



Town and city jobs: How your job is different in another location[☆]

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ABSTRACT

This paper shows that a job contains a different task package in a large city than the same job in a small city. We question whether the division of tasks is more extensive in large cities. Most datasets hinder such an empirical analysis as they lack spatial variation in job content. Using individual German task data, we are able to empirically estimate spatial variations in task content of jobs. The estimations support the idea of Adam Smith: jobs in large cities consist of other task packages than the same jobs in small cities. Workers in large cities focus more on their core tasks and perform fewer subtasks than workers in small cities.

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1. Introduction

A lawyer in a small rural town works on all kinds of cases. Whether you have a business conflict or a divorce, he is the person to go to. In large cities there are thousands of lawyers, with hundreds of different specialities. Big cities provide more career opportunities than small towns. In the big city you have more chances to become a ‘true’ expert, work on more complex cases and learn from your peers. These examples stress the complexity of job contents and the variation by the extent of the market. Life is different in large cities, workers are different, local industries are different, but to what extent does the content of jobs vary across city size?

Back in 1988 Baumgardner (1988a) modelled the idea of Adam Smith that the division of labour is bound by the extent of the market. Cooperation in a larger local market results in a more efficient division of labour. Workers segregate into subsets of different activities. In a town with two lawyers, the lawyers can divide the legal activities and specialise in only half the activities. The empirical work of Duranton and Jayet (2011) shows that scarce occupations are more likely to be performed in larger French cities than in small French cities. The empirical literature investigating the variation within occupations tends to focus on particular industries and case-studies (Baumgardner, 1988b;

Garicano and Hubbard, 2009). Most research employs information about education, occupation and industry or just worker fixed effects to analyse the mechanism behind the productivity in cities. Only modest attention is paid to the impact of spatial variation in job contents. Ignored variation within occupations and industries between cities hampers adequate analyses on the mechanism behind agglomeration economies.

This paper takes a step towards unravelling the efficiency of cities by analysing the variation in job content across cities. Most datasets hinder such an attempt as they lack spatial variation in job content. We exploit the German survey of the working population, which includes job activities for individuals across German cities. Our main result is the stylised fact that the specialisation level of jobs increases with city size. Such information is important in the policy and scientific discussion about regional (wage) inequality.

We focus on the spatial division of worker tasks. The division of tasks reduces production costs but increases coordination costs. Coordination costs across locations are higher than within a location. Proximity enables division of tasks and the division of tasks is more extensive within a city than between cities.¹ The impact of proximity in combination with a large labour force results in a stronger division of labour in large cities than in small cities. We expect workers in large cities to perform a smaller range of different tasks than workers in small cities or towns.

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¹ A more extensive division of tasks indicates a ‘finer’ division of tasks across workers. In other words, workers focus more on a specific subset of tasks.

We test this idea using the German survey of the working population on qualification and working conditions (the BIBB survey). In contrast to most information on job tasks, the dataset includes individual task data next to a very broad set of other personal and work characteristics. For each worker in the dataset we obtain information on job tasks, occupation, industry, demographic characteristics, education, location and so forth. We construct a measure for the specialisation level in the job content of the worker. Specialisation is defined by the range of job tasks a worker performs. The more time a worker has to focus on the main job tasks, the more specialised he is. We measure this by the number of tasks he performs on the side, i.e. subtasks. The fewer tasks a worker performs on the side, the more time he has to focus on the main job tasks and the more specialised he is. By including job fixed effects we filter for spatial variation in jobs.

We find that workers in large cities on average perform about 5% of a standard deviation more specialised than workers in small cities. The same job consists of more subtasks when it is performed in a small city (less than 50,000 inhabitants) compared to a large city (more than 50,000 inhabitants). The results are robust for different measures of specialisation and spatial units. Furthermore, we investigate in the spatial variation across several sub-samples. It should be noted that the results have a descriptive character. The paper documents stylised facts but does not address causality. Sorting patterns of jobs and workers likely affect the spatial variation in specialisation levels of jobs.

The main idea of this paper relates to theory about the division of labour and the extent of the market. This literature is largely based on the framework of Baumgardner (1988a). The specialisation of workers into certain job tasks increases with market size. Duranton and Jayet (2011) argue that larger markets allow workers to perform more efficiently. Another strand in the literature (see Becker and Murphy, 1992) argues that the extent of the market is irrelevant for the division of labour. They state that the costs of coordination between workers overrule the costs of transportation of tasks. In this paper, we empirically examine whether the extent of the local market, hence the city size, is relevant for the division of labour.

Empirically, this field is left rather untouched. The empirical work tends to focus on case-studies. For example, Baumgardner (1988b) and Garicano and Hubbard (2009) study the division of labour across market sizes for doctors and lawyers. Other analyses focus solely on variation *between* jobs and not variation *within* jobs. Duranton and Jayet (2011) show that scarce occupations are more often observed in large French cities, while Bacolod et al. (2009) show that the allocation of cognitive skills only slightly varies across city sizes. Combes et al. (2012) find that much of the skill differences, measured by worker fixed effects, across French cities can be explained by differences between occupations rather than within occupations. We add to previous empirical work by analysing spatial variation of specialisation within and between occupations. Our dataset makes it possible to analyse the variation in job content instead of controlling for worker skills by using fixed effects.

Lastly, our work relates to the empirical work on job contents and especially the task-based approach in analysing employment pioneered by Autor et al. (2003). The spatial dimension of this strand can be found in the work of, among others, Autor and Dorn (2013) and Bacolod et al. (2010). Autor and Handel (2013) demonstrate that measures at the individual level offer substantial additional explanatory power relative to occupation level data from datasets such as Occupational Information Network (ONET). Earlier work with the German surveys is done by, among others, Spitz-Oener (2006), Gathmann and Schönberg (2010) and Dustmann et al. (2009).

The rest of the paper is structured as follows. The next section discusses the main intuition. Section 3 discusses the empirical approach and the measurement of the division of tasks. Section 4 presents the results on the spatial variation in job content. In Section 5, further sensitivity analyses are presented. Section 6 concludes.

2. Background

This section discusses the main intuition behind the empirical analysis. It relates to theory about the division of labour and the extent of the market and the frameworks of Baumgardner (1988a), Duranton and Jayet (2011) and Becker and Murphy (1992).

2.1. Division of tasks

As in Adam Smith's pin factory, a very large number of tasks (activities) are combined to produce one good. All tasks need to be performed to produce one unit of the product; tasks are complementary to each other. The output of some tasks (e.g. design) is the input of other tasks (e.g. production). Both workers and machines perform tasks. Recent technological change affects the division between tasks across workers and machines, see Bresnahan et al. (2002), Autor et al. (2003). Here, we focus on worker tasks.

Worker tasks are not carried out in isolation but bundled into occupations, firms and locations. The bundle of tasks of a product can be carried out by a single worker or by different workers. Similarly, a firm can choose to produce all tasks inside the firm but it is also possible to outsource a subset of tasks. Lastly, the performance of the tasks can take place in one location but it is also possible to set up a worldwide production process. These choices of the division of tasks across workers, firms and locations depend on the trade-off between production costs and coordination costs. The division of worker tasks generates lower production costs as each task can be performed by the most efficient worker, firm and location. At the same time, the division of tasks raises coordination costs.

Each worker performs a subset of the total number of performed tasks. The more time a worker devotes to the production of a specific task, the more specific skills for performing this task he develops (Becker and Murphy, 1992). In other words, the more a worker specialises into the performance of a task, the more efficient he becomes in producing this specific task. For instance, a handy man who only renovates bathrooms will learn more bathroom specific skills than an all-round handy man. Consequently, the bathroom specialist will be more efficient in renovating bathrooms than the all-round handy man. The division of tasks reduces production costs because of these increasing returns to worker input.

As an opposite force, coordination costs of worker tasks increase with the division of labour (Becker and Murphy, 1992). Combining tasks of different workers into a final or intermediate product requires coordination and communication about the delivered work. In the case of a large renovation, the bathroom and kitchen specialists should coordinate about the construction of pipes, floors etc. If the renovation of the bathroom intervenes with the renovation in the kitchen the two specialists should coordinate and communicate about the performed tasks. Difficulties within the coordination and communication may increase the duration of the renovation or even reduce the quality of the renovation. Coordination and production costs vary across tasks and bundles of tasks and are especially high when tasks involve a large amount of tacit, non-codified knowledge. The benefits of specialisation vary as well.

2.2. Small and large labour markets

Large cities of today prosper thanks to the importance of human interactions in modern production processes (Glaeser and Maré, 2001). Production processes require coordination, consulting, planning and other forms of communication. Tacit knowledge is easier transferred face-to-face than via other communication technologies. Face-to-face contact furthermore decreases incentive issues and facilitates knowledge spillovers. Performing tasks at the same location makes regular and spontaneous consultation possible and decreases communication and coordination costs and issues. The division of tasks within a location

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