



Working from home

Be careful what you wish for

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The corona crisis has forced many employees to work from home. A consensus seems to be emerging that this is becoming the new normal. Many companies have already offered their employees the option to work from home for several days per week, even post-COVID.

At the beginning of the pandemic, staying healthy was the prime civic duty, and the question of who pays the bill has played a minor role so far. So working from home was extended to protect employees; subsequently, the question of how to compensate employees has only gradually gained in importance.

The German labour minister has already announced that he will present a proposal in autumn 2020 that may provide employees with an enforceable right to work from home. This would imply that employers must compensate employees for the additional living space required for home offices. In this paper we analyse the long-term implications of such legislation. We find serious side effects, in particular for the real estate market and the labour market.

An enforceable right to work from home could reroute billions of euros from the office market to the housing market. The demand for office space might fall sharply, whereas the housing shortage could be exacerbated. So there is a trade-off between working from home and affordable housing – a topic that ranks high on the political agenda.

It also seems clear that the more employees work from home, the larger the risk of defaults in the office market. At the same time, additional demand in the housing market could lead to substantial overvaluation. Both could be threats to financial stability. In our view, there is even a risk of a boom-bust cycle in the housing market.

A comparison of office rents with apartment rents reveals that operational expenses would fall substantially only if employees live in or move from the cities to the relatively cheap periphery of metropolitan regions. Otherwise employers' costs could rise and profitability could fall. This is particularly true if working from home were to reduce productivity in the long run – at least in some sectors. As a result, there could be a trade-off between working from home and labour demand – unless wages compensate for this.

These important potential side effects of working from home should be taken into account by German legislators. A right for mobile working instead of teleworking, at least in the next few years, could help ensure that employers do not have to pay for the working space. This could reduce risks. It could also be wise to restrict this right to one day per workweek to avoid extreme supply-demand imbalances in the real estate market. This could also help avoid financial instability.



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German labour law distinguishes 'teleworking' and 'mobile working'

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Working from home is often used as a term for employees who do their job in their home. Under German law two types of working from home are distinguished: 'teleworking' and 'mobile working'.

Since November 2016, telework has been legally defined in the German Workplace Ordinance (ArbStättV), whereas this is not the case for mobile work. According to Section 2(7) ArbStättV, teleworking workplaces are "...computer workstations permanently installed by the employer in the private sphere of the employees..."

Furthermore, it is stated there,

"...the necessary equipment of the teleworking place with furniture, work equipment including communication facilities (is) provided and installed by the employer..."

As a consequence, if teleworking becomes an enforceable right for employees, as presumably intended by the Federal Labour Minister, then employers must compensate employees for the use of private work equipment and living spaces. By contrast, in the case of 'mobile working', as was made possible in many cases during the corona pandemic, employees usually used their private infrastructure and communication technology without an enforceable right for employees and without receiving full compensation.

Who pays for working from home? The employer, in the long-run

In their forecasts for the German office market, many analysts assume that post-COVID the share of employees working from home will remain elevated as many workers have a high preference to work from home.¹ Let us suppose this is correct. Under the current regulation this implies not only that the employer will pay for the IT infrastructure and office equipment, but wages will also include a compensation for any additional living space required to work effectively from home. In the current epidemiological and economic crisis, the question of who will eventually foot the bill plays a subordinate role, as staying safe remains the top priority. However, the German Federal Minister of Labour has already announced that he will present a draft bill in autumn 2020 that may declare that working from home becomes an enforceable right of employees. Even if this first initiative fails, we could imagine that the topic will feature prominently in the election policy statements of several parties.

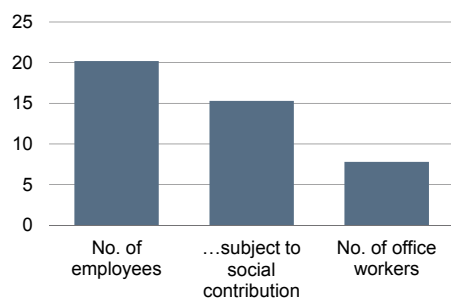
Starting point: Comparison of residential vs. office space is the key parameter

At this point we take a structural view. We also make several initial assumptions that we will revoke later. We suppose that costs of providing IT and office equipment are independent of the location. So the costs of providing computers, office chairs, etc. are assumed to be the same in a traditional office and in the dwelling of the employees. We assume that lower productivity at home due to less social control and less intense interaction between employees is offset by positive effects due to less commuting, more sports and more sleep. The question concerning productivity remains unanswered in the academic literature. So the assumption that productivity will remain unaffected might be a good first approximation. We also ignore all other factors that could influence the pros and cons of working from home. Hence, we focus on the real estate market, i.e. the comparison of the costs of residential space and in particular the space for working from home vs. traditional office space. Should home offices increasingly and permanently replace traditional offices, this would imply a negative demand shock for the office market and a positive demand shock for the residential market. We will illustrate the implications of both on a city level.

126 largest German cities: Size of labour and office market

2

in million



Sources: bulwiengesa, Deutsche Bank Research

Office jobs are of huge economic importance

We use the bulwiengesa universe, which contains data for 126 cities and data for both the housing and the office market. In 2019 roughly 30 million people (~36% of the total German population) in more than 16 million households lived in these cities. The working age population (20-65 years) was roughly 18.3 million persons. However, our calculations imply that the number of employees who worked in these cities was above 20 million. Many of these employees lived in the suburbs and commuted to the cities. The number of employees subject to social security contribution was 15.3 million and the number of office workers was 7.8 million in the 126 cities, with a vast majority of office jobs subject to social security contribution. Hence, on average roughly every second job subject to social security contribution was an office job. Due to the labour market boom, the number of office workers in our sample has increased by more than 1 million during the last decade. In 2019 the number of all office workers in these 126 cities amounted to almost 53% of the total office employment of 14.8 million

¹ See for example Möhring, Katja (et al.) (2020). Die Mannheimer Corona-Studie: Schwerpunktbericht zur Nutzung und Akzeptanz von Homeoffice in Deutschland während des Corona-Lockdowns. July 9. Alternatively, Alipour, Jean-Victor et al. (2020). Homeoffice während der Pandemie und die Implikationen für eine Zeit nach der Krise. ifo Schnelldienst 7 / 2020. Volume 73. July 15.

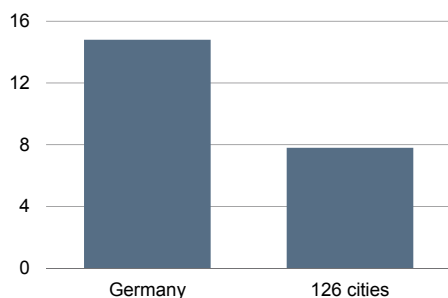


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Office market: Total employment

3

in million



Sources: bulwiengesa, Deutsche Bank Research

Example for the office market:

Decomposition of working days shows demand for office space could drop ~20%

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	pre-COVID	post-COVID
Annual	250	250
- Sickness	10	10
- Holiday	30	30
- Travel	30	10
=Office	180	200
From home	18 (=10%)	80 (=40%)
Traditional	162	120

Source: Deutsche Bank Research

in Germany.² All these figures highlight the importance of the office market for the German economy, the labour market and the 126 cities. Given its economic importance, it is clear that it would be a fundamental economic change if a large share of office jobs were permanently shifted into the living area.

Office demand could collapse

Numerous factors – including productivity effects, health issues, and career effects – may result in less working from home than we assume in the following example. However, the scenario serves as a benchmark should working from home indeed turn out to be a permanent change. In 2019 the vacancy rate across our 126 cities was 3.5%, clearly below a natural level of approximately 5%. Hence, pre-COVID there was an office space shortage in many cities. Somewhat lower demand would help to rebalance the market, although supply would also be cut in the coming years if demand fell sharply. However, demand could drop much more sharply and quickly than supply should working from home be substantially expanded. A simple example shows that when an office worker increases home working hours from 10% pre-COVID to 40% post-COVID, the number of “on-site” working days falls from 162 days to 120 days annually, i.e. by roughly 26% for each worker. Assuming that 50% of office workers are eligible for such flexible arrangements, demand for office space would fall by 13%. Assuming the average term of office contracts is 10 years and each year 10% of the contracts expire, then 1.3% of the office demand pre-COVID evaporates. This is roughly 2.4 million square meters (sqm) per year, whereas from 2009 to 2019 the total of rented sqm increased by roughly 1 million sqm in the 126 cities each year. Hence, working from home could clearly lead to a severe shock for the office market. Defaults could increase and might even create a threat to financial stability. From this perspective there is a trade-off between an extensive right to work from home for employees and financial stability.

Three cases for the real estate market show how details matter

Working from home is a multi-faceted topic with respect to property market implications. A thorough analysis requires taking into account the available space in the residential and office markets, constraints in the construction sector and the public infrastructure for commuting. There could be additional important issues such as the reallocation of demand for child-care and schools, among others. However, family-related issues and other more general topics related to the real estate market will not be considered here. We discuss three cases and focus in particular on the employers’ costs.

Case 1: Office workers work partially from home with their residential space and their office located in the same city.

Case 2: Office workers work partially from home with the traditional office in a regional capital of a metropolitan region while the home office is located in another city of the same metropolitan region.

Case 3: Office workers work partially from home with the traditional office in a city of a metropolitan region while the home office is located in a rural area of the same metropolitan region.

It is important to note that an enforceable right to work from home will reduce the employer’s operational expenses only if the costs for traditional offices exceed the costs for home offices. Otherwise if costs rise, employers may increasingly outsource activities, or if profit margins were already low pre-

² Hammermann, Andrea and Voigtländer, Michael (2020). Bürobeschäftigte in Deutschland. Eine Regionalanalyse. IW-TRENDS NR. 3. July 19.



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COVID, enterprises could even close their business. Hence, there is a trade-off between working from home and labour demand.

Case 1: Office rents exceed apartment rents in larger cities

Let us assume that in the long run the home office is the same size as the traditional office. The comparison of rents per square meter shows in which cities employers would be better or worse off. Many German apartment tenants have long-running contracts; sometimes they have been in place for several decades. Hence, the comparison of office rents with the actually paid apartment rents could be a basis to measure the costs of employers in the short run. However, we take a structural view and compare re-letting rents for apartments with re-letting rents for offices. The analysis is based on 2019 data, which may not reflect future developments in these markets. However, it is a helpful starting point.

In case 1 we compare prime rents and average rents. We define prime office rents as the average across prime rents in the central business district (CBD), the prime rents paid at the edge of the CBD, the prime rents at the periphery of the city and the prime rents in office centres. Average office rents are defined accordingly. Prime rents in the residential sector are defined as the top 3% of re-letting rents. Our analysis shows that in larger cities with more than 500,000 inhabitants, office space is generally more expensive than residential space. This is true in the prime segment as well as on average and it holds in particular for metropolises such as Berlin, Dusseldorf, Frankfurt am Main, Hamburg, Cologne, Munich and Stuttgart as well as other large cities such as Essen, Duisburg, Dortmund, Bochum, Leipzig, among others. The difference between office rents and apartment rents amounts to 1 to 5 EUR per sqm. The largest difference – double-digit figures – between office rents and rents for apartments exists in Berlin (Table 5).

There are three factors that explain the relatively expensive office rents pre-COVID. First, there is a headquarter effect as the great majority of large corporations have their headquarters in the large cities. These buildings are often more prestigious than others, they are of higher quality and therefore more expensive. They are often used not only for regular office work but also for larger client meetings and conferences. Second, we see a competition effect as highly qualified staff might also prefer better equipped and therefore more expensive offices. Third, a clustering effect seems to be at work. The key resource of business success is attracting highly qualified workers. Employees in turn prefer to work and live in cities with many interesting employment opportunities. In such an environment, highly specialised clusters emerge and this remains a key source of success even in the age of digitalisation. In Germany, examples are Frankfurt as a cluster for the financial industry in continental Europe, Munich and Stuttgart as clusters of the car sector and manufacturing industry and only recently Berlin as a hub for start-ups and IT firms. Such environments attract employers and employees. As a consequence, densely populated cities emerge where both office space and residential space tend to be scarce and expensive.

In our view, at least two of the three effects may persist even if working from home is the new normal. Companies may keep their headquarters as central locations for client meetings and important internal projects, as the centre of corporate communication and development of corporate culture. The competition effect could become less important if highly qualified employees also have a strong preference for working from home. However, it seems reasonable to expect that a large proportion of high-potential individuals want to climb the career ladder and are less interested in their work-life balance.

Case 1: Top 10 city office rents vs. rents for apartments, comparison

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Difference in EUR/sqm

Rank	City	Prime segment
1	Berlin	13.9
2	Dusseldorf	5.1
3	Hamburg	3.5
4	Frankfurt	3.1
5	Essen	3.0
6	Duisburg	2.9
7	Dortmund	2.3
8	Cologne	2.0
9	Mönchengladbach	1.9
10	Bochum	1.7

Rank	City	On average
1	Berlin	10.4
2	Dusseldorf	4.0
3	Hamburg	3.9
4	Munich	3.1
5	Duisburg	3.0
6	Dortmund	2.2
7	Essen	1.9
8	Mönchengladbach	1.6
9	Bochum	1.4
10	Leipzig	1.3

Sources: riwis, Deutsche Bank Research



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Therefore, highly qualified employees may still think that face-to-face interaction at the workplace and in after-work activities may be beneficial. Third, the clustering effect could become less important if a large share of the workforce prefers working from home and reduces the demand for living and office space in today's highly populated cities. As a result, demand for offices in the larger office markets might be less affected than in smaller office markets. In this context, it is important to note that metropolises (A-cities) account for more than 40% of the total office space in the 126 cities.

Case 1: In general the opposite holds in smaller cities

Case 1: Bottom 10 city office rents vs. rents for apartments, comparison

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Difference in EUR/sqm

Rank	City	Prime segment
117	Pforzheim	-3.6
118	Rostock	-3.7
119	Marburg	-3.8
120	Rosenheim	-3.8
121	Friedrichshafen	-3.8
122	Tübingen	-3.9
123	Reutlingen	-3.9
124	Trier	-4.1
125	Ingolstadt	-4.3
126	Konstanz	-4.9

Rank	City	On average
117	Bergisch Gladbach	-2.8
118	Passau	-2.9
119	Landshut	-2.9
120	Rosenheim	-2.9
121	Trier	3.0
122	Bamberg	-3.1
123	Ingolstadt	-3.4
124	Tübingen	-3.6
125	Konstanz	-4.1
126	Reutlingen	-4.1

On average, offices are cheaper than apartment rents in our sample of roughly 100 smaller cities. The median difference is EUR 1.1 per sqm on average and EUR 1.6 sqm in the prime segment. However, the largest difference is above EUR 4 per sqm in both segments. These cities with low office rents relative to apartment rents have a population of 100,000 or even less. They are presumably too small to attract large employers and trigger the headquarter, competition and clustering effects described above. An exception is Ingolstadt where the headquarters of the well-known automobile company Audi, a subsidiary of the Volkswagen Group, is located. However, many of the other cities are particularly attractive for commuters. Cities like Tübingen, Konstanz, Bamberg and others provide a very well-developed infrastructure for education and health and other essential elements of a good life. In many of these cities tourism may also play a role. It does not seem to be a coincidence that many of them are located in areas with relatively strong economic performance in southern Germany. Hence, office rents that are cheaper than apartments may not only be driven by relatively low office rents but also by relatively high apartment rents. Whatever the underlying causes, should working from home be the new normal, employers' cost would rise in the 100 smaller cities in case 1.

Case 1: Minimal, i.e. 12 sqm, home offices reduce costs

Let us now assume that employees accept smaller home offices than traditional offices. In our sample, the average size of a German office is 23.2 sqm per employee and the range is defined by 12.7 sqm in Görlitz to 32.9 sqm in Darmstadt. The average across the metropolises (A-cities) is more than 25 sqm whereas in the smaller cities (D-cities) the average is below 20 sqm. So in general offices are bigger in the larger cities and in the economic centres of Germany. National workplace regulations require that offices be at least 12 sqm per workplace.³ Assuming that each new home office is exactly 12 sqm, then in most cities the reduction in the required area clearly outweighs the differences in rents. Hence, working from home would help reduce operating expenses.

Case 1: But how to adapt living spaces?

There are 7.8 million office workers in our sample. Assuming 12-sqm large home offices, the total amount of additional living space would increase by more than 93 million sqm. To put this in context, in the 126 cities the completion of new living spaces over the entire house price cycle, i.e. over the last 11 years, amounts to little more than 80 million additional square meters. Hence, it seems absolutely infeasible to replace traditional offices with residential space for working from home. This statement seems true even if some dwellings already provide enough space for a comfortable home office or the home offices are shared by household members. Even a mere 10 million additional square meters -- which is roughly the new living space completed within one year pre-COVID -- seems unrealistic in the short run. For various reasons, there is a

³ Technische Regeln für Arbeitsstätten (Technical Rules for Workplaces) A1.2. www.baua.de

Sources: riwis, Deutsche Bank Research



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huge housing shortage in Germany, which seems to be a structural rather than a cyclical issue. Should traditional offices largely no longer be utilised, there would be enough space as the offices in the 126 cities occupy more than 180 million sqm. However, given the lack of qualified construction workers and the duration of approval processes, it would take many years and in some cases arguably more than a decade to convert traditional offices into living space. In short, this would be a Herculean task. An alternative solution could be that all office workers try to find an apartment that is large enough for working from home. But vacancy rates are low. They may rise if a large number of office workers move away from the cities as we discuss below. However, given the large housing shortage, it is hard to imagine that supply would exceed demand within a few years. We expect demand to also be driven by relatively high migration inflows post-COVID.⁴ So the housing shortage is likely to prevail for some years.

Trade-off between working from home and affordable housing as well as financial stability

Moreover, even if there were sufficient space available, the impact on rents and prices could be substantial. A large share – in some cities presumably even the majority – of tenants, were not affected by rising rents over the house price cycle that started in 2009. As already mentioned, some contracts cover decades and often landlords do not increase rents for an extended period of time. For example, in Berlin the average rent, due to the rent index, is roughly EUR 7 per sqm whereas the re-letting rent, i.e. the market level, is more than EUR 10 per sqm. As a result, in Germany many tenants pay rents far below the current market level. So a higher number of new tenancy agreements would very likely boost rents and prices in the residential market. Hence, there is a trade-off between working from home and affordable housing – another significant policy area, in particular one year ahead of the general election in autumn 2021. On the basis of the already-stretched valuations in some regions, in our view such a further boost could even unleash a boom-bust cycle in the housing market. So there might also be a trade-off between a right for working from home and financial stability. This argument is certainly relevant for case 1 and to a lesser extent it may also apply to the following cases.

Case 2: Office rents in regional capital vs. rents for apartments in the cities of the same metropolitan region

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Difference in EUR/sqm

Metropolitan region	Prime rents	Average rents
Berlin/Brandenburg	20.3	13.4
Munich	14.9	9.9
Rhine-Main	11.6	4.4
Rhine-Ruhr	11.2	7.8
Düsseldorf	11.0	7.6
Rhine-Ruhr Cologne	8.6	5.1
Stuttgart	4.0	2.3
Rhine-Neckar	3.1	3.3
Central Germany	2.5	2.2
HBGW	1.8	1.0
Nuremberg	1.7	0.6
Northwest	1.6	1.8

HBGW = Hanover-Braunschweig-Göttingen-Wolfsburg

Sources: riwis, Deutsche Bank Research

Case 2: Replacing the traditional office with a home office in the cities of the same metropolitan region reduces costs

In Germany there are 11 metropolitan regions with more than 50 million inhabitants. Table 7 provides an overview of the regions and their cities. In case 2 we assume that the traditional office is located in the regional capital, which is defined as the most expensive office market in each metropolitan region. We further assume that the employee has the home office in another city in the same metropolitan region. As in the first scenario, we start by assuming that the home office has the same size as the traditional office. This allows us to focus on the comparison of rents. We also distinguish again between prime and average rents. The clear message is that the office rent in the regional capital exceeds the average of apartment rents in the other cities of the metropolitan region. The difference is particularly large in Berlin and Munich. Both cities have some sort of a 'beacon' function within their regions. By contrast, cities like Heidelberg, the regional capital of Rhine-Neckar and Nuremberg in Franconia are surrounded by cities in the metropolitan region that are in many respects quite similar to the regional capital. As a result, the gap between office rents in the regional capital and apartment rents in the surrounding cities is relatively

⁴ Möbert, Jochen (2020). Immigration may increase the population up until 2030. Is India becoming the most important country of origin? Germany Monitor. Deutsche Bank Research. July 13.



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small. So the interim conclusion is that for an employee who is a commuter and lives in the metropolitan region but not in the regional capital, working from home could reduce the employers' costs. However, the extent of potential savings depends on employers' willingness to at least partially abandon their main office buildings. Hence, we believe the cost reductions would be small, as this is rather unlikely. If the office size were 12 sqm then, as in case 1, working from home would clearly reduce employers' costs.

Germany's 11 metropolitan regions

8

Metropolitan Region	Centre (=most costly office rents)	Cities of the Metropolitan Region
Berlin/Brandenburg	Berlin	Brandenburg an der Havel, Cottbus, Frankfurt (Oder), Potsdam
Rhine-Ruhr	Dusseldorf/Cologne	Bochum, Bonn, Dortmund, Duisburg, Essen, Gelsenkirchen, Hagen, Hamm, Krefeld, Mönchengladbach, Oberhausen, Wuppertal
Rhine-Main	Frankfurt	Aschaffenburg, Darmstadt, Gießen, Hanau, Mainz, Offenbach am Main, Wiesbaden
Hamburg	Hamburg	Lübeck, Lüneburg, Neumünster, Norderstedt, Schwerin, Wismar
Munich	Munich	Augsburg, Freising, Ingolstadt, Landshut, Rosenheim
Stuttgart	Stuttgart	Esslingen am Neckar, Heilbronn, Ludwigsburg, Reutlingen, Tübingen
HBGW	Hanover	Braunschweig, Celle, Göttingen, Hildesheim, Salzgitter, Wolfsburg
Nuremberg	Nuremberg	Bamberg, Bayreuth, Coburg, Erlangen, Fürth, Hof (Saale), Weiden i.d.OPf.
Northwest	Bremen	Bremerhaven, Delmenhorst, Oldenburg, Wilhelmshaven
Central Germany	Leipzig	Chemnitz, Dessau-Roßlau, Gera, Halle (Saale), Jena, Zwickau
Rhine-Neckar	Heidelberg	Mannheim, Ludwigshafen am Rhein, Neustadt an der Weinstraße, Worms

Note: *italic* = not available in our data base, HBGW = Hannover-Braunschweig-Göttingen-Wolfsburg

Source: Deutsche Bank Research

Case 3: Replacing the traditional office in the 126 cities with a home office in the rural area of the same metropolitan region could reduce employers' costs

It is obvious that even larger cost reductions could be achieved if the home office were located in the rural areas of the metropolitan region. However, rental data is missing for rural areas in Germany. A broad benchmark is the annual report on housing allowance and rents published by the government.⁵ In its latest report, the average re-letting rent for apartments across Germany was EUR 6.27 in 2017. Taking into account the rental inflation and differentiating the new from the old federal Länder (former East Germany) which is also available in the report, the 2019 average rent was EUR 5.88 in the new Länder and EUR 6.68 in the old Länder.⁶ In our bulwiengesa universe the average rent for

⁵ Wohngeld- und Mietenbericht 2018. Downloaded on 30 July 2020. bmi.bund.de

⁶ This number takes into account the rents in our 126 cities where in general rents are higher than in the rest of Germany. On the other hand, we assume that office jobs are better paid than other jobs on average and that office workers spend more on housing than the average worker. Due to the lack of more detailed data, we assume that EUR 6.45 is a useful approximation for the analysis.

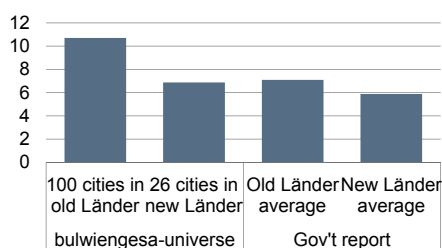


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Case 3: Average apartment rents

9

EUR/sqm

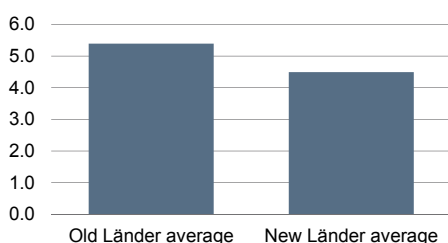


Sources: bulwiengesa, Deutsche Bank Research

Case 3: Non-bulwiengesa universe: Average apartment rents in rural area

10

EUR/sqm



Sources: bulwiengesa, Deutsche Bank Research

Case 3: Top 20 office rents in 126 cities vs apartment rents in rural area

11

Rank	City	Difference in EUR/sqm
1	Berlin	16.4
2	Munich	15.2
3	Hamburg	10.2
4	Dusseldorf	9.5
5	Frankfurt	9.2
6	Stuttgart	8.0
7	Heidelberg	7.0
8	Cologne	6.7
9	Potsdam	5.9
10	Bonn	5.5
11	Freiburg	5.3
12	Mannheim	5.0
13	Wiesbaden	5.0
14	Ulm	4.8
15	Mainz	4.7
16	Jena	4.6
17	Dortmund	4.6
18	Nuremberg	4.4
19	Leipzig	4.2
20	Darmstadt	4.1

Sources: riwis, Deutsche Bank Research

apartments is EUR 7.1 for the new Länder and EUR 10.7 for the old Länder. Based on population ratios⁷, we calculate average rents in the non-bulwiengesa universe, which consists of towns and the rural area where the average re-letting rent for apartments is EUR 4.5 in the new Länder and EUR 5.4 in the old Länder. These figures include non-metropolitan areas and therefore exaggerate cost reductions. However, we think both rent levels are a good approximation for the periphery of many metropolitan regions.

The comparison of office rents in the 100 cities in the old Länder and the 26 cities in the new Länder with apartment rents in the non-bulwiengesa universe shows that office rents are more expensive on average. In the old Länder the difference is EUR 3.1 sqm and in the new Länder EUR 2.1 sqm. In the metropolises (A-cities) office rents are on average EUR 10.7 per sqm higher than rents for apartments. The difference is EUR 4.1 in B-cities, EUR 2.9 in C-cities and EUR 1.3 per sqm in D-cities on average. Each city group contains both cities in the old and new Länder. Apartment rents in the peripheral rural area of the metropolitan area exceed office rents in only 9 cities. All are located in relatively weak economic regions with relatively small office markets. So the interim conclusion of case 3 is that employers could reduce costs where the traditional office is located in one of the 126 cities and the home office is located in peripheral towns or rural areas of the same metropolitan area. So in general the employer could reduce operational expenses and, of course, the savings are particularly large if the size of the home office is only 12 sqm.

There is also a fourth case where the traditional office is not in the regional capital of a metropolitan region and the home office is in the rural area or at the periphery of the same metropolitan region. In this case the cost reductions are smaller than in case 3. Hence, case 3 is the one with the highest potential cost reductions and we focus on this case.

Metropolitan regions have many more vacancies

Despite the housing shortage in the cities, there are areas with a large number of vacant dwellings. According to the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) there are roughly 2 million vacant dwellings in Germany.⁸ This is about 5% of the total housing stock. However, the vacant dwellings are very unevenly distributed across Germany. As a very rough guidance, the vacancy rates in the largest cities such as Berlin, Hamburg and Munich are clearly below 1%. In and close to the other economic centres such as Cologne, Dusseldorf, Hanover, Frankfurt and Stuttgart they are below 2%. In southern Germany without Stuttgart and Munich and their neighbouring counties the vacancy rates are roughly 3%, in the rest of west Germany it is very diverse, between 4 and 8%, and in eastern Germany excluding Berlin and its neighbouring counties and also excluding some large cities such as Dresden and Leipzig the vacancy rate is 10% and more.

Hence, any shift in demand towards the periphery of the metropolitan regions or even beyond their borders into the non-metropolitan areas would be helpful in reducing the price pressure in the German housing market. To put this in context, the reduction of the vacancy rate by 1pp is equivalent to 38.8 million sqm. Above we showed that if each office worker needed an additional 12 sqm of living space, then the 7.8 million office workers would require more than 93 million sqm for their home office. However, a large part of the vacancies lies outside the metropolitan region. As a consequence, vacant dwellings outside or

⁷ Population in old Länder: 70.6 m, in new Länder: 12.5 m. In the bulwiengesa universe the population in the old Länder is 22.7 m and in the new Länder 7.3 m. In the non-bulwiengesa universe the population is 47.9 m and 5.2 m, respectively.

⁸ According to BBSR there were 2.14 m (5.2% of the complete housing stock) vacant dwellings in 2017. www.staedtebauforderung.info downloaded on July 30, 2020.



Working from home: Be careful what you wish for

Case 3: Top 14 Annual cost reductions per employee (all above EUR 2000) **12**

Rank	City	EUR per Employee
1	Berlin	5332
2	Munich	5329
3	Stuttgart	4073
4	Dusseldorf	4001
5	Frankfurt	3731
6	Hamburg	3669
7	Potsdam	3202
8	Darmstadt	2975
9	Bonn	2637
10	Heidelberg	2572
11	Cologne	2530
12	Wiesbaden	2481
13	Duisburg	2369
14	Mainz	2085

Sources: riwis, Deutsche Bank Research

at the periphery of the metropolitan region are too distant for many commuters. Nevertheless, there is also good news for commuters between the 126 cities and the rural areas. Should working from home become the new normal, the current infrastructure should be clearly sufficient post-COVID. Currently, the most applied working from home model is staying at home for one to three days per week and working in the traditional office for the rest of the week. Hence, the utilisation rate of the infrastructure should decline more through the office workers who work from home and already live in the rural area of the metropolitan regions than through additional workers who would relocate their residence to these areas and commute into the traditional office for the rest of the week.

Annual costs per employee could fall substantially ...

Our analysis shows that working from home could reduce employers' costs related to the real estate market. While employers' costs decline in cases 1 and 2, case 3 presents potential for particularly large savings. In this case operational expenses fall in under three conditions. First, if the home office is smaller than the traditional office. Second, if the home office is located in an area with relative low residential rents and third, if the traditional office is fairly expensive. The annual cost reductions in case 3 are typically around a few hundred and in some cities even a few thousand euros per employee on average. The cost reductions per employee across cities are very unevenly distributed. Assuming 12 sqm home offices, there are 22 cities where the annual cost reduction per employee in euro is between 0 and 500, 42 cities between 500 and 1,000, 26 cities between 1,000 and 1,500 and 22 cities between 1,500 and 2,000. At the tail end of the distribution, there are also 14 cities with a more than EUR 2,000 annual cost reduction per employee. The maximal annual cost reduction of EUR 5,332 could be achieved in Berlin. These savings could help strengthen operational profitability post-COVID. If we assume case 3 and home offices of 12 sqm, then the total annual cost reduction of all 126 cities would amount to almost EUR 20 bn (~1.1% of total annual compensation across all employees⁹ or ~0.6% of GDP).¹⁰ In case 3 we can distinguish the size effect, i.e. the cost reductions due to downsizing of the home office, from the pure rent effect, i.e. cost reductions due to lower apartment rents than office rents. The rent effect amounts to roughly EUR 15 bn and the size effect to a little more than EUR 5 bn.

... but many obstacles to working from home as the new normal

However, many obstacles might result in much lower cost reductions than calculated above. First, as already argued above many companies might not abandon their headquarters as it is a central location for non-standard office work such as client meetings, internal strategic projects and for corporate communication in general. Accordingly, while they are a first

⁹ Gross wages and salaries plus employer contributions to the social security system.

¹⁰ The office market in Berlin has in each case a relatively large impact on the cost reductions in Germany. First, as shown above the difference between office rents and residential rents is particularly large. Second, with 19.4 million sqm it is the largest office market in Germany and accounts for roughly 10% of the total area in the 126 cities. Hence, excluding Berlin reduces the cost reductions substantially. For example, in case 3 it falls to EUR 15.6 bn.

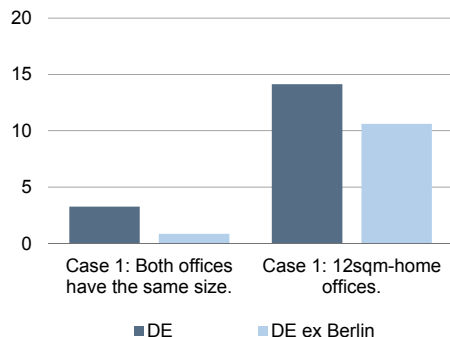


Working from home: Be careful what you wish for

Case 1: Employers' costs reduction from working from home

13

EUR bn (total of 126 cities)

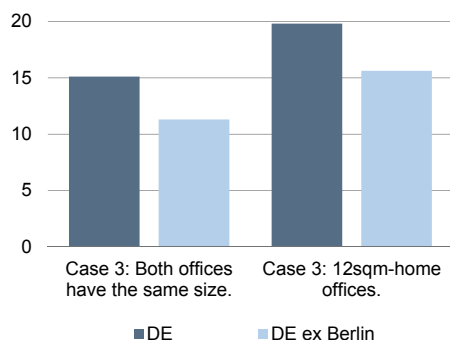


Sources: bulwiengesa, Deutsche Bank Research

Case 3: Employers' costs reduction from working from home

14

EUR bn (total of 126 cities)



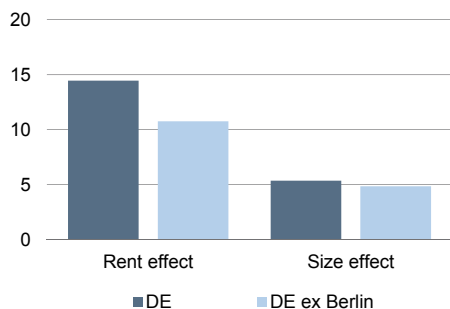
Employers' costs can also be reduced in case 2. Obviously, the cost reductions are smaller than in case 3.

Sources: bulwiengesa, Deutsche Bank Research

Case 3: Rent and size effect

15

EUR bn (total of 126 cities)



Sources: bulwiengesa, Deutsche Bank Research

benchmark, our figures might overestimate the actual savings. This holds in particular in the metropolises and also the regional capitals. Second, if employees move to the periphery of the metropolitan regions, then even if there is no housing shortage, rents are likely to rise, which again would lower potential cost reductions. Third, we compared office rents with apartment rents. However, many office workers might be interested in a house in towns and rural areas, which might be more costly. Fourth, initially we ignored the cost for providing equipment. However, if the employer has to provide the equipment for home offices under the working from home regime, employers' operational expenses will increase. For example, if the workforce is split in two groups that both work half of the time at home and half of the time in the traditional office, then the necessary equipment increases to 150% of the pre-COVID level. Fifth, while we assumed at the beginning that there are no productivity differences between traditional work and working from home, we do not believe this holds in the long run. If employees live far away, then a lower level of communication within teams could reduce output. Likewise, the development and fostering of a corporate culture as well as the integration of new joiners could be cumbersome. Another possible problem is that the costs of commuting could considerably rise and further increase the preference of employees to work from home. We could also imagine higher demand for larger office rooms as there is a greater need to regularly gather complete teams to guarantee an efficient collaboration. Sixth, if office workers – with the increasing physical distance to their colleagues and bosses – are emotionally less attached to their employer, then job-hopping may increase, at least among highly qualified employees with excellent job prospects. This could also weigh on productivity. Seventh, if working from home is the new normal, then office rents may fall, which again makes working from home less attractive from an employer's perspective.

Interim summary of the impact on businesses

Today's mobile working is a useful tool to stay safe and manage the crisis. However, the current working from home regime as discussed in Berlin could require the employer to pay for IT equipment, office furniture in the home office and most importantly additional living space under the current legal framework. Our analysis shows that working from home can reduce costs. But substantial reductions can be achieved only if office workers live in or move to the peripheral areas of the metropolitan regions. If the obstacles above reduce the potential cost reductions, then the overall benefit for employers seems relatively low. This holds in particular should productivity fall in the long run. If profitability – rather than costs -- are reduced, there will be a trade-off between working from home and demand for labour. Hence, an enforceable legal right as planned by Federal Minister Hubertus Heil could create additional cost for businesses and may weigh on the recovery. After the historic economic crash in the second quarter of 2020, we believe it would be wise to postpone any further burden for employers until the labour market is back to full employment and profit margins have normalised.

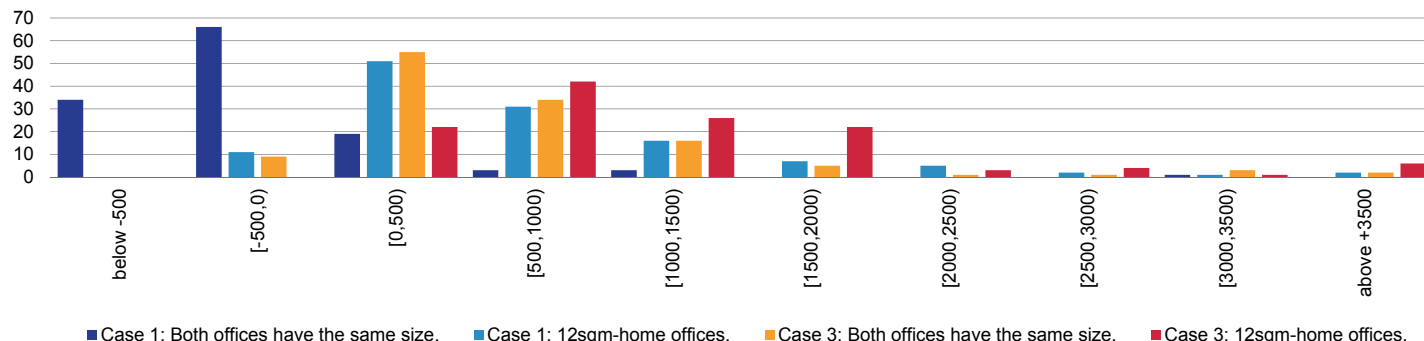


Working from home: Be careful what you wish for

Annual cost reduction per employee

16

y-axis: # of cities (sample includes 126 cities)
x-axis: cost red. in euro per employee per year



Sources: bulwiengesa, Deutsche Bank Research

Summary and conclusion

It is clear that many employees have a strong preference for working from home as it benefits their work-life balance. However, at the beginning of the corona crisis, many employees stayed at home under a mobile working regime. This does not imply an enforceable right for the employee to be compensated for equipment and living space. By contrast, the proposal of the Federal Labour Minister may include such a right under a teleworking regime. It is understandable that many politicians aim to establish such a framework for their voters. But our analysis shows many downsides of rapid implementation. In many cases employers' costs are likely to increase, providing an incentive to reduce their workforce. At the moment, the primary and overarching objective should be to strengthen the recovery to get back to full employment. Thus, we believe an enforceable right to work from home should be introduced very gradually over the coming years. It might be helpful to introduce a right for mobile working as an interim step instead of teleworking, which implies that the employer has to compensate employees. This avoids employers facing a trade-off between working from home and higher labour costs. A widespread teleworking regime would be another boost for an already tight and to some extent overvalued housing market. This could be avoided by a more limited right for mobile working. For example, at the beginning the enforceable right for mobile working could be restricted to one day per workweek. This would also ease the trade-off between teleworking and affordable housing. Likewise, the demand for traditional offices under a mobile working regime may fall less. Both the somewhat higher demand in the office market and the potentially lower demand in the housing market under a mobile working regime should also have positive effects for financial stability. So our conclusion is that a very worker-friendly enforceable right for teleworking regime could have many unintended side effects. In this respect, we would advise politicians and voters: Be careful what you wish for.

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