Adaptation trajectories of dismissed workers: a critical case study of the Lithuanian radio-electronics sector

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Abstract

This article explores why some dismissed workers successfully adapt to the disruptive changing structure of economy and upskill, while others remain trapped in low-quality jobs and experience deskilling. By conducting 50 in-depth semi-structured interviews with former workers of four bankrupt radio-electronics factories in Lithuania, the study suggests that workers with 'inherited', mainly deep, technical skills manage to find high-quality jobs when newly-emerging firms aim to recombine the available physical, financial and human assets to new productive uses. This result supports the literature on evolutionary economic geography, but stands in contrast to the propositions of economics of transition in Central and Eastern Europe. In line with previous work, findings show that women and older workers faced acute challenges in adapting to the economic shock.

Keywords: Employment, Human Capital, Lithuania, Skills, Transitional Economies, Work.

1. Introduction

How do workers adapt to shifts in economic structures: why do some engage in successful adaptation strategies that rely on 'inherited' skills and lead to upskilling, whereas others remain trapped in low-quality jobs and experience deskilling? This article examines adaptation trajectories of former employees of the Lithuanian consumer radio-electronics sector. It relies on 50 in-depth interviews with former employees of the four largest Lithuanian radio-electronics factories that all went bankrupt during an economic transition. The case study examines adaptation strategies under extreme conditions. The disintegration of the sector took place during Lithuania's transition from planned to market economy, which was accompanied by a deep recession and persistently high unemployment. All major factories went bankrupt and inter-firm mobility was not possible. Labour market institutions were wholly underfunded at the time and did not accommodate the transition (Cazes and Nešporová, 2003).

The transition economics literature argues that labour reallocation from declining manufacturing in post-socialist countries was hindered by high skill-specificity: workers could not easily move to other sectors because the 'inherited' technical skills were of little use beyond former jobs (Boeri, 2000, Lamo et al., 2011). This view rests on a premise that economic transformation implies the destruction of 'old' and creation of 'new' assets (including skills). However, the literature on economic geography argues that negative shocks can also lead to diversification in complementary sets of competences and knowledge (Boschma and Iammarino, 2009) based on related variety (e.g. Boschma and Frenken, 2006; Hassink, 2007; Martin, 2010). This involves the integration and recombination of complementary 'inherited' assets (including workforce skills) in entirely new ways, which provide the basis for competitiveness of new firms and sectors.

The results of the case study suggest that workers experienced very challenging labour market reintegration after the collapse of the sector and resulting dismissals. Some indeed were trapped in temporary, low-quality 'dead-end' jobs that resulted in deskilling. Nevertheless, 'inherited' deep skill sets facilitated access to upskilling and high-quality jobs when the newly-emerging firms recombined the assets of the disintegrating sector for new productive uses. This stands in contrast to the expectations of transition economics and supports the argument of economic geography literature. The case study also highlights the role and interplay between age, gender and education in facilitating adaptation to economic change.

The article is structured as follows. The next section discusses expectations emerging from two strands of relevant literature. The third section discusses data collection and analysis methods. The fourth section provides some background information on the economic transition in Lithuania and its radio-electronics sector. The fifth section presents the results of the case study. The last section concludes.

2. Conceptualising labour market trajectories during economic change

This section discusses two broad strands of literature studying the effects of economic restructuring on enhancement/depletion of human capital. The first strand – transition economics literature – provided a mainstream explanation of the paths and outcomes of economic transformation in post-socialist countries. However, in line with neoclassical and neoliberal models, the literature treated workers' adaptation trajectories as a 'black box' by assuming that the 'invisible hand' moves them between jobs and in and out of employment. This gap can be filled in by the second strand of literature, which emerged in parallel and focused on restructuring in developed market economies. This literature on new economic geography and transitional labour markets provides rich explanations of the factors behind alternative trajectories of workers' adaptation to economic change.

2.1. Workers' adaptation trajectories

The transition economics literature viewed workers' adaptation to economic change as a binary variable: successful transitions were characterised as movement of workers from declining to emerging sectors and firms, while failures to adapt led to unemployment or inactivity. The 'invisible hand' should have been the primary mechanism for reallocating workers. For example, early transition literature (Åslund, 1994; Balcerowicz, 1995) argued that once unleashed, the market forces should smoothly reallocate workers in Central and Eastern Europe (CEE) from unproductive state-owned enterprises to new firms. As the early expectations were proved wrong, the literature shifted its focus on framework conditions and policies that resulted in persistently high unemployment, declining activity rates (Cazes and Nešporová, 2003) and growth of shadow economy (Burroni et al., 2008). However, this literature has under-conceptualised the diverse adaptation trajectories of workers that remained in the labour market.

Theory of transitional labour markets (Jackson and Taylor, 1994; Schmid, 1995, 2017) fills in this gap by focusing on the quality of transitions to help explain long-term employment trajectories. It distinguishes between three broad adaptation trajectories (O'Reilly, 2003). First, integrative trajectories are characterised by a sequence of jobs that act as 'stepping stones', i.e. they result in higher productivity, incomes and better career prospects by utilising previously acquired skills and providing new skills (e.g. through on-the-job training). Second, exclusionary trajectories are viewed as 'traps' in poor quality, precarious jobs interrupted by unemployment and inactivity. 'Traps' destroy human capital as previously acquired skills are unused and lose value over time, which further diminishes career prospects. The third type of adaptation trajectories are

characterised as ‘bridges’, whereby a sequence of jobs requires different types but the same level of skills, i.e. reskilling – acquisition of new skills as well as the depreciation of the previously acquired but currently unused skills.

The literature points to three groups of factors explaining why workers gravitate towards different adaptation trajectories. These include speed and mode of economic change, types of previously acquired skills and personal characteristics, such as age, sex and education.

2.2. Speed and mode of economic change

Transition economics predominantly viewed the changing structure of the economy through the lens of the reallocation of (financial and human) resources from ‘old’ to ‘new’ sectors and firms. Significant debates emerged regarding the speed of reform. Proponents of the ‘big bang’ approach argued that fast liberalisation and privatisation should release labour from inefficient state-owned enterprises to be employed in the emerging private sector, while advocates of gradualist reforms emphasised the need to balance the speed of job creation and destruction as well as allow for sufficient time for emergence of the necessary market economy institutions (Blanchard, 1997; Campos and Coricelli, 2002). However, the literature largely agreed that given the ‘right’ rules of the game, the ‘invisible hand’ will reallocate human and financial resources. This implicitly suggests that economic change, fast or gradual, inevitably destroys ‘inherited’ skills and workers can at best expect that the new jobs will provide ‘bridges’ between old and new economic structures.

The evolutionary economic geography literature provides a more nuanced approach. It suggests that regions can better respond to negative shocks and undertake successful trajectories of change by enabling the recombination of complementary ‘inherited’ assets to new productive uses (e.g. Boschma and Frenken, 2006; Hassink, 2007; Martin, 2010). This is captured by the ‘related variety’ concept (Frenken et al., 2007). The literature argues that firms critically rely on region-specific assets: networks of specialised suppliers, skills of the labour force, etc. (Neffke et al., 2018). When a shock hits, regions might diversify towards new sectors or products building upon the existing region-specific resources and capabilities. Change is path-dependent because the recombination of assets already present in declining industries provides a low-cost way of building a competitive advantage in new sectors or firms (Neffke and Henning, 2013). The literature provides ample examples when ‘new’ industries emerge by re-employing the skills and other assets of declining sectors; such as the case of a dominant firm in the US radio industry which successfully diversified to the television receiver industry (Klepper and Simons, 2000). Accordingly, the ‘inherited’ skills can facilitate rebuilding of competitive advantage as workers move to new jobs that rely on a recombination of ‘old’ and ‘new’ skills.

2.3. ‘Inherited’ skills

Transition economics argued that ‘inherited’ specific skills inhibited successful adaptation of workers (Rashid et al., 2005; Rutkowski, 2006). Education systems in planned economies primarily focused on producing specialists with narrow skill sets (Clark, 2003). This allowed the workforce to perform routinised tasks in large enterprises characterised by vertical and horizontal specialisation of functions (Berryman, 2000). Highly-specific skills were further reinforced through in-enterprise training and long tenures (Mertaugh and Hanushek, 2005). During the transition, such firm-specific skills were of little value to other sectors and firms and impeded labour movement across sectors and occupations. Using participation in vocational education and training (VET) as a proxy for measuring skill specificity, studies suggest that VET graduates faced a higher probability of losing

jobs and a lower probability of obtaining new jobs in comparison to graduates of general secondary education (Boeri, 2000; Campos and Coricelli, 2002; Lamo et al., 2011).

However, the above argument leans towards a truism. Becker (1964) defined skill specificity as skills that are useful only to the current employer. Since such skills by definition have limited value to other employers, skill specificity *per se* cannot explain divergent trajectories of workers' adaptation. A more fruitful approach is offered by the skill-weights approach (Lazear, 2003). It argues that work is composed of multiple tasks and each of them requires skills of different depth. Accordingly, skill sets can be understood in terms of breadth and depth of skills. Breadth refers to the number of skills an individual possesses, which is usually linked with the multiplicity of tasks the individual has to perform at work. Depth refers to the level of mastery, experience or knowledge required to carry out a task. For example, photonics technicians rely on a narrow set of deep skills (e.g. engineering, mathematics and electronics), while canteen cashiers use a large number of shallow skills (e.g. basic mathematics, customer service and the like).

'Inherited' skill sets of differing depth and breadth are likely to have diverse impacts on workers' adaptation trajectories depending on the mode of economic restructuring. If the restructuring follows a radical shift from old to new firms and sectors, broader skill sets are likely to facilitate a more successful adaptation. The main reason is that the larger the number of skills an employee has, the higher the likelihood that at least some of them could be put to productive use in the 'new' economy: a canteen cashier is more likely to transfer skills to other occupations or sectors than photonics technicians. However, if restructuring capitalises on skill-relatedness among industries according to the notion of related variety, complementary deep skill sets are more likely to provide access to high-quality jobs: since such skills are rare and expensive to acquire, they could constitute an important element of competitive strategies of diversifying firms. Accordingly, the availability of photonics technicians may prove a vital asset to new firms relying on a similar body of knowledge, as these firms are more likely to provide jobs acting as 'stepping stones' to photonics technicians than canteen cashiers.

2.4. Age, education and gender

Workers' personal characteristics such as age, education and gender have significant effects on the success of workers' adaptation to the changing economic structure. This is supported by transition economics as well as broader literature on the sociology of work, which explores economic change in developed market economies.

The transition economics literature found that older workers were particularly prone to dropping out of the labour force (Tyrowicz and van der Velde, 2017) because their skills were viewed as obsolete in 'new' labour markets. As a result, older workers were less likely to find another job if dismissed and faced a declining wage premium on experience and education obtained prior to the transition (Chase, 1998; Kertesi and Kollo, 2001; Rutkowski, 1996). Furthermore, governments across post-socialist countries offered generous early retirement schemes, which provided an attractive exit option (Haltiwanger and Vodopivec, 2002). Work sociology literature on transformation in established market economies also found that older workers face re-employment difficulties, particularly in jobs that require computer, physical and social skills (Turek and Henkens, 2019). Studies also report that older workers are discriminated against and face ageist stereotypes (Gardner, 1995).

The transition economics literature also found that workers with higher levels of education were less likely to move into (long-term) unemployment and inactivity, and witnessed an increase in relative wages (Cazes and Nešporová, 2003; Kertesi and Kollo, 2001; Rutkowski and Scarpetta,

2005). This is in line with findings in other countries, where higher educational attainment increased capacities to adapt to disequilibrium situations (Schultz, 1975). For instance, Lippmann (2008) found that US workers with less than a high school education have 24% lower odds of switching occupations than those with a high school degree; the effects of education are particularly strong among women.

During the transition women faced higher chances of layoffs and lower chances of subsequent re-employment than men. During the first two years of restructuring in post-soviet countries, women constituted 60% of total redundancies and 80% of redundancies in management positions; due to the informal 'glass ceiling', women occupied junior positions within these occupations (Rimashevskaia, 1992). This could explain why women were particularly affected by the downsizing. Furthermore, Pollert (2003) argues that a significant share of women left employment semi-voluntarily because declining real wages and loss of social benefits associated with employment made work uneconomical.

3. Methods

This section discusses data collection and analysis methods for the case study on workers' adaptation to the bankruptcy of four major radio-electronics factories in Lithuania. This is a critical case which allows an analysis of workers' adaptation trajectories in the face of radically adverse conditions: bankruptcy of all major enterprises in the sector, high overall unemployment and weak labour market institutions (see Section 4). According to the logic of a critical case study, positive outcomes observed under the least favourable conditions may shed light on mechanisms in play in less extreme cases as well (Hancké, 2009). The case study primarily relies on 50 semi-structured interviews with former workers employed in the four largest factories in the sector.

3.1. Data collection and sample

Stratified purposeful sampling was applied to construct the study sample (e.g. Billing and Bryson, 2019). All 50 interviewees worked at the four enterprises prior to the start of transition in 1989 and terminated employment before or during the bankruptcies, i.e. between 1989 and 2005. Since complete employment records of the factories were not publicly available, the first subset (18% of interviewees) was identified from factory publications, i.e. typically books celebrating factory anniversaries. The remaining respondents were reached via chain sampling (82% of interviewees). The diversity of the sample was ensured by looking for study participants to ensure respondent variety in terms of gender, factories, occupational levels and major structural units of a typical radio-electronics factory (Table 1). Most efforts were put into finding female and worker-level respondents for the study, as the sample ended up reasonably diverse along all other categories via chain sampling.

Table 1 Stratified purposeful sampling criteria used during data collection

Sex	
Male	28 (56%)
Female	22 (44%)
Factory	
Vingis	13 (26%)
Banga	10 (20%)
Tauras	16 (32%)
Ekranas	11 (22%)
Last occupational level held at factory	
Workers	10 (20%)
Clerks	2 (4%)

Technicians	8 (16%)
Professionals	14 (28%)
Managers	16 (32%)
Workshop/ department	
Management (e.g. HR, marketing, quality)	7 (14%)
Main production workshops	15 (30%)
Workshops producing parts (e.g. stamping, galvanic workshops)	6 (18%)
Supplementary production workshops (e.g. instruments, energy halls, repair workshops)	8 (16%)
Factory servicing (e.g. transportation, property management)	5 (10%)
Technological bureaus (e.g. product development)	9 (18%)

Source: own elaboration

The interviews were carried out in September 2017 – March 2018 and conducted face-to-face (84%) or by phone. The interviews were conducted one-on-one or, in two cases, in groups of two and three respondents. The 50 interviews generated over 30 hours of recorded data, with most interviews lasting between 30 and 80 minutes. All respondents signed or gave verbal consent to (in case of phone interviews) informed consent forms stating their understanding of the voluntary nature of their participation in the interview, their agreement to being recorded and being anonymously cited in a research article, and their right to withdraw from the research at any point without further explanation.

Interviewers followed detailed interview protocols that contained an introductory script with details on the research and instructions regarding consent forms and recording. Building upon the work of Gabriel et al. (2013) and studies by Gardiner et al. (2009) and Dobbin et al. (2014) on individual biographies, the interview questionnaire comprised the following themes: educational background, career track before and during employment in one of the four factories (including first occupation, career progression, types of tasks performed and the most important skills used to perform the tasks), labour market trajectories after dismissal (including experience in finding a new job and/or occupation and career progression, as well as types of tasks performed and skills used in new jobs). All interviews were carried out and transcribed in Lithuanian. The quotations were translated to English for the purposes of this article.

3.2. Data analysis

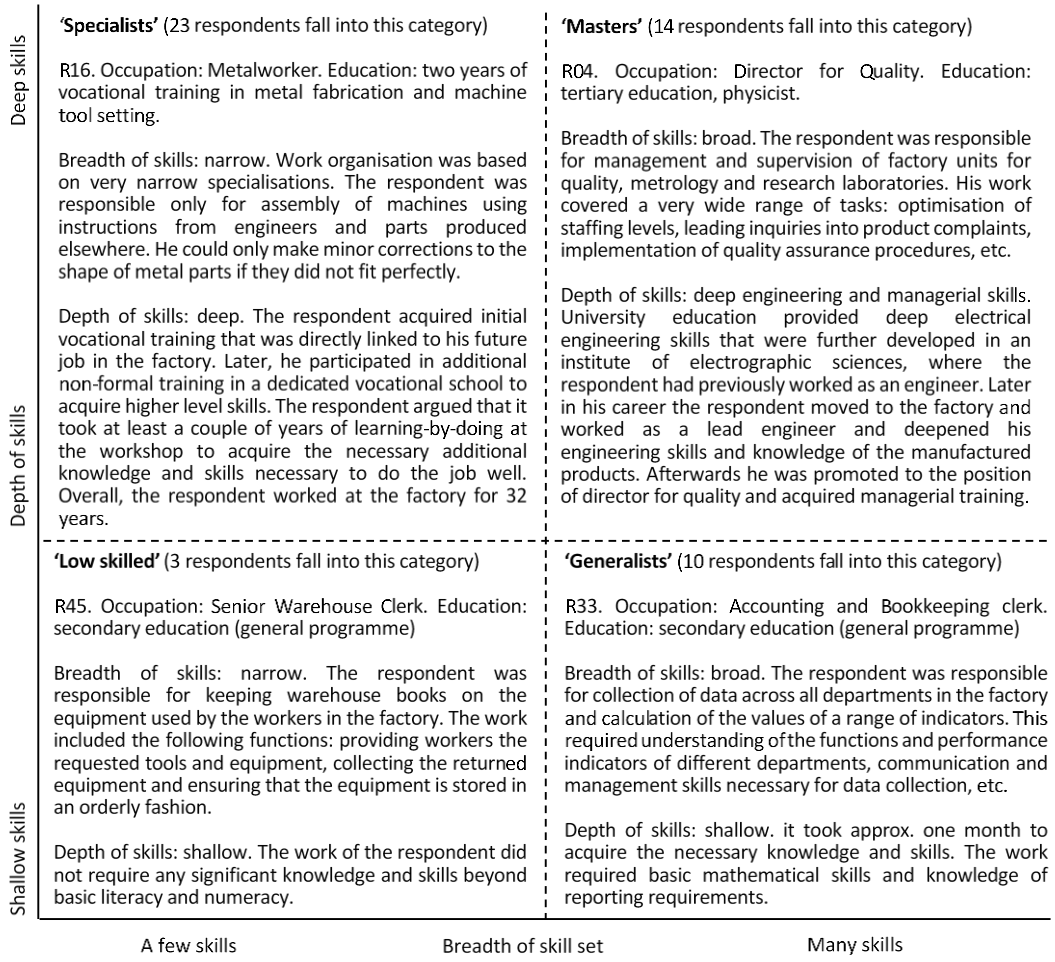
The data were analysed using NVivo software. The data were coded using a directed content analysis approach (Hsieh and Shannon, 2005). Coding started with pre-defined categories derived from juxtaposing the literature on transition economics, economic geography and sociology of work. These included: gender, date of birth and current age, factory they worked at, age at which they left the factory, highest educational level attained, field of study, first and last occupational level, position in a factory, workshop/department, positions and economic sectors after leaving the factory. An overview of the participants is presented in Table 1 of Appendix 1.

Data analysis proceeded in three steps. First, it aimed to infer the depth and breadth of skills (in line with Author A) of respondents by analysing their attained education and skill cultivation throughout career as well as types and range of tasks carried out prior to dismissal. Most interviewees had deep skills regardless of their occupation, i.e. deep skills were a common characteristic of both blue- and white-collar workers. Roughly equal proportions (about 50%) of interviewees had narrow and broad skills. Figure 1 discusses the characteristics of 'typical' skill profiles of respondents along the matrix of depth and breadth of skills.

The second step focused on emergent adaptation trajectories after dismissals. Most were non-linear, which made it difficult to ascertain a specific trajectory. Hence, the analysis focused on the

extent to which (multiple) job changes required broader/deeper skills and led to stable high-quality employment with opportunities for career advancement. Such trajectories (O'Reilly, 2003) were categorised as *integrative*. Job changes that led to poor quality, irregular employment with low skill requirements were categorised as *exclusionary* trajectories. Transitions that made use of only a sub-set of previously acquired skills and largely led to reskilling were categorised as *bridges*. Lastly, the links between 'inherited' skills and subsequent adaptation trajectories were investigated across different configurations of factors, such as mode and timing of factory disintegration.

Figure 1 'Typical' cases along the skill matrix



Source: own elaboration.

4. The setting: the 'inherited' system and its transformation

Before the transition the Lithuanian economy was characterised by central planning, oversized manufacturing sector, large state-owned enterprises and tight integration into the supply chains of the Soviet Union. Metalworking and manufacturing of machinery for metallurgy accounted for approximately a fourth of the entire Lithuanian industrial production in the mid '80s. Radio-electronics, a sub-sector of metalworking, was a cornerstone of high-tech manufacturing in Lithuania. Its factories were directly accountable to the central government of the USSR as the sub-sector supplied components for the military industry (Meškauskas, 2016). Four large enterprises that operated in four major cities comprised the backbone of consumer radio-electronics and were among the major employers in respective cities (Table 2).

Table 2 Key facts on the radio-electronics factories

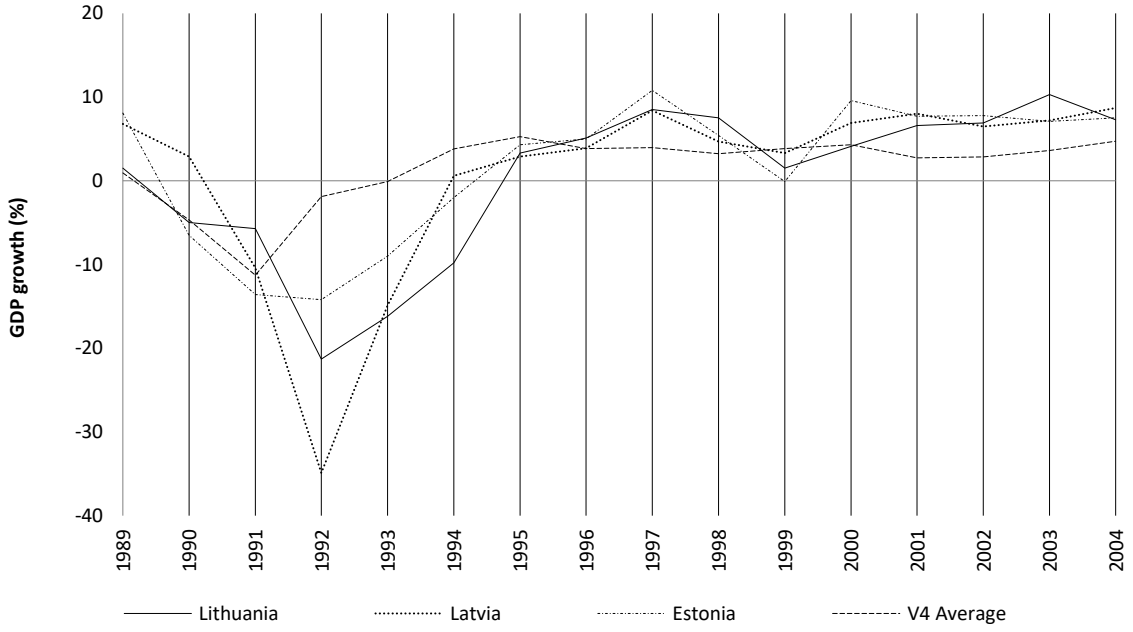
Factory	*Vingis*	*Banga*	*Tauras*	*Ekranas*
Year and place of establishment	1954, Vilnius	1956, Kaunas	1961, Šiauliai	1962, Panevėžys
Number of employees*	6,291	Approx. 10,000	Approx. 6,000	6,252
Factory employees as % of city manufacturing workers	5%	10%	19%	21%
Type of production	Television tube guidance systems	Radios, radio parts and portable TV sets	TV sets and studio TV equipment	TV screens
Evidence of integration into USSR supply chains	53% of sales to the Commonwealth of Independent States, 45% to other Lithuanian companies (predominantly *Ekranas*), remaining 2% of sales went to Western Europe (1994)	Production was shipped to 22 European and Asian countries and 18 USSR factories	In late '70s the factory was expanded to produce studio TV equipment for the Moscow Olympics	*Vingis* was its main supplier of television tube guidance systems.
Type of collapse	Halted production in 2007, declared bankrupt in 2011	Closed in 1995 (reorganised into smaller companies)	Closed in 1994 (reorganised into smaller companies)	Declared bankrupt in 2006

Source: own elaboration based on Grybkauskas and Linartas (2004), Vaitkevičienė (2016), Vaičys (2016), Kačkus (2015), Naujėkas (2002), Statistical Department of Lithuania.
Notes: *- reference year 1983 for *Vingis*, 1985 for *Banga, Tauras* and *Ekranas.*

Planned economies ensured full employment – every adult was obliged to work, while factories had incentives to hoard labour. Hence, workers developed deep-rooted expectations of 'permanent' employment or at least safe employment relations (Žilinskienė, 2016). Planning of human resources implied that VET, as well as higher education institutions (HEIs), trained the workforce for specific occupations in a particular industry (and, in some cases, a particular company). For the radio-electronics sector, VET and HEIs provided highly specialised programmes in radio technology, radio construction, radio-electronic engineering, production of radio-electronic machinery, etc. The typical deep but narrow skills profiles were further deepened during on-the-job training and long tenures within the same company.

In 1990, Lithuania declared independence from the USSR and started the transition from plan to market. In contrast to the initial rosy expectations, the transition caused a sharp and prolonged economic decline accompanied by de-industrialisation (Figure 2). The output collapse in Lithuania and the other Baltic States was significantly sharper than in the 'Visegrad Four' (V4) countries (Poland, Czech Republic, Slovakia, Hungary). This was due to a tighter integration of the Baltic economies into the rest of the USSR: disrupted trade and supply chains resulted in a larger scale of disorganisation (Blanchard and Kremer, 1997).

Figure 2 Real GDP growth in CEE countries in 1989-2004

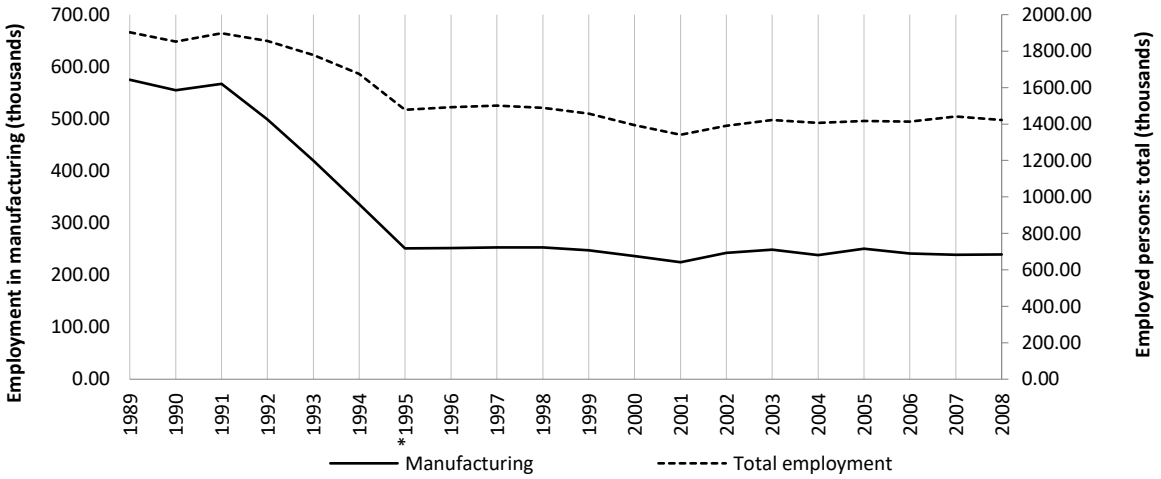


Note: V4 - 'Visegrad four' countries.

Source: European Bank for Restructuring and Development, *Transition Report* (various years).

Due to the collapse in output, employment in manufacturing halved during the first five years of transition. As the growth of the economy resumed in 1995, employment in manufacturing did not rebound to its pre-transition levels (Figure 3). The scale of de-industrialisation was significantly larger in the Baltic countries in comparison to the V4. This can be explained by a larger scale of initial disorganisation and a subsequent slow recovery due to lower inflows of foreign direct investments (Hunya and Geishecker, 2005).

Figure 3 Employment levels, total and manufacturing sector, in Lithuania (1989-2008)



Note: *- break in time series

Source: The Lithuanian Department of Statistics.

Similarly to other manufacturing sectors, the Lithuanian radio-electronics industry experienced a 'protracted death'. However, the paths to the demise of the four major companies differed

significantly. *Tauras* and *Banga* were dissolved during the early stages of transition (in 1994 and 1995 respectively). They were forced into bankruptcy due to disruptions in supply chains and difficulties in finding new markets. *Banga* was split into 7 smaller units, which were auctioned off as separate companies. These spin-offs utilised the warehouses and manufacturing infrastructure to new production uses (e.g. manufacturing of wire products, chains and springs, plastic moulding, galvanisation of metal, channel selectors). Similarly, *Tauras'* was split into 12 smaller companies that used the 'inherited' infrastructure to repair radio-electronic equipment, produce water heating systems, etc. (Vaičys, 2016).

Ekranas and Vingis initially were the success stories of transition. They attracted investment from Western manufacturers (*Phillips, Samsung,* among others), which facilitated modernisation of production lines as well as ensured access to suppliers and markets. However, *Ekranas* – producer of traditional TV screens –underestimated the importance of new technologies (LCD and plasma screens), lost its market share and went bankrupt in 2006. *Vingis* followed suit as *Ekranas* was its main customer. *Ekranas* was liquidated and its assets were sold in auction, while *Vingis* established several spin-offs before its liquidation.

Within the context of highly unfavourable framework conditions, the disintegration of the Lithuanian radio-electronics industry was an extreme case of industrial decline. However, there was some variation in the disintegration pathways of the four factories, which are discussed in Section 5.

5. Workers' adaptation trajectories

The presentation of findings is structured around two questions. First, how did different types of skills and modes of restructuring provide opportunities for the dismissed workers to engage in integrative or bridging adaptation trajectories? Workers with 'inherited' deep skills managed to adopt integrative adaptation trajectories when economic restructuring followed the path of related variety, i.e. the collapsing factories disintegrated into multiple spin-offs (*Tauras* and *Banga*) that aimed to recombine inherited assets to new productive uses, or the factory went bankrupt in a large city with a large concentration of similar enterprises (*Vingis*). When such opportunities were not available (as with the dismissed workers of *Ekranas*), deep skills were of little use and workers at best adopted bridging trajectories by relying on 'inherited' broad skills to access new sectors and occupations (Sub-sections 5.1-5.3). Second, why did some workers get trapped in exclusionary trajectories although they had similar skill sets and faced similar economic opportunity structures as their more successful colleagues? An answer to this question is presented in Sub-section 5.4. by exploring the effects of age, gender and education.

5.1. Integrative trajectories

Integrative trajectories were predominantly adopted by workers with 'inherited' deep skills from three of the four investigated factories (*Banga*, *Tauras* and *Vingis*). The mode in which the factories disintegrated opened up opportunities for workers with deep skills. *Banga* and *Tauras* disintegrated into multiple spin-offs in the mid-90s. As the two enterprises were crumbling, some entrepreneurial-spirited workers – usually workshop managers – saw this as an opportunity to privatise and restructure their workshops. The new companies had to enter new markets as the old ones had shrunk. Some spin-offs entered markets for similar products, such as channel selectors, TV signal receivers and antennas, wiring systems, etc. Others moved from production to repair and maintenance services. The competitive advantage of these spin-offs relied on relatively scarce technical know-how inherited from the factories.

The most radical diversification trajectory was adopted by a former workshop of *Tauras.* It previously manufactured and installed production lines and equipment for the factory. Its manager privatised the workshop and spotted unmet demand for boilers and other heating systems. The new company largely relied on the same metalworking equipment and skills, although it entered completely different markets (*R08, male, age 47, Deputy Workshop Manager*[1]*, Tauras*).

Some workers dismissed from *Banga* and *Tauras* moved directly into the spin-offs upon invitation from workshop managers who turned into company owners. Technical skills and work ethics were among the key selection criteria *(R41, male, age 40, Engineer-Constructor, Tauras*). The first years were very turbulent with irregular salaries and unclear prospects. However, the companies offered ample learning-by-doing opportunities due to the adoption of new technologies and entering new markets (*R18, male, age 44, Equipment Tuner, Banga*). Former engineers not only built upon their deep skills but also broadened them as they moved into managerial positions (*R19, male, age 34, Senior Engineer, Banga*).

Others, however, faced a more turbulent adaptation. Upon dismissal they faced unemployment, inactivity or took-up low-skilled jobs, such as driving a taxi (*R03, male, age 43, Radio Mechanic, Banga*) or working as a cashier (*R20, female, age 40, Workshop Supervisor, Banga*). This was a very stressful experience, in some cases leading to alcoholism and depression. Finding other meaningful jobs was difficult as thousands of workers were dismissed to a labour market already characterised by high unemployment. Furthermore, unemployment protection was virtually absent: on average 20–30% of the registered unemployed received unemployment benefits and active labour market policies in 1991–1998 were virtually absent (Gruževskis and Beleckienė, 1999). Therefore, very few respondents registered as unemployed at the Lithuanian Labour Exchange. Instead they relied on social networks – former colleagues, family and friends – to look for jobs. Some of them eventually entered the integrative adaptation trajectory as spin-offs from *Banga* and *Tauras* expanded in the late 90s and hired their former deep-skilled colleagues back. The jobs typically offered high-quality employment with upskilling pathways.

Most of the interviewed former employees of *Vingis* gravitated towards integrative trajectories. Two mechanisms were at play. First, before halting production of *Vingis*, its metalworking workshop was sold as a separate company and kept most of its employees. An interviewee recalled this as a smooth process, which hardly felt like a transition: '*everything stayed the same, only the name changed*' (*R16, male, age 55, Metalworker, Vingis*). Hence, such workers faced smoother transitions than the above-discussed workers of *Banga* and *Tauras*. Second, the dismissed workers faced relatively smooth transitions because *Vingis* halted production in 2007 – a decade later than *Banga* and *Tauras* – during an economic upswing and in the capital city with a high density of similar economic activities. Due to their engineering, metalworking, wiring and similar deep skills, they were sought out by other companies, which manufactured, for example, medical equipment (*R38, male, age 65, Engineer-Constructor, Vingis; R39, male, age 27, Deputy Workshop Manager, Vingis*), packing materials and automation systems (*R4, male, age 48, Quality Manager, Vingis*). This suggests that a high concentration of similar companies within the same geographical location can produce similar opportunities for integrative trajectories as diversifying spin-offs of *Banga* and *Tauras,* in line with economic geography literature, Marshallian agglomeration economies in particular (Marshall, 1920).

5.2. Bridging trajectories

Some former workers from all four factories adopted bridging trajectories. This was particularly prevalent among former employees of *Ekranas*. In fact, virtually none of them gravitated towards

the integrative trajectory and it appears that bridging trajectory was the most positive outcome for these workers. To explain this, the discussion below focuses on *Ekranas* employees.

Ekranas, once a beacon of successful restructuring and the largest employer in a mid-sized town (approx. 100,000 inhabitants), went bankrupt rather unexpectedly in 2006 and did not produce any spin-offs. This took place during an economic upswing, when there were multiple vacancies available in the labour market and the Labour Exchange offered relatively generous unemployment insurance. However, high-quality manufacturing jobs that would utilise previously acquired skills were scarce. Hence, the interviewees described a troubling non-linear path of adaptation. Those possessing deep skills first attempted to find a job in manufacturing. Eventually, many of them either became unhappy with the employment conditions or the companies went bankrupt after the financial crisis hit in 2008. In these unfavourable circumstances 'inherited' broad rather than deep skills proved to be more of an asset. Five interviewees with deep and broad skills recalled having to reskill in order to find reasonably good employment in services or the public sector. Interviewees recalled relying on more general interpersonal, management and critical thinking skills, as well as their ability to learn quickly to successfully adapt to their changed job profiles. In their cases deep technical knowledge acquired during formal education and on-the-job was all but destroyed. While these jobs were stable and relatively well-paid, the informants described them as boring (*R01, male, age 50, Deputy Senior Engineer-Constructor*), uninteresting (*R29, male, age 53, Engineer-Technologist*) or 'dead-end' (*R30, male, age 35, Deputy Senior Technologist*).

5.3. Exclusionary trajectories: the role of gender, level of skills and age

Upon dismissals a large share of our respondents took poor quality, low-skilled jobs (e.g. driving a taxi or cleaning), but some subsequently entered integrative or bridging trajectories, whereas others remained trapped in precarious jobs. Most of the workers that gravitated towards exclusionary trajectories had lower educational attainment as well as shallow and narrow skill sets, which closely interacted with gender and age.

Respondents' experience suggests that men and women gravitated towards different adaptation trajectories due to unequal starting positions related to previously acquired education and career opportunities. Overall, women reported broader skill profiles and lower levels of education, while men tended to possess deeper skills and were more successful at climbing the career ladder at the factories. Gender differences permeated educational attainability for at least two reasons. First, men were informally prioritised over women by institutions providing access to Soviet tertiary education (Žilinskienė, 2016). Second, women more often than men felt obliged to drop out or forego higher education in order to start and take care of a family, as one interviewee explicitly stated (*R32, female, age 47, Warehouse Clerk, Ekranas*).

Furthermore, some occupations at factories were seen as either more 'male' or 'female'. Positions in management were predominantly occupied by men. A former workshop manager recalled that out of approximately 50 managers participating in strategic governance of the factory only three were women (*R24, female, age 55, Workshop Manager, Banga*). Mid-level managers and supervisors were more likely to be females while engineers tended to be males (*R20, female, age 40, Workshop Supervisor, Banga*). Manufacturing supervisors were responsible for organising the work of a production line during a shift, which required broad interpersonal skills as the job involved a lot of interaction with workshop workers. Therefore, the position was seen as a better fit for women. Conversely, any higher specialist- or manager-level position that required deeper technical skills was viewed primarily as a 'male' job. When a female interviewee was offered an

engineering position at the prototyping bureau, she declined for reasons of social appropriateness, despite having had relevant training:

> *'I hadn't even graduated, the construction bureau already wanted me as an engineer. I don't know whether I was in my 4th or 5th year of [tertiary] studies, and […] I somehow felt uncomfortable. I thought "why me, others were as good as I was" and I declined' (R40, female, age 43, Technologist, Tauras).*

Upon dismissal women tended to take up lower quality jobs in services and particularly the ones requiring lower levels of skills, such as caretakers, saleswomen, clothing sorters, etc. (*female interviewees: R26, age 57, Workshop Supervisor, Banga; R44, age 44, Senior Workshop Supervisor, Tauras; R48, age 51, Tuning Machine Operator).* This was partially due to their poorer starting positions: before dismissals women typically have had fewer opportunities to advance further in their careers in manufacturing than men, in combination with poorer access to education and perceived obligations to take care of their family.

In contrast, male respondents tended to search for jobs in manufacturing (particularly the spin-offs) that would make the best use of their 'inherited' skills. The males that willingly transitioned to services, entered these sectors during early transition with an entrepreneurial attitude and expectations of lucrative financial returns (*male interviewees: R4, age 48, Quality Manager, Vingis; R19, age 34, Senior Engineer, Banga; R35, age 27, Business Developer, Tauras*).

Age also played an important role. Younger respondents reported strong determination to keep searching for high-quality, high-skilled jobs. Hence, after dismissal, they frequently changed jobs until finding satisfactory positions, thus avoiding exclusionary trajectories (*R30, male, age 35, Deputy Senior Technologist, Ekranas; R34, male, age 32, Control Equipment Tuner, Ekranas; R39, male, age 27, Deputy Workshop Manager, Vingis)*.

The trajectories of older respondents depended on their perception of the value of their 'inherited' skills and opportunities for finding a similar high-quality job. For example, one respondent decided to continue working several years post-retirement because he found a job that relied on previously acquired skills relatively easily: '*When I was laid off in 1996, I was eligible for a pension. But it was very boring […]. So I found this workshop that continued small scale production of studio equipment*' *(R11, male, age 60, Workshop Manager, Tauras).* However, others had a dim view of opportunities to re-employ previously acquired skills. They argued that they were not young enough to *'run around changing jobs'* (*R48, female, age 49, Machine Operator, Vingis*), *'no one needs older workers'* (*R45, female, age 46, Senior Warehouse Clerk, Tauras*) and reskilling was not attractive, because *'adventures became boring after 20 years'* (*R12, male, age 42, TV Studio Equipment Technician, Tauras*). As a result, such respondents took up elementary jobs as janitors, security guards, warehouse workers, etc. They constituted temporary positions before retirement.

6. Discussion and conclusions

The findings on adaptation trajectories of workers dismissed from radio-electronics factories in Lithuania make three contributions to the literature. First, in contrast to the expectations of transition economics literature, the critical case shows that 'inherited' specific (i.e. deep) skills did not necessarily hinder workers' adaptation. In fact, when economic change followed the path of related variety, deep skills provided access to integrative adaptation trajectories. In other words, when newly-emerging firms aimed to recombine the available physical, financial and human assets to new productive uses, they critically relied on the availability of dismissed workers with deep

technical know-how. Such recombination contributed to the competitive advantage of firms as well as provided upskilling opportunities for the workers. This finding is in line with the evolutionary economic geography literature. It argues that recovery from economic shock is path-dependent: the recombination of existing region-specific resources and capabilities provides a low-cost way of rebuilding a competitive advantage (Neffke and Henning, 2013).

Second, largely in line with the transition economics literature, the analysis shows that when similar jobs were not available, broad skills facilitated radical career changes, i.e. movement from manufacturing to services. However, respondents at large did not view this as an upward movement but rather as a readjustment to less satisfactory careers. While this adaptation trajectory facilitated acquisition of new skills, it also implied that previously held deep skills were no longer used.

These findings suggest that successful workers' adaptation trajectories are possible even under the most extreme conditions. In line with the logic of a critical case study, these findings may also be relevant for workers' transitions in less adverse conditions in other CEE and advanced capitalist countries. The major implication for successful adaptation is that 'inherited' skills are sticky (Markusen, 1996). The transitions between very distant occupations (in terms of skills used at work) imply significant costs from deskilling. The most successful transitions (in terms of further growth of human capital) involved movements to new firms and sectors that rely on complementary skill sets. Hence, policy responses to negative shocks should primarily focus on the provision of a social safety net (largely absent in this case) and diversification of regional economies in line with the related variety trajectory (Asheim et al., 2011). The latter refers to support for the emergence and growth of new firms and sectors that can recombine resources released from bankrupt enterprises.

Third, the Soviet system constrained access of women to higher education as well as engineering and top managerial positions. Hence, women 'inherited' broader and shallower skill sets. This inhibited their access to re-emerging higher-quality manufacturing jobs and pushed them towards reskilling in services or exclusionary career trajectories in elementary occupations. This is in line with evidence on female manufacturing workforce redundancies and re-employment in advanced economies (e.g. Blyton and Jenkins, 2012).

Lastly, older workers do not engage in the proactive search for better jobs when they consider their labour market opportunities as limited. Instead they take up low-skilled, low-quality jobs, waiting for retirement. This result is consistent with previous research (Lippmann, 2008) documenting that older workers are less likely to find new high-quality jobs (Koeber and Wright, 2001) and increase their post-displacement earnings (Ong and Mar, 1992).

The findings of this case study have clear limitations. The study primarily covered relatively successful transitions. However, this is not the full story. Interviewees also provided anecdotal evidence of former colleagues who failed to adapt: emigrated, left the labour market or engaged in anti-social behaviour. This does not *per se* affect the findings of the study of successful trajectories under unfavourable conditions. However, future studies should also explore adaptation failures.

Endnotes

[1] Hereinafter age and position at the time of departure from factory.

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Appendix 1

Table 1 Overview of the participants

Respondent ID	Gender	Age at the time of interview	Highest educational level attained	Factory	Last position in factory	Skill set used at factory	Age at the time they left the factory	Year of departure from factory	Position longest held after leaving the factory
R01	Male	62	Higher	Ekranas	Deputy Senior Engineer-Constructor	Master	50	2006	Public servant in social security
R02	Male	64	Higher	Banga	Quality Controller	Specialist	35	1989	Director of a TV and internet provider company
R03	Male	66	Vocational secondary	Banga	Radio Mechanic	Specialist	43	1995	Technician at a TV and internet provider company
R04	Male	61	Higher	Vingis	Director for Quality	Master	48	2005	Director for Quality at a company developing marking, packing and automation solutions
R05	Male	59	General secondary	Vingis	IT Administrator	Specialist	48	2007	Freelance IT specialist
R06	Male	63	Higher	Vingis	Workshop Manager	Master	51	2006	Assistant to the Director at a spin-off metalworking company
R07	Male	71	Higher	Vingis	Manager of Automatization-Construction Unit	Master	59	2006	Head Constructor at a spin-off metalworking company
R08	Male	71	Higher	Tauras	Deputy Workshop Manager	Master	47	1994	Deputy Director-General at a spin-off steel processing company
R09	Male	56	Vocational secondary	Tauras	Woodworker	Specialist	32	1994	Metalworker-Woodworker at a spin-off steel processing company
R10	Male	71	Vocational secondary	Tauras	TV Studio Equipment Technician	Specialist	48	1995	Repairman at a district heating network
R11	Male	82	Higher	Tauras	Workshop Manager	Master	60	1996	Retired
R12	Male	66	Vocational upper secondary	Tauras	TV Studio Equipment Technician	Specialist	42	1994	Repairman running his own consumer electronics repair shop
R13	Female	61	Vocational upper secondary	Ekranas	Workshop Supervisor	Generalist	47	2004	Public servant in social security
R14	Female	62	Higher	Ekranas	Engineer-Constructor	Master	50	2006	Public servant in social security
R15	Female	50	Higher	Ekranas	HR Specialist	Generalist	38	2006	Public servant in social security
R16	Male	68	Vocational secondary	Vingis	Metalworker	Specialist	55	2005	Metalworker at a spin-off metalworking company
R17	Female	55	Higher	Vingis	Quality Engineer	Master	44	2007	Office Administrator at a property development company
R18	Male	65	Secondary vocational	Banga	Equipment Tuner	Specialist	44	1997	Solderer at a spin-off radio-electronics manufacturing company
R19	Male	60	Higher	Banga	Senior Engineer	Specialist	34	1992	Head of Innovation at a

									spin-off radio-electronics manufacturing company
R20	Female	64	Vocational upper secondary	Banga	Workshop Supervisor	Generalist	40	1994	Cashier at a retail store
R21	Male	56	Higher	Banga	Head of Marketing	Master	35	1997	Director of a spin-off radio-electronics manufacturing company
R22	Male	65	Higher	Vingis	Engineer-Constructor	Specialist	52	2005	Salesman at a spin-off metalworking company
R23	Female	72	Vocational upper secondary	Tauras	Head of Economy Department	Generalist	48	1994	Owner of a local cafeteria
R24	Female	78	Higher	Banga	Workshop Manager	Master	55	1995	Saleswoman of lightning products
R25	Female	70	Vocational upper secondary	Banga	Senior Workshop Supervisor	Generalist	46	1994	Workshop Supervisor at a spin-off radio-electronics manufacturing company
R26	Female	81	Vocational upper secondary	Banga	Workshop Supervisor	Generalist	57	1994	Caretaker for older persons
R27	Female	69	Higher	Banga	Engineer-Technologist	Specialist	48	1997	Assistant to the Manager at a spin-off metalworking company
R28	Male	52	Higher	Ekranas	Head of Mechanics' Unit	Master	39	2005	Inspector at a public metrological control service
R29	Male	65	Higher	Ekranas	Engineer-Technologist	Specialist	53	2006	Construction Worker
R30	Male	47	Higher	Ekranas	Deputy Senior Technologist	Specialist	35	2006	Technologist at a manufacturer of construction materials
R31	Male	56	Vocational upper secondary	Ekranas	Technologist	Specialist	44	2006	Security Guard
R32	Female	59	General secondary	Ekranas	Warehouse Clerk	Low skilled	47	2006	Accountant at a retail store
R33	Female	50	Vocational upper secondary	Ekranas	Accounting and Bookkeeping Clerk	Generalist	38	2006	Accountant at a manufacturer of beverages
R34	Male	44	Vocational upper secondary	Ekranas	Control Equipment Tuner	Specialist	32	2006	Electrician at a grain processing company
R35	Male	53	Higher	Tauras	Business Developer	Master	27	1992	Owner of a small car repair shop
R36	Female	56	Higher	Tauras	Engineer-Programmer	Specialist	33	1995	Accountant at a small car repair shop
R37	Male	53	Higher	Tauras	Deputy Workshop Manager	Master	28	1993	Director of a fabric manufacturing company
R38	Male	78	Higher	Vingis	Engineer-Constructor	Specialist	65	2005	Engineer-Constructor at a medical device and material manufacturing company
R39	Male	40	Higher	Vingis	Deputy Workshop Manager	Master	27	2005	Head of Workshop at a medical device and material manufacturing company
R40	Female	67	Higher	Tauras	Technologist	Specialist	43	1994	Nanny
R41	Male	64	Higher	Tauras	Engineer-Constructor	Specialist	40	1994	Engineer-Constructor at a spin-off radio-electronics manufacturing company

R42	Male	59	Higher	Tauras	Quality Control Specialist	Specialist	35	1994	Metrologist at a public metrological control service
R43	Female	71	Higher	Tauras	Senior Workshop Supervisor	Generalist	47	1994	Freelance tailor
R44	Female	68	Vocational upper secondary	Tauras	Senior Workshop Supervisor	Generalist	44	1994	Sales Manager at an advertising company
R45	Female	70	General secondary	Tauras	Senior Warehouse Clerk	Low skilled	46	1994	Janitor
R46	Female	45	Higher	Tauras	Controller	Low skilled	22	1995	Head of Production at a spin-off radio-electronics manufacturing company
R47	Female	56	Vocational upper secondary	Vingis	Workshop Supervisor	Generalist	46	2008	Manager at a local restaurant
R48	Female	62	Vocational secondary	Vingis	Tuning Machine Operator	Specialist	49	2005	Clothing Sorter at a charity shop
R49	Female	64	Vocational upper secondary	Vingis	Coil Winder	Specialist	51	2005	Loader/ Kitchen Worker at a retail food store
R50	Female	57	Vocational upper secondary	Vingis	Solderer	Specialist	44	2005	Shift Supervisor at a retail food store