

Berlin economy and labor market



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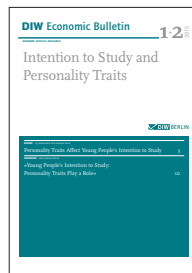
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NEXT ISSUE OF DIW ECONOMIC BULLETIN

Brexit and its consequences

Transforming Berlin from a startup hub into an economically thriving metropolis

By Marcel Fratzscher, Martin Gornig, Ronny Freier, and Alexander S. Kritikos

After a long period of stagnation, Berlin achieved an economic turnaround—and today, the city is on a stable growth path. Economic performance, employment, and the population are increasing at above-average rates for the first time in years; as well, the city has regained fiscal space and unemployment is on the decline. All the same, Berlin's unemployment rate remains above the national average, and public debt is still extremely high; as well, the city is lagging behind when it comes to productivity, and thus to average wages and income levels. In fact, Berlin is the only European capital whose productivity situated below the respective national average.

To effect any major changes, the city will need to improve especially the growth conditions for young companies, bulk up the stock of potential workers with intermediate-level qualifications, and above all else, carry out the pending infrastructure upgrades. If this all plays out successfully, positive developments can be expected for Berlin in the coming decades.

Berlin's economy experienced uneven development in the years following reunification. When the Wall came down, euphoria swelled among the German people, and the future looked bright: the real estate market was booming. But disillusionment set in when it became clear that Berlin was not actually experiencing an economic recovery: instead, it was losing ground against the rest of the country in terms of economic performance.

After the turn of the millennium, however, many people—particularly young adults—began discovering Berlin, and more and more came to study, live, and work in the capital. In the context of the overall nationwide urban renaissance,

Germany's capital was now also able to attract new impulses for growth.¹ By 2005 the economic turnaround was complete, and from then on the federal capital's economic performance grew at above-average rates.

Increasingly, Berlin was topping the list of German metropolitan regions in terms of growth. Between 2005 and 2013, Berlin's GDP grew by nearly 30 percent—not only faster than the national average, but also stronger than that of virtually any other urban region in Germany (Figure 1). Even prosperous cities like Munich, Stuttgart, and Hamburg were outpaced by Berlin's dynamic, and by 2013 only Leipzig was exhibiting higher rates of growth. In the past two years as well, Berlin has continued to grow at significantly faster rates than have the other city-states, or even Germany as a whole.

The number of employed persons in Berlin increased by 290,000 between 2005 and 2015, which corresponds to a growth rate that exceeded the national average.² The past two years alone saw the addition of 70,000 new employees, or roughly 35,000 per year. These increases led to a drop in Berlin's unemployment rate, which fell from 19 percent in 2005 to less than 11 percent by 2015.

But because Berlin's potential labor force has also increased significantly, the unemployment rate has not decreased across the board. One reason is that in 2014—that is, even before the recent massive refugee influx—the

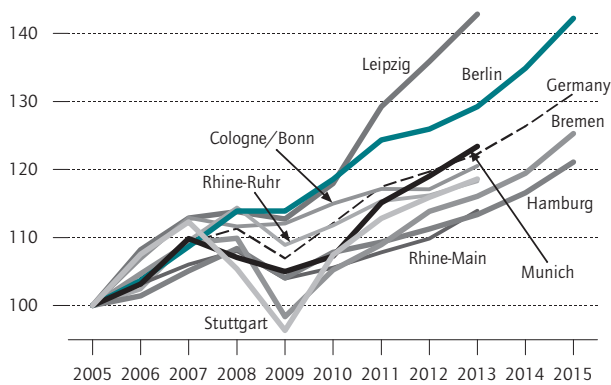
¹ Geppert, K. and M. Gornig (2010): More People, More Jobs: Urban Renaissance in Germany, Weekly Report 22, p. 173–181.

² For more on this topic, see the corresponding in this edition of the EB: Brenke, K. (2016): The Berlin labor market since 2005: strong employment growth yet unemployment remains high, incomes low. DIW Economic Bulletin 29+30.

Figure 1

Gross domestic product in agglomerations

Index 2005 = 100



Sources: National Accounts of the Länder, calculations of the DIW Berlin.

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From 2005 to 2015, Berlin's economic growth was well above the national average.

net immigration to Berlin from within Germany and beyond amounted to 55,000 people, more than five times as many as one decade earlier. Occupations for which intermediate-level skills are required have become more prevalent, and thus unemployment has dropped among such workers. Berlin's high unemployment rate, which is still higher than that of Germany as a whole, can thus be attributed to the increasing numbers of unemployed low-skilled workers.

Berlin's economic growth has gradually improved the city's budgetary situation; in some years, a share of the surpluses was directed into special assets used for covering investment requirements. There nevertheless remains an urgent need to catch up, since as part of the fiscal consolidation, Berlin was investing far too little over the course of years and instead living off the reserves. Berlin and its public companies are still investing relatively little in infrastructure³—just 807 euros per inhabitant—while in Hamburg, this figure stood at 1220 euros in 2014.

³ For more on this topic, see the article in this issue by Freier, R. et al. (2016): Public investment in the Berlin state budget: education and transport are falling short. DIW Economic Bulletin 29+30.

Apart from tourism, Berlin's primary growth drivers include the cultural industry, the Internet economy, and research-intensive industries.⁴ These developments can be traced back to the recent proliferation of new companies in Berlin, which has since become known as a hotbed for startups⁵: many businesses with innovative potential have emerged, transforming the city into an internationally recognized magnet for creatives. Helping these startups transition into fast-growing companies, however, has proven to be a challenge.

But the development process facilitated by startups and basic service providers also highlights a crucial problem in Berlin's growth patterns: its weak productivity. A sustainable increase in the per-capita economic output has not yet materialized. On the contrary, the productivity gap between Berlin and the national average has actually expanded somewhat since 2005, when Berlin's productivity was four percent below average; in 2014, this figure amounted to more than five percent. A convergence of this gap during the global financial crisis in 2009 was short-lived.

These factors all make for an unusual situation—internationally speaking—in which a national capital exhibits a lower economic performance than does the country as a whole. In each of the other EU countries, the capital region's productivity is well above the national average. In London, the difference amounts to 63 percent; in Paris to 35 percent; and in Warsaw, to 33 percent. Madrid and Rome exhibit rates that are at least eleven and six percent higher, respectively, than the national averages (Figure 2).

The main factors used to determine the level of productivity are the value-added shares of research-intensive industries and knowledge-intensive services, respectively, as well as the sizes of the companies themselves.⁶ In all three parameters, Berlin continues to exhibit shortcomings, especially when it comes to the size of its local companies,

⁴ Gornig, M. et al. (2012): *Datenanalyse zur Berliner Wirtschaft*. DIW Berlin – Politikberatung kompakt 62.

⁵ For more on this topic, see the article in this issue by Kritikos, A. (2016): Berlin: a hub for startups but not (yet) for fast-growing companies. DIW Economic Bulletin 29+30.

⁶ Gornig, M. et al. (2013): *Wirtschaftsentwicklung in Berlin: Szenario 2030*. DIW Berlin – Politikberatung kompakt 77.

which are significantly smaller than those of comparable regions. The absence of large corporate headquarters and major production sites in Berlin has primarily historical origins—that is, in the division of Germany and its consequences.

Nevertheless, it is entirely possible to establish large firms in Berlin. There is hope that the Brexit will have positive consequences for the German capital, since companies will need to relocate their London headquarters to other major cities in the EU. Experience has shown, however, that most companies—especially larger ones—only rarely relocate their headquarters when similarly important framework conditions change. To improve Berlin's productivity, and thus its income levels, it is therefore critical to facilitate the growth of companies that are already based in the city—and the pervasive startup culture has created ideal conditions for this.

By examining the three topics addressed in this edition of the Economic Bulletin—startups, the job market, and public investment—a number of strategies can be derived for improving the growth conditions for companies in Berlin.

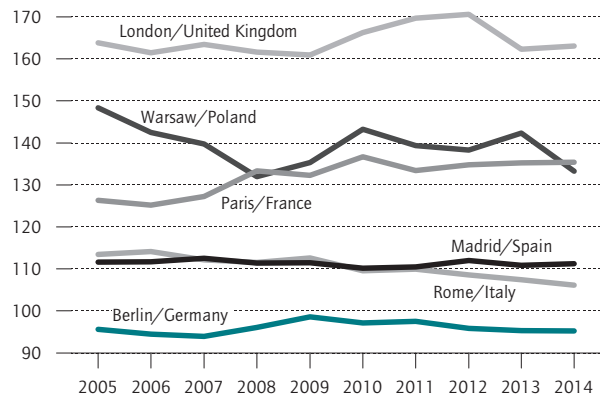
Even if the city is already doing a lot to support and make itself into a more attractive location for innovative startups, complementary measures are needed, especially when companies are transitioning from the startup phase to the growth phase. Such measures include the provision of high-quality commercial and industrial areas and the improvement of business-related administrative procedures in a service-oriented manner. These include the introduction of fast-track procedures and of electronic processes by the public administration.

There is also a need for action when it comes to providing startups and young companies with access to risk capital. Despite the strong increase in volumes granted in the recent past, Berlin companies run into difficulties when securing venture capital for their growth phases. This is especially true for companies specializing in business-to-business (B2B) transactions. In this case, it is about not only persuading the Federal Government and improving the regulatory requirements (such as those

Figure 2

Gross domestic product per employee

Relation between the capital and the nation,
Relevant national average = 100



Sources: EUROSTAT, calculations of the DIW Berlin.

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With the exception of Berlin, European capitals' productivities exceed their respective national averages.

related to taxation as well as the protection of “minority investors”), but also improving the supply of venture capital in this segment through targeted collaborations (e.g. with the predominantly state-funded High-Tech Gründerfonds).

A starting point for the support (coaching) of fast-growing companies is an active location marketing, which applies especially to companies that are moving out of technology parks and seeking new locations. Monetary incentives for the district administrations, which coordinate the land use, could be offered to these fast-growing companies.

Apart from changing its administrative and financial factors, Berlin needs to be further developed as a location for research and higher education, particularly with regard to natural sciences and technology as well as IT. Special attention should also be given to facilitating networks with innovation-oriented startups and fast-growing companies. The planned collaboration in the case of *Stiftungsprofessuren* (endowed professorships) as part of the digital agenda can make a major contribution here.

In the medium term, the discrepancy between high public research and development spending and below-average private spending should be reduced.⁷ An important step in this direction could be taken by establishing the research departments of large multinationals in Berlin. Although there has already been some success here, policy needs to make the recruitment of such establishments into a higher priority.

As well, Berlin's universities have only been offering dual degree programs to a limited extent. These programs could be increasingly used not only for providing the younger generation with a work-oriented academic education, but also for offering opportunities to employed workers who want to supplement their professional skills with additional academic qualifications—for example, through technical or craftsman training. A correspondingly more accessible and somewhat more practical university education could more effectively keep pace with the rapidly changing qualifications requirements.

From the perspective of fast-growing companies, another starting point lies in attracting professionals from within Germany and abroad. For example, regularly held and internationally oriented job fairs should be established through the recently developed *Talent* portal, because Berlin is one of Europe's largest and most attractive labor markets.

Overall, Berlin possesses a more highly skilled labor force than does any other state, or even other European capitals. But there are also significant weaknesses: these include not only the city's many low-skilled unemployed workers, but also the fact that companies are not offering nearly enough training opportunities. In school performance comparisons among all German states, Berlin regularly winds up at or near the bottom. As well, the proportion of young people who drop out of school is far above the national average.

What's needed is an education alliance for which employers would commit to providing sufficient apprenticeship

opportunities. In return, the Senate has agreed to make general education schools more performance- and career-oriented and resolve the large education investment backlog as quickly as possible. Although the special commission *Ausbildungsplatzsituation und Fachkräftesicherung* ("apprenticeship positions and securing skilled personnel") represents a step in the right direction, their objectives are too narrow to quickly eliminate the existing lack of training, and too vague when it comes to improving the quality of education in the schools.

Berlin's growth—specifically with regard to its economy—requires the modernization and expansion of infrastructure beyond the business world (which includes eliminating the above-mentioned education investment backlog). But residential infrastructure also plays a key role here, not least because cheap real estate is one of Berlin's major advantages as a business location. The increase in central Berlin's real estate costs cannot be effectively counteracted through pricing restrictions; what's needed is an increase in supply, which can be achieved through a greater densification, among other possibilities.⁸ An improvement in the transport links between Berlin and Brandenburg could increase the surrounding area's appeal for residential and commercial usage, thus reducing the use conflicts of Berlin's real estate.

Berlin's increasing capital expenditure also needs to be addressed. There needs to be an improvements in management efficiency, which will catalyze the process of making resources available for investment. The recent demographic changes have necessitated a reorganization of Berlin's civil service, which in turn provides opportunities for policy restructuring. These should be taken advantage of.

For mobilizing investment resources for public infrastructure development, the establishment of further special funds is a viable option.⁹ To accelerate the implementation of investment projects, however, an outsourced expansion plan—such as the one used by Hamburg for its school system—should be considered. Further efficiency gains in

⁷ Geppert, K. and M. Gornig (2012): *Wettbewerb der Regionen – Berlin auf einem guten Weg*. In: *Städte und Regionen im Standortwettbewerb*. Hannover: Akademie für Raumforschung und Landesplanung, p. 142-162.

⁸ Kholodilin, K. A. et al. (2016): *Die Mietpreisbremse wirkt bisher nicht*. DIW Wochenbericht 22, p. 491-499.

⁹ Fratzscher, M. et al. (2015): *Overcoming weaknesses in municipal investment*. DIW Wochenbericht 43, S. 1019-1021.

infrastructure development can be made by improving the control capabilities and evaluation options, which in turn can be achieved through the abolition of cameralistics and the implementation of double-entry bookkeeping. As well, Berlin should exploit all funding opportunities to facilitate a rapid and extensive expansion of high-speed digital networks.

Marcel Fratzscher is President of the German Institute for Economic Research (DIW Berlin) | mfratzscher@diw.de

Martin Gornig is Deputy Head of the Department Firms and Markets at DIW Berlin | mgornig@diw.de

If Berlin succeeds in carrying out the planned infrastructure upgrades, in improving the institutional framework conditions for fast-growing firms and in strengthening the labor supply United Kingdom apprenticeship training it will have many auspicious decades up ahead—even if it will likely be several years before the productivity and income levels can be raised sustainably.

Ronny Freier is Research Associate in the Department of Public Economics at DIW Berlin and Assistant Professor in the Department of Economic Policy at FU Berlin | rfreier@diw.de

Alexander S. Kritikos is Research Director at DIW Berlin | akritikos@diw.de



Prof. Dr. Martin Gornig,
Deputy Head of the Department
of Firms and Markets at DIW Berlin

NINE QUESTIONS TO MARTIN GORNIG

»Berlin needs to tap into its research potential to improve economic performance«

1. Mr. Gornig, there appear to be some contradictions in Berlin's economic situation. On the one hand, Berlin is a boomtown characterized by a flourishing tourism industry and ever-increasing real estate prices; on the other hand, unemployment is high and wages are low. What's actually going on here? *Both impressions are correct. Berlin is experiencing massive growth at high rates, but the city is still recovering from a prolonged downswing. Accordingly, economic performance is low and unemployment is still above the national average.*
2. In which sectors is the labor market thriving, and in which is it having more difficulty? *There is definitely a lot of variation here. We do have relatively dynamic development in some areas—such as tourism—where even lower-skilled workers can find employment; on average, however, high-skilled workers are the ones finding jobs in Berlin, while lower-skilled workers are running into difficulties.*
3. Why are wages in Berlin so low? *The city's history plays a role: after reunification, Berlin continued to exhibit relatively low wage levels. Another is that as dynamic as the city is, it still lacks the kinds of large companies that tend to pay above-average wages. The presence of such businesses would raise the region's overall income levels, but they're thin on the ground in Berlin—at least for now.*
4. Berlin has become known as breeding ground for startups. Is this really the case? *You could say so, but the situation varies depending on the sector. In some areas, Berlin is at the forefront—at the global level, as well—but in others, such as business-to-business transactions, this is not the case. Nevertheless, the IT industry is thriving and Berlin remains one of Europe's leading business incubators.*
5. What can Berlin do to nurture these startups—these delicate saplings, so to speak? *First of all, the garden is actually in good shape: the soil for new business is fertile, and the city does quite a lot to help the seeds to take root. What we need is for the seeds to do more than simply sprout: the plants must also experience rapid growth. In essence, Berlin needs fast-growing companies to increase the city's overall performance capacity.*
6. Berlin doesn't have the most stellar reputation when it comes to public investment in projects—like the BER airport or the renovation of the Staatsoper. What's the overall investment situation? *There is simply not enough investment. When we do invest, we're actually almost always focusing on the right areas—but we're just doing it all wrong. For example, the need for an airport is indisputable, yet the way it's been playing out is an absolute disaster. This has been the case for other projects as well.*
7. How can Berlin create a more sustainable prosperity? *Above all, public investment needs to be increased, stabilized, and better planned and organized than before. A more efficient organization of investment—so that we are investing not only in the right areas, but also in the right ways—is critical for Berlin's future.*
8. How does Berlin compare to the other city-states? *When it comes to investment activity, Berlin does not stack up particularly well, and even the level of investment is well below those of the other city-states. At the same time, there's clearly a lot of momentum in Berlin, and the existence of the special assets is an indication that the city has the intention to invest.*
9. In which areas does Berlin have the most potential? *Berlin's greatest potential lies in the broad scope of its training and research. This is the raw potential in which everything else is rooted, as it facilitates the growth of knowledge-intensive services and research-intensive industries from various sectors. These in turn form the basis for Berlin's future success.*

Interview by Erich Wittenberg

The Berlin labor market since 2005: strong employment growth yet unemployment remains high, incomes low

By Karl Brenke

Over the past ten years, the number of employed in Berlin has increased more dynamically than it has anywhere else in the country, resulting in a decrease in unemployment. But because the city's potential labor force has also experienced considerable growth, Berlin's unemployment rate remains well above the national average. Since jobs requiring intermediate qualifications have become more prevalent, this high unemployment rate is being influenced more and more by the increasing numbers of Hartz-IV recipients and low-skilled workers as well as academics.

Berlin's strong employment growth has been facilitated by the fact that the productivity gains are low, even in a nationwide comparison. This is also likely one of the reasons that Berlin is still behind when it comes to wages. The weak productivity development also indicates an insufficient innovation capacity that is preventing Berlin from achieving the economic power and income levels that would befit a national capital. Now and in the future, such a transformation requires a well-qualified workforce—which is why policymakers' highest and most urgent priorities should include combating the glaring lack of apprenticeships as well as improving the quality of local schools and vocational training.

Berlin's economy experienced uneven development in the years following the reunification. When the Wall came down, euphoria swelled among the people. The future looked bright: the real estate market was booming, and the state government was spending with abandon. But it wasn't long before investors' expectations proved to be overblown, and by the mid-'90s, the construction industry had collapsed. Berlin's politicians realized that unless they were able to get municipal spending under control, they were going to run the city into the ground.

After the illusory boom, the structural problems of the Berlin economy became more and more apparent. In Berlin's former East—like everywhere else in the former GDR—industry suffered from insufficient competitiveness. In the West, a major part of industry was only able to establish itself with high levels of subsidies, and only built subsidiary functions of production [*Werkbankfunktionen*]. The service sector was focusing almost exclusively on the regional market, and the public sector was carrying great importance. Berlin did benefit from being designated as the new German capital, but due to high levels of debt, the city had to start implementing austerity measures. This ushered in decade-long economic downturn that was only briefly interrupted by an economic peak around the turn of the millennium—though this moment of prosperity was relatively weak in Berlin. It wasn't until 2005 that this situation began to change.

The following analysis focuses primarily on the time period since then. Structures and developments in Berlin are compared with those in Germany on the whole as well as similar cities, depending on the data available.

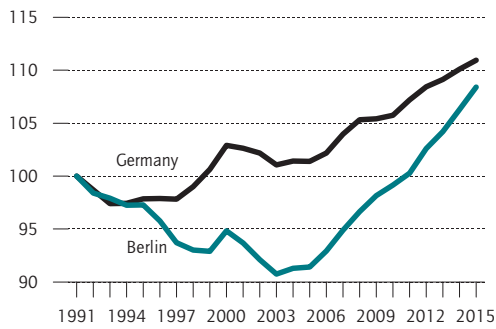
The past ten years: above-average employment growth

Due to the massive job loss in East Berlin that resulted from the structural transformation, the number of employed persons in Berlin dropped immediately after the reunification (Figure 1), and by the mid-'90s, Germa-

Figure 1

Development of Employment

Index 1991 = 100



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; DIW Calculations.

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Since 2005, clearly above average growth of employment in Berlin.

ny’s capital was completely disconnected from the rest of the country’s overall economic development. The period following this prolonged downswing—which lasted until 2005—was characterized by a process of convergence. Since the mid-’00s, Berlin’s employment rate has not only bounced back, but it has also grown even faster than in the rest of the country: in the past decade, the real GDP in Berlin increased by an annual average of

2.1 percent, while in Germany overall, this figure amounted to only 1.4 percent (Table 1).

But the powerful increase in economic performance was not the only cause. The average number of per-capita working hours in Berlin sank at a higher-than-average rate, and since fewer hours were being worked per person, the volume of work was being spread out across more employees.

Another factor that must be taken into account is productivity. Berlin’s per-hour economic output increased in the period between 2005 and 2015 by an annual average of 0.9 percent—similar to Germany on the whole (0.8 percent). What is notable is the difference in how this played out time-wise: in the past five years, the growth momentum of hourly productivity was significantly weaker it had been in the previous five years. A zero-growth situation is sufficient to maintain the current employment figures, partly because the number of per-capita working hours is decreasing. Between 2010 and 2015, however, in Germany an annual GDP growth rate of 0.6 percent—also quite low—was necessary.¹ In Berlin, the recent employment growth was accompanied by a particularly weak increase in productivity and a relatively large reduction in the average working hours.

At the same time, Berlin exhibits a relatively high number of per-capita working hours: in 2005, this figure amounted to 1,399 hours per year, while in the rest of Germany, this figure was 28 hours less (Figure 2). Ten years earlier, the difference between these figures amounted to 69 hours. Across the country, the average working time has decreased significantly, and in this respect, the development in Berlin could be interpreted as an adaptation to the general trend. However, the volume of work—that is, the amount of work performed—has increased at above-average rates in Berlin, since the number of employees has increased comparatively strongly.

Recently, however, the opposite development was observable in working hours. The average per-capita working hours in Germany overall have been increasing since 2014, while this trend was not observable in Berlin until 2015, and then only to a limited extent. Whether this constitutes a trend reversal remains to be seen.

Strong growth in social security-obligated employment

In Germany on the whole, the increase in employed persons over the past ten years was caused solely by the increase in social security-obligated employment;

Table 1

Average yearly growth rates of GDP, productivity, and employment

In percent

	Real GDP	Real GDP per employed persons	Real GDP per working hour	Employed persons	Working hours per employed persons
Berlin					
2005 to 2010	2.4	0.7	1.3	1.6	-0.6
2010 to 2015	1.8	0.0	0.5	1.8	-0.5
2005 to 2015	2.1	0.3	0.9	1.7	-0.6
Germany					
2005 to 2010	1.2	0.4	0.7	0.8	-0.3
2010 to 2015	1.5	0.6	0.8	1.0	-0.3
2005 to 2015	1.4	0.5	0.8	0.9	-0.3

Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; DIW calculations.

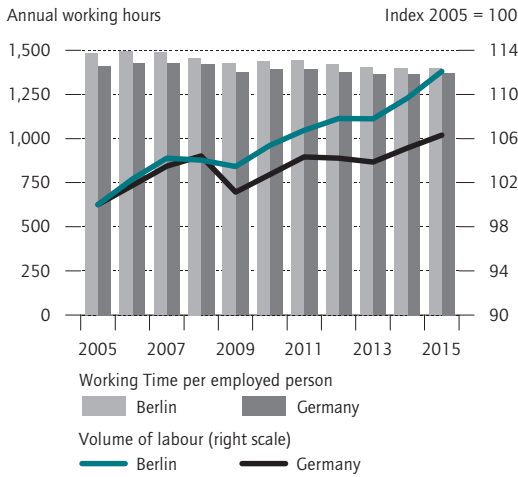
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Productivity growth in Berlin has been very slow.

¹ Between 1995 and 2005, the employment threshold stood at 0.9 percent.

Figure 2

Volume of labor and working time per employed



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; DIW Calculations.

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Berlin's labor volume has also experienced a strong increase.

in Berlin this was the primary reason, though not the only one. The increase in social security-obligated employees in Berlin was stronger than it was in the overall economy (Figure 3), and this high growth rate has hardly changed over time. Unlike the rest of Germany, Berlin was not hit hard by the 2008–2009 global financial crisis, since the city's economy has relatively little to do with foreign trade, which was particularly affected during the crisis.²

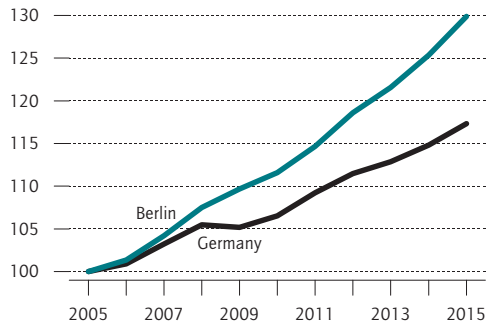
Minor employment experienced a different kind of development. The number of mini-jobbers picked up considerably in Berlin between 2005 and 2010, yet stagnated nationwide (Figure 4). Since then, the development of minor employment has trended sideways (with fluctuations) in Berlin while decreasing in Germany as a whole. In both cases, a major slump materialized in 2015—no doubt due to the introduction of the minimum wage. (The implementation of the minimum wage caused mini-jobs to lose their attractiveness to employers, who were no longer able to pay mini-jobbers lower wages with the excuse that such employees pay lower taxes overall.) The decline in mini-jobs is likely to have contributed to the recent increase in the average num-

² The financial crisis had the most powerful impact on export-dependent manufacturing. In 2015, this sector comprised eight percent of all social security-obligated employees in Berlin; in Germany overall, this rate amounted to 21 percent.

Figure 3

Number of social security-obligated employees

Index 2005 = 100



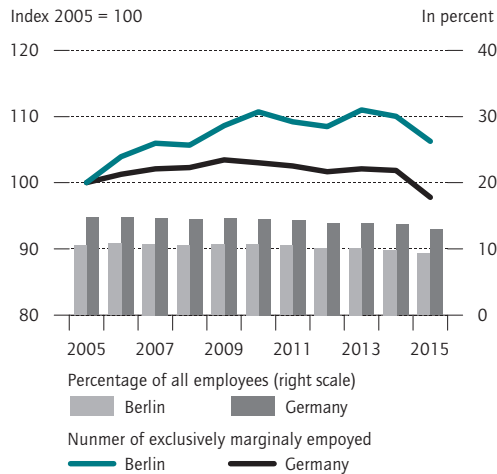
Source: Federal Labour Agency; DIW Calculations.

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Sharp growth in the number of social security-obligated employees.

Figure 4

Exclusively marginally employed persons (mini-jobbers)



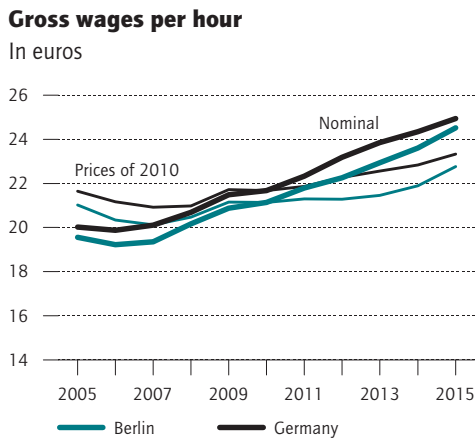
Source: Federal Labour Agency; DIW Calculations.

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Mini-jobs are less prevalent in Berlin.

ber of working hours overall; in Berlin, however, mini-jobs are underrepresented.

Figure 5



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; Federal Statistical Office; Amt für Statistik Berlin-Brandenburg; DIW Calculations.

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Wages: Berlin still lags behind.

Civil servants also count as dependent employees; however, no adequate information is available as to how many of them are working in Berlin. Data are only available for civil servants working—directly or indirectly—for the individual states (as opposed to the Federal Government). Such civil servants make up the vast majority of those working in Berlin. Since 2005, the number of these civil servants working in Berlin declined steadily and even-ly by approximately 12,000 people, or 15 percent,³ while the stock of social security-obligated employees in Berlin's public administration increased by 6,000 people.

Berlin wages still below national average

Both in Berlin and Germany on the whole, wages have grown significantly since 2010 (Figure 5). The relatively low inflation of the past few years has resulted in a rise in nominal wages, with the result that wages have also been increasing in real terms. This has been the case since 2010 nationwide, and since 2013 in Berlin.

In 2005, the nominal gross hourly wages in Berlin were 2.3 percent below the national average. This difference has persisted in the years since, and at times has even been more significant (4 percent in 2014 and 3.7 percent in 2007). Recently, however, this gap has begun to converge somewhat: the wage difference between Berlin's workforce and that of Germany on the whole was reduced to 1.7 percent in the case of nominal gross hourly wages, and 2.4 percent in the case of real wages.

A breakdown of employee wages according to function and/or occupation offers deeper insight into the structure and development of wages. However, such statistics have only been being compiled since 2007, and the breakdown is rather rough; as well, small businesses, certain sectors (agriculture and private households), and mini-jobs are excluded from these data.

The gross hourly wages for all job categories in Berlin fall below the national average (Table 2). This gap is particularly apparent in the case of "simple" jobs—that is, occupations for semi-skilled and unskilled workers—and has been widening over time. Berlin is also relatively far behind when it comes to compensation for skilled workers, or those working jobs that require an academic education. The development in wages for such workers has also been weaker in Berlin than it has in Germany on the whole. The same is true for executives' incomes. The only exceptions are occupations that usually require an apprenticeship or a secondary special education, because in those cases, wages—at least from 2010 onwards—have experienced above-average increases in

Table 2

Gross wages per hour by occupational groups resp. job grades¹

	Euro			Average annual growth rate (percent)	
	2007	2010	2015	2010 to 2015	2007 to 2015
Berlin					
Managerial personnel, executives	35.23	35.63	40.28	2.5	1.7
Highly qualified personnel	21.98	22.86	25.53	2.2	1.9
Skilled workers	16.04	16.32	17.92	1.9	1.4
Semiskilled workers	12.07	12.09	13.31	1.9	1.2
Unskilled workers	9.67	9.82	10.86	2.0	1.5
Total	19.12	19.57	21.47	1.9	1.5
Germany					
Managerial personnel, executives	35.16	37.64	43.01	2.7	2.6
Highly qualified personnel	23.05	24.49	27.49	2.3	2.2
Skilled workers	16.39	17.25	18.79	1.7	1.7
Semiskilled workers	13.47	13.93	15.10	1.6	1.4
Unskilled workers	10.98	11.51	12.61	1.8	1.7
Total	19.14	20.30	22.42	2.0	2.0
Berlin, Germany = 100					
Managerial personnel, executives	100.2	94.7	93.7		
Highly qualified personnel	95.4	93.3	92.9		
Skilled workers	97.9	94.6	95.4		
Semiskilled workers	89.6	86.8	88.1		
Unskilled workers	88.1	85.3	86.1		
Total	99.9	96.4	95.8		

¹ Excluding employees in small companies, the agricultural sector, and in private households as well as marginally employed workers (mini-jobbers).

Source: Federal Statistical Office; DIW calculations.

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Berlin: wages in all job grades lag behind.

³ Source: Statistical Office Berlin-Brandenburg.

Berlin. Nevertheless, even their total gross hourly wages are lagging behind the national average.

It is evident that in Germany overall, simple jobs have been losing prevalence (Table 3). This is hardly the case in Berlin, however. Occupations for executives and specialists have decreased proportionately nationwide, but in Berlin, this decline turned out to be more significant than the national average. This might have contributed to the fact that wages in Berlin are still below average, despite the strong growth in employment.

Berlin: a stronghold for sole contractors

Between 2005 and 2015, Berlin also experienced an increase in the number of self-employed workers (including family workers), albeit to a moderate extent (Figure 6). This figure reached a peak in 2012, decreased significantly in 2013, and has been rising slightly since then. Such figures make Berlin an outlier, because in Germany on the whole, the total number of self-employed workers has clearly been on the decline since 2012, and there are now fewer self-employed workers overall than there were a decade ago.

In Germany overall, the development of self-employment has primarily been influenced by the increase in solo self-employed workers—that is, sole contractors. In contrast, the number of self-employed workers with dependent employees stagnated.⁴

No corresponding data have been published for Berlin specifically. To compensate for this gap, individual data from the Microcensus were used. These data, however, are only available up until 2013.⁵ According to these data, the number of sole contractors in Berlin increased by nearly 90 percent in the period between 2005 and 2013, up to nearly 200,000 individuals. The number of self-employed workers with dependent employees, however, decreased by one-sixth. Due to this development, sole contractors started accounting for a larger and larger share of all self-employed workers, and by 2013, their share amounted to nearly three-quarters—significantly higher than that of Germany on the whole as well as comparable large cities such as Hamburg (Table 4). Berlin is a stronghold for sole contractors: in 2013, nearly nine percent of Germany’s sole contractors were living in Berlin. To put this into perspective, Berlin’s share of Germany’s total labor force amounted to just over four percent.

⁴ Brenke, Karl and Martin Beznoska: "Solo-Selbständige in Deutschland: Strukturen und Erwerbsverläufe." Forschungsbericht Nr. 465 of the Federal Ministry of Labour and Social Affairs, Berlin 2016.

⁵ We are grateful to the staff of the Research Data Centre of the Statistical Office for Berlin-Brandenburg for their kind assistance with the data analysis.

Table 3

Structure of employees¹ by occupational groups resp. job grades

	In percent			Change in percentage points	
	2007	2010	2015	2010 to 2015	2007 to 2015
Berlin					
Managerial personnel, executives	12.6	12.6	11.9	-0.7	-0.7
Highly qualified personnel	24.9	25.1	23.1	-2.0	-1.8
Skilled workers	40.3	41.5	43.2	1.7	2.9
Semiskilled workers	13.8	13.2	15.4	2.2	1.6
Unskilled workers	8.5	7.7	6.4	-1.3	-2.1
Total	100	100	100		
Germany					
Managerial personnel, executives	10.6	10.5	10.4	-0.1	-0.2
Highly qualified personnel	22.9	23.0	22.0	-1.0	-0.9
Skilled workers	41.6	42.7	44.1	1.4	2.5
Semiskilled workers	16.1	15.3	15.1	-0.2	-1.0
Unskilled workers	8.8	8.3	8.4	0.1	-0.4
Total	100	100	100		

¹ Excluding employees in small companies, the agricultural sector, and in private households as well as marginally employed workers (misni-jobbers).

Source: Federal Statistical Office; DIW calculations.

The structure of job grades has been shifting to medium-skilled workers.

Figure 6

Number of self-employed workers



Source: Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder; DIW Calculations.

Self-employed: different developments between Berlin and Germany on the whole.

Table 4

Self-employed without employees (sole contractors) in Berlin, Hamburg, and Germany

	Percentage of all self-employed	Part-time—percentage of all self-employed without employees	Personal monthly net income of self-employed without employees	
			Mean in euros	Median in euros
Berlin				
2005	53	26	1,560	1,100-1,300
2013	72	30	1,780	1,300-1,500
Hamburg				
2005	68	23	1,890	1,300-1,500
2013	65	27	2,060	1,500-1,700
Germany				
2005	56	24	1,680	1,100-1,300
2013	56	31	1,900	1,300-1,500

Source: Microcensus; DIW Calculations.

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Many self-employed workers without employees earn low incomes.

The incomes of sole contractors in Berlin, however, are still lower than the national average and significantly lower than those in Hamburg: in 2013, half the sole contractors in Berlin were netting no more than 1300–1500 euros per month. If one takes into account the increase in consumer prices, this figure is barely higher than it was in 2005. The mean income value—in a rough calculation⁶—was just under 1,800 Euros, which indicates that at the upper end of this income scale, there were some very well paid sole contractors.

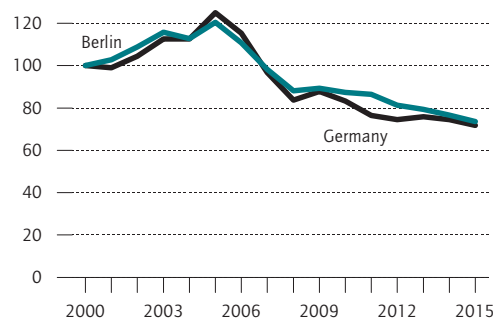
Migration and increasing labor force participation expand potential labor force

The number of unemployed individuals in Berlin has decreased significantly over the past ten years, though this decline has not been more pronounced than it has in Germany overall (Figure 7). Given the employment upswing that was especially dynamic in Berlin, this result is surprising. Clearly the number of individuals in

⁶ In the Microcensus surveys that collected the data used here, exact incomes are not specified; rather, workers are assigned specified income brackets. In order to make these data more manageable, the arithmetic mean of each income bracket is calculated, and this value is used as the exact individual income of each person (the income value for the highest category was “more than 25,000 euros”). This method relies on the assumption that all individuals within an income group have the same income, which is largely inaccurate; rather, each income category is likely to contain a scatter, which means that this method is rather imprecise. However, since the ranges within the respective income classes are small, this imprecision is not significant and the calculations sufficiently reflect the actual facts.

Figure 7

Number of unemployed workers
Index 2000 = 100



Source: Federal Labour Office; DIW Calculations.

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The number of unemployed workers declined at the same pace in both Berlin and Germany on the whole.

Berlin’s potential labor force—that is, people who have a job or are looking for one—experienced a particularly strong increase.

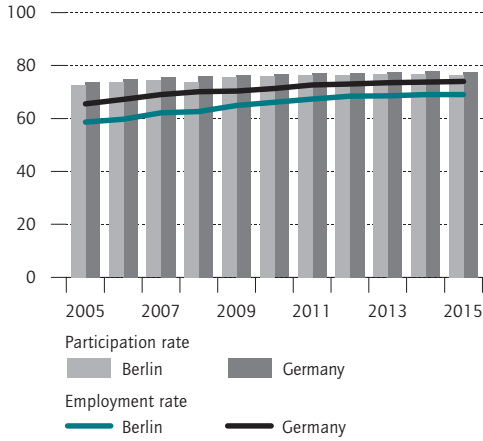
The development of the potential labor force is influenced by two factors: labor force behavior and demographic trends. Because the working-age share of the population has grown, labor force behavior has changed considerably. The share of potential workers between the ages of 15 and 64 (that is the participation rate) in Germany rose from 73.8 percent in 2005 to 77.6 percent in 2013, only to stagnate thereafter (Figure 8). Although the corresponding figures for Berlin started off at a slightly lower level, the city experienced an identical development. The somewhat lower employment rate is also likely due to the fact that in Berlin, a relatively large number of working-age people are students and therefore not available to the labor market.

The reasons for the particularly strong growth of Berlin’s potential labor force can thus be traced solely to population development. The problem is that the currently available official time series poorly reflect the actual development. In the 2011 census, it was found that the number of people recorded in the population registries was too high, especially in Berlin. The records were revised according to the census and population statistics were updated using the new basis. What were not adjusted, however, were the data collected or updated prior to the 2011 census. This situation has caused a break in the time series that is especially apparent for Berlin.

Figure 8

Participation rates¹ and employment rates

In percent



¹ Population from 15 to 64 years.

Source: Eurostat.

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Increases in the participation rates.

From 2011 onward, the population increase in Berlin has been well above the national average. This applies to individuals aged 15 to 64, as well as those aged 25 to 40—a group that generally has very high labor participation rates (Figure 9).

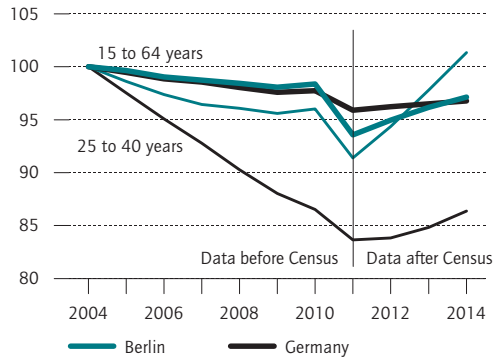
The biggest influences on the demographically induced developments in the labor force have been short- and medium-term migration. Throughout the past few decades, Berlin recorded migration surpluses—sometimes in quite significant amounts—almost without exception. The origins and destinations of these migrants have varied over time.

After the Wall fell, Berlin experienced a catch-up migration from the city center outwards. Many Berliners moved to the countryside, causing the city to suffer migration losses (Figure 10). This development reached its peak at the end of the '90s; thereafter, Berlin's migration loss through the population exchange with the Brandenburg regions around the city began to decrease. It was only recently that this migration loss was on the rise once again. In comparison to the rest of the country, however, Berlin's migration gains over the past two decades has been dependent on its economy: in times of an employment upswing, Berlin's migration gains rose, and when labor demand weakened, they declined. In population exchanges with foreign countries, Berlin almost always came out with migration surpluses. This was particularly noticeable in the first half of the '90s, when the biggest influxes comprised asylum seekers from the Eastern

Figure 9

Population development

Index, End of 2004 = 100



Source: Federal Statistical Office; DIW Calculations.

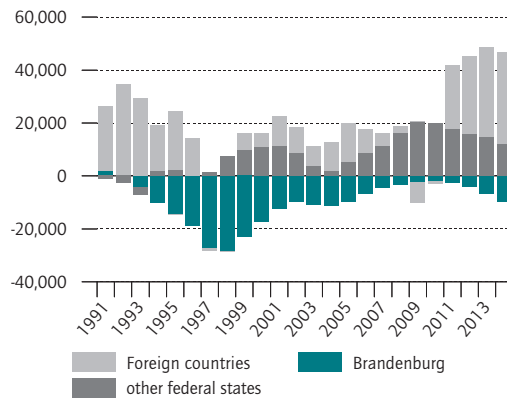
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Strong population increases, especially in Berlin.

Figure 10

Migration balance of Berlin

Number of persons



Source: Amt für Statistik Berlin-Brandenburg; DIW Calculations.

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Berlin's net migration has been growing since 2000.

Bloc as well as migrants reuniting with family members who were already living in Berlin. Berlin has also experienced strong migration gains since 2011, when the freedom of movement for citizens of countries that joined the EU in 2004 was established.

Table 5

Social security-obligated employees and commuters in Berlin

In 1,000 persons

	Employees living in Berlin	and working ...		Employees working in Berlin	From those: living outside of Berlin	Net number of commuters
		in Berlin	outside of Berlin			
2005 ¹	927.4	812.0	115.4	1,013.8	201.8	86.4
2006 ¹	933.6	814.1	119.6	1,024.5	210.4	90.8
2007 ¹	953.8	826.9	126.9	1,047.8	220.9	94.0
2008 ¹	983.9	849.5	134.4	1,081.7	232.1	97.8
2009 ¹	1,002.8	865.7	137.2	1,106.2	240.5	103.4
2010 ¹	1,021.8	880.3	141.5	1,123.2	242.8	101.3
2011 ¹	1,050.4	903.0	147.4	1,151.3	248.3	100.9
2012 ¹	1,088.9	936.0	152.8	1,190.3	254.2	101.4
2013 ¹	1,117.4	961.2	156.2	1,220.8	259.5	103.4
2013	1,111.4	957.4	154.0	1,228.3	270.9	116.9
2014	1,143.9	986.1	157.8	1,269.1	283.1	125.3
2015	1,199.8	1,033.0	166.8	1,311.1	278.1	111.3
Average yearly growth rate (percent)						
2005 to 2013 ¹	2.4	2.1	3.9	2.3	3.2	2.3
2013 to 2015	3.9	3.9	4.1	3.3	1.3	-2.4

¹ Before last data revision.

Source: Federal Labour Agency; DIW calculations.

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Starting at a low level, the number of workers commuting to Berlin increased.

Since people do not always live where they work, commuting times must also be taken into account. As is the case with other metropolitan centers, many people who reside outside of Berlin commute to the city for work (Table 5). Their numbers were increasing up until 2014, but in the past year they have experienced a marked decline for reasons not yet known.

In 2015, 111,000 social security-obligated employees—that is, roughly eight percent of Berlin's workers in this category—were commuting to the city. Nearly three quarters of commuters were coming from Brandenburg; in other words, over one-fifth of all Brandenburgers work in Berlin. At the same time, relatively few workers are commuting from outside the greater Berlin-Brandenburg area. This kind of long-distance commuting can be found in other cities, such as Hamburg, where 25 percent of all social security-obligated workers reside outside the city. Spatial-structural differences do play a role, however, and the fact that Berlin is a large city surrounded by a rather sparsely populated region does affect these figures.

Unemployment in Berlin still exceeds national average

Despite the strong growth in employment, Berlin's unemployment rate remains high. In May of this year, the unemployment rate stood at just under ten percent—nearly four percentage points above the national average. In Berlin—as is the case nationwide—men are more heavily affected by unemployment than are women (Table 6) and foreigners more heavily than Germans, although the extent of the latter discrepancy falls below the national average. Older workers account for only a relatively small portion of unemployed persons in Berlin. It is particularly striking that a very large proportion (80 percent) of unemployed workers in Berlin are also Hartz IV recipients (Table 7). These include individuals who have been unemployed for a long time or those who are ineligible to receive unemployment benefits because they did not make unemployment deposits. Over time, their share has been steadily increasing in Berlin (as well as in Germany on the whole). This indicates a structural “hardening” of the unemployed population.

This hardening is also evidenced by the fact that the share of unemployed individuals who have not undergone vocation training—in Berlin as well as Germany on the whole—has risen steadily. In Berlin, such individuals now make up more than half of all unemployed people. The unemployment structure is being influenced not only by the prevalence of low-skilled workers, but also by the ubiquity of highly qualified workers—that is, those with university degrees. In Berlin, where one out of every seven unemployed people is an academic, this is a major factor. Unemployment is also growing among academics in Berlin, but the rate of this increase is below the national average.

Berlin workforce highly qualified compared to Germany overall

The growing share of unemployed university-educated workers goes hand in hand with an overall academization of the potential labor force. This is particularly evident in Berlin, where more than one out of every three people seeking employment possesses an academic degree. In Germany as a whole, this ratio amounts to one in four (Table 8). No other state—including the city-states—has such a large proportion of academically trained individuals in the workforce than does Berlin.

The situation is different when it comes to low-skilled workers: the proportion of those without qualifications in Berlin's employed labor force was equal to the national average, but in Berlin's potential labor force, this share was below the national average. This reflects both

Table 6

Unemployed workers according to selected characteristics

In percent

	Unemployment rate ¹						Percentage of all unemployed		
	Total	Men	Women	Germans	Foreigners	Younger Persons (up to 24 years)	Older Persons (55 to 64 years)	Persons with Hartz IV benefits	
Berlin									
2005	19.0	20.5	17.4				10.8	70.5	
2006	17.5	18.9	15.9				10.3	77.4	
2007	15.5	16.7	14.1				9.9	80.4	
2008	13.8	15.0	12.6	12.4	25.9	14.8	10.0	81.1	
2009	14.0	15.2	12.7	12.5	26.6	15.2	11.3	80.7	
2010	13.6	14.7	12.3	12.1	25.5	13.8	11.8	80.9	
2011	13.3	14.3	12.1	11.7	25.2	13.4	13.1	82.4	
2012	12.3	13.2	11.3	10.8	23.4	13.3	13.9	80.6	
2013	11.7	12.5	10.9	10.3	22.3	12.0	14.7	79.0	
2014	11.1	11.8	10.3	9.6	21.2	10.8	15.4	79.3	
2015	10.7	11.4	9.8	9.0	21.4	10.0	16.1	80.7	
May 2016	9.7	10.4	8.9	8.2	18.8	9.3	16.7	80.8	
Germany									
2005	11.7	11.7	11.8				12.0	57.0	
2006	10.8	10.5	11.0				12.7	62.9	
2007	9.0	8.5	9.6				12.6	66.9	
2008	7.8	7.4	8.2	7.1	15.8	7.0	13.1	69.1	
2009	8.1	8.3	7.9	7.4	16.6	7.8	14.5	65.1	
2010	7.7	7.9	7.5	7.0	15.7	6.8	16.4	66.8	
2011	7.1	7.1	7.0	6.4	14.6	5.9	18.2	70.0	
2012	6.8	6.9	6.8	6.2	14.3	5.9	18.8	68.9	
2013	6.9	7.0	6.7	6.2	14.4	6.0	19.3	67.1	
2014	6.7	6.8	6.6	6.0	14.3	5.7	20.0	67.8	
2015	6.4	6.6	6.2	5.6	14.6	5.3	20.3	69.3	
May 2016	6.0	6.3	5.7	5.1	14.7	5.0	20.8	71.0	

¹ Percentage of the total civilian labour force

Source: Federal Labour Agency; DIW calculations.

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More than 80 percent of the unemployed in Berlin receive Hartz IV benefits.

Table 7

Structure of unemployed workers by vocational training level

Share in percent

	Berlin				Germany			
	Unskilled	Skilled			Unskilled	Skilled		
		Total	Upper secondary and post-secondary education	Tertiary education		Total	Upper secondary and post-secondary education	Tertiary education
May 2009	50.4	49.6			44.0	56.0		
May 2010	48.3	51.7			42.7	57.3		
May 2011	49.6	50.4	40.7	9.8	44.8	55.2	49.4	5.8
May 2012	50.3	49.7	39.1	10.6	45.4	54.6	48.4	6.2
May 2013	50.3	49.7	37.5	12.2	45.5	54.5	47.7	6.7
May 2014	50.4	49.6	36.6	13.0	46.4	53.6	46.4	7.1
May 2015	51.3	48.7	35.1	13.5	47.7	52.3	44.8	7.5
May 2016	52.1	47.9	34.0	13.9	49.5	50.5	42.9	7.7

Source: Federal Labour Agency; DIW calculations.

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The structure of the unemployed has been shifting to the unskilled.

Table 8

Structure of the workforce and employed workers by vocational training level¹

In percent

	Active Population			Employed Persons		
	Lower than upper secondary education ¹	Upper secondary and post-secondary education ²	Tertiary education ³	Lower than upper secondary education ¹	Upper secondary and post-secondary education ²	Tertiary education ³
Berlin						
2005	17.3	47.9	34.8	13.5	47.8	38.7
2010	14.5	49.2	36.3	11.5	49.2	39.4
2015	13.4	48.8	37.7	11.0	49.3	39.8
Germany						
2005	17.7	57.7	24.5	16.1	57.8	26.1
2010	14.7	58.7	26.6	13.4	58.8	27.8
2015	13.3	59.0	27.8	12.4	59.2	28.4
Other Bundesländer						
Baden-Württemberg	15.2	55.0	29.8	14.5	55.2	30.3
Bavaria	12.4	58.6	29.0	12.0	58.7	29.3
Brandenburg	6.8	64.7	28.5	6.2	64.3	29.5
Bremen	17.9	55.0	27.1	16.5	55.8	27.7
Hamburg	13.8	50.9	35.4	12.9	51.0	36.1
Hesse	14.4	55.8	29.8	13.6	56.2	30.3
Mecklenburg-Western Pomerania	7.8	66.4	25.8	6.9	65.8	27.3
Lower Saxony	13.9	62.2	23.9	13.1	62.6	24.4
North Rhine-Westphalia	16.3	58.3	25.4	15.0	58.9	26.1
Rhineland-Palatinate	15.4	59.2	25.4	14.4	59.7	25.9
Saarland	15.4	63.4	21.1	13.9	64.2	21.9
Saxony	5.2	65.2	29.6	4.4	64.9	30.7
Saxony-Anhalt	7.5	68.2	24.3	6.2	68.0	25.8
Schleswig-Holstein	12.7	63.8	23.5	11.7	64.3	24.0
Thuringia	5.4	67.6	27.0	4.8	67.3	27.9

1 International Standard Classification of Education (ISCED) 0 to 2.

2 ISCED 3 to 4.

3 ISCED 5 and higher.

Source: Eurostat; DIW calculations.

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Relatively well qualified workforce in Berlin.

the employment structure that is particular to Berlin as well as job-related problems faced by low-skilled workers.

A look at the individual German states reveals there are quite a few untrained workers in the west. This is especially true for the city-states—but even in some of the non-city states, the proportion of lower-skilled workers is higher than it is in Berlin. In the East German non-city states, on the other hand, there are relatively few workers without vocational training.

Far too few internships available

It has become clear that in Berlin as well as in Germany overall, the employment structure is shifting in favor of occupations that require intermediate-level qualifica-

tions. Correspondingly, unemployment has been especially prevalent among individuals with training certificates and or professional degrees. For years, the Chamber of Commerce and Industry of Berlin (IHK Berlin) has been voicing concerns about a shortage of executives, most recently this past April.⁷ This dilemma calls the efficacy of Berlin's dual training system into question.

At the beginning of the current academic year—that is, in autumn 2015—the number of internships in Berlin was well below the demand: for every available spot, there were 1.5 applicants (Figure 11). No other individu-

⁷ See: "Personalnot in Berlin." Der Tagesspiegel, April 5, 2016. <http://www.tagesspiegel.de/wirtschaft/fachkraeftemangel-personalnot-in-berlin/13401896.html>

al state had such an unfavorable ratio, and in Germany overall, supply and demand were more or less in sync, at least quantitatively. Apart from Berlin, North Rhine-Westphalia, Hesse, Brandenburg, and Saxony are also suffering from a dearth of available internships, while Mecklenburg-Western Pomerania, Thuringia, Bavaria, Hamburg, and Baden-Württemberg actually have too few applicants for the available internships.

For Berlin, not only is the gap between the supply and demand of internships particularly significant, but there is also an unfavorable ratio between new trainees and already employed workers with trainee certificates: for every 100 of Berlin’s social security-obligated employees with apprenticeship certificates or professional degrees, there are only two apprentices. This ratio is significantly higher in Germany overall: 2.7 apprentices for every 100 social security-obligated employees. This indicates that in Berlin, not enough is being done in terms of vocational training, both for Berlin’s younger generation as well as companies’ future replacement and expansion needs.

Conclusions

In recent years, Berlin has experienced a powerful employment growth rate that has surpassed the nationwide average, primarily due to an increase in social security-obligated employment. In the course of this development, unemployment in Berlin decreased considerably, but not to the same degree that it did in Germany on the whole. The reason for this discrepancy is that Berlin’s potential labor force has expanded powerfully as a result of migration and an overall increased labor market participation. Increases in the number of employees in Berlin can also be explained with low GDP growth figures, however. Due to the very weak productivity development, it only takes a slight increase in economic performance to achieve this. The low productivity gains may also be the reason why the city still lags behind the national average in wages. There are also other reasons: for example, jobs for executives and highly qualified workers in Berlin have become even more scarce.

Berlin—as well as Germany overall—needs to focus on innovation, and such a change requires corresponding specialists. Berlin’s potential labor force does exhibit a high level of qualification compared to other states, but this does not mean that policy can be lax: significant weaknesses also exist. Such weaknesses are not simply due to the prevalence of unemployed low-skilled individuals in the city, but also to the fact that companies are not offering sufficient training opportunities. At the same time, changes in the employment structure indicate that more workers with intermediate-level qualifications are needed.

Figure 11

Ratio between apprenticeship applicants and available apprenticeships and professional training intensity, September 2015

Relations



Source: Federal Statistical Office, Federal Labour Agency; DIW Calculations.

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Berlin lacks available apprenticeships.

Berlin therefore needs an alliance for education, especially for more dual vocational training and better schooling. Attention should be directed to schools: for many years, the Berlin school system was like a ground for experimentation, with one reform replacing the next. And yet despite all these changes, success has failed to materialize: in a nationwide comparison among all states, Berlin’s students usually end up at or near the bottom.⁸ In addition, the proportion of young people in Berlin who leave school without completing their secondary modern school qualification (*Hauptschulabschluss*) is far above the national average.⁹ Additionally, many training contracts

⁸ See, for example: Titz, Christoph: "Mathe und Naturwissenschaften: Leistungsgefälle zwischen Schülern in Ost und West ist gravierend." Spiegel-Online, October 11, 2013. <http://www.spiegel.de/schulspiegel/wissen/laendervergleich-ostdeutsche-schueler-in-mathe-besser-als-westdeutsche-a-927216.html>

⁹ In the 2014–2015 school year, 9.2 percent of all students dropped out of general education schools in Berlin, while only 5.8 percent of all students dropped out of such schools nationwide. See: Federal Statistical Office: Education and Culture. General education schools. School year 2014–2015. Subject-matter series 11, Row 1.

in Berlin are terminated prematurely: in 2014, for every three new training contract there was one cancellation of an existing contract, while in Germany as a whole, this ratio was three-to-one.¹⁰ This imbalance indicates a need

for more comprehensive career guidance, which is best begun in high school.

10 See: Federal Statistical Office: Education and Culture. Vocational training. 2014. Subject-matter series 11, Row 3.

Karl Brenke Research Associate in the Executive Board of the DIW Berlin | kbrenke@diw.de

JEL: R10, R23, R28

Keywords: Berlin, employment, wages, unemployment, vocational training

Berlin: a hub for startups but not (yet) for fast-growing companies

By Alexander S. Kritikos

Over the last 20 years, Berlin has developed into Germany's self-employment capital and into a startup hub. A large number of innovative companies have been launched. The city has become an internationally renowned magnet for creative startups. Mainly using official statistical data, the present report shows that the startup trend in Berlin is above average compared to other major cities in Germany while it is primarily driven by the high startup rates among non-Germans. However, with respect to turning startups into fast-growing companies, Berlin has room for improvement. Consequently, future policy measures should focus on supporting these types of companies. Possible measures include developing high-quality industrial sites, cutting red tape and providing fast-track administrative procedures in all business-related matters, improving recruitment processes for highly qualified employees, as well as further expanding the knowledge transfer between research institutes and the fast-growing companies.

Berlin is Germany's self-employment capital. Around 272,000 people—over 16 percent of the total labor force—were self-employed in 2014, at a time when the German average was only about ten percent (see Table 1). This has not always been the case. Shortly after German reunification, Berlin's ratio was still less than half this figure, close to the national average. The reason for this reversal of fortune: Berlin has the highest share of individuals venturing into self-employment compared to other German federal states. Measured by the number of business startups (as either the primary or secondary occupation) as a percentage of the total labor force, Berlin's startup propensity has been a good two percent for a number of years; the most recent German average is only 1.3 percent (see Table 2).¹

Under certain circumstances, entrepreneurs can have a major economic impact on where their business is located. If the entrepreneurs manage to successfully launch their product, innovative technologies, or services on the market, and then turn their firm into a fast-growing company, they will create new jobs and contribute to economic growth and employment in a region. Moreover, new companies may challenge the incumbents, subsequently increasing the competitiveness of all companies remaining in the market. Consequently, young companies can simultaneously improve the productivity of firms and economies, thus accelerating structural changes.² These effects are particularly pronounced if the startups develop into companies with growth ambitions, which account for around one percent of each founder cohort in Germany.³ At the same time, smaller companies can also not only positively impact economic growth and change, but productivity as well.

¹ See M. Fritsch, A.S. Kritikos, and A. Rusakova, "Self-Employment in Germany: The Trend Has Been Increasing for Some Time," *DIW Economic Bulletin*, no. 3 (2012): 3-13.

² See, for example, A.S. Kritikos, "Entrepreneurs and their Impact on Jobs and Economic Growth," *IZA World of Labor* 8 (2014).

³ See Ramboll, *Studie über schnell wachsende Unternehmen* (2012), report commissioned by the Federal Ministry for Economic Affairs and Energy (BMWi), Berlin.

Table 1

Self-Employment in Berlin and in Germany
Numbers in Thousands

	Berlin				Germany			
	wage employees	self-employed	total number of working people	self-employment rate	wage employees	self-employed	total number of working people	self-employment rate
1991	1,689	127	1,828	7.5	37,445	3,037	39,376	8.1
1994	1,609	154	1,833	9.6	36,076	3,288	39,571	9.1
1997	1,530	176	1,788	11.5	35,805	3,528	39,694	9.9
2000	1,471	180	1,720	12.2	36,604	3,643	39,730	10.0
2003	1,420	190	1,737	13.4	36,172	3,744	40,195	10.4
2005	1,434	220	1,777	15.3	36,566	4,080	41,150	11.2
2009	1,555	253	1,801	16.3	38,662	4,215	41,895	10.9
2010	1,569	264	1,806	16.8	38,938	4,259	41,887	10.9
2011	1,530	264	1,731	17.3	38,916	4,295	41,317	11.0
2012	1,570	270	1,752	17.2	39,206	4,315	41,430	11.0
2013	1,605	268	1,790	16.7	39,618	4,239	41,799	10.7
2014	1,644	272	1,824	16.5	39,942	4,192	42,032	10.5

Source: Mikrozensus.

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Table 2

Business Registrations in Berlin and in Germany

	2011	2012	2013	2014	2015
Berlin					
startup rate in percent	2.3	2.4	2.3	2.1	2
business registrations					
in primary occupation	31,083	29,509	28,085	27,229	25,416
in secondary occupation	10,467	11,637	11,704	11,127	10,873
business registration (total)	41,550	41,146	39,789	38,356	36,289
Germany					
startup rate in percent	1.5	1.4	1.4	1.3	1.3
business registrations					
in primary occupation	401,459	346,412	337,929	309,891	298,546
in secondary occupation	241,689	241,197	248,882	251,116	248,703
business registration (total)	653,148	587,609	586,811	561,007	547,249

The self-employment rate is calculated in proportion to the number of employed persons in the previous Year, see Mikrozensus in Table 1.

Source: Business Registration Statistics, analyzed by IFM Bonn.

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The remainder of this report analyzes the dynamic growth of Berlin’s startup companies and shows how the conditions could be improved particularly for fast-growing companies in Germany’s capital city.

Berlin: Germany’s startup hub

Every year for the past five years, between around 37,000 and 42,000 businesses were established in Berlin (see Table 2). In a comparison of the three city-states, Berlin ranks ahead with a startup propensity of around two percent, compared to Hamburg at 1.6 percent and Bremen at 1.3 percent, according to the most recent figures available (see Table 3).⁴

Naturally, the quality of startups varies considerably. In addition, the statistics of business notifications also distinguishes between the registration of small businesses by individual founders and company registration. The latter are startups by legal entities, i.e., mostly corporations, set up as more economically active companies.

Berlin recorded around 7,000 company startups in 2013, the most recent year for which figures are available.⁵ This corresponds to approximately 37 entities per 10,000

⁴ In a recent comparison of major cities, Berlin was also considerably ahead of Munich, Frankfurt, and Hamburg. See, for instance, BBB, *Metropolenvergleich* (2013).

⁵ See IBB, *Berlin aktuell: Gründungsboom in den Berliner Zukunftsbranchen* (Berlin: 2014).

Table 3

Business Registrations in the Federal city-states

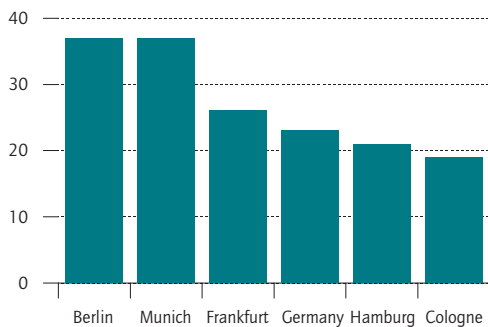
	working population in 1,000	business registrations	startup rate in percent
Berlin	1,824	36,289	2.0
Hamburg	1,027	16,784	1.6
Bremen	373	4,397	1.2

Quellen: Gewerbezeigenstatistik, ausgewertet vom IfM Bonn, 2016.

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Figure 1

Company registrations in different German cities per 10,000 individuals of the working population



Source: data of the IBB Berlin based on the business registration statistics for 2013, Mikrozensus; Calculations of DIW Berlin.

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Berlin and München have the highest relative number of company registrations (related to the total number of the working population) than other German cities.

members of the labor force. Berlin managed to soar above the general trend in Germany: there were 23 startups per 10,000 members of the working population throughout the country as a whole. When we look at German cities, Berlin shares the number one spot with Munich (see Figure 1).

The structural shift toward services is also evident among startups. A total of 37 percent of all startups in Berlin are in three segments of the service sector; the corresponding figure for Germany as a whole was 34 percent (see Table 4). The construction industry also plays a key role here (at 24 percent for Berlin; 17 percent for Germany as a whole). The much higher share of the construction sector in Berlin is primarily driven by the large number

Table 4

Business Registrations in selected sectors in Berlin and Germany

	business registrations				company registrations			
	Berlin	shares in percent	Germany	shares in percent	Berlin	shares in percent	Germany	shares in percent
Construction industry	9,598	24	95,470	17	654	11	14,856	17
Other Services	5,653	14	59,465	10	550	9.3	4,212	4.9
Other Economic Services	5,608	14	77,327	13	555	9.3	7,083	8.1
Professional, technical and scientific services	3,558	8.9	59,351	10	699	12	10,927	13
Manufacturing industry	1,264	3.2	21,592	3.7	281	4.7	4,516	5.2

Source: business registration statistics; analyzed by BBB for 2013.

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of solo startups, however. If we only take company startups in this sector into account, Berlin's share decreases to just under 11 percent, while Germany's share is still 17 percent (see Table 4).

Finally, what is striking is the large number of manufacturing sector startups in Berlin, amounting to just under 300 companies at the most recent count (see Table 4). This may be due to cluster effects, for instance, in Berlin-Adlershof where a particularly high number of industrial high-tech startups have been established.⁶

High startup propensity in Berlin driven by non-German nationals

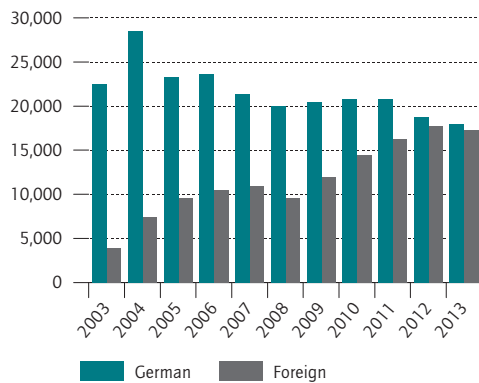
If we distinguish between nationalities, it is clear that the number of startups in Berlin established by individuals without German citizenship is increasing, while those founded by Germans is falling. Almost 50 percent of startups in German are founded by foreigners living in Germany (see Figure 2).⁷ Polish citizens account for most of these (most recently, just under 6,000 startups).⁸ The startup propensity among non-German citizens is currently around 3.5 percent across all nationalities, while the startup propensity of German citizens living in Berlin is slightly less than one percent, which is similar to

6 See DIW Econ, *Hightech für Berlin, die regionalwirtschaftliche Bedeutung der Technologiezentren in Adlershof* (Berlin: 2015).

7 See GUWBI, *Statistische Materialien zu Existenzgründung und Selbstständigkeit der Wohnbevölkerung mit Migrationshintergrund in Berlin* (Berlin: 2014).

8 See BBB, *Sonderauswertung Nationalitätenvergleich* (Berlin: 2013).

Figure 2

Business registrations by nationalities

Source: Office of Statistics Berlin-Brandenburg; Federal statistical office; calculations of the GUVWI (2014).

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In Berlin currently almost every second business is ventured by a non-german person.

the national average.⁹ The high startup propensity in Berlin is, therefore, an effect sustained by Berlin's foreign residents.

Plenty of innovative startups ...

If all innovative startups are taken together—on the basis of the list of research-intensive industries and knowledge-intensive services compiled for the Commission of Experts for Research and Innovation (EFI)—Berlin also occupies a leading position.¹⁰ In recent years, around 6,500 companies were founded in sectors with high innovation potential,¹¹ corresponding to one in six startups or around 35 startups per 10,000 members of the labor force. This puts Berlin more or less on a par with Munich and Hamburg again.¹² There is no visible difference between the startup propensity of Germans and other nationals in Berlin in this segment. According to the most recent figures, 18 percent of these particularly innovative companies were founded by foreign nationals,¹³ again mostly by individuals coming from Poland.

⁹ See Michael Fritsch, Alexander S. Kritikos, and Alina Rusakova, "Who Starts a Business and Who is Self-Employed in Germany," *IZA Discussion Paper* 6326 (Bonn: 2012).

¹⁰ See <http://www.e-fi.de/>, accessed June 30, 2016.

¹¹ See IBB, *Berlin aktuell*.

¹² Own calculations on the basis of data from IBB, *Berlin aktuell*.

¹³ Own calculations on the basis of the 2015 statistics of business notifications. This is approximately the same as the share of the population of Berlin accounted for by foreign nationals.

The majority of recent startups are in the fields of information and communications technologies (ICT), media and creative industries, followed by the fields of transport, mobility, and logistics, energy technology, the health sector, and optics.¹⁴ The continued positive trend in the fields of ICT and (albeit at a much lower level) optics should also be noted.¹⁵

... but few fast-growing companies

Startups have a particularly positive impact on the local economy if they develop into fast-growing companies, known as gazelles.¹⁶ Around four percent of all gazelle companies founded in Germany in the past 20 years are based in Berlin,¹⁷ a below-average figure in view of the fact that 7.5 percent of all company startups and 6.5 percent of all innovative startups have been in Berlin. Since new companies are particularly mobile while they are still small, it cannot be ruled out that some of Berlin's potential gazelles relocated elsewhere once they were established.¹⁸

The gazelles in Berlin are primarily research and development (R&D) companies in the fields of natural sciences, engineering, agricultural sciences, and medicine. A second focus area is e-commerce, as the most recent flotations and venture capital investments have shown.¹⁹

Favorable framework conditions needed to attract fast-growing companies

Innovative companies are highly mobile and there is global competition to attract them. Consequently, good institutional frameworks are particularly relevant for these companies. What is important here, *inter alia*, is the transfer of technology and know-how between the research community and industry, as well as the provision of venture capital. A key role is also played by other business location factors, such as the characteristics of the labor market and the local implementation of administrative regulations.²⁰ A cursory look at the framework

¹⁴ For an in-depth account of innovative startups in Berlin, see, for instance, IBB, *Berlin aktuell*, or McKinsey, *Berlin gründet* (Berlin: McKinsey, 2013).

¹⁵ See IBB, *Berlin aktuell*.

¹⁶ The OECD defines fast-growing companies as those with at least ten employees in the base year that then create an average of 20 percent more jobs per year over the next three years. Consequently, the number of employees must have increased by 73 percent after three years.

¹⁷ See Ramboll, *Studie über schnell wachsende Unternehmen*.

¹⁸ In this context, Berlin's *Investitionsbank Berlin* (IBB) even refers to the "risk that Berlin is attractive as a 'nursery' for startups, but that the companies founded then are leaving the city as soon as they are operating at a profit." See IBB, *Berlin aktuell*.

¹⁹ See McKinsey, *Berlin gründet*.

²⁰ See OECD, *Small Business, Job Creation and Growth: Facts, Obstacles and Best Practice* (Paris: 1997) as well as European Commission, *A policy for Indus-*

conditions for high-growth startups in Berlin makes the following points clear:

The city has an extensive scientific and research landscape that supports the transformation of research findings and inventions into product ideas and innovations, for instance, the research hubs of Berlin-Buch and Berlin-Adlershof. This is also reflected in the figures: Berlin has an above-average rate of expenditure on public research and development institutions (amounting to 400 euros per inhabitant in 2013).²¹

Case study: Berlin-Adlershof research hub

Not only is the Berlin district of Adlershof home to a range of science and research centers conducting government-funded basic research, it is also an integrated business, technology, and media park. Adlershof houses a total of nine departments from the Humboldt-Universität Berlin's Faculty of Mathematics and Natural Sciences and Faculty of Life Sciences, as well as 11 non-university research institutes from, for instance, the Leibniz and Helmholtz Associations. It is also the location of a number of technology and startup centers in sectors compatible with the aforementioned institutes' areas of research, including optical technologies, biotechnology and environment, microsystems and materials, ICT and media, as well as renewable energy and photovoltaics.

In addition to publicly funded basic research, the science and technology park also houses 500 high-tech startups operating in the five technology aforementioned sectors. These companies are able to benefit directly from the knowledge transfer facilitated by the research cluster located there, in the aforementioned optics field, for instance. The startups in Adlershof's technology centers have shown positive growth in recent years. They currently employ over 6,000 people and, in 2013, had a gross value added of just under 400 million euros accompanied by rising growth rates.²² Some of the startups in the Adlershof Technology Park have become gazelles in the sectors where Berlin enjoys a locational advantage thanks to its easy access to scientific research.

However, the Adlershof site could ideally be better linked to the rest of Berlin's commercial infrastructure. For example, so far there has been very little networking between the more B2B-oriented cluster in Adlershof and the fast-growing group of B2C companies located in Ber-

lin's city center. Further, compared to other large cities, Berlin has so far seen only a small number of established multinational companies set up local research offices designed to benefit from the research output of Adlershof and other research sites in Berlin.

Venture capital investment in Berlin doubled since 2014

During and after the launch of a new product, access to venture capital is crucial for firms with rapid growth potential. This growth phase is capital intensive and, consequently, access to capital is a prerequisite for the sustainability of the startups. On the whole, access to venture capital in Berlin is improving.²³

Recent data indicate that, in 2015, venture capital investment in Berlin had increased sharply compared with other German (and European) cities, doubling since 2014.²⁴ This puts the city ahead of London, Stockholm, Paris, Hamburg, and Munich; it accounts for 14 percent of all venture capital investment in Europe. Berlin's young companies received over 2.1 billion euros, which is the equivalent of around 70 percent of the total volume of venture capital in Germany.²⁵

Despite this positive development, there continues to be a financial shortfall in companies' initial growth phase, directly after startup, which has been bridged only in a small number of cases.²⁶ While the lion's share of venture capital was invested in consumer services and e-commerce,²⁷ the Adlershof cluster, which is of importance to the gazelle companies but much more B2B oriented, had less access to venture capital investment.

High bureaucratic hurdles for young enterprises

The administrative environment also plays a crucial role for fast-growing companies. It is precisely the entrepreneurs establishing innovative startups who tend to prefer locations with fast and unbureaucratic processes and an attractive institutional framework.

Berlin has only an indirect impact on national regulatory arrangements but it can influence how quickly and in what form regulatory requirements are implemented. Here, Berlin is lagging behind other startup hubs;

trial Champions: From picking winners to fostering excellence and the growth of firms, (Brussels: 2006); and Compass (2015).

21 By way of comparison, the average corresponding figure for Germany as a whole is 150 euros per inhabitant, with Hamburg spending 270 euros per inhabitant, for instance. See Federal Statistical Office (2015).

22 DIW Econ, *Hightech für Berlin*.

23 Compass (2015).

24 Ernst & Young, *Start-up Barometer Deutschland* (Berlin: 2016).

25 In addition, there is also the supporting funding for investment by young enterprises within these thematic fields, provided by government development banks such as IBB. This amounts to an additional 220 million euros.

26 McKinsey, *Berlin gründet*.

27 Ernst & Young, *Start-up Barometer*.

according to recent surveys, it still takes up to ten days simply to set up a company, while in other countries this can be done within 24 hours or even online within an hour. Overall, there is substantial evidence that business-related administrative processes take much longer in Berlin than in other startup cities.²⁸

Bottlenecks in supply of highly qualified employees

Another key prerequisite for fast-growing companies to choose a specific location is the quality of the local labor market and the ready availability of a well-trained labor force without too much red tape.²⁹

Here it is obvious that Berlin's productivity development is still lagging a long way behind other German metropolitan areas.³⁰ On the one hand, this indicates a lack of local highly qualified employees. On the other hand, Berlin's consistently relatively high unemployment, including academics, suggests a high labor supply.³¹ It remains unclear, however, to what extent these unemployed academics fulfill the requirements of young, innovative, and fast-growing companies.

Thus, the fast-growing companies in Berlin especially depend on recruiting individuals from other countries. Currently, over 40 percent of all startup employees come from abroad, predominantly from other EU countries.³² For these individuals, with its (still) affordable rents and high quality of life, Berlin is an attractive location, despite the relatively low wages.

Individuals from countries outside the EU still encounter major difficulties obtaining a German work permit. On average, the immigration procedure in Berlin takes three months to complete,³³ but innovative enterprises report cases where non-EU citizens had to wait far longer before receiving their work visa.³⁴ Frequently, legal entry and the process of acquiring a residence permit are even more protracted for the families of these employees.

²⁸ For these and other examples, see World Bank, *Ease of Doing Business* (Washington: 2016). McKinsey, *Berlin gründet* also illustrates the continuing complexity of dealing with the Berlin authorities with reference to various examples.

²⁹ European Commission, *Policy for Industrial Champions*.

³⁰ R. Ahrend, E. Farchy, I. Kaplanis, and A. C. Lembcke, "What makes cities more productive? Evidence on the role of urban governance from five OECD countries," *OECD Regional Development Working Papers*, no. 5 (Paris: OECD Publishing, 2014), <http://dx.doi.org/10.1787/5jz432cf2d8p-en>.

³¹ See also in this edition of *DIW Economic Bulletin* the article by K. Brenke, (2016): The Berlin labor market since 2005: strong employment growth yet unemployment, remains high, incomes low.

³² *Compass* (2015), 75.

³³ *Compass* (2015), 76.

³⁴ <http://www.morgenpost.de/berlin/article140104525/Wie-die-Buerokratie-Berliner-Startups-bremst.html>.

Berlin's recently created Business Immigration Service offers a glimmer of hope for a solution to this problem.

Conclusion

Berlin is a dynamic startup hub. This dynamic growth relies largely on Berlin's non-German residents. In terms of innovation-driven startups in the research-oriented industries and knowledge-intensive services, Berlin shares the number one spot with other metropolitan areas, such as Munich and Hamburg. When it comes to gazelles—the fast-growing companies—Berlin is lagging behind. Therefore, one objective should be for Berlin to retain as many dynamically growing companies as possible or, better still, to attract more companies of this type.

Although the city is already endeavoring to support innovative startups, in order to become an attractive location,³⁵ a brief overview of the factors impacting Berlin as a location for startup companies suggests that there are various measures that could improve the current situation. Policy measures include providing high-quality commercial spaces and industrial sites as well as improving the service dimension of all business-related administrative procedures, by providing fast track administrative processes and by increasingly switching to online processes.

Apart from improvements at the administrative level, other key measures are to further develop Berlin as a research location and to strengthen its IT sector. The ten-point agenda developed by the "Berlin unit for digitalization" proposes, *inter alia*, the appointment of 30 professors. To further strengthen this measure with the objective of establishing common labs fostering the digitalization of the manufacturing industry (Industry 4.0) in the future, the Berlin government could complement every privately funded professor position with a second one using public funding. This would also facilitate better networking with innovation-based startups and fast-growing companies.

Further, active location marketing is needed to attract potentially fast-growing startups, those being currently located in Berlin or even elsewhere, for instance, when these companies leave the technology parks and are searching for new locations. One option would be to reward the city administration in the form of appropriate monetary incentives for successfully attracting companies to the city. Second, policy-makers should also focus more on encouraging major multinational companies to locate their research departments in Berlin. We have

³⁵ See, for instance, Berlin Unit, *Startup-Metropole Berlin, Berliner Agenda für ein optimiertes Gründungsumfeld* (2016).

seen some initial success here with German DAX companies locating nine “innovation centers” in Berlin.³⁶

The Brexit decision has made active location marketing even more relevant since London is currently home to a large number of high-tech startups and companies conducting research which will now be considering whether to relocate.

Efforts should also be made to facilitate the recruitment of skilled workers both from within Germany and from abroad—beyond the recently developed talent portal for Berlin—by holding regular job fairs with an international focus. Accelerating visa procedures for individuals from non-EU countries remains another element of enhancing Berlin’s attractiveness for highly qualified employees.

The provision of venture capital also needs to be improved. Despite the strong growth in the volume of venture capital granted recently, Berlin still suffers from underdeveloped access to this, particularly in the all-important initial growth phase and, especially, for B2B companies. Beyond the planned measures to influence the federal government and improve regulatory

legislation,³⁷ the supply of venture capital in this segment should be boosted through targeted partnerships (for instance, with the predominantly government-funded High-Tech Start-Up Fund). Making Berlin an attractive location for multinational companies’ research departments would also pay off because these companies are more likely to provide venture capital to startups if they are on site.

Finally, the quality of life in Berlin, for instance, the quality of schools, cultural institutions, and healthcare, are also decisive factors in the attractiveness of the city as a startup hub. There is still room for improvement in some of these areas in Berlin.

In recent years, Berlin has increasingly benefited from the dynamic growth in startup companies and has earned an excellent reputation as a startup hub. Now the focus should be on improving Berlin’s attractiveness as a location for fast-growing firms in order to increase the likelihood of existing opportunities resulting in sustainable economic growth and attractive jobs in the long term.

³⁶ See <http://www.ihub.berlin/9-von-19-innovation-center-von-dax-konzernen-sind-in-berlin/>

³⁷ For instance, taxation as well as the protection of “minority investors” is currently under discussion.

Alexander S. Kritikos is Research Director at DIW Berlin | akritikos@diw.de

JEL: D22, L26

Keywords: Startups, Entrepreneurship, Berlin

Public investment in the Berlin state budget: education and transport are falling short

By Felix Arnold, Johannes Brinkmann, Maximilian Brill, and Ronny Freier

In Berlin, as elsewhere, public investment is critical to an individual's life satisfaction and a prerequisite for positive economic development. There are many fields of activity for public investment. For instance, the tasks for Berlin include a sustainable transport concept that maintains and develops the local passenger transport network, a sustainable cycle concept, new schools need to be built and old ones need renovating, and Berlin must find answers to problems in its housing market.

A glance at Berlin's public investment activities reveals a mixed picture. In 2014, the city invested a total of 2.8 billion euros in its core budget and in local public firms, equivalent to around 810 euros per inhabitant. This means the capital city is worse off than Hamburg, for example.

To strengthen public investment activity, Berlin's administrative practices should be thoroughly reviewed in order to gain an overview of its asset situation and public investment requirements. In addition, it is recommended that the structure be organized in content-related special funds or public enterprises with their own personnel and extensive rights to assert claims—similar to Grün Berlin GmbH.¹ Since schools are one of the most important locational factors, not only must gaps in the school infrastructure be closed but also more teachers need to be employed.

The present article, one of three published in the current edition of *DIW Economic Bulletin*, analyzes public investment spending in the Berlin state budget. It outlines some of the fields of activity and provides an overview of investment in the public sector (see box). First, the report documents the development of total spending on investment over time. Then it reviews the distribution of investments by type, i.e., construction, acquisition of material assets, grants, and by administrative level, i.e., the Senate, districts, and public firms. There is a particular focus on investment in education and transport. Furthermore, the article examines public housing. Although the three tasks mentioned above are important aspects of public investment activity, other areas such as day care centers, digitalization, or public services have been excluded. The data analyzed here are mainly from 2014 because records for this year are complete. Furthermore, the report attempts to outline current developments in the most important areas.

Poor planning and failures in public investment

Berlin is often publicly criticized for its investment projects. Berlin-Brandenburg Airport (BER) is now symbolic of poor planning and financial risk in public investment. Berlin's *Staatsoper* (state opera) will cost twice as much as expected, according to current estimates.² Berlin's education system is suffering from a chronic lack of teachers and the school buildings are often old and dilapidated, or schools are under-equipped. More recently, the people took housing construction policy on the future of the Tempelhofer Feld to task and the transport policy may yet suffer a similar fate as a result of Berlin's Bicycle Referendum on cycle traffic. In 2003, the Ber-

¹ Grün Berlin GmbH is a public company that designs Berlin's "cityscapes": these include Tempelhofer Feld (location of the former Tempelhof airport), the park at Gleisdreieck, and the *Internationale Gartenausstellung* (International Garden Festival) 2017.

² Berlin House of Representatives, Committee of Inquiry into the State Opera, printed papers 17/2999 from June 10, 2016 (2016), 108-109. The cost to the city of Berlin has risen from nine million to the current 196 million euros.

Box

Data basis

Data from a variety of sources were used to obtain an overall picture of investment activity in the cities of Hamburg and Berlin. The figures relating to investment in the core budget largely originate from the budget and capital account (Berlin) or the revenue and expenditure account (Hamburg). Further investment figures in public and state enterprises were derived from the respective participation reports or budgets of the two cities. These are realized figures and, in the case of Hamburg's state enterprises, budget data are available for 2014. Participation data are only considered if the relevant city holds a 100-percent stake in the companies. A clear political association can thus be guaranteed. Data on the SIWA investment program originate from the Berlin Senate Department for Finance. Generally, it

should be noted that the search for data proved difficult. A variety of sources were used and combined to ensure good comparability and allocations. We sometimes deviated from the official definition of investments by adding maintenance and repair costs to assure comparability between Berlin and Hamburg. Another problem was the numerous special programs (e.g., the joint task on improving regional economic structures, GRW) that sometimes invest in transport without indicating this under the appropriate items in the budget. Moreover, we sometimes had to incorporate contradictory information from different sources into the report. In order to be as transparent as possible, the relevant problems and assumptions are identified in footnotes in the applicable sections of the report.

lin Senate decided to stop funding social housing completely.³ Faced with a growing housing shortage, the public sector began financing social housing again in 2014.⁴ That same year, Berlin's core state budget was indebted to the tune of 60 billion euros. This explains why there has never been enough money available for investment in Berlin's public infrastructure.

Berlin economic policy successes: Adlershof and the Charité

Nevertheless, there are some success stories. Economic conditions have changed for the better.⁵ Berlin has managed to become an attractive location for startups and new companies⁶. Prime examples of successful economic policy are the Adlershof research hub and strong development in the health sector with the Charité hospital at its core.⁷ Overall, Berlin is an attractive location for science, thus creating the prerequisites for new and innovative economic activity. Even the unfinished Ber-

lin-Brandenburg Airport (BER) has already stimulated growth in the south of Berlin⁸—a trend that will probably increase again when it opens.

Another positive factor is that regular budget surpluses in recent years have gone to servicing debt and into an investment program. The city's major investment projects are organized separately from the core budget and implemented using a special infrastructure fund for a growing city (SIWA). The key focus is on investment in education and the improved provision of accommodation for refugees.⁹

As Germany's largest city and city state, it is difficult to compare Berlin with other German cities. In addition to making municipal investments, Cologne and Munich also implement large state projects which cannot always be assigned to the relevant municipalities in state budgets. In contrast, the other two city states of Bremen and Hamburg are more comparable, although Bremen is too small in relative terms. The figures can be better compared to those for Hamburg because Berlin is certainly in direct competition with Hamburg both to attract businesses and in terms of economic strength. Nevertheless, it is clear there are problems with comparability here. Hamburg is a net payer into state financial equalization; it has a strong economic base and its state budget is in better shape. In addition, Berlin has a special role as the

³ <http://www.stadtentwicklung.berlin.de/wohnen/anschlussfoerderung/>.

⁴ <http://www.stadtentwicklung.berlin.de/wohnen/wohnungsbau/de/foerderung/>.

⁵ Compared to all the other German federal states, growth of Berlin's economy has been well above average in the past decade. See the editorial in this issue of *DIW Economic Bulletin*.

⁶ See in this issue the articles by Kritikos, A. (2016): Berlin: a hub for startups but not (yet) for fast-growing companies and Brenke, K. (2016): The Berlin labor market since 2005: strong employment growth yet unemployment remains high, incomes low.

⁷ The Charité generated an added value in Berlin of 1.4 billion euros with a grant from the Senate worth 217 million euros. In addition, the university hospital generated around 26,000 jobs. See DIWecon, "Wirtschaftsfaktor Charité," from November 2, 2012, accessed June 21, 2016.

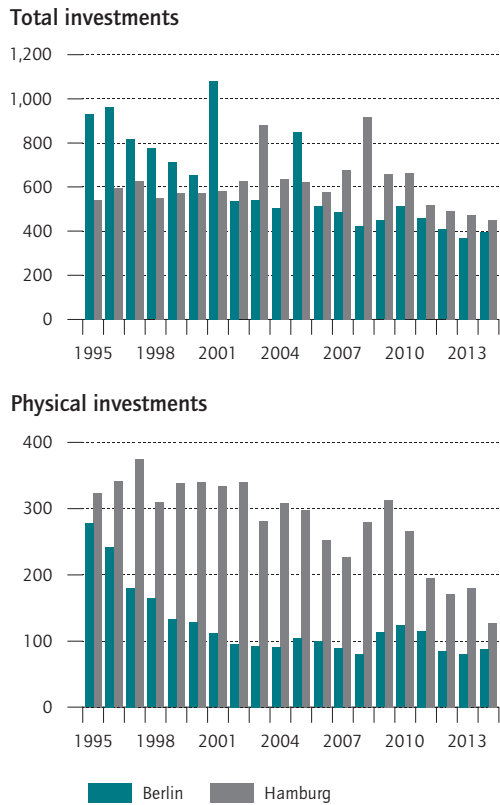
⁸ BertelsmannStiftung, *Kommunaler Finanzreport* (Gütersloh, 2015), 89.

⁹ www.berlin.de/sen/finanzen/presse/pressemitteilungen/pressemitteilung.454452.php.

Figure 1

Public investment in town budgets in Berlin and Hamburg

In Euro per capita



Source: Berlin—Official town budgets; Hamburg—2001 Genesisdata (Federal Office of Statistics), from 2002 town budgets

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Total public investment in Berlin is shrinking since the mid-nineties. Hamburg clearly ahead in physical investment.

federal capital. Moreover, it should be noted that the division of administration in core budgets as well as investment in public firms and state enterprises is specific to each federal state and depends on the sector.

Long-term trend: total and real investment is declining

Both total spending on investment and real investment (investment in construction and acquisition of tangible assets) have declined considerably since the late 1990s (see Figure 1).¹⁰ This shows, first, that pressure on direct investment after reunification has eased over time and,

¹⁰ The enormous increase in 2001 was due to an emergency bailout for the Landesbank Berlin. Since the Bankgesellschaft Berlin almost failed to meet its equity capital quotas, the City of Berlin agreed a fresh injection of capital

second, funds from the Solidarity Pact II were reduced from 2005 onward.¹¹

Between 2002 and 2010, Berlin invested considerably less in its core budgets than Hamburg. Only in recent years has there been a convergence in per capita investment in the core budgets of the two cities. In 2014, Berlin spent around 398 euros per inhabitant on investment; in Hamburg, the corresponding figure was 451 euros. In terms of real investment, which is considered a more precise definition of investment in construction and property, Berlin only planned to spend 87 euros per capita, while in Hamburg this figure was 127 euros.¹²

Largest types of investment in core budget: grants to public and private firms

In order to better understand total spending on investment and real investment, it is worth looking at the composition of this budget item in the revenue and expenditure account for 2014 (see Figure 2). This shows that well over 50 percent of investments are booked as grants, including grants to state-owned firms and participations, for example, in the Berlin Transport Authority (BVG) and the hospital group Vivantes, as well as to public bodies such as universities and the Charité, and grants for investment in private and non-profit enterprises, such as charitable day care centers and other social agencies.

The second largest item is real investment with approximately 21.8 percent of total investment spending. This is subdivided into three groups: 15.2 percent is on construction, 5.3 percent on the acquisition of movables and 1.3 percent on the acquisition of immovables. The main reason why the shares of these types of investment are so low is because of the administrative structure consisting of a large number of outsourced investment activities. The grants awarded here might also be used for real investments but are not categorized as such in the core budget.

In addition to investment grants and real investment, a variety of financial transactions are booked as investment spending. These include spending on participating interests in companies, direct lending for economic development, and invoked guarantees.

worth two billion euros as part of the capital increase. Bankgesellschaft Berlin, *Annual Report* (2001), 1 and 50.

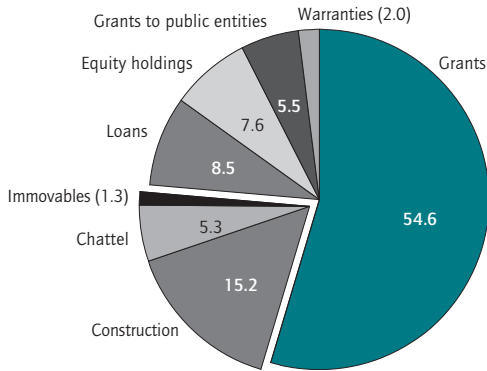
¹¹ The Solidarity Pact II replaced the Solidarity Pact I in 2005. Funds for the former East German federal states declined each year. For Berlin, this means a reduction from around two billion euros in 2015 to 400 million euros by 2019. See *Financial Equalization Act* (Finanzausgleichsgesetz, FAG), 11 (2001).

¹² In Berlin and Hamburg, the share of real investment to total investment in the core budget is relatively low due to investment grants to private and public firms which are not categorized as real investments.

Figure 2

Public Investment in town budget Berlin 2014—by type of investment

In percent



Source: Official town budget 2014, p. 47-49.

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Grants make for the largest part in the investment budget.

Investment by public companies is almost as high as the core budget

The following section considers the total investment by the Senate, the districts, state enterprises, and companies with public participation (see Figure 3). In addition to the core budget, it gives an overview of the investment activities of public companies—again compared to Hamburg.

Initially, it appears that the difference in investment in the core budget between Berlin and Hamburg, i.e., the Senate and the districts, is not particularly large. Within Berlin's core budget, the investment rate of the districts is at ten percent. In contrast, Hamburg allows its districts to implement less than two percent of investment in the core budget. This difference between Berlin and Hamburg is to a large extent due to the fact that Berlin's districts are responsible for schools. Hamburg, however, set up a special fund for school property in 2010 and has since invested heavily in its education infrastructure.

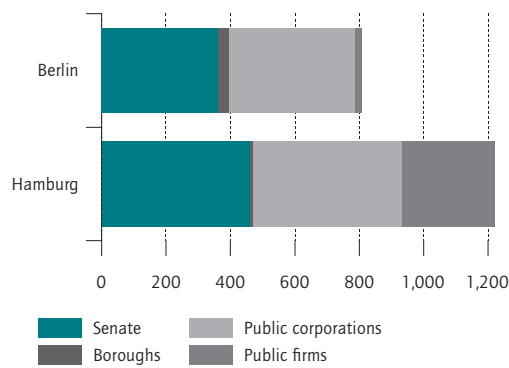
Apart from investment in the core budget, Berlin's public companies also play an important role. These are divided into participations in companies and state enterprises, including special funds. According to the investment report for 2014, Berlin owns 33 companies outright.¹³ Examples include the Berlin Transport Authority

¹³ If we were to also include enterprises in which Berlin had a less than 100-percent stake, per capita investment would increase by around 170 euros.

Figure 3

Public investment in Berlin und Hamburg 2014—by senate, boroughs, public corporations and public firms

In Euro per capita



Source: "Haushaltsjahr 2014 Gesamthaushalt IST" for Berlin und "Haushaltsplan 2014" ("Zahlenwerk") for Hamburg, statements of public firms.

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Hamburg invests more than Berlin, especially through public firms.

(BVG), the Olympic Stadium, Grün Berlin GmbH, Vivantes, and several housing associations. The city holds less than 100-percent shares in 22 companies.¹⁴ These include Berlin-Brandenburg Airport (BER), the integrated public transport system in Berlin and Brandenburg (*Verkehrsverbund Berlin-Brandenburg, VBB*), and Berlin's trade fair (*Messe Berlin*). For the purposes of the present study, we will restrict ourselves to the companies in which Berlin has a 100-percent stake because of the clear political controllability.¹⁵ In general, the outsourcing of investment to public companies is only of interest when the outsourcing results in responsibility for a particular area being met centrally, when it is profitable, and when tasks are fulfilled transparently for both citizens and politicians.¹⁶ In addition to cases of legally independent participation, which are reported in the participation report, there are also some federal state firms. Managing them has been outsourced to independent organizations. Legally, however, these are clearly part of Berlin's state ad-

¹⁴ The shareholding structure of Berlin's water utility company (*Berliner Wasserbetriebe*) is unusual. Here, Berlin is directly and indirectly the outright owner but the participation report only indicates a participation of 50.1 percent. Due to its *de facto* ownership, Berlin's water utility company was counted as having a 100-percent participation.

¹⁵ Another problem with public firms is their organizational structure in holdings whose other subsidiaries do not necessarily need to disclose their investments in the participation report.

¹⁶ Cullmann et al., "No Decline in Investment in Public-Sector Energy and Water Supply," *DIW Economic Bulletin*, no. 43 (2015): 577-583 and "No Differences in Efficiency Between Public and Private Utilities," *DIW Economic Bulletin*, no. 20 (2016): 233-238.

ministration.¹⁷ They include, *inter alia*, state enterprises such as the Berlin State Mint, special real estate funds, and facility management firms.¹⁸

Investment in public companies in Berlin is almost as high as spending in the core budget (see Figure 3).¹⁹ In Hamburg, investment in public companies is around 1.6 times greater than investment spending in the core budget.²⁰ There is a major difference in the amount invested by Berlin and Hamburg in state enterprises—in particular due to the special fund mentioned above.

The investment activities of public enterprises in 2014 show that Berlin had a considerable investment gap compared to Hamburg. Overall, per capita investment in Hamburg was almost 50 percent higher than that of Berlin.

Too little investment in Berlin's schools for too long

Education and culture are not only interesting because both the Senate and the districts are responsible for these areas but also because they form the largest investment area in the core budget (31 percent in 2014).

In the education sector, Berlin spends 56 euros per capita on universities and science and research. These include investment grants for universities, renovating the Charité building, and grants to non-university research institutes. Here, Berlin is in fact investing more than Hamburg which spends around 31 euros per inhabitant (see Figure 4).

Conversely, Hamburg invests more in cultural heritage and listed buildings: 49 euros per inhabitant, compared to 27 euros in Berlin. Most of this goes to the Elbe Philharmonic Hall which in 2014 alone cost Hamburg 47 euros per inhabitant. By contrast, a modest 15 euros per inhabitant were spent on the Berlin State Opera.

The big difference in education policy is reflected in the amount invested in schools. Here, only 53 euros per in-

¹⁷ Hamburg has considerably more public firms and often a complex structure with holdings and subsidiaries. Additionally, there are 24 local public firms and special funds.

¹⁸ Berlin also has a local public company for day care centers. Data on investments in local public firms could not be found in its budget.

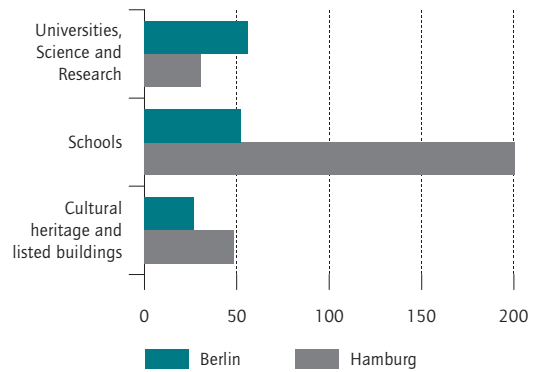
¹⁹ We have only considered 100-percent participations in Berlin and Hamburg in the present study because their political controllability can be transparently allocated.

²⁰ However, it should also be mentioned here that investments in participations in Hamburg are higher because essential services were handed back to the municipalities. As a result, public companies invest in the water, waste water, and energy supply, while in Berlin only the supply of water is controlled by the public sector.

Figure 4

Public investment in schooling and culture in Berlin und Hamburg 2014

In Euro per capita



Source: "Haushaltsjahr 2014 Gesamthaushalt IST" for Berlin und "Haushaltsplan 2015/2016" (with current budget for 2014) for Hamburg, statements of public firms.

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Berlin slightly ahead in higher education and science, but way behind in schooling.

habitant was set aside in Berlin's 2014 budget, while Hamburg invested around 200 euros per inhabitant in schools during the same period.²¹

This also explains why there is a massive investment backlog in Berlin's schools. Germany's capital has since identified a need to invest 4.9 billion euros in refurbishing its schools as a result of a building survey.²² To put this number into context, a comparison can be made with the findings of the municipal panel set up by the reconstruction loan corporation (*Kreditanstalt für Wiederaufbau, KfW*). This identified an investment gap of 34 billion euros for the area federal states, which equates to around 450 euros per inhabitant.²³ Berlin's investment requirement is, however, more than three times this fig-

²¹ In fact, a precise representation of the figures for Berlin is difficult here. Apart from the usual investments, the 52 euros per capita also include building maintenance and construction as part of the sanitary installation and sporting facility renovation program. For the present analysis, the original definition of investment is different from that in the core budget. This allows us to better compare with the special fund in Hamburg which also implements renovation measures.

²² See <https://www.berlin.de/sen/bjw/schulsanierung/>, accessed July 5, 2016.

²³ This includes the investment backlog in the entire education sector (also day care centers). This means that Berlin's backlog in school investment is even greater. Kreditanstalt für Wiederaufbau, *KfW-Kommunalpanel 2016* (KfW Bankengruppe, 2016), 1.

ure at over 1,400 euros per capita. Between 1.2 and 1.5 billion euros need to be invested within the next ten years to rectify the worst shortcomings.²⁴ However, in order to obtain this sum alone, annual investment in the education sector would need to be almost doubled.

The Berlin districts are responsible for their respective schools, but this fragmented division of responsibility seems to be a problem. Even the result of the current building survey needs to be checked again, as the data reported by the districts are not yet compatible due to different software and different methods of recording certain renovation projects. Consequently, the Senate established a task force for school building construction called *Task Force Schulbau* to better coordinate the development of schools.²⁵ The districts are also to receive standardized software in 2017.

Hamburg, however, recognized seven years ago there was a large investment requirement and passed legislation to set up a special fund for school property in January 2010.²⁶ The responsibility for schools was transferred to the centrally organized fund, investment requirements were systematically documented, and investment measures implemented. The example of Hamburg shows that centralizing the task of constructing schools has a positive impact. For Berlin, however, the question is whether the districts would be prepared to give up this part of their mandate.

Transport policy is more than just an airport

Transport policy is also a crucial part of investment in the core budget (24 percent in 2014). On this subject, Berlin-Brandenburg Airport has dominated the media in recent years. The cost of the airport was initially estimated at two billion euros but that figure has since risen to a whopping 6.5 billion euros²⁷. The *Flughafengesell-*

schaft Berlin Brandenburg GmbH (FBB), which also operates Tegel and Schönefeld airports in Berlin, is responsible for the construction of the new airport. The states of Berlin and Brandenburg each hold a 37-percent and the federal government a 26-percent stake in the airport company.²⁸

The final financial burden for the state of Berlin is yet unknown. Much of the investment in the capital's new airport was secured through bank loans with public guarantees totaling 2.4 billion euros.²⁹ The share of bank loans to total assets is around 65 percent (as of 2014).³⁰ Should the *Flughafen GmbH* ever generate surpluses from a functioning airport, these will go into debt financing. However, there is also the risk that the guarantee will be called in if the project fails. Then Berlin would bear a financial burden amounting to its total shareholders stake. From 1999 to 2010, Berlin invested over 300 million euros in the company's equity.³¹ When the company ran into financial difficulty as a result of the opening being postponed in 2012, the three shareholders had to provide an additional 1.2 billion euros in equity, according to their shareholdings, as emergency aid for the company.³² This sum had not been fully accessed by the end of 2014.

In addition to the city having a vested interest in the airport opening soon, Berlin also had to maintain and improve the public transport infrastructure and road construction including cycle paths. Both in Berlin and in Hamburg, the local public transport network makes up for a large portion of investment (see Figure 5). Per capita, Hamburg spends more than double as much as Berlin on roads, including cycle paths.³³

Berlin benefits from direct federal investment in road construction as any other state, for instance, in federal highways. The long controversial expansion of the A100 is financed almost entirely by the federal government.³⁴

24 Joint declaration on a status survey to determine the status of renovation and renovation requirement of Berlin schools, Senate Department for Education, Youth and Science from June 30, 2016.

25 Senate Department for Education, Youth and Science, press release from June 28, 2016, accessed July 1, 2016. See http://www.berlin.de/sen/bjw/service/presse/pressearchiv-2016/pressemitteilung_492227.php.

26 On January 1, 2010, Hamburg transferred the entire fund for school buildings and real estate—almost four billion euros. The special fund was financed by renting the schools to the schools authorities and from external loans. See <http://www.hamburg.de/pressearchiv/2038002/2010-01-07-fb-sov-schulbau-gf/>. Last accessed June 13, 2016. On January 1, 2013, the special fund was restructured. The local public firm SBH Dienstleistungen was awarded the contract to construct the schools while the school buildings remained part of the special fund for school real estate. Most of the personnel moved from the special fund to the public company. Senate communication to Parliament, printed papers 20/5317 (2012), from September 18, 2012, accessed June 17, 2016.

27 See <http://www.tagesspiegel.de/berlin/flughafen-in-berlin-eu-begrenzt-ber-kosten-auf-6-5-milliarden-euro/12728266.html>.

28 The aforementioned figures do not include the *Flughafengesellschaft's* investment in the Berlin-Brandenburg Airport. The present report only includes investments by public companies in which the city of Berlin has a 100-percent stake. This is not the case for the airport. See <http://www.berlin-airport.de/de/unternehmen/ueber-uns/unternehmensorganisation/beteiligungsstruktur/>.

29 Berlin-Brandenburg Airport press release from June 30, 2009, accessed June 21, 2016. <http://www.berlin-airport.de/de/presse/pressemitteilungen/2009/2009-06-30-bbi-finanzierung/index.php>.

30 City of Berlin's Participation Report, vol. 2 (2015), 396.

31 Budget plans for Berlin, Capital Assets for 2000 to 2012/2013.

32 Berlin-Brandenburg Airport press release from December 19, 2012, accessed June 21, 2016. <http://www.berlin-airport.de/de/presse/pressemitteilungen/2012/2012-12-19-finanzierung/index.php>.

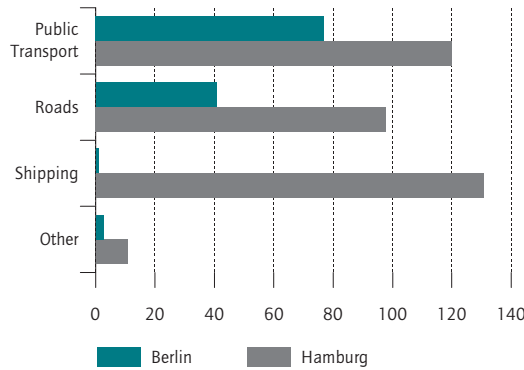
33 Around one-third of Hamburg's investment in roads has been set aside for the order management of federal highways and capping the A7. If these special effects are excluded, per-capita spending is doubled. Spending on refurbishing and maintaining roads has been added to transport investment for both Berlin and Hamburg.

34 The city of Berlin only covered the planning costs.

Figure 5

Public investment in urban mobility in Berlin und Hamburg 2014

In Euro per capita



Source: "Haushaltsjahr 2014 Gesamthaushalt IST" for Berlin und "Haushaltsplan 2014" ("Zahlenwerk") for Hamburg, statements of public firms.

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Hamburg invests more in public transportation and roads.

This project involves huge sums of money because the 16th construction phase, scheduled for completion in 2022³⁵, will cost around 473 million euros.³⁶

Berlin should invest more in cycling infrastructure

According to the Berlin state budget of 2014, only around seven million euros was set aside for maintaining cycle paths and improving the cycling infrastructure. Despite a budget of seven million euros, only projects costing a total of around five million euros had been implemented by the end of the year. Consequently, 30 percent of the planned cycle infrastructure budgets has not been invested. Additionally, Berlin has awarded just under two million euros in grants from the joint scheme for improving regional economic structures (GRW) for the construction of cycle paths.³⁷ Nevertheless, in 2014, Berlin

35 The German Federal Transport Infrastructure Plan (*Bundesverkehrswegeplan*, BVWP) recently published by the Federal Ministry of Transport and Digital Infrastructure includes both the 16th and 17th construction phases of the A100. A total of 848 million euros has been set aside for both sections in the cost planning. In addition to the A100, the plan also includes a total of 126.5 million euros for the refurbishment and extension of the AVUS highway section to six lanes. The new BVWP also includes investment for Hamburg, *inter alia*, in the new inner-city highway connection to the harbor (895 million euros) and the capping of the A7. See <http://www.bvwp-projekte.de>.

36 See http://www.stadtentwicklung.berlin.de/bauen/strassenbau/a100_16_ba/de/zahlen.shtml.

37 Notification on funds from the European Regional Development Fund (ERDF) and the joint task on improving regional economic structure (*Gemein-*

only spent a total of around two euros per inhabitant on the cycling infrastructure. Compared to other cities in Germany and in Europe, this figure is very low. For example, in 2015/16, Oslo invested over 70 euros per inhabitant in the cycle path infrastructure³⁸ and Copenhagen spent more than 20 euros per inhabitant and per annum. In 2014, Hamburg invested around seven euros per capita, which was considerably more than Germany's capital city.

Small wonder that, in the context of Berlin's Bicycle Referendum on cycling in the capital, the first hurdle was overcome when it garnered 105,000 signatures in favor of introducing legislation on cycling. A costing of the initiative revealed spending on this legislation would cost around 13 euros per person per year. The total cost for an improved cycling infrastructure in Berlin would be around 320 million euros over an eight-year period. According to estimates by the Berlin Senate, financing required to implement a cycling act would reach more than two billion euros.³⁹

Investment requirement for the local public transport network

As more and more people move to Berlin, it is also important for the Berlin Senate to consider expanding its local public transport network. In addition to the construction of the new extension to the U5 line from the main railway station to Alexanderplatz,⁴⁰ there have also been discussions about extending certain underground routes, such as extending the U1 to Frankfurter Tor (or Ostkreuz) to the east and to Adenauerplatz in the west, extending the U8 into the Märkisches Viertel, and the U3 to Mexikoplatz.⁴¹ There are plans to expand the tram network following some existing improvements in this area. There are also discussions on improving connections in Berlin's hinterland (connecting Falkensee or Nauen to the suburban railway and reactivating Berlin's main line).

schaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur," GRW, Berlin House of Representatives, printed papers 17/1796, accessed June 21, 2016.

38 Oslo also declared cycle transport one of its stated aims with the election of a new mayor in 2015 and plans to invest more than 460 million euros in this area by 2025 (with around 600,000 inhabitants).

39 Promotion of Cycling Act (*Gesetz zur Förderung des Radverkehrs in Berlin, RadG*)—Berlin's Bicycle Referendum. See www.volksentscheid-fahrrad.de.

40 Although for a long time the project seemed to be within budget and on time, the costs have since shot up. It is currently 20 percent over budget (from 433 to 525 million euros). The cost of the new underground connection will be covered by central government and the City of Berlin. The U5 line is due to be completed in 2020. Should the project not be completed on time, Berlin will have to pay back grants from central government of 150 million euros, plus interest. See <http://www.projektu5.de/de/die-neueu5/> and <http://www.morgenpost.de/berlin/article206823699/Kanzler-U-Bahn-wird-noch-mal-um-30-Millionen-Euro-teurer.html>.

41 Land development plan for Berlin, *FNP-Bericht 2015, FNP-Themenkarte Schienennetz*, (2015), 161, accessed July 5, 2016.

The BVG also has a specific investment requirement in expanding its fleet of buses, laying new tram lines, and purchasing new underground trains. Even though new vehicles were purchased, there are still not enough trains on the U5 to U9 lines. The BVG also plans to invest in the accessibility of its underground network.⁴²

It is also important for transport policy to monitor the direct correlation between the housing market and housing policy. The more connectivity urban areas enjoy, the more attractive residential areas emerge.

Housing market policy should focus on additional living space

In general, rental prices in Berlin are lower than in other German major cities or European capitals. However, rents have risen considerably in recent years.⁴³

In response to the tight housing market in Berlin, the Senate implemented an initial rental brake and, in May 2014, it also issued a ban on alienation in use of buildings, e.g., renting flats as holiday apartments. As discussed in *DIW Wochenbericht*, no. 22/2016, these measures do not go far enough.⁴⁴ The pressure on the market can only properly be relieved by creating additional living space.

Berlin has only recently begun to invest in social housing again. A housing construction fund was set up in 2014 which has been enshrined in law as a special fund since last year. Between 2014 and 2017, 320 million euros were set aside to finance it.⁴⁵ The funding will be made available as loan financing for builders or as rental grants and is subject to rents and occupancy conditions. In 2014 and 2015, around 1,200 apartments were financed under these conditions.⁴⁶ How quickly and to what extent the funds provided will be made available to and accessed by investors remains to be seen. With almost 40,000 additional inhabitants per year, Berlin will have to step up its efforts considerably.

⁴² Around 64 percent (110 of 173) of Berlin's underground stations are currently fully accessible. The BVG is planning to make all stations fully accessible by 2020 and intends to convert ten stations in 2016 alone. "Neuer Aufzug am U-Bahnhof Haselhorst," BVG news release, January 29, 2016 and a written inquiry by parliamentary representative Alexander Herrmann, printed paper 17/16504 from June 29, 2015.

⁴³ Not least, the number of empty apartments in Berlin has halved since 2014. See Kholodilin et al., "Die Mietpreisbremse wirkt bisher nicht," *DIW Wochenbericht*, no. 22 (2016): 491–499.

⁴⁴ In particular, the rental brake has proved ineffective to date. There are now political discussions on further tightening the rental brake, among other things.

⁴⁵ See House of Representatives, dossier 1482, letter to the chairman of the committee from April 1, 2014.

⁴⁶ See <http://www.stadtentwicklung.berlin.de/wohnen/wohnungsbau/de/foerderung/>.

Funds are available but are only being accessed slowly

In order to take account of recent developments, it is also worth mentioning at this point a special fund set up to meet the needs of the growing city (SIWA). Due to a higher than expected budget surplus of more than 800 million euros in 2014, in December of the same year, it was decided to distribute these surpluses proportionally in debt reduction and the SIWA investment program. The Senate also decided to plow half of surpluses in future years into this special fund.⁴⁷ Responsibility for investment spending continues to lie with the personnel of the relevant authorities. Unlike investment measures in the core budget, money in the special fund is not linked to a specific year and can be spent over several years.⁴⁸

The total volume of surpluses from 2014 invested in SIWA I is 496 million euros. Another 193 million euros from surpluses in 2015 are earmarked for SIWA II. Measured against total investment in the budget and in public companies of almost three billion euros in 2014, this constitutes a substantial program to improve infrastructure (see Figure 6). SIWA I includes 120 million euros for infrastructure projects in the districts, 58 million euros for new underground trains, 40 million euros for refugee accommodation, and 18 million euros for schools (modular auxiliary facilities).⁴⁹ Of the funds that will go to the districts, the majority of investments will be in schools. Overall, a total of around 93 million euros is earmarked for the education sector.⁵⁰

Of the funds in SIWA II for 2016, more than 80 million euros will be invested in refugee accommodation and 70 million euros in schools (see Figure 6), five million euros will be spent on police shooting ranges,⁵¹ and four million euros on subway elevators.⁵²

The program is headed in the right direction to close the investment gap. However, many measures are delayed.

⁴⁷ The precise regulation depends on the exact surplus amount. Half of surpluses are incorporated in the investment program, as long as the surpluses exceed 200 million euros. If surpluses are lower, a different regulation applies. See SIWA establishment act (*SIWA ErrichtungsG*), 4, sentence 1.

⁴⁸ See SIWA establishment act (*SIWA ErrichtungsG*), 4, 3.

⁴⁹ See Senate Department for Finance, news release on SIWA from March 3, 2015, <https://www.berlin.de/sen/finanzen/haushalt/nachrichten/artikel.272270.php>.

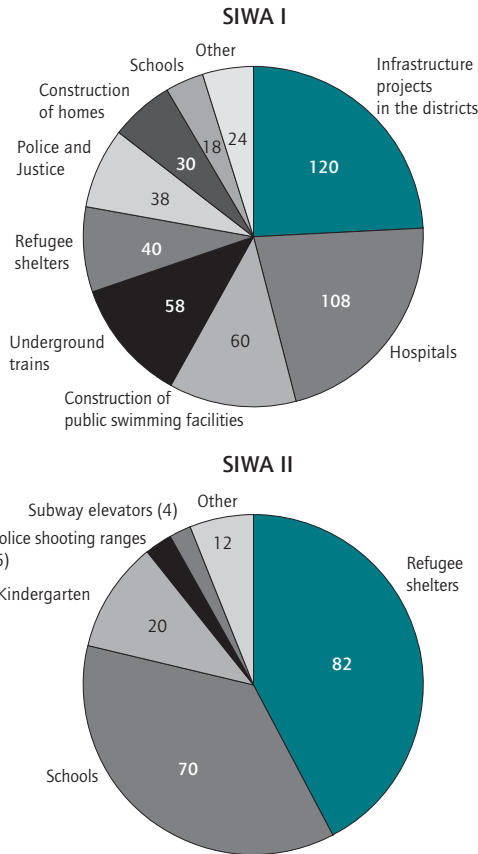
⁵⁰ See <https://www.berlin.de/sen/finanzen/haushalt/siwa/siwa-i-2014/artikel.457146.php>, accessed July 5, 2016.

⁵¹ In fact, many shooting ranges owned by the Berlin Police have been closed for years because they are contaminated or need renovation. As a result, firearms' training for Berlin's police force has been limited. See written inquiry to the Berlin House of Representatives, printed paper no. 17/15416.

⁵² See Senate Department for Finance, news release, no. 16–002, March 3, 2016 on SIWA II, <https://www.berlin.de/sen/finanzen/presse/pressemitteilungen/pressemitteilung.454452.php>.

Figure 6

Planned investment programs SIWA I and SIWA II
In Mill. Euro



Source: Press release of the Senatsverwaltung für Finanzen.

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Investment program finances multitude of issues, special focus on refugees homes, hospitals and schools.

Despite the available funds, the Berlin Senate and its districts only accessed ten percent of the total amount in 2015. From a budget of 496 million euros, only 48 million has actually been invested. The largest single item is the purchase of underground trains worth around 43 million euros,⁵³ with delivery scheduled for 2017 and 2018.

⁵³ Article in the *Tagesspiegel*, confirmed by the Senate Department for Finance according to rbb, <http://www.tagesspiegel.de/berlin/siwa-programm-fuer-infrastruktur-berlin-will-689-millionen-investieren-und-schafftes-nicht/12907980.html>, <http://www.rbb-online.de/politik/beitrag/2016/02/stadt-berlin-und-bezirke-rufen-bisher-nur-zehn-prozent-der-siwa-mittel-ab.html>, accessed July 5, 2016. See also Senate Department for Urban Development and the Environment, Interim Report on the Local Transport Plan 2014 to 2018—incorporating the procurement of new underground trains in financial planning, June 12, 2015, 1677 C, accessed June 22, 2016.

Conclusion

The present study reveals a mixed picture of investment activity in Berlin. In particular, the comparison with Hamburg shows that Berlin has a substantial investment gap.⁵⁴ There is an enormous investment requirement, primarily in schools and transport. On the other hand, budget surpluses in 2014 and 2015 have provided the financial framework to implement additional projects for the first time ever. The SIWA fund shows that there is a political will for more investment in Berlin’s infrastructure. However, implementation of the measures planned has been slow.

The most urgent requirement is in Berlin’s schools. Here, the investment backlog is almost three times as high as in other federal states in Germany. Schools, as one of the most important locational factors, must be substantially improved—as the findings of the other reports in this issue of *DIW Economic Bulletin* show. Berlin needs a major initiative to close the investment gap in renovating and constructing new school buildings. To ensure the quality of schools, the city must also strive to employ more teachers.

As well as in schools, Berlin is also seriously lagging behind when it comes to investment in the transport infrastructure. Negotiations with Berlin’s Bicycle Referendum initiative give Germany’s capital an opportunity to pave the way for a sustainable solution for the good of the city. In addition, more detailed plans should be outlined to extend the local public transport network in order to take account of the growing population and provide access for more residential areas.

Overall, the housing policy has a crucial role to play. For a city like Berlin with its as yet below-average salary structure (see the second article of this issue *DIW Economic Bulletin*) investment in affordable housing is essential. Furthermore, it forms the basis for maintaining Berlin’s thriving startup and artistic scene (see the third report). The rental brake and the ban on holiday apartments only provide superficial relief and are no substitute for much needed new housing. Berlin must consistently put into practice its planned support for social housing, making the necessary areas available for construction, and working proactively with state-owned housing enterprises. There is no reason why public housing companies should not achieve a reasonable rate of return on their investments in socially responsible housing, using private capital where necessary.

⁵⁴ The objective investment requirement and investment efficiency cannot be measured and were therefore not included in the present report.

Berlin has a number of problem areas that need tackling urgently. Implementing these investment measures purposefully and quickly will not only require additional personnel but also a change in administrative practices. When preparing the data for this report, it was apparent that the budget lacks transparency. A consistent transition from cameralistic to double-entry bookkeeping would help here. In addition, the double-entry bookkeeping system provides a consistent evaluation of all assets held thus allowing investment gaps to be readily determined.

Moreover, organization according to content-related units is recommended in order to avoid duplicating responsibilities. Individual areas of administration could be re-organized as either special funds or as a public enterprise each with its own personnel and extensive rights to assert claims. The best example of this is Grün Berlin GmbH. The special fund set up in Hamburg for school property shows what a model of this type is able to achieve.

Felix Arnold is Research Associate in the Public Economics Department at DIW Berlin | farnold@diw.de

Johannes Brinkmann is Student Assistant in the Public Economics Department at DIW Berlin | jbrinkmann@diw.de

Maximilian Brill is a Student of Economics at FU Berlin | m.brill@fu-berlin.de

Ronny Freier is Research Associate in the Department of Public Economics at DIW Berlin and Assistant Professor in the Department of Economic Policy at FU Berlin | rfreier@diw.de

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