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Small Private Sector in Bulgaria: Labour Market Impact and "Grey Zone" Activity

The wiiw Balkan Observatory

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The Small Private Sector in Bulgaria: Labour Market Impact and 'Grey Zone' Activity

1. Introduction

The emerging new private sector and, in particular, the small private sector is the most dynamic part of all post-communist economies. It has contributed the most to the process of reallocation of resources in these economies and to the creation of new jobs. While being dynamic and vital, small private firms – as suggested by both analytical research and anecdotal evidence – often engage in informal activities which are not always properly reported in their books. In this context, this paper focuses on two main aspects of the evolution and performance of the small private sector in Bulgaria: 1) its effect on the Bulgarian labour market; 2) a tentative assessment of its "grey" business activity.

The first part of the paper is devoted to an analysis of the impact of the small private sector on the Bulgarian labour market on the basis of empirical evidence of the small private firms' labour market performance. Based on recent performance statistics from the available comprehensive enterprise dataset, we evaluate various types of job flows in the Bulgarian by sectors of economic activity, by types of firms and by regions and seek to identify the role of small private firms in the dynamics of these flows.

The second part of the paper addresses one specific type of informal business activity which is mostly practiced by small private firms. We use the term "grey zone" to define economic activities that are actually performed by formally registered firms (over and above the formal part of their business) but, for various reasons (in the first place, tax evasion but also due to institutional bottlenecks), are not formally reported in the firms' books. In the paper we attempt an indirect evaluation of some of the "grey" activity of Bulgarian small private firms on the basis of the reported data for their formal activity.

The main underlying hypothesis is that, due to tax evasion, small private firms likely underreport the level of the remuneration of their employees while wages actually paid are higher than those reported. As a result value added generated by these firms is also likely to be higher than reported. The tentative evaluation of the level wage/value added underreporting is made by applying different assumptions about wage formation in different types of firms such as: 1) wage equalization for employees with similar skills within economic sectors/branches; 2) similarity of cost structures (including share of labour costs in total costs) within economic sectors/branches; 3) similarity in the pattern of wage

* The empirical work reported in this paper was performed by Nasko Dochev and Nikolay Markov from the Centre for Economic and Strategic Research.

formation in firms characterised by similar governance structures. This allows to produce an alternative estimate of the actual value added produced contribution in the small private sector and its contribution to aggregate economic activity.

2. The labour market impact of the small private sector in Bulgaria

2.1. The small private sector and labour market adjustments in the transition from plan to market

The newly emerging small private sector has been the most dynamic part of the central and eastern European countries undergoing economic and political transformation. Its dynamism has its roots in several important features of the process of transition from plan to market. First of all, this segment of the business spectrum was virtually non-existent in most centrally planned economies as private entrepreneurship (with very few exceptions) was practically banned. Besides, central planners had no interest in small-sized firms; their attention was mostly focused on "prestigious" industrial giants which shaped the industrial structure. Given the fact that the potential demand for various goods and especially services that the small private sector can offer (and that these new market opportunities grew and diversified with the overall economic liberalization), the filling of this lacuna was a natural supply side response to the opening of market entry.

Secondly, the mushrooming of the small private sector was part of the major restructuring and adjustment effort that the economies in transition economies had to undertake. Due to the excessive emphasis of central planners on heavy industry, these economies inherited an oversized and obsolete manufacturing sector, structured around a relatively small number of large but inefficient firms. The exposure to market conditions and competition revealed the non-viability of many such firms. Hence all transition economies were faced with the challenge of massive re-location of resources, in the first place, labour. For example, in Bulgaria, between 1989 and 2002 the number of the employed in industry (mining, manufacturing and utilities) dropped from 1646 ths. persons to 707 ths. persons, or by 57%! Hence the opening of a small business was also a survival strategy for many of those that lost their previous jobs.

The importance of the small business sector as a catalyst of structural change and, in particular, as an important engine of re-location of labour is widely acknowledged in the literature (see, e.g. Davis, Haltiwanger and Schuh, 1993). As evidenced by a number of studies, its role has been especially pronounced the countries undergoing transition from plan to market. Thus EBRD (1995) emphasizes the positive spillover effects (or externalities) generated by SMEs: they invigorate markets, encourage product and process innovation and stimulate competition in local markets.

The small business sector has also been identified as one of the main sources of new jobs in the transition economies. On the one hand, the opening up of the local markets for the entry of small private firms provided opportunities for many skilled people to find alternative application of their skills, to improve their career prospects and, ultimately, to increase the return on their human capital. Intensive job-to-job shifts towards the private sector were typical of this process of massive re-allocation of labour. Thus, by analyzing job flows in a number of transition economies Boeri (1995) argues that small private firms in these countries tend to hire persons already employed in other firms (in the beginning of transition, mostly from SOEs) and not from unemployment.

On the other hand, the liberalization of market entry allowed many people who lost their previous jobs to start their own business and thus to take their fate in their own hands. While in this case some of the new entrepreneurs tried to enter a business with a similar profile to what they were doing in the past, mainly relying of accumulated knowledge and skills, others entered totally new business areas, seeking to expand and/or diversify their skills. Many of these firms, especially in the services sectors, are family businesses which provide labour opportunities mainly to the members of the owners' family.

While the importance of the new small private sector as a catalyst and engine of labour market adjustment has been widely acknowledged, relatively few studies have succeeded to provide an in-depth empirical analysis of the actual mechanisms and channels through which small firms participate in, and contribute to, the relocation of labour in the transition economies. One of the important obstacles for the implementation of this type of the analysis is the absence or the scarcity of relevant data. Obviously, matched employee-employer data covering both firm performance and individual job flows would be the most comprehensive source for the purposes of such an analysis. However, comprehensive datasets of this sort (covering also the small private sector) are practically non-existent for most of the countries in transition. Among the very few studies using matched employee-employer data, is that by Haltiwanger and Vodopivec (2003) who analyse worker and job flows in Slovenia and the interrelations of these flows with firms' wage policies. They find that wage compression in firms (low average wages and/or low within-firm wage dispersion) tends to be associated with higher job volatility (both creation and destruction of jobs), especially for highly skilled workers.

Due to the existing data constraints, most empirical studies in this area are based on either "employer only" (firm level data sets) or "employee only" (household surveys). However, even firm level data sets containing the relevant data for small-sized firms are not always readily available as most statistical offices monitor small firms only through surveys of representative samples; moreover, even these are often difficult to obtain for research purposes. One of the few studies that are based on comprehensive data coverage of the small private sector is that by Konings, Lehmann and Schaffer (1996) which, however,

contains only one data point (one year of observation) for the small private sector, 1991. Drawing from the empirical evidence, these authors emphasize the role of de novo private firms in generating new jobs during the recession years at the start of transition in Poland. Most of the firm-level studies devoted to the relocation of labour during the transition exclude small firms due to the absence of relevant data for this category of firms. Thus Faggio and Konings (2003) who analyse in detail job flows in five transition economies (Poland, Estonia, Slovenia, Bulgaria and Romania) are only concerned with medium-sized and large firms, the types of firms reported in the AMADEUS dataset.

Other labour market studies devoted to the small private sector have attempted to overcome this difficulty by analysing the labour market behaviour of individuals on the basis of household survey data. Using this type of worker-level data in their assessment of job relocation in the Czech Republic and Estonia, Jurajda and Terrell (2002, 2003), provide important insights into the motivation and driving forces of jobs flows in the two countries. The analytical focus of these studies is on the labour market impact of start-up private companies and one of the central findings of Jurajda and Terrell is that de novo private firms indeed generated more jobs in these countries than large old firms which existed prior to 1990. Another interesting finding is that job growth within industries in the Czech Republic and Estonia was quantitatively more important than job growth due to across-industry relocation. Using a similar data set, Haltiwanger and Vodopivec (2002) analyse job creation and destruction in the private and public sector in Estonia and find that job flows were higher for small private firms; besides the relocation of labour differed across sectors of economic activity and was most intensive in some services industries. In general, while providing important insights into some key aspects of the process of labour relocation, the studies based on household survey data stop short of capturing the importance of firm performance as a determinant of job and worker flows.

2.2. Worker flows in the Bulgarian corporate sectors and the role of the small private sector

Similarly to developments in other post-communist economies, the newly emerging small private sector has been the most dynamic part of the Bulgarian economy since the start of economic and political transformation. In this section we look at some of the performance characteristics of the small private sector, focusing on its labour market impact, in particular, worker flows. In the context of the categorization of research in this area outlined above, it falls into the first category, i.e. it is based on “employer-only” data. However, compared to other similar studies its coverage is considerably broader, as it covers the greater part of the existing small private firms in Bulgaria.

For this study we use a comprehensive enterprise dataset for Bulgarian firms which has been compiled at the Centre for Economic and Strategic Research in Sofia. It covers

practically all incorporated firms that report to the National Statistical Institute in accordance with the double-entry accounting method.[1] What is missing from the small private sector in this dataset are individual entrepreneurs and partnerships which are not required to maintain their books in accordance with the double-entry accounting method. However, this category of firms has a relatively small weight in the Bulgarian economy and hence our coverage can be regarded as quite comprehensive.[2]

It should also be noted that due to the specificity of the source data provided by the National Statistical Institute, not all of the available firm-level entries can be used in the analysis of dynamic performance characteristics.[3] Due to this we distinguish between two definitions of our sample: 1) the "full sample" which covers all individual firm-level data entries for each specific year; 2) an "operational sample" which contains dynamically linked data, i.e. firms that can be traced at least in two adjacent years which allows to analyse their dynamic performance characteristics. Some of the firm performance characteristics presented below (in particular, the dynamic characteristics) are based on the operational subsample.

Tables 1 to 3 present an overview of the population of firms comprising the Bulgarian corporate sector in the period 1995-2001. It also shows the evolution and role of the small private sector in this period, focusing on its labour market effect as reflected in some basic employment characteristics. For the purposes of this assessment, the data are organized in three different breakdowns:

1) By sectors of economic activity (in this case, by the NACE one-digit sections).
2) By size and ownership categories. We have introduced six categories of firms which allow to trace both the ownership transformation and the role of the small private firms:
   - state-owned firms (SOEs);
   - Firms privatized to domestic investors;
   - Domestically controlled de novo private firms with 20 or more employees;
   - Foreign controlled firms with 20 or more employees;
   - Domestically controlled de novo private firms with less than 20 employees;
   - Foreign controlled private firms with less than 20 employees.

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1 In accordance with the acting legislation, all incorporated entities are required to apply the double entry accounting method and are mandated to provide their annual statements to the National Statistical Institute for statistical purposes.

2 For example, for 2001 the small firms in our sample accounted for some 85% of the total employment of all small firms (including individual entrepreneurs) and for some 90% of the total sales of small firms.

3 In accordance with the Law on Statistics, the Bulgarian National Statistical Institute only provides to outside users unidentified data for specific data points (years). However, the analysis of dynamic performance characteristics requires time series for individual entities (firms). As the individual entities are not disclosed in the original dataset, the dynamic linking can only be performed through indirect methods, e.g. comparing the same indicators reported in adjacent years (beginning-of-the-year and end-of-the-year values). This is an extremely difficult and cumbersome task which due to numerous practical difficulties, precludes a complete dynamic linkage of the frirms.

- For the purposes of this study we have defined the new small private sector in Bulgaria as the sum of the last two categories of firms.

3) By region (in this case, based on the latest administrative division of the country which is broken down into seven major regions).

(Tables 1 to 3 here)

Table 1 and 2 confirm the rapid development of the new small private sector and its increasing role in the Bulgarian economy: between 1995 and 2001 its share in total employment increased from 3.3% to 18.4% (table 2). The rapid pace of privatization in this period is also illustrated by the dynamics of the share of SOEs in total employment: it dropped from some 78.5% in 1995 to 25.7% in 2001.[4] The statistics on the average number of employed persons in different types of firms (table 3) suggest that by 2001, new small private firms prevailed in many sectors of economic activity (agriculture, fishing, trade, construction, hotels and restaurants, real estate).

Tables 4 to 6 illustrate some features of job flows in the Bulgarian corporate sector as well as of the labour market impact of the Bulgarian new small private sector. These tables are computed on the basis of the operational sample only.

The intensity of job flows for firms in different sectors and for different ownership/size categories of firms is reflected in the rates of gross job creation and job destruction (table 4). The following definitions are used for this purpose. A firm is defined as a net job creator in year t if its average annual number of employees in year t is greater than the average number of employees in year t-1. In the opposite case it is a net destroyer of jobs. The gross job creation within a certain category of firms is defined as the sum of jobs created in job-creating firms; accordingly, gross job destruction is defined as the sum of jobs destroyed in job-destroying firms. The rates of gross job creation and destruction shown in table 4 are computed as the ratios between gross job creation (respectively, gross job destruction) in year t and the total number of employees in year t-1, for each category of firms.

Table 4 represents the rates of gross job creation and job destruction for the various categories of firms used in this study (by sectors of economic activity, by ownership categories and by region). It should be noted that this table only refers to worker flows in

[4] The privatized firms to domestic investors are probably the most severely under-represented in the operational sample: their share drops from 13% in 1997 to low single digits thereafter due to difficulties in dynamic linking. These difficulties are partly due to the fact that many privatized firms underwent substantial subsequent organizational changes which prevents their further identification as privatized entities.

"existing" or "surviving" firms, i.e. firms that are present in our dataset for two adjacent years (both start-ups and firms that exit the market are excluded from this assessment).[5]

(Table 4 here)

The magnitude of the rates of gross job creation and destruction in existing firms is indicative of the considerable volatility of the Bulgarian job market. The sum of (the absolute values of) the two rates actually reflects the rate of total job "shifts" within each category of firms; the numbers presented in the table suggest that each year in the period 1995-2001 between 10% and almost 30% in some years of all formal jobs in the corporate sector shifted from one firm to another, or to non-existence. Among ownership categories, gross job destruction was the most intensive in small-sized firms and in privatized firms (especially in the years 1995-1996). Gross job destruction in SOEs was uneven which probably reflects the uneven process of restructuring of these firms: while at the beginning of the period job destruction in SOEs was not very pronounced, it soared after 1997 with the advance of some special restructuring and reorganization programs.[6] The rate of job destruction has been the lowest in large foreign controlled firms, which, on the one hand, suggests that jobs created in such firms tend to be more stable and, on the other hand, may be related to more rigorous human resource policies in such firms. While there was also considerable variation in job destruction across sectors of economies activity, the variation across regions was much less pronounced.

Gross job creation in Bulgarian firms has been no less dynamic but until 2001 gross job creation in the corporate sector as a whole fell short of gross job destruction. According to our results, foreign controlled and larger de novo domestically owned private firms have contributed the most to gross job creation in this period. These were also the categories of firms where the rates of gross job creation more often than not exceeded those of job destruction (this was especially pronounced in foreign controlled large firms). Not surprisingly, the rate of job creation was the lowest in SOEs (with the exception of the year 2001 when most probably there were some job-to-job flows within the state-owned sector). It could also be noted that, in contrast to job destruction, there was significant intra-regional variation in job creation, with the capital Sofia emerging as the clear leader among other regions in recent years.

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[5] This assessment may be incomplete as, due to the identification problems outlined above, it is sometimes difficult to trace the dynamic performance of firms in our dataset. In particular, the identification of market exits is especially problematic, as often firms are re-organized and then appear in different forms in later years. For the same reasons the identification of medium- or large start-up firms is also problematic, as they may be mixed up with spin-offs or re-organized firms. Among market entries, only small-sized start-up firms are relatively easy to trace in the dataset.

[6] After the major economic crisis in 1996-1997 and the introduction of a currency board in 1997, the process of market reforms (including enterprise restructuring) in Bulgaria was stepped up considerably.

Table 4 also provides evidence of the high instability – as well as dynamism – of jobs in small private firms: both the rates of job creation and destruction for this category of firms were considerably higher than those in larger firms. One of the unusual results is that the rates of job destruction in existing small private firms as a rule exceeded considerably the rates of job creation. Most likely this outcome is related to the very low survival rate of small Bulgarian firms. While, in principle, low survival is a general feature of small firms in all economies, the extent to which this was happening in Bulgaria is probably unusual.

Table 5 presents further evidence of the considerable turbulence prevailing in the Bulgarian job market in this period, and of the incidence of intensive and continuing massive job flows. The data presented in this table reflect the share of firms with growing employment over two consecutive years. Again, similarly to table 4, these results are based on the subset of "existing" or "surviving" firms, i.e. firms that are present in our dataset for two adjacent years. Looked from a different angle, the numbers in table 5 reflect the capacity of existing firms to generate stable jobs. As a general feature, these data confirm that jobs in the Bulgarian corporate sector were extremely volatile and that there was a very high degree of turnover of personnel. The generally fairly low shares of firms with growing employment levels also reflect a persistently low labour demand in the Bulgarian corporate sector. Notably, in the initial years of this period there was a considerable cross-sectoral variation in the capacity of firms to create stable jobs; however, over time this variation across sectors decreased substantially.

(Table 5 here)

Table 5 highlights once again the importance of large foreign controlled firms in the generation of stable new jobs: the share of such firms with growing employment in all years between 1995 and 2001 was considerably higher than for any other category of firms. Firms privatized to domestic investors and large de novo domestically owned private firms were ranked second and third in terms of the generation of stable new jobs whereas small foreign-controlled firms did not differ substantially in this characteristics from small domestically controlled private firms. For the corporate sector as a whole the share of firms with growing employment dropped considerably in 1997 (in the aftermath of the financial crisis) but has recovered thereafter.

Table 6 is specifically designed to capture the job creating effect of start-up small private firms. As already noted, due to the identification problems in our dataset, this is probably the only category of market entry which is relatively easy to detect and identify. The data presented in this table highlight another striking feature of the Bulgarian job market: start-up businesses played an extremely important role as generators of employment in this period. In the initial years of the observed period (1995 and 1996) jobs in start-up companies accounted for some 45%-50% of all jobs in small private firms! Later this share

gradually declined but still remained quite significant. Notably, the cross-sector variation in this indicator was considerable, with start-up activity retaining greater importance in some services sectors as compared to agriculture and industry.

(Table 6 here)

3. An assessment of some "grey zone" activities of Bulgarian small private firms

3.1 Conceptual background

The existence of a business sector outside the official economic system is a well established and widespread phenomenon which exists in all types of economies. At the same time, the notion of informal (unofficial, hidden, shadow, unobserved, etc.) economic activity is very broad and there are no established definitions of its coverage. When introduced by Hart (1970), it was used to broadly denote self-employed persons in developing economies. Later the notion was refined and narrowed somewhat in order to define real life economic activities (such that contribute to GDP) but do not comply with government regulations and do not pay taxes (Gerxhani, 1999; Ihrig and Moe, 2001; Schneider, 2002). A distinction is also usually made between informal and illegal economic activity: the first category may include activities that in principle, if registered, can be performed legally in the formal economy while the second category usually refers to business undertakings that are forbidden by law. The illegal economy is thus only one part of the informal sector.

While the informal sector of the economy is generally not directly covered by the official statistics, it may produce observable outcomes that fall into the categories of economic results scrutinized by the official statistics. One obvious example is the situation when the income generated in the informal economy is used for the purchase of goods and services in the formal economy. To the extent possible, national statistical offices make adjustments to the national accounts to take into account the existence of the informal sector of the economy.

On the basis of a survey of national statistical practices of measuring the size of the informal economy, the UN Economic Commission for Europe has suggested several concepts and definitions related to this type of business activity (UNECE, 2003). The broadest concept coined in that publication is that of the "non-observed economy" which refers to all productive activities that are not captured in the source data used for the compilation of the national accounts. The non-observed economy is assumed to comprise three main components: "underground production" (activities that are legal by their nature but are concealed for tax evasion purposes); "informal activities" (legal production activities characterized by low level of organization, typically based on unofficial relationships);

"illegal activities" (those banned by law or illegal when performed by unauthorized persons).

While the conceptual framework dealing with informal economic activity is still rather vague and ambiguous, there is much less disagreement in the literature on the driving forces or determinants of this type of business activity. Four main groups of incentives have been identified as explaining the motivation of informal business undertakings (Johnson, McMillan and Woodruff, 2000): 1) to avoid paying taxes (this is the number one factor pinpointed by most authors writing about the informal economy); 2) to avoid paying kickbacks (which is also a sort of a tax) to corrupt, bribe-seeking government officials; 3) to hide some output in order to escape extortion by criminal gangs (the latter, as an illegal activity, also being part of the informal economy); 4) to circumvent existing institutional bottlenecks (e.g., if legal enforcement of contracts is inefficient, agents have few incentives to register their business).

In this paper we deal with one specific type of informal business activity that we have named the "grey zone" economy. It is conventionally assumed that there is a clear distinction between "formal" economic activities (those that are properly registered and recorded, and pay their taxes) and "informal" ones (those that do nothing of the above). By contrast, based on the available evidence, we assume in this paper that there may be a "grey" sector of the economy, which is somewhere between the strictly formal and strictly informal parts of the economy. We use the term "grey zone" to define economic activities that are actually performed by formally registered firms (as a complement to the formal part of their business) but, for various reasons (in the first place, tax evasion but also due to institutional bottlenecks), are not formally reported in the firms' books.

With respect to the business activity of Bulgarian corporate entities, our main "suspicion" about grey zone activity falls on the underreporting of wages by small private firms. A first piece of hard evidence in support of this suspicion is the actual statistics about the level of formally paid wages in the Bulgarian corporate sector (table 7). A visual inspection of the data presented in this table indicates that average wages paid in domestically controlled small private firms after 1997 are ways below the average wages paid in other categories of firms.

(Table 7 here)

In principle there can be different explanations or interpretations of this differential. One possible factor could be productivity: if wages are related to firms' productivity then productivity differentials may give rise to wage differentials. Hence if small firms are less productive than larger firms, then the wage differential may be merely a reflection of this gap. However, the actual data on the productivity performance of different categories firms

(table 8) does not seem to support this conjecture: on average small domestically controlled firms in Bulgaria are more productive than the sample average.

(Table 8 here)

Another possible explanation of the wage gap could be that the drop in the relative wages in small private forms recorded after 1996 was in response to the recession after the 1996-1997 financial crisis: these firms were most sensitive to the drop in final domestic demand and responded by restraining relative wages in order to reduce costs and maintain their profit margins. While such type of an adjustment probably did take place, it seems unlikely that it alone can explain the extremely low relative wages in small private firms.

Yet a third (preferred by us) explanation is that this drop was in response to the changes in payroll taxes in a situation of a weak institutional environment. Payroll taxes such as compulsory social security contributions have been progressively increasing in Bulgaria but the most significant changes took place in 1997-1998 with the complete overhaul of the social security system. These included a full-scale reform of the pension system aiming at the introduction of a three-pillar pension system; one of the centrepieces of this reform was the creation of a National Insurance Institute (first pillar) and the adoption of legislation for the establishment of private pension funds (second mandatory pillar). There was a complete overhaul in health care with the goal of establishing a fully-funded and self-sufficient health care system. The reform measures included the establishment of a Health Insurance Fund and the commercialization (subsequent privatization is envisaged) of health services. Other components of the social security system were also reorganized. All these reforms resulted in raising the level of statutory payroll taxes. At the same time, the institutional environment in Bulgaria remained weak; in particular, contract enforcement through the judiciary system is still rather inefficient which, as noted, reduces the incentives to perform business in the formal economy and creates a conducive environment for tax evasion.

Widely reported anecdotal evidence suggests that due to the perceived high level of taxation of labour costs, a large number of firms (mostly small private ones) seem to be formally paying to their employees the minimum wage only; accordingly, they use this low basis also to make their contributions to the social security system. Another portion of the actual remuneration apparently is being paid in the shadow economy thus avoiding taxation (both income and payroll taxes).

Why should mostly small firms engage in this type of activity? One of the important reasons is governance, namely, the combination of ownership and control. As owners of small firms are at the same time their managers, they have the strongest incentive to engage in tax evasion as they own the cash flow that they control. The separation of

ownership and control (typical of larger firms) reduces the importance of this incentive. Besides, in large firms generally there is a higher degree of accountability and more checks and balances; in these firms the formally paid wages are more likely to reflect the actual remuneration of labour.

One indirect piece of evidence in support of this hypothesis was the introduction in 2003 (as part of the on-going pension reform) of lower limits ("insurance thresholds") for the minimum payroll contributions to the social security system. The previous system related compulsory social security contributions to reported (formally paid) wages. Among the openly stated reasons for the introduction of this change was the perception of massive tax evasion in the payment of compulsory social security contributions. Hence by introducing the insurance thresholds the government was hoping to be able to reduce the level of tax evasion at least with respect to the payroll taxes.

Our main underlying hypothesis thus is that, due to tax evasion, small private firms likely underreport the level of labour remuneration, that is, the wages actually paid are higher than those officially reported. To be able to pay such wages, obviously these firms should also have additional, unreported revenue (sales), on top of what is actually reported in their books. As a result, the actual value added generated by these firms will also be higher than what is officially reported. In what follows we attempt a rough estimate of the degree of such underreporting.

What would be the implication if our hypothesis were true? As shown, below, on the basis of some additional assumptions, it could be possible to draw some inferences about possible underreporting of activity within the reported enterprise balance sheets such as the actual wage levels/labour costs (vis-à-vis reported levels which are possibly underreported) and, as a result, about the corresponding underreporting of the level of sales and value added produced by these firms. However, admittedly, this approach would not help to identify all informal activities that are not reported in the company books. E.g. no inferences can be drawn about unreported sales that are not allocated as wages but contribute to retained earnings, or about unrecorded labour input (activity in the informal economy). Hence our approach only offers a partial solution to the measurement of one part of the informal economy.

What could be the possible approach for a rough evaluation of the level of underreporting (that is, to measure, or guesstimate, the size of this grey sector)? Any such approach would have to be based on a specific model of wage formation in the suspected category of firms (small domestically controlled private firms), defining wages as a function of some observable variables of firm performance (the latter is essential for the practical implementation). In what follows we suggest and quantify three possible approaches, based on alternative assumptions about wage formation.

1. One plausible hypothesis could be that of the identicalness (or similarity) of cost structures across similar firms. This hypothesis is equivalent to the assumption of efficient factor and product markets, pressing firms that compete in the same markets to use identical (or similar) production technologies; in turn, this would lead to identical (or similar) levels of productive efficiency. As a result, their cost structures would also be identical (or similar). We could then take the observed cost structure of a reference sub-sample (which is presumably non-distorted) and use it to recover the actual cost structure of the sub-sample with suspected distortions (the small domestically owned private firms).

2. Alternatively, one could hypothesize wage equalization for employees with similar skills in similar types of firms. This hypothesis is equivalent to the assumption of an efficient and competitive job market where firms are pressed to offer competitive wages to workers of similar skills. Accordingly, we could take the reported wage levels in a reference sub-sample (which are presumably non-distorted) and use them as the actual wage levels for the sub-sample with suspected distortions (the small domestically owned private firms).

3. Finally one might also hypothesize similarity of the pattern of wage formation in firms characterized by similar governance structures. In a simplified version based on two types of governance structures (SOEs and private firms) this hypothesis is equivalent to the assumption that the model of wage formation (wage in relation to some key performance characteristics) in each of these categories is identical. We could then estimate a wage equation on the basis of a reference sub-sample (in which reported wages are presumably non-distorted) and use it to model wage formation in the sub-sample with suspected distortions (the small domestically owned private firms). The actual wage levels in the latter will be computed through simulation.

3.2 Empirical results

In this section we present quantitative estimations of the level of underreporting on wages and value added on the basis of the three approaches outlined above. In order to apply any of these approaches, we have to choose a reference sample of firms where we assume that reported wages are realistic and non-distorted, and from there, to make the corresponding adjustments to the level of wages in the small domestically owned private firms (those with less than 20 employees) which are our main suspect for underreporting.

For the first two approaches our choice of such a reference sample is that of small SOEs. While this may at first glance appear as a dubious choice, there are several arguments to support it. First, as noted, managers of SOEs do not have equally strong incentives to avoid taxes as they do not own the cash flow. Secondly, SOEs are subject to much stricter regulation by policy (including wage formation) and usually there is some degree of public

control over the books of such firms. There is, however, one practical problem in selecting a sub-sample that is fully matching in size: as there are only very few SOEs with less than 20 employees, we have taken as a reference sub-sample the group of SOEs with less than 100 employees.

In applying the first approach, we assume similarity of the cost structures in the two categories: "Domestically controlled de novo private firms with less than 20 employees" and "SOEs with less than 100 employees". More specifically, we assume that the ratio of wage costs to capital costs in these two categories of firms is the same within single-digit NACE sections. In applying the second approach we assume that the average wages in the category "Domestically controlled de novo private firms with less than 20 employees" are the same as those in "SOEs with less than 100 employees", again within single-digit NACE sections.

Some quantitative results of this exercise are reported in tables 9 and 10. Table 9 reports the cost structures that result from applying the above assumption. As can be seen, this yields much higher shares of wage costs in the total costs of small domestic private firms than originally reported. Note, however, that the resulting cost structures in the two categories of firms are not identical: in the adjusted cost stricture, wage costs of small domestic private firms occupy a higher share than in the case of small SOEs. This is because we only adjust wages but not payroll taxes in small private firms as the assumption is that they do pay extra wages in the grey zone but do not pay extra payroll taxes.

(Table 9 here)

Table 10 reports the average reported wages in small domestic private firms relative to the sector's average and relative to the average for the reference sample (small SOEs) by single-digit NACE sections. When applying our second approach we assume that average wages in small private firms take the level of the corresponding small SOEs. Hence the lower lines represent the adjustment margin that we have applied in individual NACE sections.[7]

(Table 10 here)

For the application of the third approach, our choice of a reference sub-sample is that of foreign controlled firms with 20 or more employees. The rationale is the following. On the one hand, these are similar categories in terms of their governance and managerial

[7] Note that in the initial years wages in small domestic private firms are generally higher than those in small SOEs, i.e. for these years our hypothesis is not valid. Despite that, we have applied the same approach to these years as well, for the completeness of the exercise.

incentive structures, something that could substantiate the assumption of similarity in the mechanism of wage formation in the two categories of firms. On the other hand, as argued above, due to the separation of ownership and control in larger firms (and, moreover, in the presence of foreign investors), the officially reported wage statistics in the firms of the reference sub-sample are less likely to be marred by distortions.

For the application of the third approach we estimate a wage formation model on the basis of the sub-sample of foreign controlled firms with 20 or more employees (the reference sub-sample) for which we assume that there are no distortions in reported wage levels. We then assume that this mechanism of wage formation applies also to small domestically owned private firms. The next step is then to emulate wage formation in small domestically owned private firms on the basis of the estimated wage formation model.

Regarding the actual model of wage formation, following Basu, Estrin and Svejnar (1997) our main hypothesis is that firm wages depend on enterprise characteristics as well as on some structural factors:

$$(1) \qquad w_i = (Q_i/L_i, O_i)$$

where w_i is the average wage in firm i; Q_i and L_i are gross output (net sales) and total labour input (average number of employees) in firm i, respectively (hence Q_i/L_i is the firm's labour productivity), and O_i is a vector of relevant structural variables. While rather basic, this model in fact embeds different more elaborate models of wage formation (such as, e.g. the efficiency wage hypothesis, or profit sharing).

The data presented in table 7 suggest that there is considerable cross-sectoral and cross-regional variation in wage formation. While the cross-sectoral variation likely reflects differential productivity patterns (and hence will be captured by our specification), in order to control for the specific features of wage formation in the region of Sofia-city (which is systematically featured by higher average wages than other regions[8]) we introduce a special dummy variable. So our final specification of the wage formation equation is:

$$(2) \qquad w_i = a_{i0} + a_{i1} (Q_i/L_i) + a_{i2} D_{Si}, + e_i ,$$

where D_{Si} is the dummy variable for Sofia-city (=1 for firms located in Sofia-city and 0 for all other firms).

[8] Apart from the capital Sofia, there is also additional variation across other regions. However, as the limited number of observations reduce the degrees of freedom, we try to keep the model as simple as possible. Due to this we only control for the region of Sofia as a structural factor of wage formation.

Due to the ongoing major structural changes in the economy, structural relations are unstable and time-varying. For this purpose we prefer cross-section to panel estimations of the wage equation, i.e. we estimate this relation for each of the years between 1995 and 2001. One additional advantage of using cross-section estimations is that in this case we do not need to be concerned about inflation and hence we can estimate the wage formation equation on the basis of nominal (current price), rather than real (constant price) data.

The estimation results for the estimated wage formation equations in foreign controlled firms with 20 or more employees are shown in table 11.

(Table 11 here)

In accordance with the assumptions of our approach, we reckon that the same relationship holds for domestically controlled de novo private firms with less than 20 employees. Hence we can compute new wage levels in individual small domestic private firms by using the estimated equation (the error term will be omitted in this case).

(3) $$w_j = a_0 + a_1 (Q_j/L_j) + a_2 D_{Sj},$$

This is basically a simulation exercise: we substitute the values of the corresponding variables (Q_j/L_j) and D_{Sj} for each individual domestically controlled de novo private firm j with less than 20 employees in order to compute the corresponding wage level w_j in that firm (for this purpose we use the corresponding equation for the same year). Finally we compute new average wage levels in domestically controlled de novo private firm j with less than 20 employees by NACE sections, for each year between 1995 and 2001 (table 12).

(Table 12 here)

In applying each of the three approaches we first compute alternative measures of wages and wage costs in each sector. Having done that, we can then make the corresponding adjustments to other performance variables such as value added and revenue (sales). As our assumptions is that the "extra" wages are paid on the bases of unreported revenue, we do that by simply adding the difference between estimated and reported wages to the sales, respectively, to value added. Some of these results representing the alternative measures of value added produced in each NACE sector are reported in table 13.

(Table 13 here)

According to the first approach, in the years between 1996 and 2001[9] the value added produced in small domestic private firms was between 20% and 100% higher than actually reported. According to the second estimate, the corresponding figures were in the range between 30% and 50%. The results obtained from the third approach suggest differences between 40% and 60%. On average, the results produced by different approaches suggest a generally increasing level of underreporting over time.

To assess the magnitude of these figures, we also provide an estimate of underreporting as percentage of the total value added produced in the whole corporate sector (that is the total "grey zone" economy, which is reported in the last two lines of table 13). According to the first approach in the last three years the "grey zone" economy was between 5% and 10% (and increasing over time). In the second approach the corresponding range was between 3% and 4.5%. In the third approach, the "grey zone" economy is estimated in the range between 2.5% and some 5%. In any case, these numbers suggest a very significant level of underreporting of the level of economic activity for the economy as a whole.

Our estimates of the grey zone economy compare favourably with some of the estimates made by the Bulgarian National Statistical Institute. The Bulgarian statistics estimates the total share of the non-observed economy (which, as discussed, is a broader concept including underground production, informal activities and illegal activities) in 1998 and 1999 at some 12% of GDP and in 2000 – at 16% of GDP (UNECE, 2003). Of this, the so called "economic underground" (which is the closest to, but probably somewhat broader than, our definition of the "grey zone" economy) in 1998 and 1999 accounts for some 5% of GDP and in 2000 – for 7.5% of GDP. Interestingly, the official estimate also suggest a surge in unobserved activity in the year 2000.

4. Concluding remarks

This paper deals with some aspects of the evolution and performance of the small private sector in Bulgaria focusing its effect on the Bulgarian labour market and on some of its "grey" business activity.

The overall assessment of the evolution of the job market in the Bulgarian corporate sector indicates a high degree of turbulence and volatility with very intensive job flows, both in terms of job creation and job destruction. This turbulence and volatility are especially pronounced in small private firms where both the rates of job creation and destruction are considerably higher than those in larger firms. One of the unusual results is that the rates

[9] For 1995, the results for two of the approaches do not support our underlying hypothesis. This may indeed be due to the absence of underreporting in this year (see the arguments in the text) or may also statistical distortions due to the relatively small numbers of firms in our samples for that year.

of job destruction in small private firms in some years exceed considerably the rates of job creation, which is most likely related to a very low survival rate of small Bulgarian firms.

At the same time the empirical results presented in the paper indicate that small private firms do create net new jobs and are in fact among the most important generators of new jobs. Our analysis, however, reveals that this is mostly due to extensive job creation in start-up businesses.

In the second part of the paper we propose a methodology to measure some of the "grey" activity of Bulgarian small private firms. Our main hypothesis is that, due to tax evasion, small private firms likely underreport the level of remuneration while wages actually paid are higher than those reported. As such extra wages have to be paid from revenue, this implies that sales and value added generated by these firms should also be higher than actually reported. We propose different possible approaches for quantitative estimation of the level of underreporting based on different assumptions about wage formation in the economy such as: 1) similarity of cost structures in similar firms, 2) wage equalization for employees with similar skills and 3) similarity in the pattern of wage formation in firms with a similar governance structure.

The three approaches are then tested on actual data for Bulgarian firms. According to the first approach in the years 1996-2001 the underreporting in proportion to total value added produced in the whole corporate sector (the "grey zone" economy) was between 5% and 10% (and increasing over time). In the second approach the corresponding range was between 3% and 4.5%. In the third approach, the "grey zone" economy is estimated in the range between 2.5% and some 5%. These estimates of the size of grey zone economy compare favourably with some of the estimates of unobserved economic activity made by the Bulgarian National Statistical Institute.

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Table 1

Number of corporate entities in Bulgaria by NACE sections, ownership categories and regions

	1995	1996	1997	1998	1999	2000	2001
I. Number of firms by NACE sections							
A. Agriculture, hunting and forestry	3345	3462	3643	3771	3917	3803	3937
B. Fishing	21	29	27	35	38	38	48
C. Mining and quarrying	89	109	120	125	145	165	165
D. Manufacturing	4420	7463	8297	8999	10163	10917	11775
E. Electricity, gas and water supply	79	103	106	95	116	145	165
F. Construction	1597	3108	3299	3814	4498	4818	5222
G. Wholesale and retail trade; repair	6240	15956	19394	23086	28011	30309	32760
H. Hotels and restaurants	391	793	890	1269	1882	2363	2658
I. Transport, storage and communication	703	1797	2129	2472	3137	3677	4333
J. Financial intermediation	109	230	210	236	843	1103	915
K. Real estate, renting and business activity	1676	3442	4306	5751	7529	9241	10436
M. Education	82	119	127	165	268	351	393
N. Health and social work	50	69	89	143	261	1268	1515
O. Other community, social and personal service	560	779	868	801	1158	1303	1496
II. Number of firms by ownership categories							
SOEs	5363	5322	3890	3242	2714	2810	2408
Firms privatized to domestic investors	550	156	1016	305	518	300	364
Domestically controlled de novo private firms with 20 or more employees	2658	3453	4379	5952	6351	6988	7614
Foreign controlled firms with 20 or more employees	61	147	319	452	590	710	818
Domestically controlled de novo private firms with less than 20 employees	10478	26418	31410	37731	48148	54748	60584
Foreign controlled private firms with less than 20 employees	257	1964	2491	3080	3646	3945	4031
III. Number of firms by regions							
North-West	945	1055	1339	1522	1726	2069	2288
North-Central	2565	4919	6292	6880	8305	9230	10420
North-East	2479	4267	5087	6391	9244	10897	12041
South-East	1411	2340	2779	3131	3769	4164	4921
South-Central	3680	9643	10750	11533	13069	14017	14372
South-West	1378	3273	3279	3995	4688	5058	5584
Sofia-city	6909	11963	13979	17221	20531	24066	26193
All firms	19367	37460	43505	50762	61967	69501	75819

Table 2

Breakdown of employment in the Bulgarian corporate sector by NACE sections, ownership categories and regions (% of total)

	1995	1996	1997	1998	1999	2000	2001
I. Breakdown by NACE sections							
A. Agriculture, hunting and forestry	9.1	8.0	8.2	7.9	7.2	6.2	5.2
B. Fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C. Mining and quarrying	4.4	4.8	4.7	4.7	3.8	3.1	2.8
D. Manufacturing	47.4	44.8	41.9	43.2	41.0	37.1	35.6
E. Electricity, gas and water supply	4.0	4.2	4.4	4.2	5.1	5.2	4.7
F. Construction	8.1	7.7	7.8	7.4	7.6	6.6	6.6
G. Wholesale and retail trade; repair	7.9	9.4	10.9	11.7	13.1	14.0	15.5
H. Hotels and restaurants	1.7	1.8	2.0	2.0	2.2	2.3	2.4
I. Transport, storage and communication	12.9	14.2	14.0	12.1	12.7	11.3	10.3
J. Financial intermediation	0.1	0.1	0.1	0.3	0.3	0.6	1.6
K. Real estate, renting and business activity	2.9	3.3	4.0	4.3	5.0	6.5	7.5
M. Education	0.1	0.2	0.2	0.3	0.2	0.5	0.4
N. Health and social work	0.0	0.0	0.1	0.1	0.1	4.8	5.3
O. Other community, social and personal service	1.4	1.5	1.7	1.9	1.7	1.9	2.0
II. Breakdown by ownership categories of firms							
SOEs	78.5	72.8	51.8	45.2	35.2	30.5	25.7
Firms privatized to domestic investors	2.2	1.3	13.1	2.2	5.0	3.0	2.2
Domestically controlled de novo private firms with 20 or more employees	15.2	17.6	22.4	36.2	37.5	41.2	45.3
Foreign controlled firms with 20 or more employees	0.8	1.8	3.5	4.8	7.2	8.0	8.4
Domestically controlled de novo private firms with less than 20 employees	3.2	6.2	8.8	10.9	14.3	16.4	17.4
Foreign controlled private firms with less than 20 employees	0.1	0.3	0.5	0.6	0.9	1.0	1.0
III. Breakdown by regions							
North-West	5.3	5.0	4.9	4.6	4.5	4.3	4.2
North-Central	14.9	14.4	13.4	13.8	13.9	13.8	13.4
North-East	13.0	13.0	12.7	13.0	13.2	13.1	12.9
South-East	10.0	9.9	9.6	9.9	10.1	9.9	10.0
South-Central	21.9	22.3	21.4	22.3	21.6	21.0	20.6
South-West	8.3	8.3	7.9	7.9	7.8	7.6	7.3
Sofia-city	26.5	27.0	30.1	28.5	28.9	30.3	31.6
Total number of employed persons (ths.)	1450.4	1612.6	1534.8	1550.0	1477.3	1475.6	1523.8

Table 3

Average number of employed persons in Bulgarian firms by NACE sections, ownership categories and regions

	1995	1996	1997	1998	1999	2000	2001
I. By NACE sections							
A. Agriculture, hunting and forestry	40	37	34	33	27	24	20
B. Fishing	22	16	16	17	10	9	9
C. Mining and quarrying	719	710	596	578	383	279	261
D. Manufacturing	155	97	78	74	60	50	46
E. Electricity, gas and water supply	727	664	642	684	656	532	435
F. Construction	74	40	36	30	25	20	19
G. Wholesale and retail trade; repair	18	9	9	8	7	7	7
H. Hotels and restaurants	62	37	35	24	17	15	14
I. Transport, storage and communication	267	127	101	76	60	45	36
J. Financial intermediation	9	8	9	17	5	7	26
K. Real estate, renting and business activity	25	15	14	12	10	10	11
M. Education	16	28	26	24	13	20	16
N. Health and social work	12	11	11	10	6	55	53
O. Other community, social and personal service	37	31	30	37	21	21	21
II. By ownership categories of firms							
SOEs	212	221	204	216	191	160	163
Firms privatized to domestic investors	57	132	198	112	143	146	90
Domestically controlled de novo private firms with 20 or more employees	71	59	63	83	81	78	81
Foreign controlled firms with 20 or more employees	166	106	139	147	175	155	146
Domestically controlled de novo private firms with less than 20 employees	5	4	4	5	4	4	4
Foreign controlled private firms with less than 20 employees	3	2	3	3	3	4	4
III. By regions							
North-West	81	76	56	46	38	31	28
North-Central	84	47	33	31	25	22	20
North-East	76	49	38	31	21	18	16
South-East	103	69	53	49	40	35	31
South-Central	86	37	31	30	24	22	22
South-West	88	41	37	31	24	22	20
Sofia-city	56	36	33	26	21	19	18
All firms	75	43	35	31	24	21	20

Table 4

Rates of gross job creation and destruction in existing firms by NACE sections, ownership categories and regions (%)

	1995		1996		1997		1998		1999		2000		2001	
	Job creation	Job destruction	Job creation	Job destruction	Job creation	Job destruction	Job creation	Job destruction	Job creation	Job destruction	Job creation	Job destruction	Job creation	Job destruction
I. By NACE sections														
A. Agriculture, hunting and forestry	11.7	-25.8	11.9	-13.6	12.1	-15.2	10.6	-10.6	11.0	-23.9	9.4	-23.9	9.0	-23.0
B. Fishing	9.0	-4.9	2.1	-13.2	9.8	-32.1	12.7	-4.3	4.5	-28.1	9.7	-23.0	19.4	-13.3
C. Mining and quarrying	0.9	-5.5	5.4	-3.6	1.5	-10.1	1.2	-9.3	1.6	-14.4	4.4	-14.2	4.0	-7.9
D. Manufacturing	2.9	-6.4	5.4	-7.2	5.1	-12.1	7.7	-9.3	5.7	-17.2	7.8	-18.5	9.1	-12.4
E. Electricity, gas and water supply	1.9	-0.2	2.1	-0.5	1.1	-1.1	1.8	-1.8	0.4	-1.1	3.8	-15.5	8.6	-12.9
F. Construction	4.1	-13.2	9.0	-22.4	5.2	-19.9	11.2	-20.0	10.0	-19.5	11.9	-17.4	14.4	-15.1
G. Wholesale and retail trade	2.6	-11.7	16.3	-8.3	7.5	-13.2	11.8	-8.8	13.2	-15.1	16.3	-12.6	17.3	-10.8
H. Hotels and restaurants	7.1	-17.8	13.1	-9.5	11.0	-17.6	8.7	-7.1	9.8	-18.3	13.8	-14.6	13.8	-12.2
I. Transport, communication	0.4	-5.1	2.9	-2.5	1.6	-6.3	3.5	-18.0	4.4	-11.9	3.9	-14.2	4.1	-14.3
J. Financial intermediation	0.3	-0.7	11.3	-0.6	5.2	-6.9	7.1	-3.5	50.5	-15.5	42.1	-10.7	81.2	-3.9
K. Real estate, renting	6.4	-10.9	19.4	-8.3	15.2	-15.4	16.0	-24.8	18.6	-31.3	26.6	-10.6	19.5	-16.7
M. Education	4.5	-9.8	20.5	-3.2	8.1	-19.2	10.8	-5.9	31.3	-19.9	38.5	-7.5	22.0	-28.4
N. Health and social work	5.4	-4.2	6.6	-5.0	2.4	-7.6	12.8	0.6	9.8	-36.2	1.0	-0.4	13.1	-15.2
O. Other community, social service	7.5	-9.5	9.9	-7.7	9.4	-15.8	14.0	-9.0	17.0	-20.9	19.5	-10.9	14.4	-12.6
II. By ownership categories														
SOEs	3.1	-8.7	3.6	-7.6	2.5	-10.0	3.3	-12.5	2.7	-14.6	2.7	-16.5	8.5	-14.6
Firms privatized to dom. investors	4.8	-35.5	13.0	-12.8	2.8	-19.4	6.1	-34.7	3.4	-19.3	3.3	-18.5	5.9	-17.4
Domestic de novo private with L>20	6.1	-6.0	16.9	-7.4	12.7	-10.0	11.7	-9.5	10.3	-14.5	13.3	-13.1	13.8	-10.0
Foreign controlled firms with L>20	4.4	-1.7	31.1	-2.6	11.4	-7.6	15.5	-4.8	10.8	-11.1	13.9	-11.0	20.1	-8.0
Domestic de novo private with L<20	4.7	-15.9	14.7	-14.0	8.3	-20.3	12.1	-13.3	13.8	-29.0	15.6	-20.7	14.5	-21.4
Foreign controlled firms with L<20	2.1	-5.1	30.4	-5.1	7.5	-10.3	14.2	-4.9	12.2	-28.6	18.1	-17.7	17.3	-24.0
III. By regions														
North-West	3.9	-8.6	4.7	-7.1	5.9	-12.5	5.8	-10.9	5.3	-15.9	5.9	-22.7	12.0	-11.4
North-Central	3.9	-8.9	4.0	-9.5	7.0	-15.1	9.2	-8.0	7.3	-15.0	9.3	-15.4	9.5	-12.8
North-East	4.5	-11.0	6.9	-8.3	6.7	-13.6	7.5	-9.3	6.0	-18.8	8.9	-18.3	12.7	-12.6
South-East	4.2	-7.4	4.8	-6.5	6.0	-11.3	7.1	-7.1	6.1	-16.6	10.3	-15.6	9.9	-12.3
South-Central	3.7	-9.9	5.2	-9.3	7.8	-12.7	8.0	-10.8	7.4	-16.7	8.7	-15.6	10.7	-12.8
South-West	4.4	-11.0	5.0	-9.3	5.5	-18.4	9.5	-10.1	9.8	-16.1	8.3	-16.2	9.7	-13.9
Sofia-city	2.2	-7.2	13.7	-6.0	3.4	-8.0	11.1	-18.3	10.0	-17.1	13.4	-12.7	17.6	-14.5
All firms	3.6	-9.0	7.5	-7.9	5.8	-12.0	8.7	-11.4	7.9	-16.7	10.2	-15.4	12.9	-13.3

Table 5

Share of firms with growing employment from previous year by NACE sections, ownership and regions (% of corresponding category)

	1995	1996	1997	1998	1999	2000	2001
I. By NACE sections							
A. Agriculture, hunting and forestry	30.2	37.6	35.6	31.5	24.3	24.0	25.3
B. Fishing	28.6	9.5	24.1	37.0	14.3	23.7	36.8
C. Mining and quarrying	37.8	41.6	21.1	25.0	17.6	33.8	35.2
D. Manufacturing	30.0	34.6	21.1	30.3	31.4	33.2	36.5
E. Electricity, gas and water supply	68.5	60.8	35.9	32.1	30.5	49.1	41.4
F. Construction	25.4	32.4	14.5	29.1	30.7	30.2	30.7
G. Wholesale and retail trade; repair	17.8	32.0	13.1	27.0	29.0	29.9	28.2
H. Hotels and restaurants	29.2	26.6	14.2	24.3	27.5	31.4	28.7
I. Transport, storage and communication	16.5	25.7	16.6	26.2	30.7	31.6	34.2
J. Financial intermediation	33.3	26.6	7.4	0.0	14.0	28.6	25.7
K. Real estate, renting and business activity	22.1	32.6	12.5	25.9	22.8	33.0	29.3
M. Education	17.5	24.4	13.4	24.4	26.1	38.4	33.0
N. Health and social work	30.8	22.0	7.2	32.6	25.9	39.1	35.6
O. Other community, social and personal service	34.7	22.9	17.1	18.9	25.2	32.1	31.0
II. By ownership categories							
SOEs	n.a.	25.4	20.2	22.3	13.0	27.6	27.7
Firms privatized to domestic investors	n.a.	40.0	23.7	42.0	35.7	43.1	33.3
Domestically controlled de novo private firms with 20 or more employees	n.a.	29.5	23.3	28.9	27.6	31.4	37.6
Foreign controlled firms with 20 or more employees	n.a.	43.8	27.1	46.3	43.6	48.0	50.3
Domestically controlled de novo private firms with less than 20 employees	n.a.	37.9	15.8	27.6	30.2	30.7	29.1
Foreign controlled private firms with less than 20 employees	n.a.	31.0	9.6	26.0	20.3	27.5	28.4
III. By regions							
North-West	29.3	31.1	25.4	28.3	26.4	27.8	29.7
North-Central	27.8	28.4	22.7	29.9	30.8	30.3	29.9
North-East	29.3	33.9	23.8	27.8	29.4	29.9	29.8
South-East	23.5	29.5	23.3	27.5	30.9	28.8	32.6
South-Central	24.7	29.1	19.7	26.0	27.0	30.0	28.8
South-West	32.5	32.1	21.0	27.9	30.1	28.3	31.6
Sofia-city	24.8	37.9	7.6	27.8	27.3	33.9	30.8
All firms	27.3	33.1	17.2	27.7	28.3	30.8	30.2

Table 6

Share of employment in start-up firms (created in current year) in the subset of firms with less than 20 employees by NACE sections, ownership and regions (% of employment in corresponding category)

	1995	1996	1997	1998	1999	2000	2001
I. By NACE sections							
A. Agriculture, hunting and forestry	21.0	15.7	10.7	10.0	9.1	8.5	6.5
B. Fishing	39.7	44.1	14.2	33.3	23.6	9.5	17.2
C. Mining and quarrying	32.4	40.3	16.6	32.9	16.6	19.9	8.9
D. Manufacturing	57.9	46.1	24.5	23.9	19.1	14.5	11.9
E. Electricity, gas and water supply	24.0	51.7	24.2	6.8	19.2	17.1	15.6
F. Construction	77.0	79.6	25.6	27.3	21.1	13.6	11.7
G. Wholesale and retail trade; repair	50.8	50.7	29.1	29.2	23.0	15.4	13.8
H. Hotels and restaurants	59.1	65.9	36.1	40.4	40.9	24.8	20.7
I. Transport, storage and communication	87.8	79.3	30.8	31.5	24.8	20.0	16.7
J. Financial intermediation	88.0	n.a.	37.6	78.6	34.0	27.7	14.9
K. Real estate, renting and business activity	57.3	77.4	29.3	33.7	28.0	21.1	14.9
M. Education	23.5	62.3	19.1	41.2	44.1	27.7	15.9
N. Health and social work	66.6	61.5	27.9	40.5	38.3	69.5	22.3
O. Other community, social and personal service	30.6	56.8	27.7	36.3	29.7	23.0	17.3
II. By ownership categories							
Domestically controlled de novo private firms with less than 20 employees	44.5	48.8	25.8	26.7	21.9	16.6	13.5
Foreign controlled private firms with less than 20 employees	68.8	90.2	29.4	33.3	25.9	24.2	16.1
III. By regions							
North-West	27.0	17.6	23.2	21.0	18.7	23.7	14.1
North-Central	39.0	46.4	26.4	23.2	20.5	15.0	13.2
North-East	37.0	38.3	26.5	29.2	30.2	17.5	13.4
South-East	43.6	45.4	28.7	28.7	22.9	19.2	19.0
South-Central	59.9	55.7	25.1	24.1	19.0	16.0	12.9
South-West	35.2	59.1	19.6	27.6	19.4	16.1	13.4
Sofia-city	60.9	79.6	27.7	30.6	22.4	17.4	13.4
All firms	44.9	50.0	26.0	27.3	22.6	17.0	13.6

Table 7

Average wage by NACE sections, ownership categories and regions relative to the sample average (all firms = 1.0)

	1995	1996	1997	1998	1999	2000	2001
I. By NACE sections							
A. Agriculture, hunting and forestry	0.73	0.68	0.76	1.02	0.76	0.78	0.73
B. Fishing	0.57	0.53	0.58	0.56	0.46	0.48	0.44
C. Mining and quarrying	1.34	1.36	1.48	1.35	1.57	1.84	1.78
D. Manufacturing	0.96	0.98	0.98	1.09	0.95	1.02	0.96
E. Electricity, gas and water supply	1.28	1.53	1.78	0.65	1.98	1.71	1.78
F. Construction	1.16	1.26	1.22	1.40	1.11	1.04	0.96
G. Wholesale and retail trade; repair	0.99	0.85	0.68	0.84	0.68	0.72	0.68
H. Hotels and restaurants	1.16	1.02	0.80	0.90	0.77	0.72	0.70
I. Transport, storage and communication	1.06	1.02	1.11	0.74	1.14	1.28	1.65
J. Financial intermediation	1.17	0.53	0.58	0.21	..	0.66	0.30
K. Real estate, renting and business activity	0.92	0.77	0.60	0.84	0.82	0.78	0.79
M. Education	1.01	1.43	1.58	0.49	1.05	0.63	0.61
N. Health and social work	0.80	0.75	0.64	0.53	0.66	0.51	0.93
O. Other community, social and personal service	0.83	0.65	0.56	0.64	0.74	0.79	0.73
II. By ownership categories							
SOEs	1.06	1.11	1.27	1.06	1.34	1.30	1.55
Firms privatized to domestic investors	1.13	0.69	0.95	2.00	1.14	1.19	0.95
Domestically controlled de novo private firms with 20 or more employees	0.56	0.69	0.61	0.95	0.79	0.88	0.83
Foreign controlled firms with 20 or more employees	0.97	1.01	1.10	1.37	1.35	1.49	1.31
Domestically controlled de novo private firms with less than 20 employees	1.58	0.63	0.42	0.58	0.49	0.47	0.47
Foreign controlled private firms with less than 20 employees	2.94	1.45	0.72	0.97	0.99	0.94	0.99
III. By regions							
North-West	0.81	0.97	0.99	0.97	1.02	1.09	1.06
North-Central	0.81	0.80	0.77	1.01	0.84	0.89	0.84
North-East	0.96	0.97	0.96	1.04	0.90	0.90	0.89
South-East	0.92	0.96	0.98	1.08	0.88	0.93	0.87
South-Central	0.89	0.91	1.01	1.03	0.94	0.94	0.94
South-West	1.07	1.06	1.04	0.95	1.01	0.99	0.95
Sofia-city	1.26	1.20	1.11	0.94	1.20	1.14	1.19
All firms	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 8

Average labour productivity (sales per employee) in firms by NACE sections, ownership categories and regions, average for all firms=1.0

	1995	1996	1997	1998	1999	2000	2001
I. By NACE sections							
A. Agriculture, hunting and forestry	0.48	0.42	0.51	0.57	0.43	0.43	0.45
B. Fishing	2.74	1.96	0.41	0.38	0.36	0.44	0.59
C. Mining and quarrying	0.66	0.66	0.71	0.57	0.66	0.71	0.68
D. Manufacturing	1.00	0.91	0.90	0.79	0.70	0.76	0.66
E. Electricity, gas and water supply	1.23	1.68	1.86	0.46	1.65	1.48	1.87
F. Construction	0.58	0.48	0.50	0.77	0.73	0.69	0.75
G. Wholesale and retail trade; repair	3.02	3.34	2.97	3.53	2.95	2.98	2.84
H. Hotels and restaurants	0.61	0.54	0.43	0.54	0.48	0.42	0.47
I. Transport, storage and communication	0.67	0.56	0.57	0.48	0.66	0.71	0.85
J. Financial intermediation	1.54	0.43	0.31	0.11	..	0.54	0.14
K. Real estate, renting and business activity	0.46	0.36	0.28	0.50	0.51	0.39	0.41
M. Education	0.35	0.31	0.30	0.18	0.33	0.15	0.16
N. Health and social work	0.26	0.16	0.19	0.21	0.24	0.07	0.13
O. Other community, social and personal service	0.36	0.28	0.23	0.34	0.44	0.41	0.39
II. By ownership categories							
SOEs	0.93	0.92	1.02	0.67	0.76	0.67	0.79
Firms privatized to domestic investors	0.91	1.02	0.61	1.02	0.86	0.64	0.56
Domestically controlled de novo private firms with 20 or more employees	0.61	0.78	0.77	0.90	0.72	0.77	0.78
Foreign controlled firms with 20 or more employees	1.17	2.06	1.76	1.81	2.02	2.28	1.87
Domestically controlled de novo private firms with less than 20 employees	4.33	2.11	1.66	2.21	1.75	1.57	1.44
Foreign controlled private firms with less than 20 employees	11.14	3.94	2.68	3.33	2.47	2.33	2.29
III. By regions							
North-West	0.69	0.70	0.65	0.63	0.67	0.73	0.68
North-Central	0.78	0.79	0.76	0.92	0.81	0.76	0.75
North-East	0.96	0.98	1.07	1.05	1.00	0.98	1.00
South-East	0.75	0.69	0.72	0.78	0.62	0.65	0.63
South-Central	0.77	0.80	0.88	0.88	0.82	0.74	0.78
South-West	1.42	1.79	1.68	1.09	1.40	1.52	1.00
Sofia-city	1.36	1.22	1.13	1.22	1.30	1.32	1.41
All firms	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 9

Share of wage costs in total costs (value added definition of output) by NACE sections in small private firms and in a reference sample (small SOEs)

NACE sections		1995	1996	1997	1998	1999	2000	2001
	Small SOEs	44.8	58.5	46.0	60.7	60.0	62.7	63.7
A. Agriculture, hunting	Small private, reported	55.4	50.6	71.0	60.8	53.4	51.9	48.9
and forestry	Small private, adjusted	44.3	71.3	73.2	74.0	73.5	72.9	76.6
	Small SOEs	29.7	55.9	31.7	54.3	57.1	62.7	51.4
	Small private, reported	37.9	44.9	43.4	48.3	37.2	41.1	34.3
B. Fishing	Small private, adjusted	26.8	72.2	69.5	66.5	67.6	74.1	58.2
	Small SOEs	46.6	53.7	32.1	56.7	56.7	58.1	57.2
	Small private, reported	45.6	29.9	59.4	59.3	51.1	39.2	47.5
C. Mining and quarrying	Small private, adjusted	47.5	66.8	56.2	69.0	65.4	68.9	65.2
	Small SOEs	43.1	44.7	60.4	53.4	51.2	47.6	45.0
	Small private, reported	47.9	41.0	64.1	53.5	50.1	46.9	44.7
D. Manufacturing	Small private, adjusted	44.1	48.3	65.9	58.8	56.9	50.2	47.9
	Small SOEs	56.0	55.2	52.1	53.8	50.8	48.0	44.8
E. Electricity, gas and	Small private, reported	58.9	60.6	41.2	57.6	66.2	63.5	56.9
water supply	Small private, adjusted	73.0	73.7	52.7	65.7	69.0	64.8	58.6
	Small SOEs	60.6	63.4	26.1	35.6	42.3	56.3	54.8
	Small private, reported	64.1	53.8	54.3	60.3	55.4	57.9	52.9
F. Construction	Small private, adjusted	67.4	59.7	52.4	56.6	60.6	61.0	67.8
	Small SOEs	37.3	46.3	42.4	55.2	58.6	60.9	61.7
G. Wholesale and retail	Small private, reported	31.7	25.6	51.0	49.3	46.0	44.7	41.3
trade; repair	Small private, adjusted	39.1	54.6	63.3	66.4	73.4	75.0	78.3
	Small SOEs	51.0	50.9	29.2	50.9	49.2	53.6	54.2
	Small private, reported	35.7	43.7	54.3	49.9	37.8	37.9	35.7
H. Hotels and restaurants	Small private, adjusted	58.1	70.0	54.5	52.2	59.2	65.4	68.3
	Small SOEs	57.7	58.8	17.6	57.3	57.0	61.8	71.9
I. Transport, storage and	Small private, reported	28.7	39.6	50.4	44.7	39.9	36.5	35.4
communication	Small private, adjusted	72.1	71.2	66.1	74.5	75.0	78.8	76.6
	Small SOEs	74.2	70.6	40.1	n.a	66.8	66.7	66.1
J. Financial	Small private, reported	12.4	20.8	33.7	52.1	54.9	55.4	57.0
intermediation	Small private, adjusted	95.1	95.6	94.7	n.a	83.5	86.2	88.8
	Small SOEs	54.6	63.3	25.3	48.1	58.0	57.8	56.3
K. Real estate, renting	Small private, reported	54.9	44.1	40.4	57.3	51.7	42.5	43.3
and business activity	Small private, adjusted	60.0	79.3	73.0	67.4	73.0	69.7	67.7
	Small SOEs	68.2	67.8	71.2	58.7	60.5	72.6	63.5
	Small private, reported	78.6	77.3	74.7	70.7	66.1	65.2	65.7
M. Education	Small private, adjusted	79.1	77.2	85.4	68.0	60.6	83.5	66.1
	Small SOEs	67.3	49.3	52.7	61.0	63.6	67.9	67.4
	Small private, reported	65.9	46.4	68.3	44.5	49.6	58.5	61.4
N. Health and social work	Small private, adjusted	85.4	88.4	90.3	89.9	89.5	77.9	78.0
O. Other community, ,	Small SOEs	64.8	65.9	57.9	62.5	62.1	64.5	63.5
social and personal	Small private, reported	57.2	53.1	74.5	53.5	52.9	47.8	43.4
service	Small private, adjusted	80.1	83.0	83.4	78.9	81.9	82.4	79.9
	Small SOEs	45.4	51.4	39.4	52.6	53.0	54.3	48.8
	Small private, reported	41.6	37.3	56.0	53.5	48.9	46.5	43.9
All sectors	Small private, adjusted	68.4	67.3	70.2	67.5	71.4	72.6	74.2

Table 10

Average wage in small private firms relative to the sector's average and the average for the reference sample (small SOEs) (corresponding reference = 1.0)

Average wage in small private firms relative to:		1995	1996	1997	1998	1999	2000	2001
A. Agriculture, hunting	Sectoral average wage	1.50	1.29	1.22	1.16	0.96	0.92	0.93
and forestry	Average wage in small SOEs	1.22	0.93	0.83	1.11	0.91	0.96	0.88
	Sectoral average wage	1.08	0.29	0.39	0.79	0.75	0.84	0.97
B. Fishing	Average wage in small SOEs	1.09	0.25	0.34	0.64	0.43	0.56	0.56
	Sectoral average wage	0.39	0.25	0.24	0.39	0.28	0.20	0.23
C. Mining and quarrying	Average wage in small SOEs	0.70	0.38	0.48	0.62	0.47	0.36	0.43
	Sectoral average wage	1.13	0.52	0.37	0.44	0.51	0.44	0.51
D. Manufacturing	Average wage in small SOEs	1.08	0.50	0.47	0.47	0.38	0.31	0.31
E. Electricity, gas and	Sectoral average wage	0.90	0.50	0.46	0.47	0.64	0.34	0.33
water supply	Average wage in small SOEs	0.93	0.50	0.45	0.62	0.85	0.38	0.34
	Sectoral average wage	1.02	1.64	0.30	0.30	0.36	0.53	0.63
F. Construction	Average wage in small SOEs	1.40	0.82	0.37	0.38	0.42	0.58	0.67
G. Wholesale and retail	Sectoral average wage	1.15	0.66	0.54	0.56	0.58	0.59	0.61
trade; repair	Average wage in small SOEs	1.09	0.56	0.34	0.47	0.48	0.44	0.45
	Sectoral average wage	0.83	0.32	0.30	0.32	0.38	0.44	0.49
H. Hotels and restaurants	Average wage in small SOEs	0.87	0.39	0.39	0.34	0.24	0.28	0.30
I. Transport, storage and	Sectoral average wage	1.15	0.99	0.51	0.30	0.29	0.22	0.19
communication	Average wage in small SOEs	1.49	1.17	0.53	0.58	0.56	0.55	0.60
J. Financial	Sectoral average wage	0.87	4.95	1.26	1.18	0.88	0.88	2.91
intermediation	Average wage in small SOEs	1.42	1.69	1.17	n.a	0.96	0.53	0.52
K. Real estate, renting	Sectoral average wage	1.18	0.91	0.87	0.74	0.78	0.63	0.62
and business activity	Average wage in small SOEs	1.37	0.76	0.58	0.39	0.48	0.35	0.38
	Sectoral average wage	0.92	0.55	0.32	0.97	0.52	0.58	0.52
M. Education	Average wage in small SOEs	1.54	0.91	0.67	0.62	0.62	0.52	0.48
	Sectoral average wage	1.21	0.79	0.57	0.88	0.71	0.89	0.48
N. Health and social work	Average wage in small SOEs	1.43	0.92	0.56	0.44	0.55	0.81	0.37
O. Other community,	Sectoral average wage	1.75	1.04	1.13	0.55	0.67	0.56	0.56
social and personal service	Average wage in small SOEs	1.15	0.96	1.05	0.56	0.62	0.63	0.55
	Sectoral average wage	1.15	0.81	0.45	0.48	0.47	0.44	0.45
All sectors	Average wage in small SOEs	1.19	0.69	0.48	0.52	0.46	0.46	0.41

Table 11

Estimated equation of wage formation in foreign controlled firms with 20 or more employees

Dependent variable: average annual nominal wage. Estimation method: OLS.

	1995	1996	1997	1998	1999	2000	2001
Labour productivity	0.0178	0.0004	0.0008	0.0043	0.0027	0.0040	0.0023
	[5.48]***	[1.77]*	[2.15]**	[6.04]***	[6.02]***	[7.84]***	[8.83]***
Dummy for Sofia-city	0.052	0.232	1.244	1.668	2.502	2.830	3.187
	[2.60]**	[6.74]***	[6.48]***	[6.48]***	[10.12]***	[9.26]***	[9.89]***
Constant	0.050	0.125	1.226	1.602	1.862	2.232	2.478
	[5.73]***	[5.73]***	[9.45]***	[9.45]***	[11.73]***	[11.35]***	[11.80]***
Number of observations	78	246	384	516	628	754	875
Adjusted R^2	0.435	0.160	0.105	0.172	0.190	0.174	0.181

Note: Absolute value of t statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 12

Average annual wage in small private firms: actual and simulated values, BGN

Sector		1995	1996	1997	1998	1999	2000	2001
A. Agriculture, hunting and forestry	Actual	107	168	1687	2378	1978	2006	2023
	Simulated	72	156	2037	2286	2061	2542	2707
B. Fishing	Actual	58	29	415	885	960	1126	1264
	Simulated	73	127	1543	1595	1894	2698	3113
C. Mining and quarrying	Actual	61	67	759	1767	1438	1276	1515
	Simulated	72	159	1913	3926	2703	3069	3595
D. Manufacturing	Actual	110	96	663	1001	1310	1253	1475
	Simulated	122	193	1806	2031	2694	3048	3353
E. Electricity, gas and water supply	Actual	116	150	1500	1513	2672	2542	2563
	Simulated	144	270	2961	1401	2300	3201	3942
F. Construction	Actual	110	400	701	904	1167	1569	1831
	Simulated	86	800	2356	2154	2563	4209	2486
G. Wholesale and retail trade; repair	Actual	127	104	669	989	1107	1210	1260
	Simulated	286	261	2295	2590	2805	3690	3672
H. Hotels and restaurants	Actual	95	59	432	623	770	928	1044
	Simulated	152	177	1665	1938	2276	3001	3344
I. Transport, storage and communication	Actual	125	194	1053	1219	1291	1309	1438
	Simulated	182	369	3048	2845	2857	3537	3671
J. Financial intermediation	Actual	130	150	1161	1334	2885	1598	1815
	Simulated	130	355	2681	1909	3160	3197	3051
K. Real estate, renting and business activity	Actual	115	119	807	1205	1804	1323	1465
	Simulated	127	282	2975	2581	3504	3346	3715
M. Education	Actual	120	137	1001	1450	1554	1554	1481
	Simulated	68	273	2158	2386	2542	3447	3543
N. Health and social work	Actual	100	113	582	857	1306	1259	1342
	Simulated	82	244	2352	1947	2735	1381	3072
O. Other community, , social and personal service	Actual	154	125	1154	928	1394	1230	1221
	Simulated	174	205	2744	1654	2922	3501	3698
All sectors	Actual	117	154	823	1150	1319	1322	1428
	Simulated	161	313	2262	2389	2756	3420	3438

Note: In this exercise wage formation in small domestically owned private firms is emulated through the estimated equation for foreign controlled firms with 20 or more employees.

Table 13

Alternative assessment of value added produced in small private firms (corresponding reported value added = 1.0) and underreporting of total value added

NACE sections		1995	1996	1997	1998	1999	2000	2001
A. Agriculture, hunting and forestry	Cost structure approach	0.87	1.37	1.03	1.65	2.37	2.28	2.58
	Wage equalization	0.93	1.02	1.05	0.92	1.10	1.04	1.09
	Simulated wage formation	0.88	0.98	1.05	0.97	1.04	1.23	1.22
B. Fishing	Cost structure approach	0.96	8.46	1.18	1.32	1.35	2.37	1.42
	Wage equalization	0.99	1.66	1.18	1.16	1.18	1.34	1.20
	Simulated wage formation	1.03	1.75	1.25	1.23	1.13	1.62	1.37
C. Mining and quarrying	Cost structure approach	1.06	2.09	0.97	1.22	1.33	1.83	1.37
	Wage equalization	1.30	1.48	1.29	1.26	1.47	1.60	1.46
	Simulated wage formation	1.12	1.41	1.41	1.51	1.36	1.48	1.48
D. Manufacturing	Cost structure approach	0.94	1.12	1.03	1.09	1.13	1.06	1.07
	Wage equalization	0.79	1.34	1.41	1.41	1.71	1.98	2.10
	Simulated wage formation	0.84	1.34	1.63	1.38	1.45	1.64	1.63
E. Electricity, gas and water supply	Cost structure approach	8.97	11.42	0.82	1.58	3.97	2.02	2.12
	Wage equalization	1.03	2.57	2.65	1.27	1.08	1.40	1.79
	Simulated wage formation	1.12	2.37	2.42	0.97	0.94	1.06	1.22
F. Construction	Cost structure approach	1.10	0.51	0.71	0.94	1.09	1.06	1.42
	Wage equalization	0.50	1.74	1.91	1.65	1.54	1.33	1.24
	Simulated wage formation	0.52	2.79	2.26	1.54	1.46	1.79	1.17
G. Wholesale and retail trade; repair	Cost structure approach	1.10	1.41	1.11	1.28	1.65	1.81	2.31
	Wage equalization	0.90	1.13	1.33	1.31	1.31	1.39	1.40
	Simulated wage formation	1.11	1.24	1.41	1.44	1.45	1.61	1.61
H. Hotels and restaurants	Cost structure approach	1.74	22.17	1.01	1.03	1.46	1.71	2.43
	Wage equalization	1.07	2.18	2.01	1.67	2.04	1.86	2.17
	Simulated wage formation	1.30	2.53	2.84	1.74	1.65	1.76	2.09
I. Transport, storage and communication	Cost structure approach	2.28	2.24	1.35	1.93	1.92	2.77	2.45
	Wage equalization	0.85	0.94	1.34	1.26	1.20	1.27	1.20
	Simulated wage formation	0.95	1.40	1.73	1.48	1.32	1.55	1.45
J. Financial intermediation	Cost structure approach	41.63	n.a	17.00	n.a	n.a	n.a	n.a
	Wage equalization	0.83	n.a	0.93	n.a	n.a	n.a	n.a
	Simulated wage formation	0.88	n.a	1.61	n.a	n.a	n.a	n.a
K. Real estate, renting and business activity	Cost structure approach	1.13	2.93	2.88	1.28	1.64	1.73	1.64
	Wage equalization	0.71	1.15	1.46	1.81	1.45	1.65	1.60
	Simulated wage formation	0.85	1.68	2.69	1.60	1.39	1.53	1.56
M. Education	Cost structure approach	1.03	0.99	1.58	0.94	0.84	2.10	1.01
	Wage equalization	0.36	1.11	1.71	2.05	1.44	1.83	2.02
	Simulated wage formation	0.33	1.81	1.67	1.31	1.47	1.79	1.89
N. Health and social work	Cost structure approach	2.58	3.75	2.58	4.31	4.20	1.76	1.60
	Wage equalization	0.44	2.31	2.33	3.26	2.47	1.59	2.93
	Simulated wage formation	0.46	1.41	2.45	1.42	1.46	1.05	1.63
O. Other community, social and personal service	Cost structure approach	2.99	n.a	n.a	1.89	2.12	2.62	6.33
	Wage equalization	0.71	n.a	n.a	2.50	2.49	2.32	1.22
	Simulated wage formation	1.12	n.a	n.a	1.31	1.41	1.73	3.59
All sectors	Cost structure approach	1.74	1.71	1.20	1.31	1.63	1.83	2.11
	Wage equalization	0.83	1.19	1.29	1.35	1.41	1.49	1.51
	Simulated wage formation	0.95	1.44	1.45	1.41	1.42	1.61	1.56
Under/over-reporting (-/+) of total value added produced in all firms (%)	Cost structure approach	-4.9	-5.4	-1.1	-2.6	-5.2	-7.1	-9.5
	Wage equalization	1.2	-1.5	-1.6	-3.0	-3.4	-4.3	-4.6
	Simulated wage formation	0.3	-3.4	-2.4	-3.5	-3.5	-5.3	-5.1

Note: In some cases (e.g. in sectors J and O), the reported figures on sectoral value added are negative; in these cases the corresponding ratios do not have a meaningful interpretation and are shown in the table as "n.a."