I just started to work for him as culáger on building sites.

Several subjects mentioned becoming self-employed, but this form of securing a livelihood is often reported to be stressful, as previous quotes have shown. Education is also often recognised as a crucial source of opportunities. Subjects often relate their own fates, their good health and their good jobs to the fact that they received good education and that they continued to educate themselves throughout

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12 The expression means unskilled worker, hireling. The word is coming from German, as several stonemasonry related expressions in Hungary
the years. As a retired health care manager in state ownership dominated, severely deindustrialised Salgótarján, who could set up her own health consultancy company, told during her interview:

I could better survive this period for two reasons. First, right around 1989 I obtained three diplomas. And I did not stop, I continued to educate myself. Second, I also was lucky to work for a hospital that was not affected by privatisation.

12 per cent of the interviewees reported to have found jobs abroad. Most often, they were driven by the lack of opportunities at home or by growing debts they could not repay with their regular incomes:

My generation, we worked day and night, we broke our back so that we can buy a new TV or go on a holiday. ... In the 1980s we took a loan to build a new house, 80,000 forints. During the 1990s this grew to 1 million. I could not pay back our debt. I had to go to work abroad to secure living for my family.

**Hardships**

Fear of job loss is a feeling that subjects associate with other phenomena such as the loss of communities, the increase in hostilities at the workplace. Fear of joblessness propels subjects to work harder and tolerate unfair treatment, whilst rising precariousness feeds into a sense of the lack of control over work relations. Fear of joblessness also acts as a mental burden, as a former worker in a telecommunications company reports:

After privatisation everyone felt that this is going to be tight. They started to fire people. It went like this: We went in, we started to work at 7am, and then they came in at around 10am. Then the boss came, and said: “come I’d like to talk to you”. Then they brought the papers, made the calculations, and then you were sent home, you were fired. This happened to everyone. We couldn’t handle this. This has tormented us mentally, that we could not know who is going to be the next, tomorrow it’s you, then the day after tomorrow it’s me.

The fear of joblessness is seen by many as the driver of the breakup of company-based communities and the start of an era of hostilities, individualised competition and loss of solidarity. The fear of joblessness was a feature that had a long-term impact of the moral fabric of communities, as a former worker at the Szerencs Sugar Factory put it:

These conflicts, they had an impact on people. This turned people against each other. The thing that you should get fired, I don’t want to get fired, I don’t want my family to be insecure. It’s your family that should be insecure, not mine. So in a sense this was a fight for survival.

32 per cent of the interviewees referred to a feeling of vulnerability, feeling unsafe as their future seemed to be unpredictable and they felt themselves at the whim of forces beyond their control. Vulnerability and a sense of insecurity were common features felt in every town and were reported by
subjects regardless of their age or education, but the most vivid reactions come from prime age uneducated workers:

Vulnerable, helpless. Insecurity is the worst thing. Because when you face a bad thing that’s certain, that’s different, I know what to expect. But I don’t know what’s coming next, that’s the worst. Then they [the job agency] sent you around the town, you were sent here, you were sent there, you were sent yonder. Then you realise they don’t want you because you’re old. This is horrible, it’s horrible. And it got only worse. I tell you, when you know a certain bad thing, it’s better, but the uncertainty, that’s the worst.

**Injustice, control and hope**

The way subjects evaluate the global transformations taking place in their companies and their towns is translated into experiences of injustice such as abandonment, dispossession, colonisation and unfair treatment. Abandonment is often linked to the fates of companies and the towns and seemed to be inseparable from the fate of the broader environment people inhabit. As a women working formerly as a clerk in a pharmacy, at present a social care worker said:

You know what one my older patients told me? He told me: “you know how it looks now my darling? My darling, it’s like they took off the dog’s chains, but dog hasn’t got any food to eat. That is freedom. Freedom, like 100 years ago, you don’t have your dinner.”

I think he hit the nail on the head. Freedom, they took off the chains, but the dog doesn’t have a dinner.

A quarter of the interviewees complained about unfair treatment either at the workplace or outside of it. Several subjects complain about being exploited, about being forced to work too hard under increasingly precarious circumstances. A former clerk at the Dunaújváros Ironworks (moderate deindustrialisation, prolonged state ownership) told her story that encompasses several themes touched upon in this chapter. She worked at a division of the company that was downsized. She received an offer from her boss to be relocated to another part of the company. The Ironworks established a foundation that employed people made redundant as temporary workers until they could retire. So she was spared from the worst unemployment in a company that was dominated by state ownership. But she still felt hurt as she found out that part of the reason for her getting fired was that her boss wanted to hire a relative. Moreover, she was just a year from regular retirement, and she felt that being fired only one year before retirement just to make place for a relative is a grave injustice. She started to cry again when recollecting her memories:

They, they really… I felt like stumped, trumped upon, they humiliated me so much. When you feel like, you could retire with dignity after forty years of hard work. And I couldn’t just get over it. I had to attend these sessions. And I was angry at the world, for a very long time. Angry at people. I didn’t really speak at that time. I was just crying and bellowing, I cried my eyes out. Although from a distance, I think it turned out OK, I could
go on to retire. But I didn’t feel like a proper pensioner. I felt like violated. I felt stigmatised. This sense of unfair treatment very often fuels anger and frustration, as subjects report to have no control over these processes. Although the sample contained subjects with higher than average social capital, only five per cent of the interviewees said they felt they could influence social level processes, the fate of the country. These were subjects in high-level positions, involved in politics and trade unions. 65 per cent of the interviewees explicitly reported to have no control whatever over the transition, or the fate of society in general.

As consecutive experiences of vulnerability, insecurity and inability to fight injustice accumulated, the subjects fell into a sense of helplessness and hopelessness. 26 per cent of the interviewees explicitly express that they lost hope in the regime-change. As former miner who now works as a security guard in Ajka told:

When you have democracy, you have to make sacrifices. And we made sacrifices. The problem is that we still keep on only making sacrifices. That’s not what we expected. That’s not what we have expected with the regime change. You know, the little people, the Joe Six-pack, and that covers most of society, is sliding downwards. You could try to endure this with willpower, but I think that’s not fair, this is not OK, and it won’t get any better.

Figure 16 provides an overview of the themes of injustice in the four towns. Again, subjects in Dunaújváros (moderately deindustrialised, state ownership dominated) talk the least about injustice-related themes, and when they do so, they mostly talk about unfair treatment and dispossession. Dispossession refers to moral outrage about corruption and theft during privatisation, as the capitalist class was created as part of the post-socialist original accumulation of capital. The themes of unfair treatment and dispossession are referred to by most subjects in Ajka (moderately deindustrialised, domestic private capital dominated) which might again reflect the increased precariousness and exploitation in the new private jobs that subjects could find there. In the two severely deindustrialised towns of Salgótarján and Szerencs, subjects more often complain about abandonment. This sense of abandonment is connected to the erosion and shrinkage of the towns, the experience of shrinkage and plant closures. The new private economy might provide new jobs but it also invokes feelings of unfair treatment in subjects. Whereas deindustrialisation and a lack of sufficient new jobs in the private economy evoke a feeling of abandonment in them.
Discussion

As opposed to the expectations of the behavioural and the neoclassical approaches, the breakdown of socialist institutions and the rapid introduction of markets caused prolonged human suffering and did not lead to the rapid improvement in people’s health. Supporting hypothesis H11, the analysis of the narrower context of health revealed that health-related discourses are tightly interwoven with subjects’ labour market trajectories and these in turn are influenced by deindustrialisation and privatisation histories, leading to divergent labour market profiles across the four towns. Similar economic complexities of lay health discourses were also revealed in two deindustrialised areas in Scotland (Mackenzie et al. 2016). The interviews also suggest that alcohol in Hungary was perhaps used as a
stress reliever by people who already were regular drinkers. This is consistent with the fact that alcohol consumption has decreased in Hungary during the early years of the post-socialist transition, when mortality rates were increasing (WHO 2017). Thus, the “culture of alcoholism” alone cannot be held accountable for the post-socialist mortality crisis in Hungary.

Analysing the broader context of health in interviewees’ accounts revealed that companies are central institutions in the cognitive maps of workers and that the fates of these companies affected the workers in multiple ways, supporting hypothesis H11. Privatisation is overwhelmingly seen in negative terms, the themes most often associated with privatisation were asset stripping, mismanagement, precarious work, the abandonment of the socialist markets, and increased work intensity. Prolonged state ownership was viewed more favourably by subjects, with subjects in Dunaújváros reporting the least health problems and the least critical remarks about the economic transformation. As companies were privatised and/or shut down, subjects experienced the collapse of company-based communities and the trimming of company services. The loss of opportunity to go on holiday, the need to work more, the loss of health care coverage and precarious employment, the loss of company doctors are all directly linked to stress by the interviewees, and the association of these phenomena with health problems is obvious (Lewchuk, Clarke and de Wolff 2008). Subjects often refer to perceptions of healthy communities in relation to the companies and towns before 1989. There is evidence in the associated literature that stronger community networks are associated with better health (Skrabski, Kopp and Kawachi 2003; Ziersch et al. 2005).

Running parallel to individual stories of loss, illness and hardships are the stories of the towns that people inhabit. Like the companies the subjects used to work for, these towns are also more than mere places where subjects happen to work and live. People’s physical homes are inseparable from the symbolic homes they create through interpreting their towns. Deindustrialised towns often invoke a sense of loss, depression, and town-level bereavement. The community rituals that once provided a sense of belonging disappeared as the plants were closed. The experience of shrinkage further aggravates the sense of loss. There is evidence that people residing in socially and economically marginalised places have more mental health problems (Keene and Padilla 2014; Thomas 2016).

Subjects often refer to their experience of abandonment, unfair treatment, and fear of joblessness or vulnerability as a source of outrage, depression, hopelessness and lack of control. These cognitive evaluations have been empirically shown to be associated with ill health in the existing literature. There is evidence, that a sense of abandonment is associated with mental illness among care-givers (Given et al. 2004) as well as among people living in abandoned neighbourhoods (Ross 2000). Empirical research also confirmed that exposure to neighbourhood-level unfair treatment is associated with psychological
distress (Schulz et al. 2000). Unfairness at the workplace was also found to be associated with increased risk of coronary heart disease in the Whitehall II study (De Vogli et al. 2007). Low levels of perceived control has been also shown to be associated with self-rated health and with physical functioning in Russia (Bobak et al. 1998). The interviews analysed in this chapter also reveal a complex traumatic experience of post-socialist deindustrialisation and privatisation that fed hopelessness and long-term depression in multiple ways. The role of learned helplessness and depression in the post-socialist mortality crisis has been confirmed empirically in the context of Hungary previously (Skrabski et al. 2005).

State employment and social policies are perceived by subjects as important buffers against the worst impact of unemployment and downward mobility. The maximum duration of unemployment benefit in Hungary between 1989 and 1993 was 24 months with the unemployed receiving 70 per cent of their previous gross earnings during the first six months of unemployment (Vodopivec, Wörgötter and Raju 2005). Policymakers during the early transition years also actively encouraged early retirement to smooth the transition. During the early transition years (1990-1996) 75 per cent of newly retiring men were early retirees (Kolosi and Tóth 2008: 22). These practices were reported most often in Dunaujváros in relation to the state owned ironworks, but subjects in Szerencs also often mentioned that the new transnational owners of the companies sent people to early retirement instead of firing them.

The cultural political economy approach to health adopted in this chapter allowed me to explore the complex contextual channels that link economic transformation to individual health. I built on institutionalist development theory emphasising the role of companies as economic institutions (Chang and Evans 2005; King, Hamm and Stuckler 2009; Murrell 1992; Rodrik, Subramanian and Trebbi 2004; Stiglitz 1999). I used the cultural sensitivity of relational political economy to unpack the notion of companies and the class relations they define as the cultural crux around which whole ways of life become maintained and organised (Kalb 1997). Building on the theoretical framework elaborated by Bernard et al. (2007) I analysed the economic domain (e.g. companies), the community organisations domain (e.g. NGOs), the institutional domain (e.g. public services) and the local sociability domain (informal networks) also showing the complex interrelations among these domains. The interviews revealed that the changes affecting the companies as economic institutions reverberate through the neighbourhoods over a long time period and alter their social, cultural and symbolic infrastructure. These changes are often directly linked to health outcomes through loss of job or through isolation. They also affect health indirectly through subjects’ cognitive evaluations, accumulating perceptions of injustice in relation to post-socialist change that build up into a sense of loss of hope and control that, in turn, increases depression. Finally, the institutionalist approach also allowed me to show how state
social policies (unemployment benefits and pensions) mitigated the impact of deindustrialisation and privatisation.

The extent of deindustrialisation and the type of ownership in the four towns influenced subjects’ experience in multiple ways. Subjects in severely deindustrialised towns experience more stress and talk about feelings of abandonment, loss of place-based identity and a massive erosion of company-based communities. Privatisation is generally viewed in negative terms by the subjects. Interviewees often talk about asset stripping and dispossession in every town. The accumulating experience of injustice related to privatisation increases subjects’ sense of loss of control and hopelessness that feed into depression. Yet, there are some crucial differences in the health impact of privatisation. Subjects living in towns with prolonged state ownership talk more about the potential to withdraw from the labour market through early retirement, which acts as a cushion against the shock of the transition. Subjects living in towns with more private companies report about new opportunities, especially educated interviewees with higher social capital working for foreign owned companies. Yet the arrival of the new private economy is also associated with increased insecurity, higher workload, more stress, more exploitation as well as new hostilities, as the moral economy that bound together socialist collectives dissolves under the pressure of competition.

**Conclusion**

By analysing semiotic processes related to health (health-related discourses) in towns with divergent deindustrialisation and privatisation trajectories, this chapter has demonstrated the relevance of the cultural political economy approach to health and also increased our understanding of the post-socialist mortality crisis. The cultural political economy of deindustrialisation reveals that the implications of deindustrialisation for health go beyond the individual labour market channel, encompassing companies, localities, and cognitive evaluations about the economic transformations. The interviews show that the meanings that subjects associate with health are not produced in a social vacuum but are tightly interwoven with the narrower labour market context and the broader economic context.

Although such a qualitative study has obvious limitations in terms of generalisability, it represents an important added value to quantitative statistical analyses. The most important strength of the multi-sited cultural political economy approach followed in this chapter was that it provided novel complex exploratory insights into the lived experience of divergent deindustrialisation and privatisation trajectories.
Chapter 8) Conclusion

The post-socialist mortality crisis represents the largest demographic catastrophe seen outside China since the Second World War (Eberstadt 2010). As Michael Walker so aptly put it in the concluding sentences of his study on survival strategies in a deindustrialised town in East Ukraine: “There is no massacre taking place, but a lot of formerly very solid Soviet citizens are nonetheless going to their somewhat premature demise quietly, victims of the illusion that the transition to a mature market economy could take place in a relatively short period of time (Walker 1998: 202).”

The magnitude of this human crisis stands in contrast to our limited understanding of the complexities of how post-socialist global economic transformations influenced this mortality shock. The average life expectancy of Hungarian men fell by 1.6 years between 1988 and 1993. With this poor human performance Hungary diverges from the other Central and Eastern European countries that managed to increase life expectancy throughout the early 1990s. However, Hungary also differs from the post-soviet states that experienced an even worse drop in longevity. Hungary’s economic transformation resulted in an unprecedented collapse of employment that surpasses even the Russian decrease in employment. The strategy based upon importing foreign investment helped to stabilise the macro-economy and boosted high value added exports. Yet, these economic achievements proved to be insufficient to prevent a massive increase in mortality in Hungary. This dissertation sought answers to the following questions: What explains the drop in life expectancy and the increase in mortality in post-socialist Hungary during the early years of the transition? What factors explain the differences in the speed of improvement in longevity in the longer run during the transition? How did rapid socioeconomic change influence mortality? Through what contextual channels do deindustrialisation, economic liberalisation and privatisation impact health?

Answering these questions in this dissertation I offered a relational political economy account of the post-socialist mortality crisis in Hungary. My aim was to increase our knowledge of the political-economic determinants of mortality in general and to shed light on the economic processes behind the post-socialist mortality crisis in particular. The existing empirical research on Hungary has pointed out the proximal determinants of health such as hazardous alcohol consumption and individual differences in education and income. However, the literature offers little knowledge about the contextual background factors of this major mortality crisis. The distal economic determinants remained unexplored in the literature on Hungary as I demonstrated in the systematic literature review. Building on and extending the growing political economy of health literature I presented a multilevel theoretical framework that connects global economic transformations, state economic and social policies, town

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level socioeconomic characteristics and individual health outcomes. I analysed the post-socialist mortality crisis in Hungary by putting emphasis on the economic institutions of post-socialist dependent capitalism in Hungary, as embedded in the semi-periphery of the global economy, their gendered implications and their cultural construction.

I tested whether severe deindustrialisation increased the relative chance of mortality when compared to moderate deindustrialisation in the short run. Similarly, I investigated whether reindustrialisation via foreign direct investment impacted death rates. I also tested whether privatisation to domestic or foreign capitalists made a difference to health, compared to prolonged state ownership in the long run. Finally, I also presented a qualitative exploration of the complex contextual mechanisms that translate economic transformation into individual health outcomes. I applied a mixed-method strategy, combining innovative quantitative and qualitative data collected over several years as a result of a multidisciplinary project. The empirical strategy of this dissertation is based on a database that encompasses data at multiple levels, allowing for random intercept multilevel survival modelling to be applied investigating the association between micro-level data with meso-level variables in a robust way.

The results are at odds with the hypotheses derived from the major alternative theoretical frameworks: with the strong version of the behavioural approach as well as with the neoclassical economic approach. The rapid economic transformations did not result in swift improvements in health. The destruction of socialist economic institutions had an opposite effect. Alcoholism, smoking and other detrimental health habits are important determinants of health. The weak formulation of the behavioural approach accepts the role of social stress and broader political and economic factors in mortality, and is supported by the evidence presented in this dissertation. However, the strong formulation of the behavioural approach maintained that individual lifestyle factors would be the major or most important determinants of the post-socialist mortality crisis. The literature review and the review of the long-term trends have shown that individual health behaviour actually improved during the early years of the transition, with the level of alcohol consumed decreasing and the amount of fruits and vegetables increasing. The empirical results presented in this dissertation showed that alcoholism and smoking do not explain away the role of economic change. Privatisation and deindustrialisation are associated with health independently of individual health behaviour.

Policy advisors following the Washington Consensus prescribed the rapid privatisation and restructuring of former state owned enterprises. Following the “wealth-equals-health” paradigm, they predicted that the these reforms would free resources for more efficient investments and allow rapid improvements in economic welfare which would trickle down to everyone and lead to universal improvements in health. Although some people could clearly benefit from the new private economic arrangements, the
empirical evidence presented in this dissertation shows that severe deindustrialisation was associated with a significantly higher relative chance of dying for men compared to men living in towns experiencing moderate deindustrialisation. The results also suggest that unemployment benefits can moderate the impact of deindustrialisation as a cushioning mechanism in times of economic shocks. The results are in accordance with the hypothesis based on the relational political economy and on the world-system approaches, regarding the detrimental health effect of premature deindustrialisation.

In contrast to the expectations of world-system theory, foreign investment did not result in an increase in mortality. In fact, the evidence presented suggests that, compared to domestic firms, transnational companies were associated with higher reductions in unemployment and higher income growth. Yet, this economic added value did not translate into improvements in health. The reasons of this are unclear, but the regional concentration of foreign capital and the focus of investors on already healthier and wealthier towns could limit the health spill-over effect of foreign investment. I also presented evidence that men had better chances to gain from transnational companies in the long run; whereas the presence of prolonged state ownership was associated with significantly lower odds of mortality for women, compared to both domestic and foreign investment dominated towns.

The cultural sensitivity of the relational political economy approach was useful to further unpack the notion of companies and the class relations they entail as the cultural crux that defines how ways of life are maintained and organised. The multi-sited semi-structured interviews showed differences in the lived experience of the transition across towns with different privatisation and deindustrialisation histories. As companies were privatised and/or shut down, subjects experienced the collapse of company-based communities, the trimming of company services and an increasingly precarious occupational environment. People living in towns with prolonged state ownership reported the least health problems and offered the least critical remarks about the economic transformation. State employment and social policies were also perceived by subjects as important buffers against the worst impact of unemployment and downward mobility. Running parallel to individual stories of loss, illness and hardships is the story of the towns that people inhabit. Deindustrialised towns often invoke a sense of loss, depression, town level bereavement. Subjects often refer to their experience of abandonment, unfair treatment, and fear of joblessness as a source of outrage, depression, hopelessness and lack of control. The interviews analysed in this dissertation revealed a complex traumatic experience of post-socialist deindustrialisation and privatisation that fed hopelessness and long-term depression in multiple ways; factors that are directly associated with increased mortality.

The dissertation has some limitations. Although the analyses presented are built on a novel multilevel database encompassing a broad scope of individual, town and company information, the data used have
some limitations. I discussed the shortcomings of the indirect sampling technique (Brass method) that formed the backbone of the data collection process in the methods chapter. This survey technique results in a sample that is not directly representative. The chance of inclusion is not uniformly distributed and might be influenced by the size of the family and the type of the relatives that were included. Migration could also introduce a potential bias to the indirect estimates on mortality. However, several factors offset against this potential bias. Due to the large number of interviews conducted in each town the project collected information from a range of different types of individuals. Various survey techniques were used to increase the randomness of the sample, such as the grid method and the random walk procedure. Controlling for outmigration allowed me to filter out the bias resulting from migration. There is no evidence in the literature that Brass method would lead to biases for adult mortality rates in a developed country.

Recall bias might be a more severe limitation that could influence the reliability of the dataset. The long time-span covered by the questionnaire makes it difficult for respondents to accurately remember relevant information, especially regarding their relatives. Some of the information collected could not be accurately linked to specific years, only to decades, which limits the accuracy of the individual-level information. Cognitive tests and proxy questions were used to minimise the difficulties with the questions. Nevertheless, these techniques cannot fully ensure the complete accuracy of individual-level data especially regarding retrospective health behaviour. Yet, as compared to currently available survey data and conventional registry data, the PrivMort database is the only information source that allows researchers to connect individual social and health information to town level data in Hungary. Thus this approach currently represents, though not the best possible, the best available method to analyse the economic determinants of mortality. Nevertheless, that issue of data imprecision has to be taken into account when evaluating the results.

A third limitation of this study is that the towns were not matched on socio-economic characteristics before conducting the PrivMort surveys which makes it harder to eliminate selection bias. This study design does not allow us to draw robust causal conclusions. However, I sought to reduce selections bias using multiple techniques. I used a broad range of town and individual-level control variables with different specifications, also controlling for initial heterogeneity including initial differences in town level mortality. Second, I checked pre-existing mortality differentials using individual PrivMort surveys covering the 1980s. This way I ruled out the possibility that towns with severe deindustrialisation that were associated with higher mortality in the short run, and that towns with prolonged state ownership that were associated with lower mortality in the long run, were already different in terms of mortality before the economic transformation. I also controlled for unobserved heterogeneity using town level fixed effects panel regression with regard to deindustrialisation. These techniques significantly raise the
causal potential of the analysis. I also controlled for the most important variables that were identified in the literature. However there remains still some room for error due to unobserved heterogeneity, both at the individual and town levels.

This project could form the basis of further research on the impact of macro-economic change on individual mortality and beyond. Some of the limitations of this dissertation can be addressed by using more precise individual-level data. Linking multiple surveys would be a cost-efficient strategy to achieve this. Such new data could allow a more robust and time sensitive estimation of individual health behaviour, such as smoking and alcohol. This would allow a precise robust testing of the relationship between economic changes and individual coping mechanisms. One of the interesting findings of the present dissertation is the gendered difference in the impact of deindustrialisation, foreign investment and prolonged state ownership. Future research could explore this gender-related difference in coping in more detail. More precise measurements of individual income and individual labour market status could also allow linking economic change and individual health in a more robust way. There is no official data available on settlement-level income inequalities and the individual data did not allow calculating the distribution of individual income within towns. Multi-level data collection techniques in the future could thus focus more on town level inequalities and social cohesion that could be important determinants of mortality differentials.

Future research should also look at the health impact of trade liberalisation, and the collapse of the socialist COMECON market. The literature suggests that beyond the availability of resources and the problems of productivity, the sudden collapse of socialist markets could have been an important factor behind company failures and terminations in Eastern Europe during the 1990s. Trade liberalisation represents an important element of the Washington Consensus whose health effect has not been adequately researched in the post-socialist context. Although the dissertation provided some quantitative and qualitative evidence for the centrality of state social policies, but the data did not allow for a robust consideration of the role of the welfare regime in mitigating the mortality shock in Hungary. Given the fact that the collapse of employment was the most severe in Hungary in Eastern Europe during the 1990s, it is puzzling why the mortality rates did not increase more during this period. Relatively generous social insurance policies could have been a major factor in protecting the health of downwardly mobile Hungarians. There is little research on the role of social policies in the mortality differentials during the post-socialist transition. Future research should address this lacuna. Finally, following Amartya Sen’s assertion that mortality is a good measure of development, the results presented open up a research potential on the relationship between health, mortality and democratic consolidation in post-socialist countries. The recent backsliding in democratic quality in post-socialist countries is not been understood enough, linking health and democracy could be a new way of looking
at the social roots of recent authoritarian tendencies. Future research could use individual- or settlement-level measures of mortality to analyse the social foundations of the rise in support for authoritarian parties in the region.

This dissertation represents a significant contribution at the empirical, theoretical, methodological and policy levels. 1), it represents a significant empirical contribution to our understanding of the mortality crisis in Central and Eastern Europe and in Hungary in particular. This is the first study that analysed the role of deindustrialisation, foreign investment and prolonged state ownership in the post-socialist context. Through the results presented we gain novel insights into the determinants of mortality in Eastern Europe. 2), the dissertation also represents a theoretical contribution to the literature by elaborating a new relational political economy framework to analyse health outcomes. I brought together theories and empirical lessons from economic sociology, the sociology of development, institutional economics and social epidemiology. This conceptual schema allows researchers to analyse the multilevel mechanisms that link global economic transformations, foreign investment, economic liberalisation, privatisation and health in a non-deterministic but structuralist way. The literature on the health impact of state ownership and foreign investment is sparse not just in the post-socialist context but in general. To the best of my knowledge this dissertation represents the first project that analysed the health impact of foreign direct investment in a multi-level setting, and a first research project that analysed the health impact of prolonged state ownership. 3), the dissertation also represents a methodological contribution through the combination of an unprecedented scope of individual, company and town level data. Most of the relevant existing literature relies on conventional registry data or on cross-country regressions. The multilevel data coming from a retrospective cohort study allowed me to remedy some of the methodological shortcomings of the existing literature, such as the potential of committing ecological fallacy. The multilevel survival modelling approach to determine the structural causes of mortality allows for more robust conclusions than relying solely on town or country level data.

Finally 4), this dissertation also contributes with policy-relevant knowledge to the existing literature. Many countries worldwide are experiencing major economic transformations, thus studying the natural experiment of the post-socialist mortality crisis in Hungary offers lessons that go beyond a single country and the post-communist region. Tensions of the global economy are surfacing cyclically with the world heading towards a more chaotic, as opposed to more coordinated, global governance. The questions of human survival chances and strategies in times of uncertainty increase the prominence of such research as presented in this dissertation. These global challenges and national economic transformations will remain high on the agenda in the coming decades increasing the need for social epidemiology and health sociology research informed by political economy.
The policy lessons offered by this dissertation can be summarised as follows. Rapid economic transformations threaten health; they should be avoided where possible but if this is not possible, strong safety nets should be in place. Countries embarking on privatisation in the future should opt for a carefully planned privatisation strategy. Prolonged state ownership not only allows time to effectively restructure state owned enterprises but also helps to preserve health and higher levels of human capital that are in turn important factors for successful economic development and are also valued by foreign investors. Foreign investment promotes income growth, but in itself cannot mitigate the human impact of severe deindustrialisation; therefore long-term and indirect effects of foreign investment on the domestic economy are not inherent. Well-designed institutions, social and industrial policies are needed to support the growth of jobs and to ensure sustainable human development. Choosing FDI-led development instead of mass-privatisation should not let policymakers forget that long-term and indirect effects of foreign investment on the domestic economy are not automatic. Foreign investment should not be treated as a substitute for social policies to develop human capital and industrial policies to support domestic enterprises and reduce uneven development.

The findings of this dissertation also suggest that efforts to ameliorate inequalities in health need to go beyond tackling the health impact of status loss. The relational political economy of mortality presented revealed that the health implications of deindustrialisation and privatisation go beyond the individual labour market channel, encompassing companies, localities, and cognitive evaluations about the economic transformations. Strong safety nets, pensions, health insurance and unemployment benefit mitigate the impact of these rapid transformations. However, offsetting the negative health effect of spatial stigmas and the experience of injustice, loss of control and hopelessness necessitate a more complex involvement into the social structures of power, production and social distribution of economic chances and burdens. With the traditional institutions of social insurance facing increasing limitations, new arrangements, a new form a democratic, capability-enhancing development state seems necessary to redistribute the gains and risks of economic development (Evans 2014; Evans 2010; Sen 1999). New forms of interest representation, new taxes on wealth and risky activities, a renewed focus on social investments as well as a guaranteed basic income could be tools that may further improve the quality of human lives in the 21st century.

The importance of health and mortality go beyond the most obvious direct impact on life chances. As Amartya Sen (1998) has argued, mortality can also be used as a robust indicator of economic development. In a time when an increasing number of countries undergo de-democratisation (Crouch 2004b; Krastev 2016; Merkel 2014; Streeck 2014), it is also important that it has been shown that the legitimacy of political and economic institutions depends on their social performance (Lipset 1994). Thus, health and mortality might serve as a direct measure of the political and economic success of
global economic transformations opening up a new line of research on health and democratic stability. In times of Brexit, Trump and the general rise of anti-liberal politics, understanding the social determinants of mortality could not only lead to better evidence-based health policies, better and more equal life chances, but through distributing the fruits of social transformation more evenly, it could also improve the prospects of socially and democratically sustainable economic transformation. I hope that, by analysing the wounds of post-socialism through presenting a political economy of mortality, this dissertation has contributed to this timely endeavour.
Appendix

Table A1. Individual-level characteristics of male subjects, 1989-1995

<table>
<thead>
<tr>
<th>Extent of deindustrialisation (1989-1995)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate (0-50%)</td>
<td>Severe (50-100%)</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Total males</td>
<td></td>
</tr>
<tr>
<td>Number of deaths 1989-1995</td>
<td></td>
</tr>
<tr>
<td>Education: Elementary?</td>
<td></td>
</tr>
<tr>
<td>Education: Secondary?</td>
<td></td>
</tr>
<tr>
<td>Education: University/College?</td>
<td></td>
</tr>
<tr>
<td>Alcohol: abstainer</td>
<td></td>
</tr>
<tr>
<td>Alcohol: 1-4 times a month</td>
<td></td>
</tr>
<tr>
<td>Alcohol: daily or several times a week</td>
<td></td>
</tr>
<tr>
<td>Smoking: never</td>
<td></td>
</tr>
<tr>
<td>Smoking: regularly</td>
<td></td>
</tr>
<tr>
<td>Smoking: quit</td>
<td></td>
</tr>
<tr>
<td>Marital status: married</td>
<td></td>
</tr>
<tr>
<td>Marital status: single</td>
<td></td>
</tr>
<tr>
<td>Marital status: divorced/separated</td>
<td></td>
</tr>
<tr>
<td>Marital status: widow/er</td>
<td></td>
</tr>
</tbody>
</table>
Table A2. Individual-level characteristics of female subjects, 1989-1995

| Extent of deindustrialisation (1989-1995) | Moderate (0-50%) | Severe (50-100%) | | | | |
|-----------------------------------------|------------------|------------------|-------|-------|
| Total females                            | 12,248 66.48%    | 6,175 33.52%     | 18,423 100.00% |
| Number of deaths 1989-1995               | 1,639 67.50%     | 789 32.50%       | 2,428 100.00% |
| Education: Elementary?                   | 7,533 64.39%     | 4,166 35.61%     | 11,699 100.00% |
| Education: Secondary?                   | 3,822 69.34%     | 1,690 30.66%     | 5,512 100.00% |
| Education: University/College?           | 785 74.06%       | 275 25.94%       | 1,060 100.00% |
| Alcohol: abstainer                       | 10,196 65.71%    | 5,320 34.29%     | 15,516 100.00% |
| Alcohol: 1-4 times a month               | 1,685 69.66%     | 734 30.34%       | 2,419 100.00% |
| Alcohol: daily or several times a week   | 219 73.74%       | 78 26.26%        | 297 100.00% |
| Smoking: never                           | 9,815 67.32%     | 4,765 32.68%     | 14,580 100.00% |
| Smoking: regularly                       | 1,429 59.82%     | 960 40.18%       | 2,389 100.00% |
| Smoking: quit                            | 909 68.50%       | 418 31.50%       | 1,327 100.00% |
| Marital status: married                  | 6,104 67.52%     | 2,936 32.48%     | 9,040 100.00% |
| Marital status: single                   | 304 72.55%       | 115 27.45%       | 419 100.00% |
| Marital status: divorced/separated       | 972 65.76%       | 506 34.24%       | 1,478 100.00% |
| Marital status: widow/er                 | 4,806 65.07%     | 2,580 34.93%     | 7,386 100.00% |
Table A3. Deindustrialisation and mortality between 1989 and 1995
(Random intercept multi-level survival models, quartiles reverse coded)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Model</th>
<th>Deindustrialisation (1989-1995)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Q1 (100%–52%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N=13</td>
</tr>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Males</td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td>Females</td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age and relationship to the respondent
Model 2: adjusted for all variables in model 1 plus individual-level covariates (smoking, alcohol intake, education and marital status)
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994)

Nt refers to number of towns, Ns refers to the number of subjects.
* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A4. Deindustrialisation and mortality between 1989 and 1995
(Random intercept multi-level survival model, quartiles)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Model</th>
<th>Deindustrialisation (1989-1995)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Q1 (0%–30%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nt =13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR (95% CI) OR (95% CI) p-value</td>
</tr>
<tr>
<td>Males</td>
<td>Model 1</td>
<td>1.00 (ref.) 1.06 0.93-1.20 0.377</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.) 1.03 0.91-1.17 0.615</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.) 1.07 0.94-1.21 0.335</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.) 1.06 0.94-1.20 0.347</td>
</tr>
<tr>
<td>Females</td>
<td>Model 1</td>
<td>1.00 (ref.) 0.99 0.86-1.14 0.891</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.) 1.00 0.86-1.14 0.994</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.) 1.02 0.87-1.19 0.811</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.) 1.02 0.88-1.20 0.732</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age and relationship to the respondent
Model 2: adjusted for all variables in model 1 plus individual-level covariates (smoking, alcohol intake, education and marital status)
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994)

Nt refers to number of towns, Ns refers to the number of subjects.
*p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A5. Foreign investment and mortality between 1989 and 1995
(Employment-weighted ownership assets, random intercept multi-level survival models)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Model</th>
<th>Foreign Investment in Town Total Assets</th>
<th>Less than 10%</th>
<th>More than 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>N&lt;sub&gt;t&lt;/sub&gt;=21</td>
<td>N&lt;sub&gt;t&lt;/sub&gt;=31</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td>N&lt;sub&gt;s&lt;/sub&gt;=9,930</td>
<td>N&lt;sub&gt;s&lt;/sub&gt;=14,447</td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.04 0.95-1.15</td>
<td>0.382</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>1.04 0.94-1.16</td>
<td>0.455</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>1.04 0.94-1.14</td>
<td>0.503</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.04 0.94-1.14</td>
<td>0.503</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td>N&lt;sub&gt;s&lt;/sub&gt;=7,757</td>
<td>N&lt;sub&gt;s&lt;/sub&gt;=10,666</td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.05 0.95-1.17</td>
<td>0.330</td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>1.04 0.92-1.16</td>
<td>0.551</td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>1.00 0.88-1.13</td>
<td>0.943</td>
</tr>
<tr>
<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.01 0.90-1.14</td>
<td>0.819</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age and relationship to the respondent
Model 2: adjusted for all variables in model 1 plus individual-level covariates (smoking, alcohol intake, education and marital status)
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus pooled town-level death rate per 100,000 inhabitants in 1989 and average unemployment in 1990-1994)

N<sub>t</sub> refers to number of towns, N<sub>s</sub> refers to the number of subjects.
*p < 0.05, **p < 0.01, ***p < 0.001 (two tailed tests)
Table A6. Odds of mortality before the treatment period between 1985 and 1988
(Random intercept multi-level survival models)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Moderate (0-50%)</td>
<td>Severe (50-100%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N&lt;sub&gt;t&lt;/sub&gt;=36</td>
<td>N&lt;sub&gt;t&lt;/sub&gt;=16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
<td>p-value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.04 0.90-1.20 0.572</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>0.99 0.85-1.15 0.906</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>0.98 0.85-1.14 0.834</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.01 0.86-1.18 0.897</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>1.00 (ref.)</td>
<td>1.01 0.86-1.19 0.905</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 2</td>
<td>1.00 (ref.)</td>
<td>1.01 0.85-1.21 0.882</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 3</td>
<td>1.00 (ref.)</td>
<td>1.01 0.84-1.21 0.943</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Model 4</td>
<td>1.00 (ref.)</td>
<td>1.03 0.85-1.24 0.766</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model 1: adjusted for age and relationship to the respondent
Model 2: adjusted for all variables in model 1 plus individual-level covariates (smoking, alcohol intake, education and marital status)
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of inhabitants in 1989-1994)
N<sub>t</sub> refers to number of towns, N<sub>s</sub> refers to the number of subjects.
* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A7. Deindustrialisation and settlement-level male mortality between 1989 and 1997
(Settlement-level fixed effects panel regression)

<table>
<thead>
<tr>
<th></th>
<th>model 1</th>
<th>model 2</th>
<th>model 3</th>
<th>model 4</th>
<th>model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>CI95%</td>
<td>p</td>
<td>Coef.</td>
<td>CI95%</td>
</tr>
<tr>
<td>deindustrialisation</td>
<td>0.63**</td>
<td>[0.19,1.06]</td>
<td>0.005</td>
<td>0.64**</td>
<td>[0.20,1.08]</td>
</tr>
<tr>
<td>(percentages)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>population</td>
<td>0</td>
<td>[-0.02,0.02]</td>
<td>0.676</td>
<td>0</td>
<td>[-0.02,0.02]</td>
</tr>
<tr>
<td>unemployment rate</td>
<td>-0.6</td>
<td>[-2.90,1.69]</td>
<td>0.606</td>
<td>-0.51</td>
<td>[-2.91,1.90]</td>
</tr>
<tr>
<td>income per capita</td>
<td>-0.02</td>
<td>[-0.20,0.16]</td>
<td>0.793</td>
<td>-0.28</td>
<td>[-0.68,0.13]</td>
</tr>
<tr>
<td>dependency ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>414</td>
<td></td>
<td></td>
<td>414</td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05, **p < 0.01, ***p < 0.001 (two tailed tests)
Table A8. Age-standardised proportions of subjects’ characteristics, 1995-2004

<table>
<thead>
<tr>
<th></th>
<th>Dominant ownership of town</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>Foreign</td>
<td>State</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n=7,546</td>
<td>n=5,162</td>
<td>n=3,065</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% (95% CI)</td>
<td>% (95% CI)</td>
<td>% (95% CI)</td>
<td></td>
</tr>
<tr>
<td>Education: Less than secondary</td>
<td>37.6 (36.5-38.7)</td>
<td>29.7 (28.5-31.0)</td>
<td>29.5 (27.9-31.1)</td>
<td></td>
</tr>
<tr>
<td>Education: University/College</td>
<td>6.6 (6.0-7.2)</td>
<td>10.0 (9.1-10.8)</td>
<td>9.0 (8.0-10.0)</td>
<td></td>
</tr>
<tr>
<td>Experienced material deprivation (in the 1990s or 2000s)</td>
<td>14.0 (13.2-14.7)</td>
<td>11.8 (11.0-12.7)</td>
<td>14.3 (13.1-15.5)</td>
<td></td>
</tr>
<tr>
<td>Alcohol intake: abstainer</td>
<td>31.3 (30.3-32.3)</td>
<td>35.6 (34.3-36.9)</td>
<td>28.9 (27.3-30.5)</td>
<td></td>
</tr>
<tr>
<td>Alcohol intake: daily or several times a week</td>
<td>23.0 (22.0-23.9)</td>
<td>20.8 (19.7-21.9)</td>
<td>21.5 (20.0-22.9)</td>
<td></td>
</tr>
<tr>
<td>Smoking: ever smoker</td>
<td>63.5 (62.5-64.6)</td>
<td>59.7 (58.4-61.0)</td>
<td>65.8 (64.1-67.5)</td>
<td></td>
</tr>
</tbody>
</table>

|                                      | Dominant ownership of town |   |   |   |
|                                      | Private                     | Foreign | State |
|                                      | n=5,323                     | n=3,469 | n=2,214 |
|                                      | % (95% CI)                  | % (95% CI) | % (95% CI) |
| Education: Less than secondary       | 56.5 (55.3-57.8)            | 51.1 (49.6-52.6) | 50.9 (49.0-52.8) |
| Education: University/College        | 6.8 (6.1-7.4)               | 8.3 (7.4-9.1) | 7.9 (6.8-9.0) |
| Experienced material deprivation (in the 1990s or 2000s) | 14.4 (13.5-15.4)            | 11.7 (10.6-12.7) | 14.3 (12.9-15.8) |
| Alcohol intake: abstainer            | 83.4 (82.5-84.4)            | 82.0 (80.8-83.3) | 76.0 (74.2-77.7) |
| Alcohol intake: daily or several times a week | 16.5 (13.0-19.9)            | 16.2 (12.0-20.4) | 21.2 (15.2-27.2) |
| Smoking: ever smoker                 | 26.5 (25.4-27.7)            | 23.1 (21.7-24.5) | 27.0 (25.2-28.8) |
Table A9. Ownership and change in unemployment rates between 1995 and 2004
(Using non-weighted company ownership data)

<table>
<thead>
<tr>
<th>Dominant company-ownership</th>
<th>Quartiles of towns according to change in unemployment rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1 (range: -0.3% to +1.7%)</td>
<td>Q2 (range: -0.9% to -0.5%)</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Private</td>
<td>6 (17)</td>
<td>10 (29)</td>
</tr>
<tr>
<td>Foreign</td>
<td>1 (10)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>State</td>
<td>4 (57)</td>
<td>2 (29)</td>
</tr>
</tbody>
</table>

Ordered logistic regression

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95%CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>Private</td>
<td>1.00 (ref)</td>
<td></td>
</tr>
<tr>
<td>Foreign</td>
<td>2.05 (0.56-7.43)</td>
<td>0.276</td>
</tr>
<tr>
<td>State</td>
<td>0.17 (0.03-0.86)</td>
<td>0.032</td>
</tr>
</tbody>
</table>

*Model 1: crude
Model 2: adjusted for baseline unemployment rate (average in 1995-1997)*
Table A10. Ownership and change in income per capita between 1995 and 2004
(Using non-weighted company ownership data)

<table>
<thead>
<tr>
<th>Dominant company-ownership</th>
<th>Quartiles of towns according to change in income per capita (personal income tax base in thousand forints)</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1 range: 150.0-252.4</td>
<td>Q2 range: 257.0-310.1</td>
<td>Q3 range: 312.7-359.1</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Private</td>
<td>11 (31)</td>
<td>12 (34)</td>
<td>6 (17)</td>
</tr>
<tr>
<td>Foreign</td>
<td>1 (10)</td>
<td>0 (0)</td>
<td>4 (40)</td>
</tr>
<tr>
<td>State</td>
<td>1 (14)</td>
<td>1 (14)</td>
<td>3 (43)</td>
</tr>
<tr>
<td></td>
<td>Ordered logistic regression</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model 1</td>
<td>OR (95%CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>Private</td>
<td>1.00 (ref)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign</td>
<td>7.10 (1.78-28.24)</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>3.08 (0.71-13.40)</td>
<td>0.133</td>
<td></td>
</tr>
</tbody>
</table>

Model 1: crude
Model 2: adjusted for baseline income per capita (average in 1995-1997)
Table A11. Ownership and mortality between 1995 and 2004
(Random intercept multilevel survival models using non-weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td>Model 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OR (95%CI)</td>
<td>p</td>
<td>OR (95%CI)</td>
<td>p</td>
<td>OR (95%CI)</td>
</tr>
<tr>
<td>males</td>
<td>3,851/15,773</td>
<td>private</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>foreign</td>
<td>0.88* [0.79,0.98]</td>
<td>0.021</td>
<td>0.90* [0.82,1.00]</td>
<td>0.046</td>
<td>0.88* [0.79,0.99]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>state</td>
<td>0.97 [0.86,1.09]</td>
<td>0.569</td>
<td>0.97 [0.87,1.08]</td>
<td>0.597</td>
<td>0.93 [0.82,1.04]</td>
</tr>
<tr>
<td>females</td>
<td>1,809/11,006</td>
<td>private</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>foreign</td>
<td>1.01 [0.84,1.21]</td>
<td>0.94</td>
<td>1.03 [0.84,1.27]</td>
<td>0.751</td>
<td>0.9 [0.74,1.11]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>state</td>
<td>0.89 [0.72,1.09]</td>
<td>0.269</td>
<td>0.89 [0.70,1.11]</td>
<td>0.299</td>
<td>0.76* [0.61,0.95]</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average outmigration in 1995-2004)
*p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A12. Foreign investment and mortality between 1995 and 2004
(Using 10 per cent cut-off, random intercept multilevel survival models using weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OR (95%CI)</td>
</tr>
<tr>
<td>males</td>
<td>3,851/15,773</td>
<td>FDI &lt; 10%</td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDI &gt; 10%</td>
<td>0.95 [0.85,1.06]</td>
</tr>
<tr>
<td>females</td>
<td>1,809/11,006</td>
<td>FDI &lt; 10%</td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FDI &gt; 10%</td>
<td>1.12 [0.93,1.35]</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average outmigration in 1995-2004)
* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A13. State ownership and mortality between 1995 and 2004
(Random intercept multilevel survival models using weighted company-ownership data)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>death/n</th>
<th>Dominant owner</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>OR (95%CI)</td>
<td>p</td>
<td>OR (95%CI)</td>
<td>p</td>
</tr>
<tr>
<td>males</td>
<td>3,851/15,773</td>
<td>private/foreign state</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.98 [0.87,1.11]</td>
<td>0.797</td>
<td>0.99 [0.89,1.11]</td>
<td>0.878</td>
</tr>
<tr>
<td>females</td>
<td>1,809/11,006</td>
<td>private/foreign state</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.9 [0.73,1.10]</td>
<td>0.293</td>
<td>0.89 [0.71,1.11]</td>
<td>0.303</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average outmigration in 1995-2004)

* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
**Table A14.** Ownership and mortality between 1995 and 2004

(Random intercept multilevel survival models using weighted company-ownership data and the foreign investment dominated towns as reference)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Dominant owner</th>
<th>Odds ratio of mortality (1995-2004)</th>
<th>OR (95%CI)</th>
<th>p</th>
<th>OR (95%CI)</th>
<th>p</th>
<th>OR (95%CI)</th>
<th>p</th>
<th>OR (95%CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
<td></td>
<td></td>
<td>Model 2</td>
<td></td>
<td>Model 3</td>
<td></td>
<td>Model 4</td>
<td></td>
</tr>
<tr>
<td>males</td>
<td>private</td>
<td>1.03 [0.94,1.13]</td>
<td>0.533</td>
<td></td>
<td>0.99 [0.91,1.08]</td>
<td>0.872</td>
<td>1 [0.91,1.09]</td>
<td>0.953</td>
<td>0.99 [0.91,1.08]</td>
<td>0.831</td>
</tr>
<tr>
<td></td>
<td>foreign</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td></td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>state</td>
<td>1 [0.89,1.13]</td>
<td>0.983</td>
<td></td>
<td>0.99 [0.89,1.11]</td>
<td>0.908</td>
<td>0.98 [0.88,1.10]</td>
<td>0.781</td>
<td>0.99 [0.89,1.10]</td>
<td>0.828</td>
</tr>
<tr>
<td>females</td>
<td>private</td>
<td>1.03 [0.88,1.20]</td>
<td>0.699</td>
<td></td>
<td>1.01 [0.85,1.20]</td>
<td>0.912</td>
<td>1.08 [0.91,1.27]</td>
<td>0.382</td>
<td>1.06 [0.91,1.24]</td>
<td>0.445</td>
</tr>
<tr>
<td></td>
<td>foreign</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td></td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>state</td>
<td>0.87 [0.71,1.05]</td>
<td>0.148</td>
<td></td>
<td>0.85 [0.68,1.06]</td>
<td>0.146</td>
<td>0.80* [0.65,0.97]</td>
<td>0.023</td>
<td>0.79* [0.65,0.96]</td>
<td>0.019</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education, experience of material deprivation and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus average number of gender-specific deaths in the 15-64-year age group per 100,000 inhabitants in 1990-1994, average outmigration in 1995-2004)

*p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A15. Odds of mortality before the treatment period between 1985 and 1988
(Random intercept multilevel survival models using weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR (95%CI)</td>
</tr>
<tr>
<td>males</td>
<td></td>
<td></td>
</tr>
<tr>
<td>private</td>
<td></td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>0.93 [0.82,1.05]</td>
</tr>
<tr>
<td>state</td>
<td></td>
<td>0.84* [0.73,0.98]</td>
</tr>
<tr>
<td>females</td>
<td></td>
<td></td>
</tr>
<tr>
<td>private</td>
<td></td>
<td>1 [1.00,1.00]</td>
</tr>
<tr>
<td>foreign</td>
<td></td>
<td>0.99 [0.84,1.16]</td>
</tr>
<tr>
<td>state</td>
<td></td>
<td>0.92 [0.76,1.12]</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus number of inhabitants in 1989-1994)
*p < 0.05, **p < 0.01, ***p < 0.001 (two tailed tests)
Table A16. Odds of mortality before the treatment period between 1985 and 1988
(Random intercept multilevel survival models using non-weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td></td>
<td>OR (95%CI)</td>
<td>p</td>
</tr>
<tr>
<td>males</td>
<td></td>
<td></td>
</tr>
<tr>
<td>foreign</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td>state</td>
<td>0.85* [0.74,0.99]</td>
<td>0.034</td>
</tr>
<tr>
<td>females</td>
<td></td>
<td></td>
</tr>
<tr>
<td>foreign</td>
<td>1 [1.00,1.00]</td>
<td>.</td>
</tr>
<tr>
<td>state</td>
<td>0.92 [0.78,1.08]</td>
<td>0.288</td>
</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus number of inhabitants in 1989-1994)

* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table A17. Odds of mortality before the treatment period between 1985 and 1988
(Random intercept multilevel survival models using weighted company-ownership data)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td>Model 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
<td>OR (95%CI) p</td>
</tr>
<tr>
<td>males</td>
<td>private/foreign</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
</tr>
<tr>
<td>state</td>
<td></td>
<td>0.87* [0.75,1.00] 0.048</td>
<td>0.9 [0.78,1.03] 0.118</td>
<td>0.91 [0.78,1.05] 0.186</td>
<td>0.9 [0.79,1.04] 0.155</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>females</td>
<td>private/foreign</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
<td>1 [1.00,1.00] .</td>
</tr>
<tr>
<td>state</td>
<td></td>
<td>0.93 [0.78,1.11] 0.422</td>
<td>0.94 [0.77,1.14] 0.546</td>
<td>0.88 [0.72,1.09] 0.24</td>
<td>0.87 [0.72,1.06] 0.17</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Model 1: adjusted for age, relationship to the respondent
Model 2: adjusted for all variables in model 1 and individual-level variables: smoking, alcohol intake, education and marital status
Model 4: stepwise backwards exclusion of settlement-level covariates (controls: model 2 plus number of inhabitants in 1989-1994)
* p < 0.05, ** p < 0.01, *** p < 0.001 (two tailed tests)
Table B1. Within-country studies on the social determinants of mortality in Hungary

<p>| Reference            | Year | Citations in Scopus | Level of analysis | Time scope | Study design | Method                                | Dependent variable                                      | Independent variables                                                                 | Results                                                                                                                                                                                                 |
|----------------------|------|---------------------|-------------------|------------|--------------|---------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------|
| Orosz (1990a)        | 1990 | 14                  | National          | 1930-1985  | Time series  | Description of trends                 | Mortality by gender; cause-specific mortality rates     | Analysis of occupational, educational, urban/rural and regional data over several decades demonstrate large disparities in the availability of health care and in infant and adult mortality. Mortality has been particularly high for middle-aged males. |
| Orosz (1990b)        | 1990 | 0                   | National          | 1930-1985  | Time series  | Description of trends                 | Mortality by gender; cause-specific mortality rates     | The trend in the life expectancy of the Hungarian population deviates away from that in advanced Western countries and is accompanied by increasing social and regional differences in mortality. This phenomenon can be interpreted as a “social cost” of post-1945 socio-economic development. |
| Molnár (1992)        | 1992 | 1                   | National          | 1930-1979  | Time series  | Description of trends                 | Mortality by causes of death, occupation, marital status| Mortality increased most significantly among cooperative peasants, decreased among intellectuals, and stayed the same among workers between 1963 and 1981. Participation in the secondary economy lead to an increase in the workload, stress, status-inconsistency and mortality. |
| Makara (1994)        | 1994 | 15                  | National          | 1960-1990  | Time series  | Description of trends                 | All-cause mortality                                     | Mortality trends in Western and Eastern Europe have differed considerably during the past three decades. No political strategies were initiated or launched to combat the mortality and morbidity tendencies. |
| Hajdu, McKee and Bojan (1995) | 1995 | 53                  | National          | 1969-1991  | Time series  | Description of trends                 | Mortality by marital status                               | Increases in premature mortality in Hungary have been greatest among men who are widowed, have never married and, in particular, are divorced, with married men appearing to have been relatively protected. |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Type</th>
<th>Time Period</th>
<th>Description of Trends</th>
<th>Study Design</th>
<th>Analysis</th>
<th>Variables</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klinger (2003)</td>
<td>2003</td>
<td>Subregion</td>
<td>1996-2000</td>
<td>Time series</td>
<td>All-cause mortality</td>
<td>Correlation, linear regression (N=12,643)</td>
<td>Distrust, Reciprocity, Received help from civil associations, Age, Unemployment rate, Education, Income (GDP), Spirit consumption, Smoking</td>
<td>Morality is highest in the north-eastern and in the south-western subregions of the country, and lowest in the north-western subregions and Budapest. Mortality is the highest in the subregions with the lowest economic development indicators.</td>
</tr>
<tr>
<td>Skrabski, Kopp and Kawachi (2003)</td>
<td>2003</td>
<td>County</td>
<td>1995</td>
<td>Cross sectional</td>
<td>Gender specific mortality rates</td>
<td>Correlation, linear regression (N=12640)</td>
<td>Self-rated health, self-rated working disability, subjective social status, objective social status (income, education)</td>
<td>GDP, unemployment and education are the most important determinants of mortality, but all of the social capital variables were also significantly associated with middle age mortality. Help from civic organisations among men, and perceptions of reciprocity among women were particularly important.</td>
</tr>
<tr>
<td>Kopp et al. (2004)</td>
<td>2004</td>
<td>County</td>
<td>2002</td>
<td>Cross sectional</td>
<td>Gender specific mortality rates</td>
<td>Correlation, linear regression (N=12,643)</td>
<td>Years of education, Collective efficacy, Perceived reciprocity, Social mistrust, Competitive attitude, Membership in civic organisation, Religious involvement, Cigarettes per day, Spirit consumption, Taxable income</td>
<td>Among men self-rated health explained 67.3 per cent of mortality (objective measures of social status not included), while subjective social status 6.7 per cent. Among women, subjective social status is more important (18.8%).</td>
</tr>
<tr>
<td>Skrabski, Kopp and Kawachi (2004)</td>
<td>2004</td>
<td>Subregion</td>
<td>2002</td>
<td>Cross sectional</td>
<td>Gender specific mortality rates</td>
<td>Correlation, linear regression (N=12,643)</td>
<td>Various measures of social capital, education and collective efficacy were each significantly associated with middle age mortality. Religious involvement was protective among women. Community cohesion may buffer the harmful health effects of competitive attitudes.</td>
<td>Male standardised mortality rates were highly significantly connected with depressive symptomatology, while female mortality rates and depressive symptomatology were not significantly connected, as well as measures of income and economic performance.</td>
</tr>
<tr>
<td>Kopp, Csoboth and Réthelyi (2004)</td>
<td>2004</td>
<td>County</td>
<td>1988; 1995</td>
<td>Linear regression</td>
<td>Mortality by gender</td>
<td>Correlation, linear regression (N=12,643)</td>
<td>Income, education, subjective social status</td>
<td>Education and subjective social status of women were more significantly associated with middle aged male mortality, than were male education, male subjective social status, and income</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Sample Size</td>
<td>Study Design</td>
<td>Method</td>
<td>Analytical Method</td>
<td>Variables</td>
<td>Findings</td>
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<tr>
<td>Kopp et al. (2006)</td>
<td>2006</td>
<td>29</td>
<td>Subregion</td>
<td>Cross sectional</td>
<td>Correlation, linear regression (N=12,643)</td>
<td>Gender specific mortality, ischaemic heart disease, and cerebrovascular mortality rates</td>
<td>Control at work, Social support at work, Job security, Week day work hours, Weekend work hours, Personal income, Education, Social status, Unemployment rate, Depression, Hostility, Anomie, Social support, Smoking, Drinking</td>
<td></td>
</tr>
<tr>
<td>Kovács (2008)</td>
<td>2008</td>
<td>7</td>
<td>National</td>
<td>Time series</td>
<td>Description of trends</td>
<td>Age standardised gender specific suicide, alcohol-related mortality rates</td>
<td>The health consequences of low education among men might be mostly explained by chronic stress caused by work- and close-partner-related factors, and the toxic components of this interaction are depression, hopelessness, and anxiety.</td>
<td></td>
</tr>
<tr>
<td>Uzzoli (2008)</td>
<td>2008</td>
<td>-</td>
<td>County</td>
<td>Cross sectional</td>
<td>Description of trends</td>
<td>All-cause mortality, life expectancy by gender</td>
<td>There are significant mortality differentials between the Western and the Eastern half of the country. The difference between the average life expectancy of the counties of the best and the worst values is 2.5 years.</td>
<td></td>
</tr>
<tr>
<td>Almasi et al. (2009)</td>
<td>2009</td>
<td>26</td>
<td>Individual</td>
<td>Survival analysis</td>
<td>Conditional logistic regression (N=194 + 194 control).</td>
<td>Suicide</td>
<td>Being unmarried or having no current relationship, lack of other social contacts, low educational attainment, history of self-harm, current diagnosis of affective disorder, unemployment, concern over work prospects, changes in living standards were also associated with suicide.</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Year(s)</td>
<td>Study Size</td>
<td>Study Location</td>
<td>Study Type</td>
<td>Analysis Method</td>
<td>Dependent Variable</td>
<td>Independent Variables</td>
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<tr>
<td>Juhász et al.</td>
<td>2010</td>
<td>11</td>
<td>Municipality</td>
<td>Survival</td>
<td>Hierarchical Bayesian Method</td>
<td>Mortality due to diseases of the circulatory system</td>
<td>Deprivation index (composed of income, qualification, unemployment, one-parent families, large families, density of housing and car ownership)</td>
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<tr>
<td>Döme et al.</td>
<td>2011</td>
<td>21</td>
<td>National</td>
<td>Regression</td>
<td>Suicide</td>
<td>Alcohol consumption, tobacco consumption, total number of man-hours worked per year by psychiatrists, real GDP growth, deprivation index (composed of income, qualification, unemployment, one-parent families, large families, density of housing and car ownership)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kopp et al.</td>
<td>2011</td>
<td>8</td>
<td>Individual</td>
<td>Survival</td>
<td>Cox proportional hazard model (N=12668)</td>
<td>Mortality by gender</td>
<td>Education, occupational class, income, subjective social status, control available at the workplace, job security, social support from colleagues, depression, self-efficacy, smoking, alcohol, marital status.</td>
<td></td>
</tr>
<tr>
<td>Uzzoli</td>
<td>2011</td>
<td>-</td>
<td>County</td>
<td>Correlation</td>
<td>Life expectancy by gender</td>
<td>GDP, employment rate, unemployment rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lackó</td>
<td>2011</td>
<td>1</td>
<td>National</td>
<td>Regression</td>
<td>All-cause mortality</td>
<td>Alcohol consumption, tobacco consumption, extra work in the second economy (proxied with inflation), GDP, number of doctors, unemployment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagy et al.</td>
<td>2012</td>
<td>4</td>
<td>Municipality</td>
<td>Survival</td>
<td>Hierarchical Bayesian method</td>
<td>Mortality amenable to health care</td>
<td>Socioeconomic status</td>
<td></td>
</tr>
</tbody>
</table>

Life expectancy has been increasing recently but in a geographically uneven distribution. In the connection between average life expectancy at birth and economic development, GDP per capita, average income, and unemployment rate are equally determinative.

Areas of significantly high deprivation were identified in the north-eastern, eastern and south-western parts of Hungary. A statistically significant association was found between premature cardio-vascular mortality and deprivation status in both genders.

Annual tobacco consumption was significantly associated with the suicide rate in a positive manner, while antidepressant use and man-hours were significantly associated with the suicide rate in a negative manner.

Each measure of socioeconomic position was more deleterious in men compared with women. Work stress factors, poor lifestyle, low social support and marital status also contributed to the explanation of the link between socioeconomic disadvantage and premature death in men.

Life expectancy in Hungary has been increasing recently but in a geographically uneven distribution. In the connection between average life expectancy at birth and economic development, GDP per capita, average income, and unemployment rate are equally determinative.

Following the system change, up until 1993 the extensive hidden economy, together with rapidly growing unemployment played a major role in the deterioration of health among men mostly through adverse lifestyle changes.

Mortality amenable to health care has been declining in Hungary since the 1980s, but was still 2-3 times higher than the EU average in 2004. A statistically significant association was found between amenable mortality and deprivation status.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Study Type</th>
<th>Time Period</th>
<th>Study Design</th>
<th>Variables</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nagy et al. (2013)</td>
<td>2013</td>
<td>Municipality</td>
<td>2004; 2008</td>
<td>Survival analysis</td>
<td>Hierarchical Bayesian method, Alcoholic liver diseases mortality</td>
<td>Deprivation index (composed of income, qualification, unemployment, one-parent families, large families, density of housing and car ownership) A statistically significant association was found between mortality and deprivation status in males. Areas of highest age-adjusted relative risks were found, for males, in the south-western part, and at the eastern border of the country.</td>
</tr>
<tr>
<td>Rihmer et al. (2013)</td>
<td>2013</td>
<td>National</td>
<td>1961-2011</td>
<td>Time series</td>
<td>Description of trends</td>
<td>Suicide by gender, marital status and age</td>
</tr>
<tr>
<td>Balint et al. (2014)</td>
<td>2014</td>
<td>Subregion</td>
<td>2005-2011</td>
<td>Cross sectional</td>
<td>Regression</td>
<td>Age and gender standardised suicide mortality ratio</td>
</tr>
<tr>
<td>Fountoulakis et al. (2014)</td>
<td>2014</td>
<td>National</td>
<td>2000-2011</td>
<td>Time series</td>
<td>Correlation</td>
<td>Suicide rates</td>
</tr>
</tbody>
</table>

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References


Human Mortality Database. 2017. Human Mortality Database. University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany): Available at www.mortality.org (last accessed: 16 March 2017).


