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AN ANALYSIS OF THE RELATIONSHIP BETWEEN WAGES IN

THE PUBLIC AND PRIVATE SECTOR IN COLOMBIA:

A PANEL DATA APPROACH

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An analysis of the relationship between wages in the public and private sector in Colombia: A panel data approach[*]

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Abstract

This document examines the time-series properties of the wage differentials that arise between the public and private sector in Colombia during the sample period 1984 to 2005. We find conflicting results in unit-root and stationarity tests when looking at wage differentials at an aggregate level (such as for men, women or both). However, when we analyse wage differentials at higher levels of disaggregation, treat them jointly as a panel of data, and allow for the presence of potential cross section dependence, there is more supportive evidence for the view that wage differentials are stationary. This implies that although wage differentials do exist, they have not been consistently increasing (or decreasing) over time.

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1 Introduction

Historically, the role and the size of the public sector have been topics of considerable debate among economists. In this debate, both employment and remuneration in public sector labour markets have usually been at the core of the discussion. Clearly, these two issues are of importance because of their economic and social policy dimensions, as wages constitute the main source of income for a large number of individuals and their families. In addition, wages serve as the mechanism that guides not only an individual's work-leisure decision problem, but also his/her choice of where to work.

It is well known that economic theory establishes that wages are positively related to labour productivity. However, when it comes to the public sector the question of how wages and employment are determined is not easy to answer. As indicated by Gregory and Borland (1999), while in the private sector employment and earnings are determined within a market environment, in the public sector the same decision-making process takes place within a political environment, where politicians and bureaucrats may well have objective functions that differ from those utilise by the owners of firms in the private sector. Thus, for example, a politician's objective function may well be one of vote-maximisation, or alternatively one of budget-maximisation. In addition to this, the effects of unions and collective bargaining are more likely to be observed in public sector labour markets than in private ones.

The purpose of this document is to study the relationship between wages in the public and private sector in Colombia. During the last two decades or so, Colombia has become an interesting case-study that features high and persistent unemployment, low rates of job creation in the formal private sector, and the growing importance of an informal private sector that is characterised by new contractual forms in the labour market.[1] These new contractual forms include the creation of

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[1]Lora and Márquez (1998) present some stylised facts of employment in Colombia as well as in other Latin American economies see . For a formal econometric analysis of the labour market in Colombia see e.g. Arango and Posada (2002).

companies whose main objective is to act as intermediaries between workers and firms, where the latter aim to minimise the payroll taxes associated to the formal sector, which include social security payments and pension contributions, among others. As a result, jobs in the public sector become more attractive due to the fact that it is more difficult for employers to avoid the payment of these additional costs to their employees.

International literature on the evolution of wages in the public and private sectors and the corresponding differential that arises between them is extensive; see, inter alia, Pederson, Schmidt-Sørensen, Smith, and Westergård-Nielsen (1990), Hundley (1991), Mueller (1998), Tansel (1998), Adamchik and Bedi (2000), Bender (2002), Panizza and Qiang (2005) and Lamo, Perez, and Schuknecht (2008). Literature for Colombia is more scarce. Two relatively recent exceptions are Arango and Posada (2007), who present a descriptive analysis of the dynamic behaviour of public sector wages in several occupational categories, and Galvis (2010), who studies wage disparities for private sector employees. Based on our literature review, it appears that there are no other works for Colombia that analyse the behaviour of public and private sector wages, both within each sector as well as between them.

The main objective of this document is to examine whether there is evidence of a stable long-run equilibrium relationship between wages in the public and private sector in Colombia. We believe that the study of the Colombian experience is interesting because ever since 1886, the central government concentrated political, administrative and fiscal powers. Then, in 1991 a constitutional reform introduced important modifications and changes in the existing territorial order of the country, so that regional and local levels of government were given greater power and responsibilities, and a new set of parameters to assign and determine transfers from the central government were defined.[2] Thus, it is of some interest to determine whether this decentralisation process has led to increasing wage differentials between sectors. Initially, this analysis can be undertaken at an aggregate level by comparing

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[2]See e.g. Iregui (2005), for estimates of the welfare effects of decentralisation in Colombia.

earnings in the private sector with those in the public sector. Then, one could further analyse gender, city and occupational category differentials between public and private sector employees.

This document offers three main contributions to existing literature. First, we use data from Colombian household surveys collected over the period 1984 to 2005. The advantage of this source of information is that it allows us to focus on how individual-level data have changed over time for different economic sectors, gender, occupational category and city. The selection of the sample period is dictated by the availability of a consistent dataset. This is because in 2006 significant methodological changes were implemented in the household survey system, so that results before and after this year are not directly comparable.

Second, we focus on an examination of the time series properties of wage differentials or, put another way, we assess whether or not wage differentials are stationary. In this sense, finding that a wage differential is stationary is equivalent to saying that the two wages are cointegrated with a known cointegrating vector equal to $[1, -1]'$. From an economic point of view, this means that wage levels maintain a stable long-run equilibrium relationship, so that the corresponding wage differential does not increase (or decrease) without bound as time passes. To the best of our knowledge, this empirical modelling approach has not been implemented by other authors.

Third, the time-series analysis will be undertaken by looking at each wage differential individually as well as within a panel data framework. The advantage of adopting a panel data setup is that it allows us to examine the potential effect of cross-sectional dependence among wages that may arise from common shocks (or innovations). Another advantage of panel data is that by combining information from the time-series dimension with that from the cross-section dimension, fewer time series observations are required for statistical tests to have power.

The document is organised as follows. Section 2 presents a brief literature review on wage differentials between the public and private sectors. Section 3 presents the

methodology that will be used in the document. We start off by briefly presenting important time-series concepts that will be used in the document, along with their economic implications. Then, we describe the statistical tests that will be applied to assess the time-series properties of several wage differentials. Section 4 describes the data that will be used in the document and shows some of the stylised facts about the evolution of wages in Colombia. Section 5 examines the time-series properties of wage differentials in the country. Section 6 offers concluding remarks.

2 Brief literature review

During the last three decades or so, a number of authors have analysed the dynamic behaviour of public and private sector wages. The study of wage differentials between the public and private sectors has been motivated, among other factors, by the recent growth of the public sector in many countries around the world and the corresponding cost-implications on tax-payers. There are two main reasons why one should be interested in the operation of public sector labour markets. First, public sector labour markets are large and their financial resources primarily come from the functioning of the private sector. Second, public sector labour markets are different from private sector labour markets in as much as politicians or bureaucrats' objective function differs from that of the owners of private sector firms. Indeed, as indicated in the previous section, decision-making on public sector employment and wages takes place in a political environment, where politicians and bureaucrats may have objectives that not always seek profitability. By contrast, private sector decision-making occurs in a market environment in which owners (or shareholders) of private sector firms continuously monitor the performance of their companies.

Ehrenberg and Schwarz (1986), Gregory and Borland (1999) and Bender (2002) present comprehensive surveys of the literature concerning wage differentials between the public and private sectors. Ehrenberg and Schwarz (1986) focus mainly on studies dealing with the United States, while the other two also include references for other developed and developing countries. Bender (2002) reviews the

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literature that provides theoretical reasons that attempt to explain the existence of public/private wage differentials. According to this author, there are several factors that may be taken into consideration when examining possible explanations. First, there is the influence of trade unions on demand for public sector goods and the 'vote producing' activities by civil servants. Second, part of the public/private wage differential may emerge from economic rents perceived by public sector workers because of their bargaining power in those services that are considered essential. Third, the idea of a public/private wage differential has to be analysed carefully because of the existence of selection bias and other econometric problems that may arise from the available data. According to Bender (2002) a common finding of the empirical studies in his survey is the existence of a declining premium paid to central government employees, although for developing countries wage differentials are found to be negative in some instances. As will be shown below, there are different ways to study the existence of wage differentials between the public and private sectors. However, an important factor that must be taken into account, in particular for the purposes of international comparisons, is the size of the public sector in the economy, as it reflects the capacity of the sector to compete for workers in the labour market.

In their analysis of public sector labour markets, Gregory and Borland (1999) find a persistent increase in the size of the public sector in several countries. According to these authors, public sector workers get higher average earnings than private sector ones due to differences in levels of education (which is higher for individuals in the public sector). At the same time, these authors also find that the earnings distribution of public sector workers exhibits is more concentrated around its mean value compared to that of private sector workers. In addition, the union/non-union and male/female wage gaps tend to be smaller in the public sector.

Turning to specific country-case studies, most of the literature is related to developed and emerging market countries; see, for instance, Pederson, Schmidt-Sørensen, Smith, and Westergård-Nielsen (1990) for Denmark, Hundley (1991) for the United States, Alvarez, Jareño, and Sebastian (1993) for Spain, Dustmann and Soest (1998)

for Germany, Mueller (1998) for Canada, Tansel (1998) for Turkey, Adamchik and Bedi (2000) for Poland, and Lamo, Perez, and Schuknecht (2008) for a sample of OECD and Euro zone countries. Some of these studies have looked at the determinants of wages, while others have examined the existence of wage differentials between the public and private sectors.

Pederson, Schmidt-Sørensen, Smith, and Westergård-Nielsen (1990) examine the public/private wage differential using Danish data from a panel of individuals over the period 1976 to 1985. The results of estimating fixed-effect type regressions show evidence that a wage-twist policy has been applied over the sample period. The idea of a wage-twist policy is to implement a series of mechanisms to affect the allocation of resources between the public and the private sector. Thus, for example, a government may attempt to reduce the private/public wage differential in order to overcome recruitment and retention problems for public sector employees. An additional interesting finding form their work is that "women employed in the formal sector tend to have higher average skills than men employed in the formal sector (...) probably due to supply and demand considerations" (p. 830). According to these authors, if it is accepted that job security is important in the public sector, then the public wage premium has to be analysed from a different perspective, such as the general equilibrium one considered by Shapiro and Stiglitz (1984).

Hundley (1991), using data from the 1985 Current Population Survey of the United States, finds that public/private wage differentials tend to decline as the level of skill required to fulfil an occupational category is increased. Mueller (1998) uses quantile regression techniques to estimate the size of the public/private wage differential in Canada. This author finds that this differential tends to be highest for women, federal government employees, and individuals at the lower tail of the wage distribution. The use of quantile regressions is crucial to understand differences in public/private wages over the whole distribution of wages and not only at the mean of the distribution.

Dustmann and Soest (1998) analyse several statistical assumptions used in em-

pirical models on public/private sector wage structures for Germany. They use an extended version of a standard switching regression model that allows for endogeneity in the level of education, experience, and hours worked. Several model specifications are estimated and the results of such models are subsequently compared. It turns out that their results are sensitive to the identification assumptions that are adopted, but robust to the regressors that are included in the model. Alvarez, Jareño, and Sebastian (1993) use Spanish data over the period 1964–1991 to analyse transmission mechanisms between prices and nominal wages. The results of estimating a VAR model indicates that private sector wages help explain inflation, while public sector wages play a minor role. They also find that public sector wages do not have an impact on private sector wages.

Adamchik and Bedi (2000) examine whether there are wage differentials between workers in the public and the private sectors in Poland. After standardising for worker characteristics and sector selection effects, they find evidence of a private sector positive wage premium. This wage premium is particularly large for university educated workers. According to the authors, the existence of these wage differentials make it difficult for the public sector to attract and retain skilled employees. In addition, lower public sector wages may encourage moonlighting and compromise the efficiency of the public sector.

Lamo, Perez, and Schuknecht (2008) analyse the interaction between public and private sector wages during 1960-2006 for a sample of OECD and Euro zone countries. They find empirical evidence that salaries are positively correlated over the business cycle. Also, they uncover evidence of short-, medium- and long-run co-movements between public and private sector salaries. Lastly, causality tests suggest a predominant role of private salaries over the business cycle. Tansel (1998) finds mixed results when analysis public/private wage differential in Turkey. Indeed, after controlling for observed individual characteristics and sample selection bias, this author finds that wages for men (women) in public administration are lower (greater) than wages for men (women) in the private sector. Moreover, wage

differentials because of gender are not found for individuals working in the public sector, although they are found to exist for workers in the private sector.

For Latin American countries, existing literature appears more scarce; see e.g. Panizza and Qiang (2005) for a study of a sample of Latin American countries, Stelcner, der Gaag, and Vijverberg (1989) for the case of Peru, and Arango and Posada (2007) and Galvis (2010) for studies of the Colombian case. Panizza and Qiang (2005) use household survey data for thirteen Latin American countries to investigate wage differentials between the public and private sectors, as well as wage differentials that may arise because of gender.[3] These authors find that in the cases of Brazil, Colombia, Costa Rica, Ecuador and El Salvador, there is evidence of a statistically and economically significant public wage premium that favours male workers. Interestingly, in the cases of Brazil, Colombia, Costa Rica, Honduras, Mexico and El Salvador, they also uncover evidence of a wage premium for women working in the public sector. Stelcner, der Gaag, and Vijverberg (1989) use Peruvian data to study the emergence of wage differentials between male and female workers in the public and private sectors. The authors estimate a switching regression model and find that there is not a "pure" wage advantage or economic rent of government workers when corrected estimates of wage functions are compared. Their findings indicate that in Lima there is a wage differential in favour of private sector employees, while in other urban areas there is no significant wage differential. In the case of Colombia, the evolution of the public and private sector wages has not received a great deal of attention. Two relatively recent exceptions are Arango and Posada (2007) and Galvis (2010). Arango and Posada (2007) present a descriptive analysis of the dynamic behaviour of public sector wages in several occupational categories. An interesting feature of this work is that the authors use payroll information from the Ministry of Finance, which covers the sample period 1978–2005. On the other hand, Galvis (2010) uses Colombian household survey data for the period 1984 to 2009, to study real wage disparities for private sector employees in the seven main

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[3]These countries are Bolivia, Brazil, Colombia (urban only), Costa Rica, El Salvador, Ecuador, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru and Venezuela.

metropolitan areas, namely Barranquilla, Bogotá, Bucaramanga, Cali, Manizales, Medellín and Pasto. This author finds that there are significant differentials among different categories of private sector wages, and that in some cases these differentials have been growing over time.

3 Methodology

3.1 Background

Economists typically use information that is available in three different formats: (i.) cross-section data; (ii.) time-series data; and (iii.) panel data. Cross-section data describe the activities of individuals, firms, countries or other units of analysis that are collected at a particular moment in time. Time-series data describe the movement of a variable through time, and this could be for different periodicity such as annual, quarterly, monthly, weekly or even daily. Lastly, panel data combine the first two types of information; that is, they describe the activities of individuals, firms, countries or other units of analysis through time.

Focusing for the moment in the analysis of time-series data, the starting point is the concept of stationarity. A time-series is said to be stationary if its probability distribution function does not change through time. In practice, this definition turns out to be very strong and difficult to verify, so that a weaker version of the concept states that a time-series is "weakly stationary" (also referred to as "covariance stationary") if its first two moments (i.e. its mean and its variance) do not change over time. The intuition behind this definition is that if the first two moments of a time-series do not change through time, then its future is going to be similar to its past, and this can be exploited for forecasting purposes.

Unfortunately, most to the time-series that are studied by economists and econometricians alike, exhibit a tendency to increase over time, that is, they are non-stationary series. This is case, for example of the series of the gross domestic product (both in nominal and real terms), consumer price index, monetary aggregates, employment, and wages, among others. From a statistical point of view, the use of

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non-stationary series involves a number of problems in the sense that conventional hypothesis tests, confidence intervals and predictions about the future are not going to be reliable. A classic example of the problems that arise with the use of non-stationary data is that of the non-sense regression problem discovered by Yule (1926), or spurious regression problem in the terminology of Granger and Newbold (1974). The idea is that when one estimates a regression between two or more variables that grow over time (whatever these variables may be), it is more likely than not that one is going to find an apparent positive association between the variables, regardless of whether this association truly exists.[4]

The solution to the problem of working with non-stationary series depends upon the nature or cause of the non-stationarity, that is whether it is deterministic or stochastic. Until the early 1980s, the trending behaviour of a time-series used to be eliminated by running a regression of the series under consideration against a linear (or even a polynomial) time trend. What this statistical approach does not recognise, however, is that it is only valid when the rate of growth of the series is always the same or, in other words, when it is constant. If, on the other hand, the rate of growth of the series is not always the same (or if it cannot be predicted perfectly), then the time series is said to have a stochastic trend, in which case the suitable approach to eliminate the non-stationarity would be to calculate the first difference of the series.

In time-series terminology, a series that needs to be differenced in order to become stationary is said to be a series integrated of order 1, and is denoted $\sim I(1)$ for short. In general, a series that needs to be differenced d times in order to become stationary is said to be a series integrated of order d, and is denoted $\sim I(d)$. In summary, economic time-series that exhibit a trending behaviour can be classified in two groups. The first group is that of the series that are stationary around a linear

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[4]Examples of the spurious regression problem include Yule (1926) who, using annual information for the period 1866–1911, finds a correlation coefficient of 95% between mortality rate in Enlgand and Wales and the proportion of Church of England marriages. Another example is provided by Hendry (1980) who finds a correlation coefficient of 98% between inflation and cumulative rainfall in the UK.

or polynomial trend, which are referred to as Trend Stationary Processes (TSP). The second group is that of the series that need to be differenced one or many more times. Interestingly, it should be noticed that a stationary series is integrated of order 0, denoted $\sim I(0)$, since it is not necessary to difference the series to make it stationary.

The fact that a time-series can be classified as an $\sim I(0)$ or an $\sim I(1)$ process can have important implications from an economic point of view. Indeed, in the case of an $\sim I(0)$ series, a shock (or innovation) will have a temporary effect (i.e. the effect of the shock disappears as time passes) and out-of-sample predictions are more precise. On the contrary, in the case of an $\sim I(1)$ series, the effect of a shock (or innovation) is permanent and out-of-sample predictions are less accurate; see e.g. Franses (1998). More importantly, while the variance an $\sim I(0)$ series is finite, that of an $\sim I(1)$ series increases without a bound.

In the specific case of public/ private sector wage differentials, which are the purpose of analysis of this document, finding that they can be best characterised as $\sim I(0)$ processes suggests that there would not be a tendency for them to consistently increase (or decrease) over time. On the contrary, if public/ private sector wage differentials are found to be $\sim I(1)$, then there would be arbitrage opportunities for individuals by moving from one sector to the other. This, of course, may become a serious obstacle for governments that aim to attract and maintain a productive labour force in the public sector.

3.2   Unit-root and stationarity tests

During the late 1970s and early 1980s, Dickey and Fuller (1979) and Dickey and Fuller (1981) propose statistical tests to determine whether a time series can be best characterised as TSP or DSP. These statistical tests are referred to in the literature as unit-root tests.

Dickey and Fuller consider three different models to test for a unit root:

$$y_t = \phi_1 y_{t-1} + \epsilon_t, \tag{1}$$

$$y_t = \phi_0 + \phi_1 y_{t-1} + \epsilon_t, \tag{2}$$

$$y_t = \phi_0 + \phi_1 y_{t-1} + \phi_2 t + \epsilon_t, \tag{3}$$

where y_t is the variable of interest (in our case a wage differential) for which we have $t = 1, ..., T$ available observations. These equations can be estimated by ordinary least squares (OLS), and the null hypothesis to test the presence of a unit root is $H_0 : \phi_1 = 1$, against the alternative that the series is stationary $H_a : \phi_1 < 1$.

For practical purposes, model (1) is rarely estimated as it is too restrictive because it assumes that y_t has a mean of zero (the model is very important for theoretical purposes though). In turn, model (2) is estimated when y_t has a non-zero mean, while model (3) is applied whenever y_t exhibits an upward (or downward) behaviour; for a more formal sequential testing procedure see Perron (1988). The models considered by Dickey and Fuller can be alternatively reparameterised as:

$$\Delta y_t = (\phi_1 - 1) y_{t-1} + \epsilon_t,$$

$$\Delta y_t = \phi_0 + (\phi_1 - 1) y_{t-1} + \epsilon_t,$$

$$\Delta y_t = \phi_0 + (\phi_1 - 1) y_{t-1} + \phi_2 t + \epsilon_t,$$

where Δy_t is the first difference of the series of interest, i.e. $\Delta y_t = y_t - y_{t-1}$. Notice that testing the null hypothesis that $H_0 : \phi_1 = 1$ is equivalent to test $H_0 : b = 0$ in the following models:

$$\Delta y_t = b y_{t-1} + \epsilon_t, \tag{4}$$

$$\Delta y_t = \phi_0 + by_{t-1} + \epsilon_t, \tag{5}$$

$$\Delta y_t = \phi_0 + by_{t-1} + \phi_2 t + \epsilon_t. \tag{6}$$

To perform the unit-root test, one calculates the t-statistic associated to the estimated coefficient on y_{t-1}, which is then compared with the critical values tabulated by Fuller (1976), Dickey and Fuller (1981), or the more recent response surfaces estimated by MacKinnon (1991).

An important assumption behind the construction of the Dickey and Fuller tests is that of no serial correlation, i.e. $\epsilon_t \sim iid(0, \sigma^2)$. If this assumption does not hold, then Said and Dickey (1984) suggest introducing lags of the dependent variable in order to whiten the residuals. Including lags of the dependent variable in equations (4), (5) and (6) yields:

$$\Delta y_t = by_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + \epsilon_t,$$

$$\Delta y_t = \phi_0 + by_{t-1} + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + \epsilon_t,$$

$$\Delta y_t = \phi_0 + by_{t-1} + \phi_2 t + \sum_{i=1}^{p} \delta_i \Delta y_{t-i} + \epsilon_t.$$

These three equations are referred to as the (Augmented) Dickey and Fuller (1979) (ADF) test regressions.

Kwiatkowski, Phillips, Schmidt, and Shin (1992) (KPSS) propose an alternative approach, in which the null and alternative hypotheses are interchanged. That is, they propose a residual-based Lagrange Multiplier (LM) tests for the null hypothesis that a time series is stationary (either around a level or a deterministic time trend), against the alternative that it is non-stationary.

KPSS consider the model:

$$y_t = \beta t + r_t + \phi y_{t-1} + \varepsilon_t,$$

where $r_t = r_{t-1} + u_t$, ε_t is $iid(0, \sigma_\varepsilon^2)$, $\sigma_\varepsilon^2 = 1$, u_t is $iid(0, \sigma_u^2)$, and $|\phi| < 1$.

Two cases of interest arise in the previous model setup. The first one occurs when $\sigma_u^2 = 0$, and the initial value of r_t is assumed to be fixed and equal to r_0. In this case, y_t is a stationary series around a linear trend term (it should be recalled that $|\phi| < 1$). Notice that if one further assumes that $\beta = 0$, then y_t is a stationary series around a mean. The second one arises when $\sigma_u^2 > 0$. In this case, y_t becomes non-stationary. Thus, the previous discussion implies that the KPSS test of the null hypothesis that a series is stationary is given by $H_0 : \sigma_u^2 = 0$, while the alternative hypothesis that it is non-stationary can be stated as $H_a : \sigma_u^2 > 0$.

The test statistic constructed by KPSS is:

$$\eta_j = \frac{T^{-2} \sum\limits_{t=1}^{T} S_t^2}{s_T^2(l)}; \qquad j = 1, 2$$

where $S_t = \sum_{k=1}^{t} \hat{\varepsilon}_k$ is the partial sum of the residuals $(\hat{\varepsilon}_k)$ that result from running a regression of y_t against an intercept, for $j = 1$, or a regression of y_t against an intercept and a linear trend term, for $j = 2$, depending on whether the null hypothesis of interest is that of stationarity around a mean, or around a linear deterministic trend, respectively.

In addition, $s_T^2(l)$ is an estimator of the long-run variance of the corresponding regression. In their original paper, KPSS propose a non-parametric estimator of $\hat{\sigma}_{\varepsilon_i}^2$ based on a Bartlett window having a truncation lag parameter of $l_q = $ integer $\left[q \left(T/100 \right)^{1/4} \right]$, with $q = 4, 12$. However, Caner and Kilian (2001) have pointed out that stationarity tests, like the KPSS tests, exhibit very low power after correcting for size distortions. Thus, in our paper we follow recent work by Sul, Phillips, and Choi (2005), who propose a new boundary condition rule that improves the size and power properties of the KPSS stationarity tests. In particular, Sul et al. suggest the following procedure. First, an AR(p) model for the residuals

is estimated, that is:

$$\hat{\varepsilon}_t = \rho_1 \hat{\varepsilon}_{t-1} + ... + \rho_p \hat{\varepsilon}_{t-p} + \upsilon_t, \tag{7}$$

where the lag length of the autoregression can be determined for example using the GEneral-To-Specific (GETS) algorithm proposed by Hall (1994) and Campbell and Perron (1991). Second, the long-run variance estimate of $\hat{\sigma}_{\varepsilon}^2$ is obtained with the boundary condition rule:

$$\hat{\sigma}_{\varepsilon}^2 = \min \left\{ T \hat{\sigma}_{\upsilon}^2, \frac{\hat{\sigma}_{\upsilon}^2}{(1 - \hat{\rho}(1))^2} \right\}, \tag{8}$$

where $\hat{\rho}(1) = \hat{\rho}_1(1) + ... + \hat{\rho}_p(1)$ denotes the autoregressive polynomial evaluated at $L = 1$. In turn, $\hat{\sigma}_{\upsilon}^2$ is the long-run variance estimate of the residuals in equation (14) that is obtained using a quadratic spectral window Heteroskedastic and Autocorrelation Consistent (HAC) estimator.[5]

It is worth mentioning that although other unit-root tests are available in the literature, see e.g. Maddala and Kim (1998) for a textbook exposition, in this document we focus on the ADF and KPSS tests since they have already been extended to deal with panel data. In the next section we briefly review the panel unit-root and stationarity tests that will be applied in this document.

3.3   Unit-root and stationarity tests in panel data

The problem of testing the presence of unit roots in panels of data has received a great deal of attention in recent years; see e.g. the literature reviews in Breitung and Pesaran (2008) and Banerjee and Wagner (2009). Among the tests available in the literature, the Im, Pesaran, and Shin (2003) (IPS) test has proved to be the most popular. This panel unit root test combines information from the time-series dimension with that from the cross-section dimension, such that fewer time

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[5]Additional Monte Carlo evidence reported by Carrión-i Silvestre and Sansó (2006) also indicates that the proposal in Sul, Phillips, and Choi (2005) is to be preferred since the KPSS statistics exhibit less size distortion and reasonable power.

observations are required for the test to have power. The IPS test is based on individual ADF test regressions:

$$\Delta y_{it} = a_i + b_i y_{i,t-1} + \sum_{r=1}^{p_i} c_{ir} \Delta y_{i,t-r} + \varepsilon_{it}, \qquad (9)$$

where y_{it} denotes relative average wage (per hour) for individual $i = 1, \ldots, N$, at time period $t = 1, \ldots, T$. In this setting, the null hypothesis to test the presence of a unit root becomes $H_0 : b_i = 0$ for all i, against the alternative that at least one of the individual series in the panel is stationary, that is $H_1 : b_i < 0$ for at least one i. The IPS test averages the ADF statistics obtained in equation (9) across the N cross-sectional units of the panel, denoted as:

$$t_{bar_{NT}} = (N)^{-1} \sum_{i=1}^{N} t_{i,T},$$

where $t_{i,T}$ is the ADF test for the ith cross-sectional unit in the panel. IPS show that after a suitable standardisation, the $t_{bar_{NT}}$ statistic follows a standard normal distribution. Moreover, they compute the mean and variance required to standardise the $t_{bar_{NT}}$ statistic via Monte Carlo simulations, for different values of T and p_i, and for different combinations of deterministic components; that is, when the test regression (9) includes intercept but no trend, and when it includes both intercept and trend.

An important assumption underlying the IPS test is that of cross section independence among the individual time series in the panel. However, it has been shown that the test suffers from size distortions in the presence of cross section dependence, the magnitude of which increases as the strength of the cross-sectional dependence increases; see e.g. Strauss and Yigit (2003) and Pesaran (2007). To allow for the presence of cross section dependence, Pesaran (2007) proposes to augment equation (9) with the cross-sectional averages of lagged level and lagged first-differences of the individual series in the panel. Thus, the test of the unit root hypothesis would be based on the following p^{th} order Cross-sectionally Augmented ADF (denoted

CADF) regressions:

$$\Delta y_{it} = a_i + b_i y_{i,t-1} + \sum_{r=1}^{p} c_{ir} \Delta y_{it-r} + d_i \bar{y}_{t-1} + \sum_{r=0}^{p} f_{ir} \Delta \bar{y}_{t-r} + \varepsilon_{it}, \qquad (10)$$

where $\bar{y}_t$ is the cross section mean of y_{it}, defined as $\bar{y}_t = (N)^{-1} \sum_{i=1}^{N} y_{it}$. The corresponding cross-sectionally augmented version of the IPS test statistic (denoted CIPS) is given by:

$$\text{CIPS} = (N)^{-1} \sum_{i=1}^{N} \tilde{t}_i,$$

where $\tilde{t}_i$ is the cross-sectional ADF statistic for the ith individual in the panel. Once again, under the null hypothesis there is a unit root in all individuals in the panel, i.e. $H_0 : b_i = 0$ for all i, while under the alternative at least one of the individual series in the panel is stationary, i.e. $H_1 : b_i < 0$ for at least one i. The critical values of the CIPS statistic are tabulated via Monte Carlo simulations by Pesaran (2007) for various values of T and N and according to the deterministic elements included in the cross-sectionally augmented ADF regressions, namely no intercepts and no trends (Case I), intercepts only (Case II), and intercepts and trends (Case III).

An important issue that arises when using both the IPS and CIPS tests is that due to the heterogeneous nature of the alternative hypothesis, one needs to be careful when interpreting the results, because the null hypothesis that there is a unit root in each cross section may be rejected when only a fraction of the series in the panel are stationary. By contrast, Hadri (2000) proposes residual-based LM tests for the null hypothesis that all the time series in the panel are stationary (either around a level or a deterministic time trend), against the alternative that some of the series are non-stationary. The Hadri tests thus offer the advantage that if the null hypothesis is not rejected, there would be evidence that all wage differentials in the panel are stationary.

Following Hadri (2000), consider the models:

$$y_{it} = r_{it} + \varepsilon_{it} \qquad (11)$$

and

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$$y_{it} = r_{it} + \beta_i t + \varepsilon_{it} \tag{12}$$

where r_{it} is a random walk, $r_{it} = r_{i,t-1} + u_{it}$, and ε_{it} and u_{it} are mutually independent normal distributions. Also, ε_{it} and u_{it} are $i.i.d$ across i and over t, with $E[\varepsilon_{it}] = 0$, $E[\varepsilon_{it}^2] = \sigma_{\varepsilon,i}^2 > 0$, $E[u_{it}] = 0$, $E[u_{it}^2] = \sigma_{u,i}^2 \geq 0$, $t = 1, ..., T$ and $i = 1, ..., N$. The null hypothesis that all the series are stationary is given by $H_0 : \sigma_{u,i}^2 = 0$, $i = 1, ..., N$, while the alternative that some of the series are non-stationary is $H_1 : \sigma_{u,i}^2 > 0$, $i = 1, ..., N_1$ and $\sigma_{u,i}^2 = 0$, $i = N_1 + 1, ..., N$.

Let $\hat{\varepsilon}_{it}$ be the residuals from the regression of y_{it} on an intercept, for model (11) (or on an intercept and a linear trend term, for model (12)). Then, for individual i the univariate KPSS stationarity test is:

$$\eta_{i,T} = \frac{\sum_{t=1}^{T} S_{it}^2}{T^2 \hat{\sigma}_{\varepsilon_i}^2}, \tag{13}$$

where S_{it} denotes the partial sum process of the residuals given by $S_{it} = \sum_{j=1}^{t} \hat{\varepsilon}_{ij}$, and $\hat{\sigma}_{\varepsilon_i}^2$ is a consistent estimator of the long-run variance of $\hat{\varepsilon}_{it}$ from the appropriate regression, for which we follow the procedure suggested by Sul, Phillips, and Choi (2005). This procedure was outlined earlier in a univariate context. Within a panel framework, the procedure advocated by Sul et al. is implemented as follows: First, for each individual i an AR model for the residuals is estimated, that is:

$$\hat{\varepsilon}_{it} = \rho_{i,1} \hat{\varepsilon}_{i,t-1} + ... + \rho_{i,p_i} \hat{\varepsilon}_{i,t-p_i} + v_{it}, \tag{14}$$

where the lag length of the autoregression can be determined for example using the GETS algorithm proposed by Hall (1994) and Campbell and Perron (1991). Second, the long-run variance estimate of $\hat{\sigma}_{\varepsilon_i}^2$ is obtained with the boundary condition rule:

$$\hat{\sigma}_{\varepsilon_i}^2 = \min \left\{ T \hat{\sigma}_{v_i}^2, \frac{\hat{\sigma}_{v_i}^2}{(1 - \hat{\rho}_i(1))^2} \right\}, \tag{15}$$

where $\hat{\rho}_i(1) = \hat{\rho}_{i,1}(1) + ... + \hat{\rho}_{i,p_i}(1)$ denotes the autoregressive polynomial evaluated at $L = 1$. In turn, $\hat{\sigma}_{v_i}^2$ is the long-run variance estimate of the residuals in equation

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(14) that is obtained using a quadratic spectral window HAC estimator.[6]

The Hadri (2000) panel stationarity test statistic is given by the simple average of individual univariate KPSS stationarity tests:

$$\widehat{LM}_{T,N} = \frac{1}{N} \sum_{i=1}^{N} \eta_{i,T},$$

which after a suitable standardisation, using appropriate moments, follows a standard normal limiting distribution. That is:

$$Z = \frac{\sqrt{N}\left(\widehat{LM}_{T,N} - \bar{\xi}\right)}{\bar{\zeta}} \Rightarrow N(0,1), \tag{16}$$

where $\bar{\xi} = \frac{1}{N}\sum_{i=1}^{N}\xi_i$ and $\bar{\zeta}^2 = \frac{1}{N}\sum_{i=1}^{N}\zeta_i^2$ are respectively the mean and variance required for standardisation. Asymptotic values of these moments can be found in Hadri (2000), while finite sample critical values appear in Hadri and Larsson (2005).

The Monte Carlo experiments of Hadri (2000) illustrate that these tests have good size properties for T and N sufficiently large. However, Giulietti, Otero, and Smith (2009) show that even for relatively large T and N the Hadri (2000) tests suffer from severe size distortions in the presence of cross-sectional dependence, the magnitude of which increases as the strength of the cross-sectional dependence increases. To correct for the size distortion caused by cross-sectional dependence, Giulietti et al. apply the bootstrap method and find that the bootstrap Hadri tests are approximately correctly sized.

To implement the bootstrap method in the context of the Hadri tests, we start off by correcting for serial correlation using equation (14) and obtain $\hat{v}_{it}$, which are centred around zero. Next, as in Maddala and Wu (1999), the residuals $\hat{v}_{it}$ are resampled with replacement with the cross-section index fixed, so that their cross-correlation structure is preserved; the resulting bootstrap innovation $\hat{v}_{it}$ is denoted $\hat{v}_{it}^*$. Then, $\hat{\varepsilon}_{it}^*$ is generated recursively as:

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[6]Additional Monte Carlo evidence reported by Carrión-i Silvestre and Sansó (2006) also indicates that the proposal in Sul, Phillips, and Choi (2005) is to be preferred since the KPSS statistics exhibit less size distortion and reasonable power.

$$\hat{\varepsilon}_{it}^* = \hat{\rho}_{i,1}\hat{\varepsilon}_{i,t-1}^* + ... + \hat{\rho}_{i,p_i}\hat{\varepsilon}_{i,t-p_i}^* + \upsilon_{it}^*,$$

where, in order to ensure that initialisation of $\hat{\varepsilon}_{it}^*$, i.e. the bootstrap samples of $\hat{\varepsilon}_{it}$, becomes unimportant, we follow Chang (2004) who advocates generating a large number of $\hat{\varepsilon}_{it}^*$, say $T+Q$ values and discard the first Q values of $\hat{\varepsilon}_{it}^*$ (for our purposes we choose $Q = 40$). Lastly, the bootstrap samples of y_{it}^* are calculated by adding $\hat{\varepsilon}_{it}^*$ to the deterministic component of the corresponding model, and the Hadri LM statistic is calculated for each y_{it}^*. The previous steps are repeated several times in order to derive the empirical distribution of the LM statistic, from which bootstrap probability values (or alternatively bootstrap critical values) may be obtained.

4 Data

We use data from the nationwide household surveys periodically undertaken by the Departamento Administrativo Nacional de Estadística (DANE). Our period of analysis, which runs from 1984 to 2005, is characterised by the implementation of two different surveys, namely the Encuesta Nacional de Hogares (ENH) and the Encuesta Continua de Hogares (ECH). The former was applied quarterly from 1979 to 2000, and up to 1983 included the four main cities: Bogotá, Medellín, Cali and Barranquilla. In 1984 three more cities were added to the ENH: Bucaramanga, Manizales and Pasto. In 2001, the ENH was superseded by the ECH, which is a monthly survey of thirteen cities: the original seven plus Ibagué, Montería, Cartagena, Pereira, Villavicencio and Cúcuta.[7]

The dataset used in the analysis consists of the hourly wage per worker. The data for each year in the period 1984-2005 was obtained by aggregating the surveys of that year. Appendix 1 reports the number of observations used in the analysis. Appendix 2 presents the series of hourly wage per worker in current pesos. These

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[7]The ECH also introduced changes in the phrasing of questions aimed at measuring labour market indicators, such us the concept of unemployment, unpaid workers, etc. These methodological differences do not affect our measure of hourly average wage.

data are subsequently deflated by the overall consumer price index (2005=100) to account for the effect of inflation; see Appendix 3.

The analysis of the evolution of wage differentials can be performed from different perspectives. To begin with, Figure 1 shows that during the first half of the sample period the public/private wage differentials for male and female workers remain relatively stable. Then, during the second half of the sample period, these differentials start to increase favouring the public sector. In addition, the public/private wage differential for male workers does not appear to be statistically different from that of female workers. Notice that the previous analysis was undertaken at a very high level of aggregation, in the sense that we only looked at average wages in the public and private sectors by gender. However, the advantage of using survey data (as we do in this document) is that other additional dimensions can be exploited as well. In particular, we also calculate:

1. Average wage in the public and private sectors by city. Here we use the main seven metropolitan areas of the country that are available throughout the sample period; namely (in alphabetical order) Bucaramanga, Barranquilla, Bogotá, Cali, Medellín, Manizales and Pasto.

2. Average wage in the public and private sectors by gender and by city.

3. Average wage in the public and private sectors by occupational category. Here we consider the following four categories: managerial, professional, office and others.

4. Average wage in the public and private sectors by city and by occupational category.

Figure 2 examines the regional dimension. This figure shows that the public/private sector wage differential seems to exhibit a similar pattern across cities. In addition, Pasto presents the highest wage differential throughout the sample period, although during the last part of the sample period the gap with Bucaramanga

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appears to be closing. This finding may be explained by the fact that Pasto exhibits a lower average wage in the private sector compared to other cities where smaller gaps are observed (as in the case of Bogotá). When one examines the gaps for male and female workers it is clear that the one for Pasto can be explained by the fact that the corresponding gap for men is wider than that observed for women; see Figures 3 and 4.

Figures 5 to 8 plot wage gaps by occupational position. These figures illustrate an interesting finding. While the public/private wage differentials for managerial and professional employees (i.e. white collar employees) do not exhibit a significant variation, for the other two occupational positions (office and others) the wage differentials show a slight increase.

Figures 9 to 22 summarise wage differentials with respect to Bogotá. When using Bogotá as the category to which others are compared, the computed gaps do not show large changes over the sample period. Here there are two, somewhat expected, results that must be highlighted: (i.) wages in Bogotá are higher than in other cities; and (ii.) in the private sector the wage gaps with respect to Bogotá are much larger than those observed for the public sector.

Figure 23 compares the distribution of wages for the years 1985 and 2005. As can be seen from the figure, the distribution of wages have not changed considerable through time. An interesting finding is that private sector wages appear more concentrated around the mean than public sector ones. When the data are further analysed by occupational categories, other interesting results emerge. The distribution for managerial workers is very similar in the private and public sectors. For office workers the distribution of wages tends to be more concentrated, while for professionals and workers in managerial activities the wage distributions exhibit more variation around their respective means. On average, public sector wages tend to be higher than private sector ones.

Figure 24 displays the distribution of wages in the public and private sectors by city. In general terms, the patterns discussed in the previous paragraph can

also be observed when examining wage distributions across cities, perhaps with the exception of Pasto, where wages are found to be less concentrated. Medellín is the city with the largest concentration in wage distribution, and the largest mean in the private sector for 2005.

The previous results describe the behaviour of wages over time. However, for a better understanding of the size of wage differentials is necessary to consider aspects such as human capital formation and demographic (market segmentation) factors. Thus, human capital formation appears in wage differentials when looking at the occupational profile of an individual, while demographic factors appear when examining differences by gender or by city. In fact, interesting results are uncovered when one relates wage differentials to age (as a proxy of an individual's work experience), years of schooling, gender and occupational category.

In the case of the age, our results indicate that men have more experience for all occupational positions, although differences in experience are smaller for blue collar employees. By sector, higher levels of experience are found in public sector workers, although in the case of white collar employees these differences tend to be smaller. Important differences in experience are also found within blue collar employees, which suggests that being an "office employee" or being another type of "blue collar employee" is determined by the educational level of the individual. The results just described provide the necessary justification for studying the relationship between public and private wages at a more disaggregated level.

Thus far, the analysis of wage differentials has been based on an informal visual inspection of the resulting series. In the following section we provide a more formal statistical analysis to assess the time-series properties of the variables under consideration.

5   Empirical analysis

Fluctuations in private and public sector wages have the potential to influence labour mobility from the public to the private sector and viceversa. Against this back-

ground, an assessment of whether wages in these two sectors maintain a stable long-run equilibrium relationship can have implications for the necessity to adjust remuneration in the public sector. Hence, there is considerable value in understanding how public and private sector wages behave in relation to each other over time. Our analysis examines three different aspects of public/private sector wages. The first one is related to the time-series properties of the public/private wage differential (Tables 1 and 2). The second one is concerned with the behaviour of public sector wages relative to that existing in Bogotá for an individual with similar characteristics (Tables 3 and 4). Lastly, the third one is related to the behaviour of private sector wages relative to that existing in Bogotá for an individual with similar characteristics (Tables 5 and 6). Thus, this sort of analysis allows us to examine wage differentials existing between the public and private sectors, as well as those that arise within each of these two sectors.

For the purposes of our empirical analysis, we examine the time-series properties of the wage differentials calculated in the previous section. The conventional ADF is applied to examine the unit-root null hypothesis for each wage differential. The test is performed including an intercept in the test regression. Also, one lag of the dependent variable is included in the test regression in order to ensure that the residuals do not suffer from serial correlation; the number of lags of the dependent variables is kept to a minimum due to the relatively small number of observations (that is $T = 22$). In addition to the ADF test, we also apply the KPSS stationarity test. For this, the model with an intercept (and no trend) is adopted in the empirical analysis, which implies that we would be testing the null hypothesis that a wage differential is stationary around a level. As indicated in the previous section, the long-run variance required to calculate the KPSS statistic is consistently estimated using the new boundary condition rule put forward by Sul, Phillips, and Choi (2005). Furthermore, to correct for possible serial correlation the autoregressive processes in (14) are estimated for up to $p = 3$ lags, and the optimal number of lags is chosen based on the GETS algorithm. This algorithm involves testing whether

the last autoregressive coefficient is statistically different from zero (say, at the 10% significance level); if it is not statistically significant, then the order of the autoregression is reduced by one until the last coefficient is statistically significant.

Then, we turn our attention to panel unit-root and panel stationarity tests. The main motivation for statistical testing using a panel of data instead of individual time series is that it has been noted that the power of the tests increases with the number of cross-sections in the panel. Thus, we first calculate the IPS test which tests the null hypothesis of a unit root in all individuals in the panel, and is based on the assumption of independence across individuals. Then, to allow for potential cross section dependence, we also calculate two additional tests: (i) the CIPS test for panel unit-root; and (ii.) the bootstrap Hadri panel stationarity test (the corresponding bootstrap p-values are based on 2,000 replications used to derive the empirical distributions of the test statistics). It should be recalled that failure to account for potential cross section dependence will result in severe size distortion of both the IPS and Hadri test statistics.

Table 1 reports the results of applying the ADF unit-root and KPSS stationarity tests to public/private wage differentials by population group (i.e. male, female and total) and city (i.e. Bucaramanga, Barranquilla, Bogotá, Cali, Medellín, Manizales and Pasto). The results of the ADF test consistently fail to reject the null hypothesis of non-stationarity, while for the KPSS test evidence is mixed (the null hypothesis of stationarity is rejected in 10 out of 21 possible cases). Thus, evidence that wages are linked by a stable long-run equilibrium relationship is not particularly strong, when the series are examined in isolation. The bottom part of Table 1 reports the results of applying the panel tests. According to our findings, we fail to reject the null hypothesis of joint non-stationarity when using the IPS test, but not when using the CIPS test. This result highlights the importance of allowing for the presence of cross section dependence in the data. Turning to the bootstrap Hadri test, we fail to reject the null hypothesis of joint stationarity for male workers. In the case of all (total) and female workers, the null hypothesis of joint stationarity is rejected at

the 5% (but not at the 1%) significance level; the resulting test statistics for all and female workers are 3.718 [p-value $= 0.021$] and 4.532 [p-value $= 0.026$], respectively. The reason why the CIPS and Hadri tests offer conflicting results may be due to the fact that the wage differentials are rather aggregate, as they do not discriminate by occupational category.

Table 2 reports the results for public/private wage differential by occupational category and city. When the series are considered in isolation results tend to be conflicting in the sense that both the ADF and KPSS tests either reject or fail to reject the null hypothesis. Panel tests, on the other hand, tell a completely different story. In this case, the CIPS test rejects the null hypothesis of joint non-stationarity for all occupational categories (i.e. managerial, professional, office and other), suggesting that at least one of the series in each panel is stationary. Stronger evidence in favour of stationarity is provided by the bootstrap Hadri test, as we fail to reject the null hypothesis of joint stationarity for any of the four occupational categories under consideration. These findings suggest that public and private sector wages maintain a long-run equilibrium relationship when analysed by occupational category, and after taking into account the presence of cross section dependence in the form of shocks (or innovations) that affect all series simultaneously.

Table 3 shows that the results when the tests are applied to public sector wages relative to the wage of an individual in the public sector in Bogotá. The conventional ADF test rejects the existence of a unit root in the wage differentials under consideration, except in the cases of male workers in the cities of Cali and Medellín. As to the KPSS test, we reject the stationarity null hypothesis in the cases of female workers in the cities of Bucaramanga, Medellín and Manizales. For the remaining 13 out of 18 cases the results of the univariate tests are consistent, in the sense that the ADF test rejects the null hypothesis, but the KPSS does not. Regarding the panel tests, the CIPS fails to reject the unit-root null hypothesis, although the calculated test statistics (–2.082, –2.035 and –2.149 for total, male and female workers, respectively) are relatively close to the 10% critical value tabulated by Pesaran (2007) (i.e.

–2.210). Overall,the results support the view that wage differentials are stationary.

Table 4 presents the results for the case of the public sector wage differential for the four occupational categories that are considered, with respect to the public sector wage of an individual in the same occupational category in Bogotá. As can be seen from the table, the results of the univariate unit-root and stationarity tests provide tend to favour the view that the wage differentials are stationary, in particular when looking at the results of the KPSS test (where we fail to reject the null of stationarity in 20 out of 24 cases). Turning to the results of the panel tests, they also provide support that the public sector wage differential with respect to Bogotá are stationary, with the exception of the CIPS test for individuals whose occupational category is "office".

The last two tables relate to wage differentials that involve the private sector. Table 5 shows the results when the tests are applied to private sector wages with respect to the wage of an individual with similar characteristics in the private sector in Bogotá. In this case the results of the univariate ADF and KPSS tests provide mixed evidence. However, the panel IPS, CIPS and Hadri tests provide support for the view that private sector wage differentials with respect to Bogotá are stationary when considered as a panel of data. Indeed, while the IPS and CIPS reject the unit-root null hypothesis for the total population as well as for male and female workers, the Hadri tests fail to reject the null of stationarity.

Table 6 reports the results of private sector wage differentials with respect to Bogota for the occupational categories under consideration. In this case the results of the univariate tests are mixed. The panel tests, on the other hand, provide support for the view that the differentials are stationary, especially after allowing for the effect of cross section dependence (the CIPS test statistic for "professional" workers is close to the 10% critical value).

6 Concluding remarks

In this document we have examined the time-series properties of the wage differentials that arise between the public and private sector in Colombia. The analysis has been based on information taken from nationwide household surveys. The utilisation of survey data offers the advantage that one can go beyond the typical calculation of the public/private sector wage differential for male and female workers, as well as for all workers. Indeed, the data can be analysed at a very high level of disaggregation. In particular, the dimensions that were studied in this document include: (i.) gender; (ii.) regional; and (iii.) occupational category.

Our findings indicate conflicting results in the unit-root and stationarity tests when one focuses on wage differentials at an aggregate level (such as for men, women and both). This is regardless of whether one is looking at each wage differential in isolation of the others, or jointly as a panel of data.

However, when we analyse wage differentials at higher levels of disaggregation, treat them jointly as a panel of data, and allow for the presence of potential cross section dependence, there is more supportive evidence for the view that wage differentials are stationary. In other words, average wages (in levels) appear to be linked by a stable long-run equilibrium relationship. In graphical terms, this long-run equilibrium relationship can be depicted as a 45 degree line, which plays the role of an attractor around which average wages fluctuate; in the short run, it may well be that average wages lie above (or below) this attractor. The economic importance of this finding is that despite the fact that wage differentials exist, they have not been consistently increasing (or decreasing) over time. If average wages were not linked by a long-run equilibrium relationship, there would exist non-negligible incentives for workers to move out of the public sector, which would undoubtedly jeopardise the ability of the public sector to attract and retain a productive and competitive labour force.

Table 1. public/private wage differential
Univariate unit-root and stationarity tests

Group	City	p	ADF	p	KPSS	
Total	Bucaramanga	1	-0.151	1	0.581	‡
	Barranquilla	1	-1.629	1	0.253	
	Bogotá	1	-0.488	2	0.144	
	Cali	1	0.884	1	0.524	‡
	Medellín	1	-1.007	1	0.334	
	Manizales	1	-0.709	1	0.371	†
	Pasto	1	-0.438	1	0.396	†
Male	Bucaramanga	1	-0.598	1	0.297	
	Barranquilla	1	-1.182	3	0.443	†
	Bogotá	1	-1.241	2	0.132	
	Cali	1	-0.024	1	0.308	
	Medellín	1	-1.102	2	0.194	
	Manizales	1	-0.778	1	0.402	†
	Pasto	1	-0.742	2	0.267	
Female	Bucaramanga	1	-0.234	1	1.076	‡
	Barranquilla	1	-2.082	1	0.484	‡
	Bogotá	1	-0.330	2	0.131	
	Cali	1	0.196	1	0.375	†
	Medellín	1	-1.114	1	0.380	†
	Manizales	1	-0.877	1	0.253	
	Pasto	1	-0.859	1	0.205	

Panel unit-root and stationarity tests

Group	IPS	CIPS		Hadri	
Total	2.795	-3.040	‡	3.718	‡
Male	1.954	-3.490	‡	2.218	
Female	2.099	-2.930	‡	4.532	‡

Notes: † and ‡ indicate 10 and 5% levels of significance, respectively, based on critical values calculated from the response surfaces in MacKinnon (1991) for the ADF test, and Sephton (1995) for the KPSS test. The IPS statistic is compared against the (lower tail of the) standard normal distribution, while the CIPS statistic is compared against critical values tabulated by Pesaran (2007). To account for potential cross section dependence, the statistical significance of the Hadri test is based on a bootstrap procedure that is implemented using 2,000 replications.

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Table 2. public/private wage differential by occupational category and city
Univariate unit-root and stationarity tests

Occupational category	City	p	ADF		p	KPSS	
Managerial	Bucaramanga	1	-2.389		3	0.159	
	Barranquilla	1	-1.407		1	0.330	
	Bogotá	1	-0.910		2	0.057	
	Cali	1	-3.356	‡	1	0.582	‡
	Medellín	1	-2.640		1	0.357	†
	Manizales	1	-1.779		2	0.205	
	Pasto	1	-1.724		1	0.305	
Professional	Bucaramanga	1	-2.060		1	0.356	
	Barranquilla	1	-2.969	†	1	0.256	
	Bogotá	1	-1.964		1	0.314	
	Cali	1	-1.861		1	0.401	†
	Medellín	1	-2.382		1	0.429	†
	Manizales	1	-1.174		1	0.276	
	Pasto	1	-4.153	‡	1	0.415	†
Office	Bucaramanga	1	-0.812		2	0.156	
	Barranquilla	1	-0.572		2	0.193	
	Bogotá	1	-0.737		1	0.201	
	Cali	1	-0.244		1	0.197	
	Medellín	1	-1.587		1	0.328	
	Manizales	1	-0.475		1	0.216	
	Pasto	1	0.428	†	1	0.254	
Other	Bucaramanga	1	-0.341		1	0.270	
	Barranquilla	1	-2.512		1	0.442	†
	Bogotá	1	0.064		2	0.157	
	Cali	1	0.011		1	0.241	
	Medellín	1	-0.262		1	0.256	
	Manizales	1	-1.353		1	0.314	
	Pasto	1	-1.096		1	0.265	

Panel unit-root and stationarity tests

Occupational category	IPS		CIPS		Hadri
Managerial	-1.421	†	-2.275	†	2.090
Professional	-2.352	‡	-3.015	‡	3.298
Office	2.613		-3.060	‡	0.873
Other	2.025		-2.954	‡	1.950

Notes: See notes to Table 1.

Table 3. Public wage relative to public wage in Bogotá
Univariate unit-root and stationarity tests

Group	City	p	ADF		p	KPSS	
Total	Bucaramanga	1	-3.741	‡	1	0.223	
	Barranquilla	1	-3.048	‡	1	0.204	
	Cali	1	-2.648	†	1	0.223	
	Medellín	1	-2.690	†	1	0.118	
	Manizales	1	-3.885	‡	1	0.157	
	Pasto	1	-2.956	†	1	0.155	
Male	Bucaramanga	1	-4.441	‡	1	0.232	
	Barranquilla	1	-2.968	†	1	0.129	
	Cali	1	-2.478		1	0.264	
	Medellín	1	-1.843		2	0.098	
	Manizales	1	-2.698	†	1	0.158	
	Pasto	1	-2.780	†	1	0.237	
Female	Bucaramanga	1	-3.046	‡	1	0.390	†
	Barranquilla	1	-2.737	†	1	0.166	
	Cali	1	-3.012	†	1	0.125	
	Medellín	1	-3.356	‡	1	0.513	‡
	Manizales	1	-4.988	‡	1	0.813	‡
	Pasto	1	-3.051	‡	1	0.208	

Panel unit-root and stationarity tests

Group	IPS		CIPS	Hadri
Total	-4.214	‡	-2.082	0.100
Male	-3.462	‡	-2.035	0.211
Female	-4.735	‡	-2.149	3.397

Notes: See notes to Table 1.

Table 4. Public wage relative to public wage in Bogotá by occupational category
Univariate unit-root and stationarity tests

Occupational category	City	p	ADF		p	KPSS	
Managerial	Bucaramanga	1	-3.238	‡	1	0.237	
	Barranquilla	1	-2.281		1	0.347	
	Cali	1	-1.836		1	0.408	†
	Medellín	1	-3.050	‡	1	0.350	
	Manizales	1	-1.734		2	0.049	
	Pasto	1	-3.126	‡	1	0.310	
Professional	Bucaramanga	1	-1.496		3	0.058	
	Barranquilla	1	-2.193		1	0.460	†
	Cali	1	-3.265	‡	1	0.214	
	Medellín	1	-2.294		1	0.101	
	Manizales	1	-3.415	‡	1	0.217	
	Pasto	1	-2.080		1	0.372	†
Office	Bucaramanga	1	-4.421	‡	1	0.100	
	Barranquilla	1	-1.918		1	0.058	
	Cali	1	-3.779	‡	1	0.177	
	Medellín	1	-3.701	‡	1	0.118	
	Manizales	1	-2.675	†	1	0.069	
	Pasto	1	-2.987	†	1	0.090	
Other	Bucaramanga	1	-2.865	†	1	0.237	
	Barranquilla	1	-4.222	‡	3	0.825	‡
	Cali	1	-1.634		1	0.081	
	Medellín	1	-1.527		1	0.172	
	Manizales	1	-1.840		1	0.271	
	Pasto	1	-1.904		1	0.249	

Panel unit-root and stationarity tests

Occupational category	IPS		CIPS		Hadri
Managerial	-2.633	‡	-2.592	‡	1.906
Professional	-2.410	‡	-1.946		1.093
Office	-4.432	‡	-2.324	‡	-1.263
Other	-2.090	‡	-2.713	‡	2.298

Notes: See notes to Table 1.

Table 5. Private wage relative to private wage in Bogotá
Univariate unit-root and stationarity tests

Group	City	p	ADF		p	KPSS	
Total	Bucaramanga	1	-1.809		1	0.652	‡
	Barranquilla	1	-3.001	†	1	0.532	‡
	Cali	1	-1.561		1	0.331	
	Medellín	1	-2.392		1	0.223	
	Manizales	1	-2.525		1	0.417	†
	Pasto	1	-1.932		1	0.127	
Male	Bucaramanga	1	-1.784		1	0.480	†
	Barranquilla	1	-2.728	†	1	0.494	‡
	Cali	1	-1.756		1	0.268	
	Medellín	1	-2.036		1	0.176	
	Manizales	1	-2.204		1	0.229	
	Pasto	1	-2.276		1	0.136	
Female	Bucaramanga	1	-2.113		1	0.607	‡
	Barranquilla	1	-3.624	‡	1	0.408	†
	Cali	1	-1.686		2	0.296	
	Medellín	1	-3.674	‡	1	0.272	
	Manizales	1	-2.950	†	1	0.848	‡
	Pasto	1	-1.985		1	0.135	

Panel unit-root and stationarity tests

Group	IPS		CIPS		Hadri
Total	-1.760	‡	-2.394	‡	3.594
Male	-1.574	†	-2.389	‡	2.144
Female	-2.961	‡	-2.355	‡	4.416

Notes: See notes to Table 1.

Table 6. Private wage relative to private wage in Bogotá by occupational category
Univariate unit-root and stationarity tests

Occupational category	City	p	ADF		p	KPSS	
Managerial	Bucaramanga	1	-1.793		1	0.227	
	Barranquilla	1	-0.946		2	0.093	
	Cali	1	-1.954		1	0.615	‡
	Medellín	1	-2.609		1	0.497	‡
	Manizales	1	-1.975		1	0.175	
	Pasto	1	-2.863	†	1	0.284	
Professional	Bucaramanga	1	-2.910	†	1	0.134	
	Barranquilla	1	-2.154		1	0.623	‡
	Cali	1	-2.212		1	0.503	‡
	Medellín	1	-2.426		1	0.297	
	Manizales	1	-2.330		1	0.649	‡
	Pasto	1	-2.203		2	0.127	
Office	Bucaramanga	1	-2.929	†	1	0.523	‡
	Barranquilla	1	-2.039		1	0.127	
	Cali	1	-1.718		1	0.428	†
	Medellín	1	-3.286	‡	1	0.418	†
	Manizales	1	-2.214		1	0.273	
	Pasto	1	-2.403		1	0.160	
Other	Bucaramanga	1	-1.956		1	0.126	
	Barranquilla	1	-2.516		1	0.119	
	Cali	1	-2.144		1	0.087	
	Medellín	1	-2.005		1	0.102	
	Manizales	1	-1.746		1	0.151	
	Pasto	1	-1.131		1	0.081	

Panel unit-root and stationarity tests

Occupational category	IPS		CIPS		Hadri
Managerial	-1.299	†	-2.731	‡	2.456
Professional	-2.193	‡	-2.065		3.741
Office	-2.345	‡	-2.574	‡	2.570
Other	-1.025		-2.283	†	-1.103

Notes: See notes to Table 1.

Figure 1. Public/private sector wage differential by gender
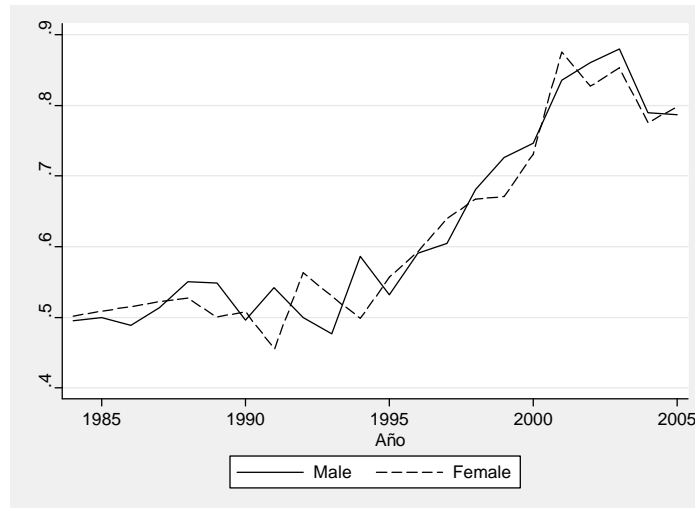
Figure 2. Public/private sector wage differential by city
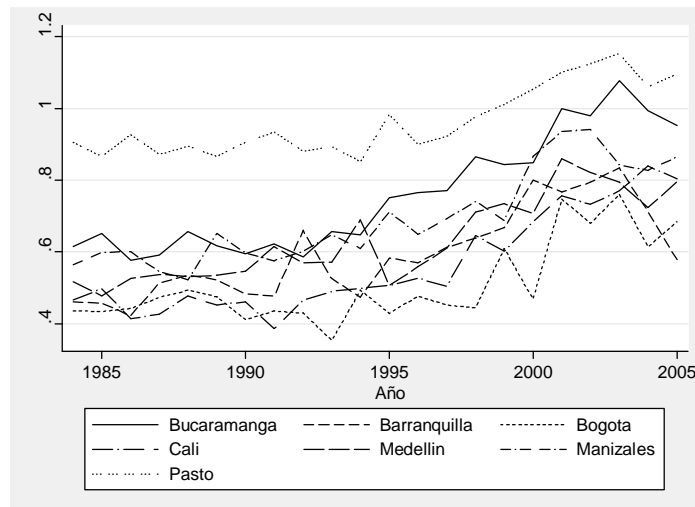
Figure 3. Male public/private sector wage differential by city
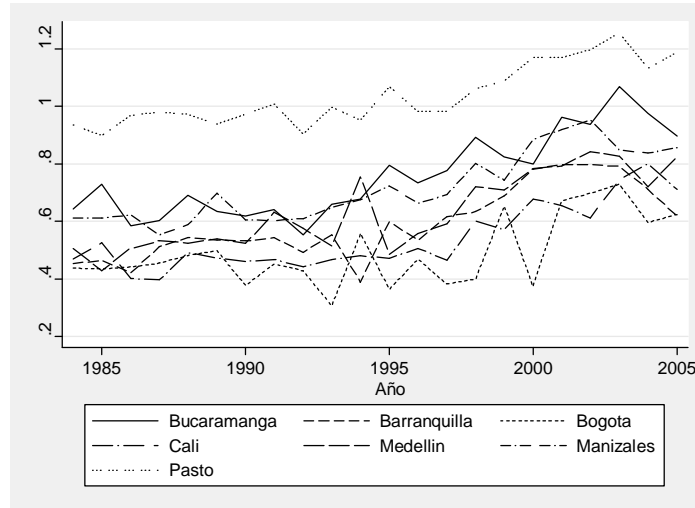
Figure 4. Female public/private sector wage differential by city
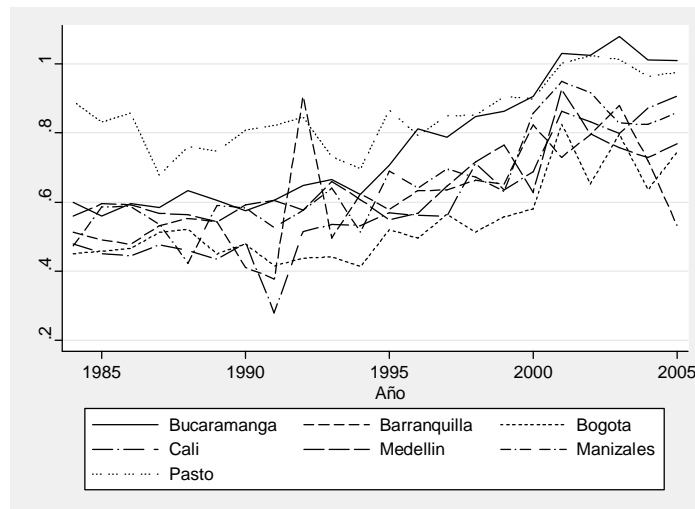
Figure 5. Office employees public/private sector wage differential by city
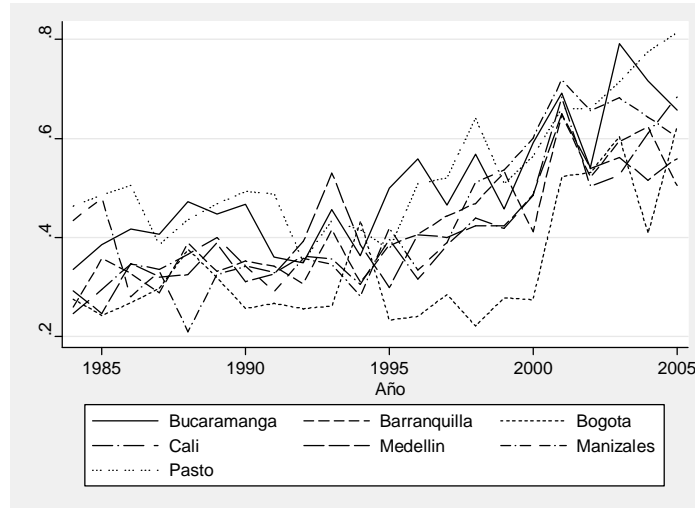
Figure 6. Other employees public/private sector wage differential by city
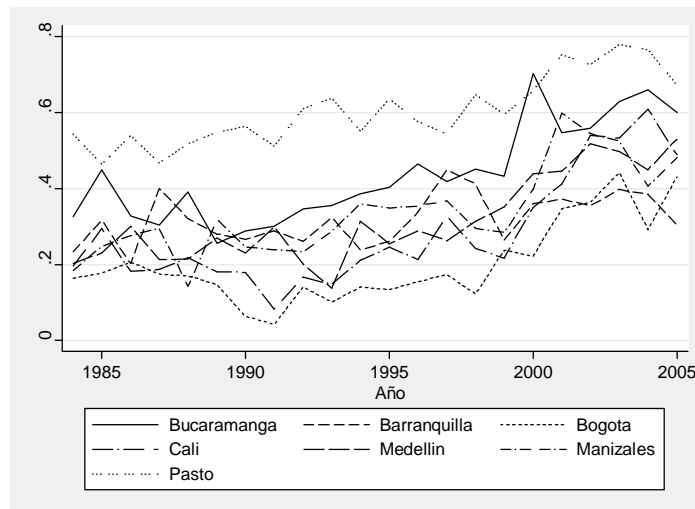
Figure 7. Managerial employees public/private sector wage differential by city
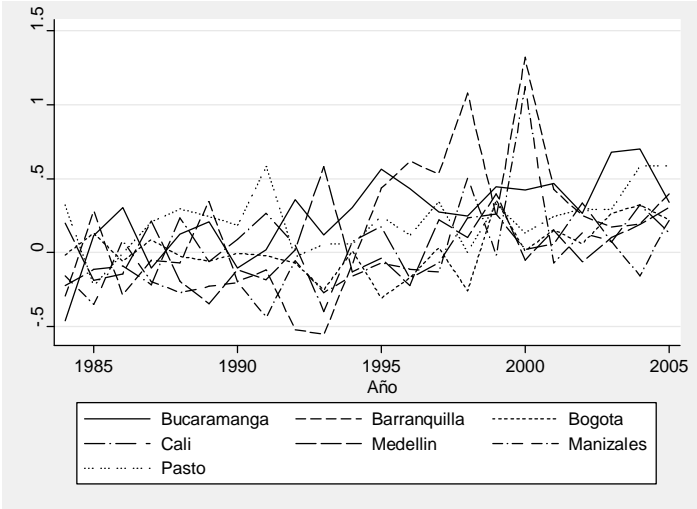
Figure 8. Professional employees public/private sector wage differential by city
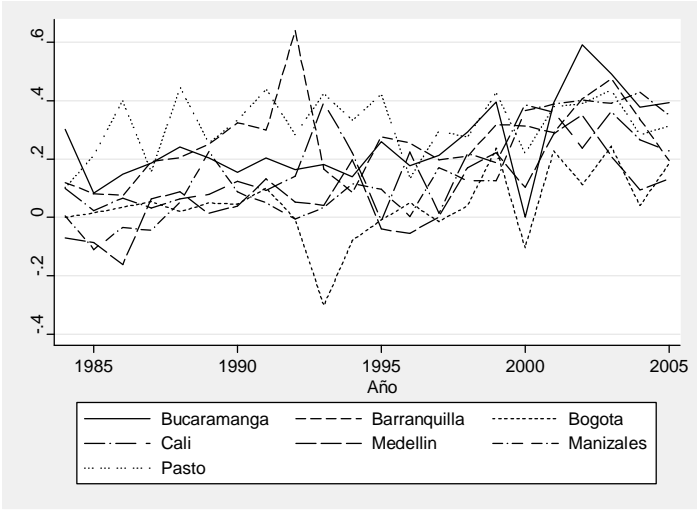
Figure 9. Public sector wage differential with respect to Bogotá
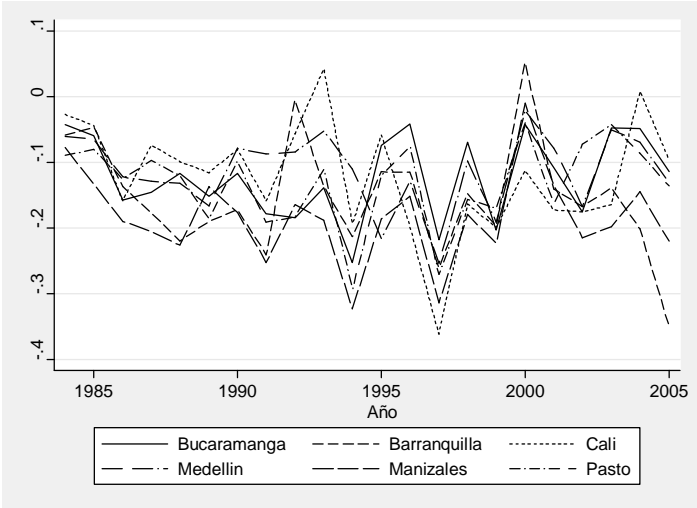
Figure 10. Public sector wage differential with respect to Bogotá (male)
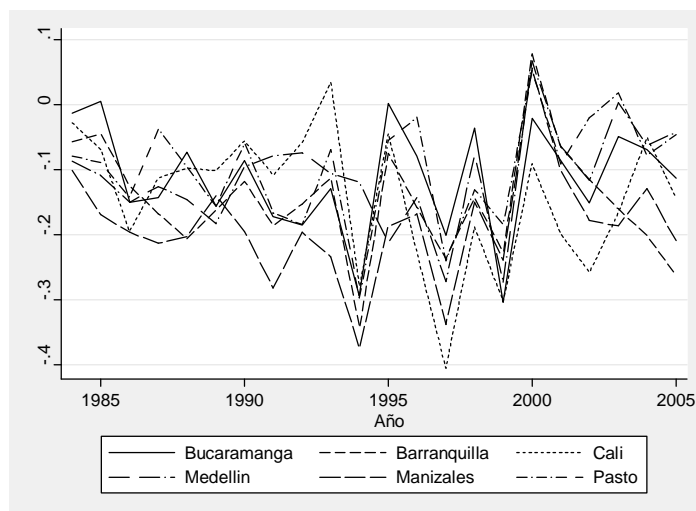
Figure 11. Public sector wage differential with respect to Bogotá (female)
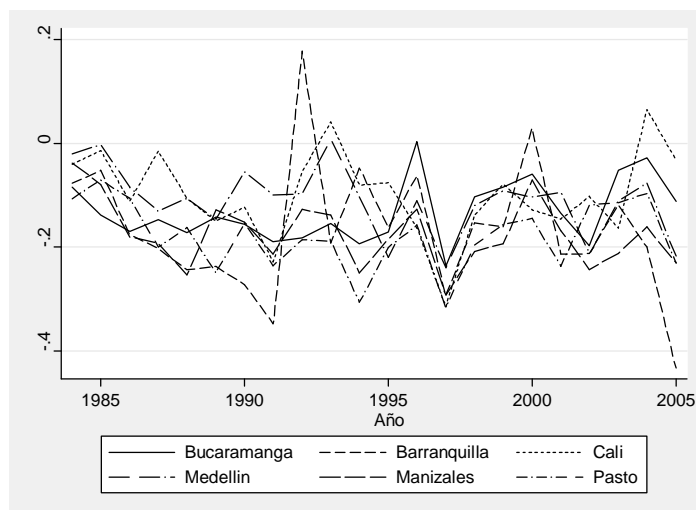
Figure 12. Office employees public sector wage differential with respect to Bogotá
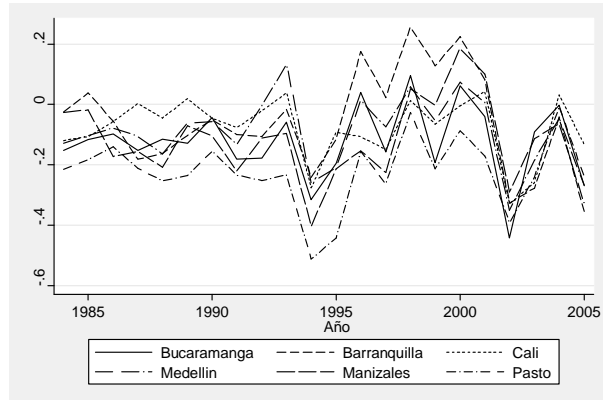
Figure 13. Other employees public sector wage differential with respect to Bogotá
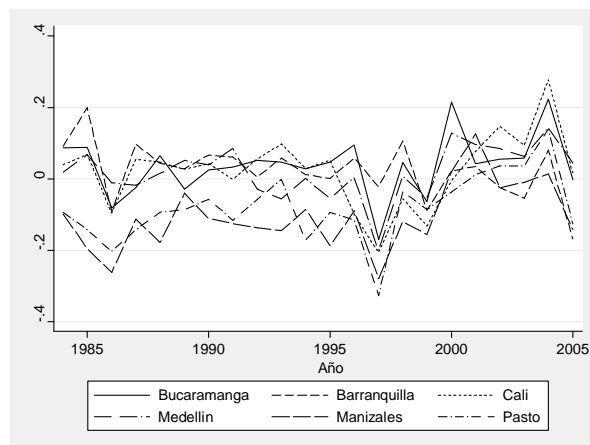
Figure 14. Managerial employees public sector wage differential with respect to Bogotá
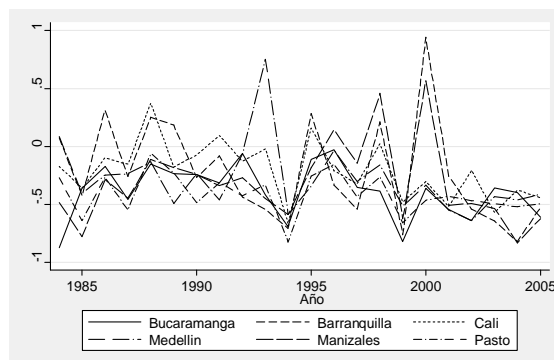
Figure 15. Professional employees public sector wage differential with respect to Bogotá
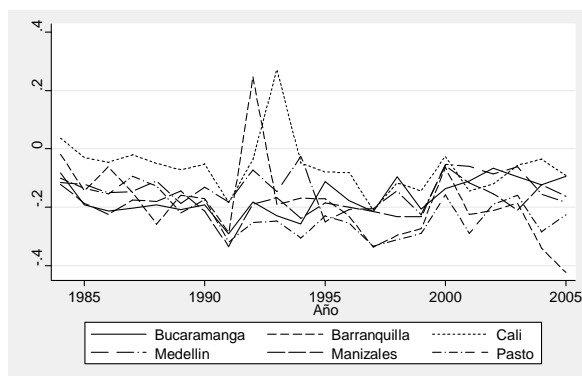
Figure 16. Private sector sector wage differential with respect to Bogotá
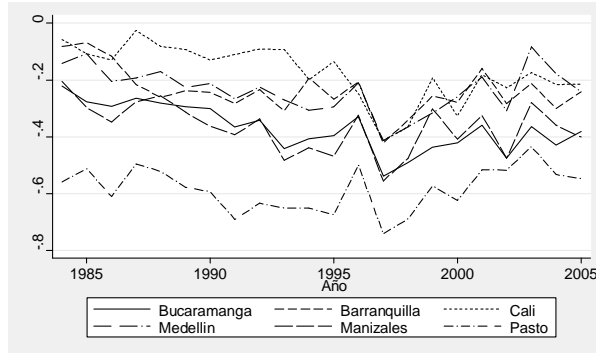
Figure 17. Private sector wage differential with respect to Bogotá (male)
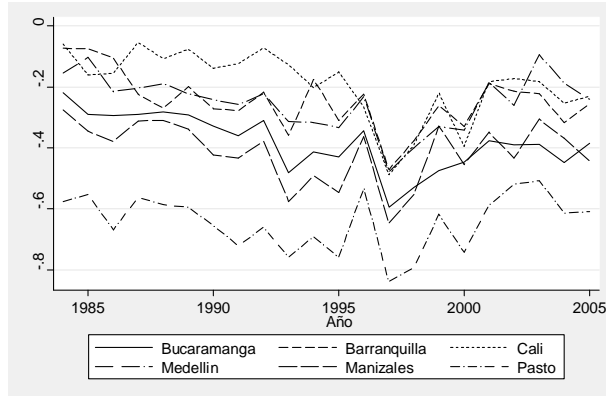
Figure 18. Private sector wage differential with respect to Bogotá (female)
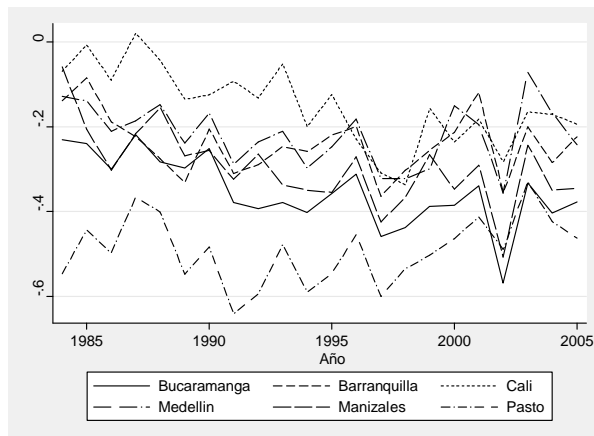
Figure 19. Office employees private sector wage differential with respect to Bogotá
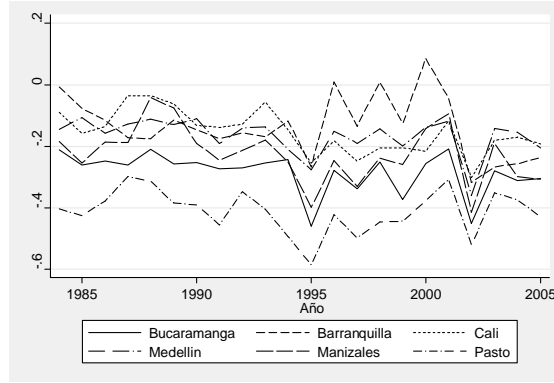
Figure 20. Other employees private sector wage differential with respect to Bogotá
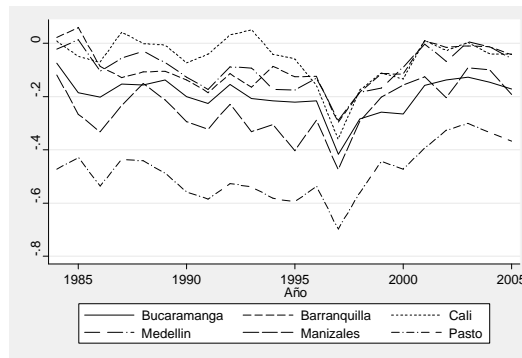
Figure 21. Managerial employees private sector wage differential with respect to Bogotá
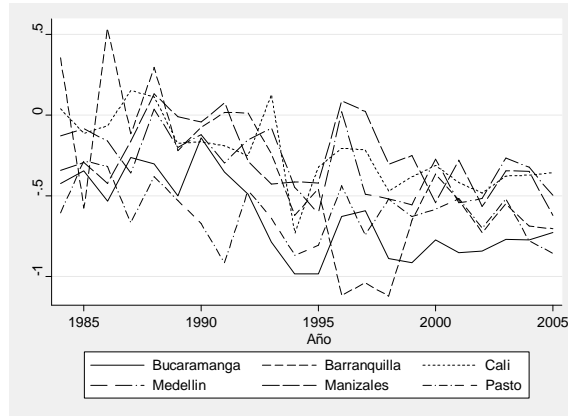
Figure 22. Professional employees private sector wage differential with respect to Bogotá
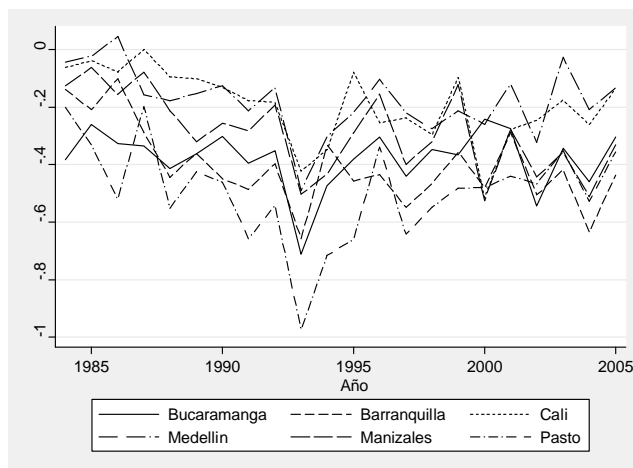
Figure 23. Distribution of wages by occupational category
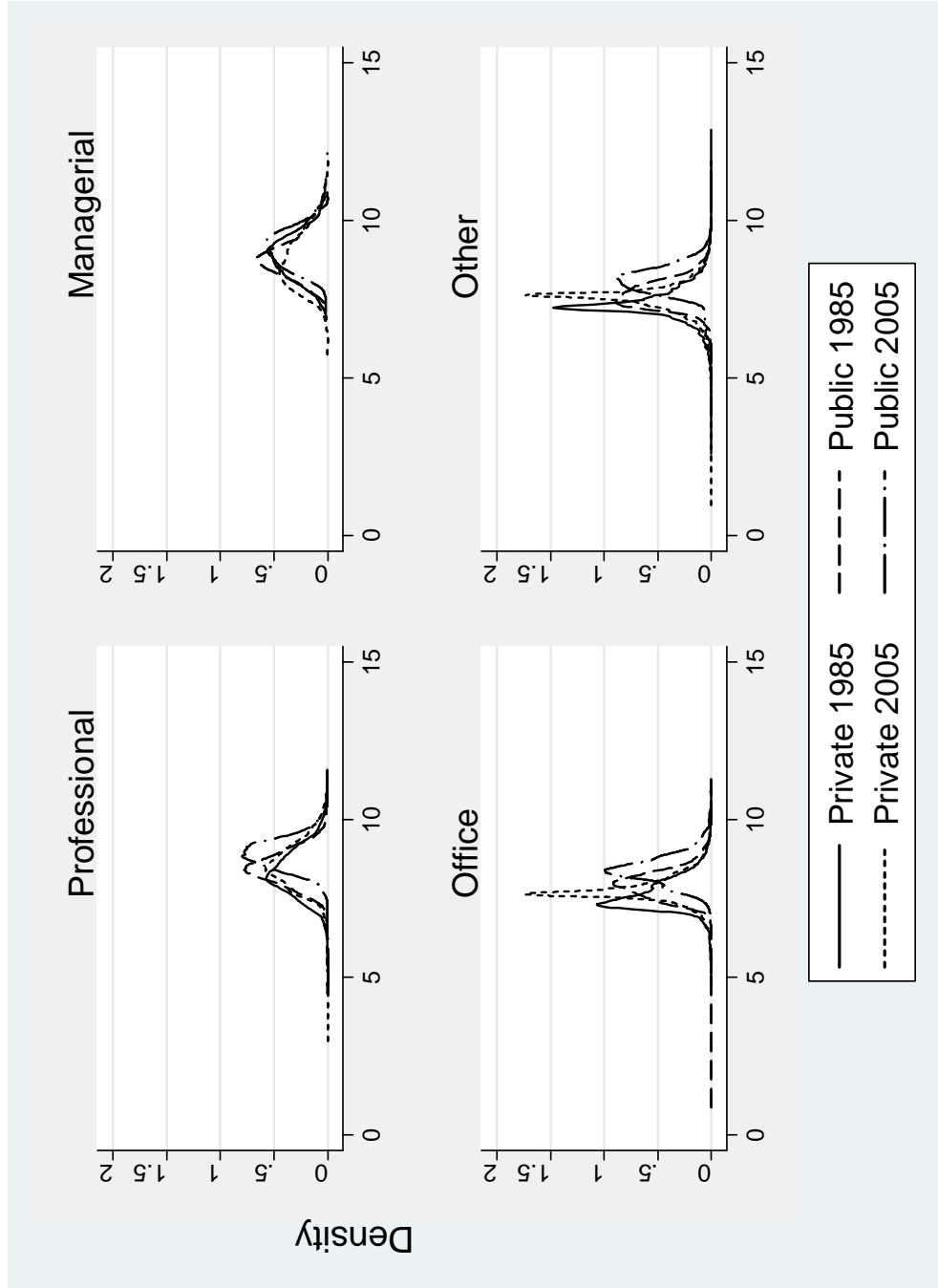
Figure 24. Distribution of wages by city

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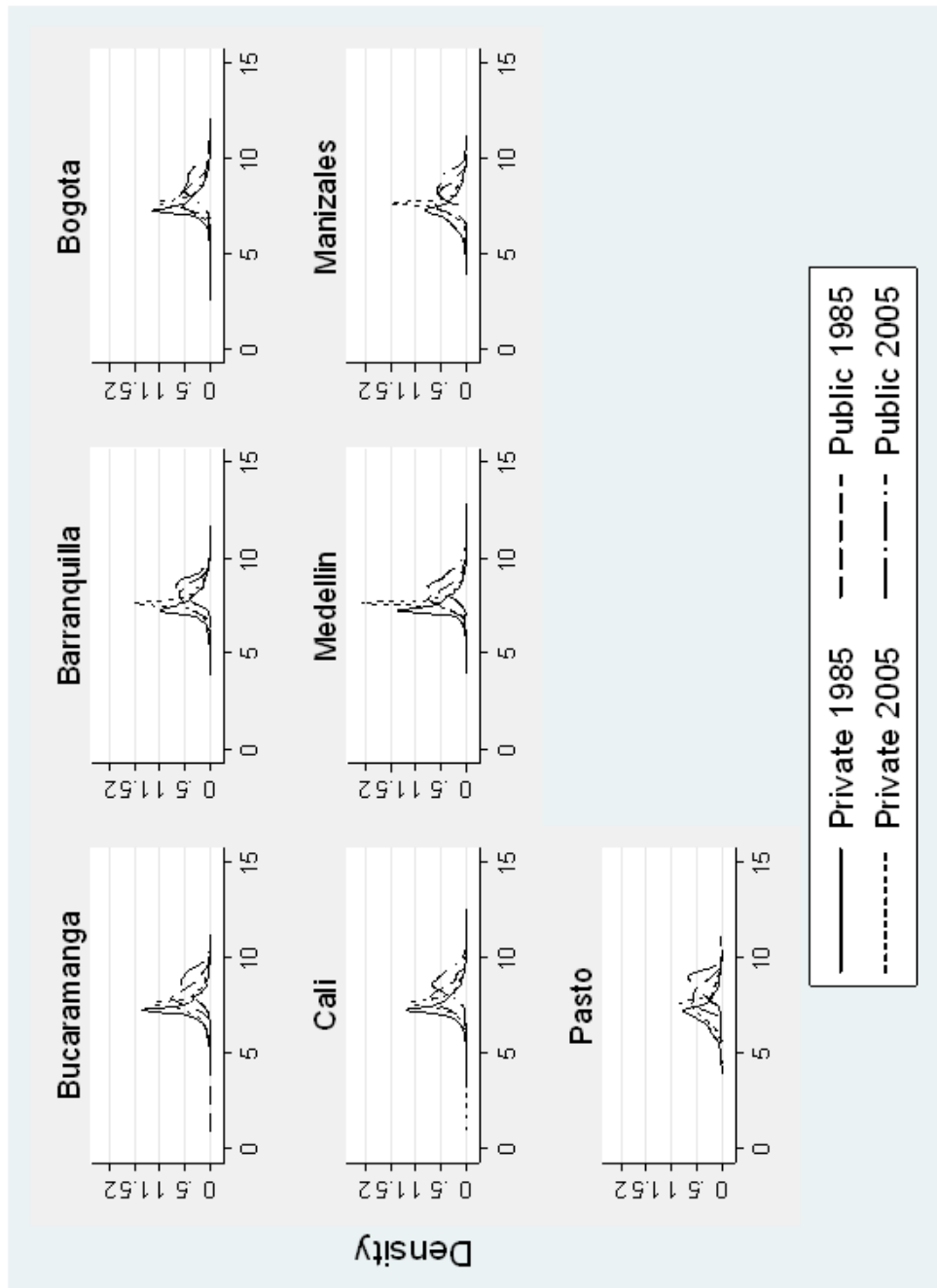
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Appendix 1.1
Number of individuals

Year	Public sector			Private sector		
	Total	Male	Female	Total	Male	Female
1984	353,829	208,881	144,948	1,627,085	1,082,388	544,697
1985	325,880	186,414	139,466	1,583,657	1,033,240	550,417
1986	339,190	197,353	141,837	1,716,702	1,118,180	598,522
1987	334,863	195,259	139,604	1,813,819	1,170,527	643,292
1988	373,542	216,328	157,214	1,959,645	1,260,705	698,940
1989	384,937	213,866	171,071	2,073,134	1,311,360	761,774
1990	408,453	230,556	177,897	2,226,004	1,407,493	818,511
1991	408,637	227,033	181,604	2,202,571	1,349,841	852,730
1992	381,678	204,755	176,923	2,345,323	1,431,521	913,802
1993	333,928	178,987	154,941	2,430,904	1,464,311	966,593
1994	372,447	202,342	170,105	2,706,833	1,640,939	1,065,894
1995	353,633	188,241	165,392	2,674,789	1,581,852	1,092,937
1996	357,547	192,411	165,136	2,604,232	1,541,076	1,063,156
1997	359,647	177,172	182,475	2,457,603	1,432,777	1,024,826
1998	385,943	193,585	192,358	2,542,859	1,467,139	1,075,720
1999	357,503	188,129	169,374	2,358,363	1,345,970	1,012,393
2000	326,495	160,153	166,342	2,378,727	1,342,309	1,036,418
2001	282,292	140,793	141,499	2,168,774	1,194,977	973,797
2002	277,244	133,873	143,371	2,217,958	1,223,511	994,447
2003	248,915	129,764	119,151	2,233,967	1,236,701	997,266
2004	283,588	137,255	146,333	2,454,722	1,356,310	1,098,412
2005	324,464	166,478	157,986	2,940,383	1,628,181	1,312,202

Notes: The number of individuals presented in this Appendix is calculated using the corresponding expansion factor in each survey.

Appendix 1.2 (continued)
Number of individuals in the public sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	20,704	24,507	181,288	41,199	58,343	14,650	13,138
1985	16,593	20,600	171,626	39,249	54,165	12,088	11,559
1986	19,762	22,530	174,432	41,481	54,069	15,106	11,810
1987	22,757	23,620	166,775	43,854	52,403	13,681	11,773
1988	28,536	23,392	185,794	43,014	62,179	17,303	13,324
1989	27,815	30,288	187,822	49,866	55,008	18,174	15,964
1990	28,683	38,237	190,270	48,146	66,677	20,181	16,259
1991	28,765	40,567	189,885	48,987	65,759	19,468	15,206
1992	28,165	31,008	176,659	45,529	66,885	18,450	14,982
1993	27,233	26,727	145,827	41,809	60,951	16,105	15,276
1994	25,390	25,522	175,696	45,190	67,504	16,239	16,906
1995	26,054	26,590	158,816	44,658	65,410	16,133	15,972
1996	26,367	33,150	167,121	37,696	59,736	16,572	16,905
1997	27,098	35,244	170,971	36,321	57,908	15,152	16,953
1998	27,743	34,310	181,472	47,165	63,490	16,342	15,421
1999	21,037	32,117	170,931	44,611	59,523	15,813	13,471
2000	20,114	25,096	161,795	41,717	51,319	13,067	13,387
2001	20,444	28,153	135,385	31,066	43,167	12,225	11,852
2002	15,548	26,402	146,356	27,472	38,030	12,105	11,331
2003	15,967	23,006	123,699	25,262	39,430	11,472	10,079
2004	17,959	23,029	150,581	24,659	45,031	12,036	10,293
2005	21,407	26,464	162,027	35,814	56,191	11,725	10,836

Appendix 1.3 (continued)
Number of individuals in the private sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	84,973	135,610	748,996	240,995	345,813	42,152	28,546
1985	69,006	113,673	777,391	241,494	317,379	35,575	29,139
1986	80,274	123,517	820,343	259,273	365,858	40,206	27,231
1987	99,348	134,515	832,096	291,914	382,537	43,772	29,637
1988	113,445	134,398	884,786	318,553	428,234	50,171	30,058
1989	119,812	167,548	958,686	323,317	421,620	51,382	30,769
1990	128,173	188,116	1,044,400	337,039	439,076	57,062	32,138
1991	140,582	192,307	995,893	343,222	443,070	53,819	33,678
1992	142,964	206,746	1,103,447	335,836	457,010	60,496	38,824
1993	150,386	209,307	1,117,665	365,417	492,807	59,243	36,079
1994	164,222	226,787	1,273,863	381,906	556,343	62,814	40,898
1995	168,085	200,097	1,304,696	364,460	531,846	62,981	42,624
1996	162,258	203,854	1,276,899	335,213	520,229	61,998	43,781
1997	155,079	203,107	1,151,012	337,285	500,584	66,312	44,224
1998	149,741	205,843	1,222,758	355,767	501,067	62,305	45,378
1999	126,499	186,355	1,162,433	346,872	440,373	55,119	40,712
2000	141,974	188,651	1,172,697	359,314	418,428	53,399	44,264
2001	149,463	195,476	1,033,847	331,969	354,741	59,905	43,373
2002	138,938	191,629	1,086,762	321,426	368,550	68,902	41,751
2003	150,117	177,026	1,052,160	338,429	407,271	63,866	45,098
2004	164,653	170,653	1,150,760	367,267	490,928	65,633	44,828
2005	198,533	211,382	1,386,525	454,267	575,506	66,556	47,614

Appendix 1.4 (continued)
Number of male individuals in the public sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	11,837	15,719	105,325	25,982	34,073	8,204	7,741
1985	8,828	11,964	96,977	23,902	31,548	6,479	6,716
1986	11,376	13,947	98,735	26,105	31,389	8,682	7,119
1987	13,173	15,287	95,498	26,885	29,529	7,896	6,991
1988	16,256	14,017	108,533	26,024	33,659	9,787	8,052
1989	14,973	17,502	101,997	29,812	30,537	9,544	9,501
1990	15,755	23,168	106,414	28,239	36,216	11,568	9,196
1991	16,321	24,237	104,054	26,605	36,208	10,772	8,836
1992	14,937	18,148	92,727	24,609	35,500	10,252	8,582
1993	14,716	15,796	74,002	24,369	32,847	8,412	8,845
1994	13,538	13,959	94,054	25,605	36,805	8,629	9,752
1995	14,008	14,318	84,322	25,012	34,151	7,899	8,531
1996	13,341	18,521	89,192	22,211	31,726	8,201	9,219
1997	13,144	18,288	78,442	20,490	30,214	7,598	8,996
1998	13,503	17,590	89,609	25,266	31,099	7,866	8,652
1999	11,385	17,052	89,689	23,352	31,619	7,690	7,342
2000	10,377	12,186	77,791	21,831	24,648	6,053	7,267
2001	9,458	13,531	68,309	15,842	21,050	6,137	6,466
2002	6,919	12,369	69,591	13,260	19,652	6,260	5,822
2003	7,181	11,575	66,929	12,878	19,908	5,796	5,497
2004	9,089	10,522	71,899	12,179	22,161	5,907	5,498
2005	11,012	13,255	82,337	19,338	28,982	5,737	5,817

Appendix 1.5 (continued)
Number of male individuals in the private sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	55,858	96,373	479,970	164,797	234,543	30,115	20,732
1985	42,086	79,025	493,287	160,798	211,487	25,377	21,180
1986	52,309	86,171	515,145	170,876	246,732	27,357	19,590
1987	63,005	93,991	516,326	193,197	252,675	30,449	20,884
1988	72,468	93,996	548,011	209,718	279,471	35,967	21,074
1989	74,152	111,700	582,647	214,384	271,721	35,290	21,466
1990	79,992	127,549	640,875	217,665	279,260	40,232	21,920
1991	88,332	129,426	584,102	215,330	274,472	36,210	21,969
1992	85,413	139,099	645,553	209,117	284,813	40,786	26,740
1993	88,983	138,416	646,441	225,989	303,330	37,957	23,195
1994	100,809	151,675	738,948	235,985	344,973	42,356	26,193
1995	103,928	129,752	733,731	219,760	325,523	41,548	27,610
1996	96,986	131,016	726,827	202,893	315,382	41,459	26,513
1997	90,072	125,333	641,095	202,172	302,877	43,493	27,735
1998	87,389	127,177	682,046	208,616	293,151	39,876	28,884
1999	70,086	114,672	641,208	203,218	256,025	34,721	26,040
2000	77,747	115,095	643,559	209,981	237,883	31,601	26,443
2001	85,102	117,917	548,511	190,326	190,210	36,324	26,587
2002	78,397	116,969	571,251	182,327	206,207	42,779	25,581
2003	82,791	108,565	560,270	194,501	223,875	38,724	27,975
2004	93,667	105,240	614,756	208,846	268,731	38,307	26,763
2005	108,846	129,286	740,947	260,847	320,843	39,127	28,285

Appendix 1.6 (continued)
Number of female individuals in the public sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	8,867	8,788	75,963	15,217	24,270	6,446	5,397
1985	7,765	8,636	74,649	15,347	22,617	5,609	4,843
1986	8,386	8,583	75,697	15,376	22,680	6,424	4,691
1987	9,584	8,333	71,277	16,969	22,874	5,785	4,782
1988	12,280	9,375	77,261	16,990	28,520	7,516	5,272
1989	12,842	12,786	85,825	20,054	24,471	8,630	6,463
1990	12,928	15,069	83,856	19,907	30,461	8,613	7,063
1991	12,444	16,330	85,831	22,382	29,551	8,696	6,370
1992	13,228	12,860	83,932	20,920	31,385	8,198	6,400
1993	12,517	10,931	71,825	17,440	28,104	7,693	6,431
1994	11,852	11,563	81,642	19,585	30,699	7,610	7,154
1995	12,046	12,272	74,494	19,646	31,259	8,234	7,441
1996	13,026	14,629	77,929	15,485	28,010	8,371	7,686
1997	13,954	16,956	92,529	15,831	27,694	7,554	7,957
1998	14,240	16,720	91,863	21,899	32,391	8,476	6,769
1999	9,652	15,065	81,242	21,259	27,904	8,123	6,129
2000	9,737	12,910	84,004	19,886	26,671	7,014	6,120
2001	10,986	14,622	67,076	15,224	22,117	6,088	5,386
2002	8,629	14,033	76,765	14,212	18,378	5,845	5,509
2003	8,786	11,431	56,770	12,384	19,522	5,676	4,582
2004	8,870	12,507	78,682	12,480	22,870	6,129	4,795
2005	10,395	13,209	79,690	16,476	27,209	5,988	5,019

Appendix 1.7 (continued)
Number of female individuals in the private sector

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	29,115	39,237	269,026	76,198	111,270	12,037	7,814
1985	26,920	34,648	284,104	80,696	105,892	10,198	7,959
1986	27,965	37,346	305,198	88,397	119,126	12,849	7,641
1987	36,343	40,524	315,770	98,717	129,862	13,323	8,753
1988	40,977	40,402	336,775	108,835	148,763	14,204	8,984
1989	45,660	55,848	376,039	108,933	149,899	16,092	9,303
1990	48,181	60,567	403,525	119,374	159,816	16,830	10,218
1991	52,250	62,881	411,791	127,892	168,598	17,609	11,709
1992	57,551	67,647	457,894	126,719	172,197	19,710	12,084
1993	61,403	70,891	471,224	139,428	189,477	21,286	12,884
1994	63,413	75,112	534,915	145,921	211,370	20,458	14,705
1995	64,157	70,345	570,965	144,700	206,323	21,433	15,014
1996	65,272	72,838	550,072	132,320	204,847	20,539	17,268
1997	65,007	77,774	509,917	135,113	197,707	22,819	16,489
1998	62,352	78,666	540,712	147,151	207,916	22,429	16,494
1999	56,413	71,683	521,225	143,654	184,348	20,398	14,672
2000	64,227	73,556	529,138	149,333	180,545	21,798	17,821
2001	64,361	77,559	485,336	141,643	164,531	23,581	16,786
2002	60,541	74,660	515,511	139,099	162,343	26,123	16,170
2003	67,326	68,461	491,890	143,928	183,396	25,142	17,123
2004	70,986	65,413	536,004	158,421	222,197	27,326	18,065
2005	89,687	82,096	645,578	193,420	254,663	27,429	19,329

Appendix 1.8 (continued)
Number of individuals by occupational category

Year	Public sector				Private sector			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	7,575	116,510	104,078	125,666	21,174	123,783	300,559	1,181,569
1985	6,168	112,767	93,139	113,806	20,641	130,454	281,311	1,151,251
1986	7,172	115,294	97,024	119,700	18,569	142,531	300,503	1,255,099
1987	6,899	109,731	95,803	122,430	20,713	142,686	307,089	1,343,331
1988	6,485	130,203	105,156	131,698	27,535	157,372	330,506	1,444,232
1989	9,438	135,188	105,763	134,548	33,109	188,757	353,351	1,497,917
1990	9,072	146,642	107,027	145,712	38,642	195,655	376,301	1,615,406
1991	9,719	144,855	107,602	146,461	34,635	201,535	387,737	1,578,664
1992	7,586	145,811	94,249	134,032	42,435	217,110	406,244	1,679,534
1993	7,295	123,157	83,575	119,901	44,651	219,275	417,775	1,749,203
1994	9,787	145,261	91,128	126,271	52,433	253,360	488,610	1,912,430
1995	9,500	135,672	86,721	121,740	43,297	253,834	488,900	1,888,758
1996	11,329	143,954	80,868	121,396	49,079	260,430	478,913	1,815,810
1997	12,257	154,027	81,456	111,907	51,975	287,339	475,463	1,642,826
1998	12,615	170,945	88,611	113,772	60,804	314,614	479,980	1,687,461
1999	10,771	153,852	78,417	114,463	60,657	277,559	447,768	1,572,379
2000	12,492	142,278	71,105	100,620	60,575	286,976	448,709	1,582,467
2001	12,306	128,608	56,952	84,426	59,917	257,654	419,401	1,431,802
2002	8,419	132,032	61,358	75,435	73,505	261,304	436,217	1,446,932
2003	8,591	123,402	48,897	68,025	81,837	266,871	428,926	1,456,333
2004	7,297	144,764	56,526	75,001	94,804	311,363	484,982	1,563,573
2005	14,812	160,541	64,052	85,059	123,155	354,460	589,886	1,872,882

Appendix 1.9 (continued)
Number of individuals in the public sector by occupational category

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	5,211	58,532	52,601	92,537	2,364	57,978	51,477	33,129
1985	4,576	54,760	44,289	82,789	1,592	58,007	48,850	31,017
1986	5,591	56,648	46,737	88,377	1,581	58,646	50,287	31,323
1987	5,846	52,309	46,188	90,916	1,053	57,422	49,615	31,514
1988	4,926	62,610	51,595	97,197	1,559	67,593	53,561	34,501
1989	7,428	64,171	47,351	94,916	2,010	71,017	58,412	39,632
1990	5,853	71,879	50,935	101,889	3,219	74,763	56,092	43,823
1991	7,174	69,074	49,276	101,509	2,545	75,781	58,326	44,952
1992	4,798	66,719	40,359	92,879	2,788	79,092	53,890	41,153
1993	5,381	53,298	37,761	82,547	1,914	69,859	45,814	37,354
1994	5,987	65,783	40,326	90,246	3,800	79,478	50,802	36,025
1995	6,055	59,242	35,620	87,324	3,445	76,430	51,101	34,416
1996	7,199	64,316	33,539	87,357	4,130	79,638	47,329	34,039
1997	6,839	62,443	34,246	73,644	5,418	91,584	47,210	38,263
1998	7,714	73,349	33,243	79,279	4,901	97,596	55,368	34,493
1999	6,203	66,169	33,453	82,304	4,568	87,683	44,964	32,159
2000	7,895	54,738	26,364	71,156	4,597	87,540	44,741	29,464
2001	6,519	51,879	22,096	60,299	5,787	76,729	34,856	24,127
2002	4,425	54,233	21,360	53,855	3,994	77,799	39,998	21,580
2003	5,085	54,920	17,867	51,892	3,506	68,482	31,030	16,133
2004	4,724	56,678	20,941	54,912	2,573	88,086	35,585	20,089
2005	9,491	64,475	26,912	65,600	5,321	96,066	37,140	19,459

Appendix 1.10 (continued)

Number of individuals in the private sector by occupational category

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	17,294	73,492	142,082	849,520	3,880	50,291	158,477	332,049
1985	15,518	76,750	133,804	807,168	5,123	53,704	147,507	344,083
1986	13,855	80,820	138,264	885,241	4,714	61,711	162,239	369,858
1987	15,436	77,052	138,942	939,097	5,277	65,634	168,147	404,234
1988	20,007	84,116	150,307	1,006,275	7,528	73,256	180,199	437,957
1989	23,080	101,254	157,578	1,029,448	10,029	87,503	195,773	468,469
1990	26,670	106,188	164,418	1,110,217	11,972	89,467	211,883	505,189
1991	23,561	107,551	165,070	1,053,659	11,074	93,984	222,667	525,005
1992	27,792	115,525	175,118	1,113,086	14,643	101,585	231,126	566,448
1993	27,014	113,388	176,775	1,147,134	17,637	105,887	241,000	602,069
1994	31,457	131,924	205,779	1,271,779	20,976	121,436	282,831	640,651
1995	24,088	130,182	201,072	1,226,510	19,209	123,652	287,828	662,248
1996	25,554	134,620	202,954	1,177,948	23,525	125,810	275,959	637,862
1997	28,254	147,683	200,531	1,056,309	23,721	139,656	274,932	586,517
1998	34,134	160,184	195,049	1,077,772	26,670	154,430	284,931	609,689
1999	32,270	133,241	181,733	998,726	28,387	144,318	266,035	573,653
2000	34,393	134,669	182,063	991,184	26,182	152,307	266,646	591,283
2001	35,130	122,948	169,944	866,955	24,787	134,706	249,457	564,847
2002	40,082	120,953	176,410	886,066	33,423	140,351	259,807	560,866
2003	45,437	125,423	181,334	884,507	36,400	141,448	247,592	571,826
2004	53,203	149,704	207,151	946,252	41,601	161,659	277,831	617,321
2005	65,858	174,564	247,299	1,140,460	57,297	179,896	342,587	732,422

Appendix 2.1
Average wage per-hour
(Current pesos)

Year	Public sector			Private sector		
	Total	Male	Female	Total	Male	Female
1984	162	169	152	99	103	92
1985	190	199	179	116	121	108
1986	228	237	214	140	146	128
1987	275	281	266	165	168	158
1988	351	367	329	206	212	194
1989	444	465	418	263	269	253
1990	553	573	527	338	349	317
1991	734	772	685	444	449	434
1992	945	946	943	560	574	537
1993	1,272	1,309	1,226	778	813	722
1994	1,723	1,834	1,587	999	1,021	964
1995	1,942	1,997	1,879	1,136	1,174	1,077
1996	2,465	2,536	2,383	1,371	1,405	1,317
1997	3,077	3,149	3,000	1,666	1,720	1,583
1998	3,916	4,052	3,775	2,005	2,051	1,936
1999	4,376	4,500	4,240	2,172	2,176	2,167
2000	4,900	4,976	4,823	2,343	2,358	2,322
2001	5,382	5,237	5,531	2,285	2,270	2,304
2002	5,724	5,619	5,829	2,448	2,376	2,548
2003	6,042	6,040	6,045	2,536	2,506	2,576
2004	6,170	6,202	6,139	2,820	2,815	2,826
2005	6,701	6,621	6,786	3,031	3,013	3,056

Notes: The average wages reported in this appendix are calculated using data from household surveys.

Appendix 2.2 (continued)
Average wage per-hour in the public sector
(Current pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	160	158	167	163	157	155	153
1985	187	190	199	190	186	174	183
1986	214	218	250	214	221	207	221
1987	259	251	300	279	264	244	272
1988	344	310	386	350	339	308	343
1989	426	410	495	442	419	432	411
1990	536	508	603	556	557	505	547
1991	698	655	833	711	764	648	689
1992	849	1,016	1,020	965	938	866	850
1993	1,186	1,188	1,362	1,421	1,293	1,128	1,219
1994	1,551	1,613	1,995	1,645	1,788	1,445	1,490
1995	1,990	1,911	2,142	2,022	1,725	1,778	1,899
1996	2,593	2,409	2,702	2,216	2,376	2,322	2,504
1997	3,133	3,002	3,895	2,714	3,022	2,846	2,972
1998	4,108	3,800	4,403	3,738	3,991	3,680	3,767
1999	4,223	4,249	5,171	4,240	4,275	4,140	4,365
2000	4,803	5,280	5,009	4,480	4,908	4,959	4,817
2001	5,420	5,246	6,034	5,080	5,584	5,271	5,128
2002	5,488	5,531	6,537	5,488	5,533	5,277	6,082
2003	6,307	5,756	6,609	5,607	6,287	5,424	6,338
2004	6,382	5,479	6,699	6,758	6,252	5,797	6,148
2005	6,894	5,456	7,724	7,025	6,788	6,202	6,747

Appendix 2.3 (continued)
Average wage per-hour in the private sector
(Current pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	87	100	108	102	94	88	62
1985	98	120	129	116	116	96	77
1986	120	143	161	141	131	113	87
1987	143	150	187	182	154	142	114
1988	178	182	236	217	199	183	140
1989	230	243	308	281	246	225	173
1990	296	313	400	351	323	278	221
1991	375	406	540	483	413	364	270
1992	472	525	664	607	531	474	352
1993	615	702	956	871	730	590	499
1994	812	1,004	1,218	999	897	785	635
1995	939	1,067	1,395	1,218	1,039	873	711
1996	1,207	1,362	1,677	1,308	1,360	1,213	1,018
1997	1,448	1,626	2,479	1,640	1,641	1,423	1,182
1998	1,730	2,006	2,823	1,959	1,959	1,754	1,418
1999	1,817	2,179	2,813	2,321	2,051	2,080	1,587
2000	2,057	2,372	3,135	2,261	2,420	2,085	1,679
2001	1,994	2,437	2,857	2,384	2,364	2,066	1,705
2002	2,061	2,498	3,312	2,639	2,433	2,060	1,975
2003	2,148	2,498	3,089	2,596	2,841	2,336	2,000
2004	2,363	2,684	3,625	2,920	3,034	2,533	2,128
2005	2,661	3,059	3,897	3,146	3,063	2,611	2,255

Appendix 2.4 (continued)
Male average wage per-hour in the public sector
(Current pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	173	165	175	170	160	158	162
1985	210	200	209	195	188	177	191
1986	227	233	264	217	227	217	229
1987	265	259	306	274	270	247	295
1988	373	326	401	363	346	327	364
1989	442	439	516	467	430	449	442
1990	565	548	616	583	560	507	581
1991	729	719	866	777	800	653	733
1992	868	897	1,044	985	970	859	869
1993	1,239	1,260	1,410	1,459	1,269	1,115	1,316
1994	1,636	1,557	2,195	1,660	1,948	1,509	1,631
1995	2,149	1,991	2,145	2,053	1,734	1,779	2,030
1996	2,589	2,393	2,802	2,231	2,431	2,369	2,750
1997	3,271	3,155	3,999	2,666	3,046	2,852	3,146
1998	4,336	3,897	4,494	3,724	4,158	3,869	3,944
1999	4,092	4,420	5,543	4,097	4,214	4,366	4,612
2000	4,742	5,234	4,839	4,420	5,175	5,119	5,105
2001	5,216	5,326	5,681	4,657	5,332	5,133	5,189
2002	5,368	5,564	6,242	4,825	5,559	5,223	6,119
2003	6,169	5,517	6,476	5,482	6,499	5,375	6,593
2004	6,288	5,508	6,738	6,410	6,330	5,926	6,232
2005	6,569	5,662	7,354	6,375	7,048	5,966	7,024

Appendix 2.5 (continued)
Male average wage per-hour in the private sector
(Current pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	91	105	113	106	97	86	63
1985	101	126	135	115	122	96	78
1986	127	153	170	145	137	116	87
1987	145	155	194	184	159	142	111
1988	187	189	248	222	205	182	138
1989	234	257	313	291	251	223	173
1990	304	322	423	368	332	277	220
1991	384	417	550	486	425	357	267
1992	499	547	681	634	545	466	352
1993	641	724	1,037	913	758	583	486
1994	831	1,055	1,256	1,026	916	768	629
1995	970	1,093	1,490	1,281	1,068	863	697
1996	1,243	1,402	1,753	1,344	1,390	1,220	1,030
1997	1,505	1,702	2,726	1,673	1,687	1,427	1,178
1998	1,775	2,068	3,015	2,041	2,022	1,735	1,364
1999	1,793	2,221	2,883	2,313	2,073	2,076	1,553
2000	2,129	2,393	3,328	2,242	2,365	2,111	1,584
2001	1,990	2,401	2,901	2,418	2,412	2,046	1,611
2002	2,102	2,506	3,106	2,614	2,394	2,015	1,848
2003	2,117	2,499	3,121	2,602	2,842	2,299	1,879
2004	2,368	2,703	3,711	2,880	3,077	2,565	2,008
2005	2,679	3,049	3,939	3,128	3,097	2,532	2,141

Appendix 2.6 (continued)
Female average wage per-hour in the public sector
(Current pesos)

| Year | City | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	144	145	157	150	153	151	141
1985	161	175	185	182	184	171	172
1986	196	195	232	208	213	194	209
1987	251	237	291	287	255	240	238
1988	308	287	366	329	329	284	311
1989	407	370	470	404	406	413	366
1990	501	446	585	518	554	503	502
1991	657	561	794	632	719	642	628
1992	828	1,187	994	941	902	875	825
1993	1,123	1,083	1,312	1,367	1,322	1,142	1,086
1994	1,453	1,680	1,762	1,626	1,588	1,373	1,297
1995	1,801	1,817	2,138	1,982	1,715	1,777	1,749
1996	2,596	2,430	2,585	2,195	2,314	2,278	2,208
1997	3,004	2,837	3,806	2,778	2,994	2,839	2,774
1998	3,890	3,699	4,313	3,756	3,828	3,503	3,542
1999	4,379	4,054	4,761	4,402	4,345	3,924	4,072
2000	4,871	5,324	5,170	4,549	4,662	4,820	4,472
2001	5,596	5,170	6,404	5,534	5,829	5,411	5,053
2002	5,587	5,501	6,806	6,142	5,506	5,335	6,043
2003	6,423	6,013	6,767	5,745	6,054	5,475	6,034
2004	6,477	5,454	6,664	7,116	6,176	5,670	6,052
2005	7,237	5,244	8,090	7,839	6,512	6,429	6,421

Appendix 2.7 (continued)
Female average wage per-hour in the private sector
(Current pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	79	87	100	93	88	94	58
1985	92	107	117	116	102	95	75
1986	108	121	146	133	118	108	89
1987	140	139	174	178	145	140	121
1988	164	165	217	208	187	186	146
1989	222	215	299	262	236	229	173
1990	282	295	363	320	307	281	224
1991	359	384	524	478	393	379	276
1992	433	480	641	562	507	492	354
1993	578	659	844	801	683	602	523
1994	780	901	1,166	955	865	822	646
1995	889	1,019	1,271	1,123	991	891	736
1996	1,152	1,290	1,575	1,252	1,312	1,201	999
1997	1,368	1,505	2,165	1,590	1,569	1,416	1,188
1998	1,666	1,906	2,581	1,843	1,870	1,789	1,512
1999	1,849	2,112	2,726	2,331	2,022	2,088	1,648
2000	1,969	2,339	2,896	2,286	2,491	2,046	1,822
2001	1,999	2,493	2,806	2,338	2,309	2,097	1,857
2002	2,008	2,484	3,544	2,672	2,483	2,134	2,173
2003	2,186	2,497	3,051	2,588	2,840	2,392	2,193
2004	2,355	2,654	3,528	2,973	2,981	2,488	2,310
2005	2,639	3,076	3,848	3,170	3,021	2,724	2,423

Appendix 2.8 (continued)
Average wage per-hour by occupational category
(Current pesos)

| Year | Public sector | | | | Private sector | | | |
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	374	242	139	98	425	239	105	80
1985	426	273	160	122	433	276	120	95
1986	466	327	197	147	507	330	143	116
1987	695	407	233	173	681	386	170	137
1988	828	524	297	213	852	489	207	170
1989	992	657	367	269	1,029	617	258	216
1990	1,197	819	453	337	1,300	747	331	278
1991	1,674	1,088	591	440	1,751	977	438	364
1992	2,069	1,406	740	563	2,228	1,278	550	453
1993	2,653	1,883	1,030	743	3,259	2,014	720	608
1994	3,531	2,501	1,359	994	3,685	2,435	959	781
1995	3,826	2,777	1,526	1,151	3,950	2,694	1,137	901
1996	4,637	3,445	1,872	1,449	5,013	3,254	1,319	1,084
1997	5,585	4,310	2,298	1,785	5,272	4,115	1,583	1,294
1998	7,925	5,381	2,934	2,079	7,807	4,770	1,916	1,505
1999	8,870	6,199	3,217	2,265	7,118	4,978	2,110	1,653
2000	9,519	6,784	3,538	2,562	8,333	6,038	2,231	1,679
2001	9,446	7,385	4,136	2,710	7,801	5,547	2,179	1,667
2002	9,422	7,725	4,225	2,927	8,535	5,746	2,435	1,771
2003	10,489	7,875	4,536	3,134	8,629	5,703	2,389	1,847
2004	10,913	7,979	4,673	3,270	9,030	6,663	2,633	2,021
2005	11,627	8,476	5,076	3,627	9,231	6,843	2,770	2,226

Appendix 2.9 (continued)
Average wage per-hour in the public sector by occupational category
(Current pesos)

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	400	284	147	102	321	200	132	88
1985	444	316	169	127	371	234	151	108
1986	488	381	211	151	386	277	183	136
1987	731	465	238	179	465	356	228	156
1988	891	612	318	222	619	443	277	189
1989	1,038	750	390	285	833	574	347	233
1990	1,275	923	467	357	1,029	719	440	292
1991	1,705	1,258	608	471	1,573	933	574	368
1992	2,059	1,511	763	597	2,090	1,317	723	486
1993	2,793	2,139	1,059	796	2,205	1,675	1,006	617
1994	3,345	3,026	1,564	1,028	3,896	2,066	1,193	906
1995	3,899	3,196	1,631	1,184	3,668	2,451	1,453	1,070
1996	4,842	3,889	1,945	1,489	4,103	3,086	1,820	1,352
1997	5,992	4,758	2,516	1,848	4,800	3,974	2,140	1,651
1998	9,094	6,126	2,969	2,095	5,603	4,804	2,912	2,045
1999	10,261	6,944	3,531	2,290	6,415	5,597	2,992	2,208
2000	10,214	7,510	3,798	2,585	7,846	6,265	3,378	2,510
2001	10,002	7,936	4,328	2,695	8,560	6,993	4,016	2,749
2002	8,618	8,492	4,338	2,919	10,507	7,176	4,155	2,945
2003	10,645	8,726	4,934	3,140	10,166	7,259	4,269	3,116
2004	12,146	8,934	5,037	3,258	8,928	7,350	4,438	3,303
2005	12,396	9,248	5,312	3,689	10,211	7,958	4,904	3,423

Appendix 2.10 (continued)
Average wage per-hour in the private sector by occupational category
(Current pesos)

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	440	275	107	84	360	187	103	71
1985	480	320	121	99	294	213	119	86
1986	549	401	146	121	371	236	141	104
1987	725	458	172	141	550	303	169	128
1988	941	587	205	176	605	383	208	155
1989	1,109	710	261	221	837	511	256	202
1990	1,429	870	331	289	1,010	602	331	252
1991	1,898	1,137	427	370	1,442	800	446	353
1992	2,390	1,458	551	469	1,905	1,077	549	420
1993	3,651	2,568	702	634	2,642	1,442	733	556
1994	4,034	2,795	944	812	3,136	2,047	969	715
1995	4,295	3,196	1,165	941	3,472	2,157	1,118	823
1996	5,813	3,823	1,340	1,117	3,906	2,665	1,304	1,020
1997	5,834	4,840	1,563	1,360	4,549	3,345	1,599	1,160
1998	8,736	5,565	1,968	1,558	6,559	3,980	1,879	1,401
1999	7,904	5,636	2,121	1,699	6,226	4,375	2,102	1,565
2000	8,909	7,432	2,252	1,706	7,571	4,896	2,216	1,633
2001	8,795	6,118	2,086	1,697	6,549	5,023	2,246	1,616
2002	9,731	6,158	2,211	1,794	7,159	5,384	2,599	1,731
2003	9,786	6,487	2,256	1,861	7,288	5,040	2,488	1,822
2004	10,093	7,692	2,489	2,052	7,653	5,792	2,741	1,970
2005	10,233	7,711	2,617	2,249	8,130	6,041	2,883	2,189

Appendix 2.11 (continued)
Average wage per-hour in the public sector by occupational category
(Current pesos)

| Year | Managerial | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	184	474	440	371	479	271	335
1985	379	355	544	379	362	250	287
1986	438	710	519	470	405	390	398
1987	514	629	813	698	643	521	470
1988	717	1,075	835	1,214	732	746	786
1989	881	1,340	1,115	934	683	929	888
1990	1,109	1,084	1,415	1,316	1,121	1,110	872
1991	1,451	1,831	1,987	2,186	1,254	1,418	1,453
1992	2,203	1,513	2,344	2,061	2,196	1,791	1,532
1993	1,874	1,648	2,839	2,784	6,021	1,815	2,038
1994	2,705	2,664	5,400	2,772	3,001	3,004	2,371
1995	3,776	5,609	4,221	4,946	2,998	3,515	3,270
1996	4,771	3,523	4,910	3,981	4,747	5,681	4,208
1997	5,269	4,375	7,508	5,443	5,549	6,503	4,865
1998	6,005	10,913	8,815	9,019	7,522	13,965	6,788
1999	6,459	6,876	14,706	9,116	8,799	7,883	7,620
2000	7,909	29,167	11,368	8,404	8,131	20,041	7,153
2001	8,088	10,783	13,918	8,296	8,045	8,382	9,057
2002	7,739	8,529	14,655	11,919	7,731	8,969	9,193
2003	11,158	8,384	15,952	9,019	10,353	9,352	9,728
2004	12,211	8,010	18,187	12,489	11,488	7,910	10,811
2005	9,702	10,559	17,884	11,502	11,839	9,582	10,922

Appendix 2.12 (continued)
Average wage per-hour in the private sector by occupational category
(Current pesos)

Year	Managerial						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	292	637	447	463	393	317	243
1985	337	268	477	425	437	355	358
1986	323	942	550	514	468	360	400
1987	571	663	745	866	520	634	382
1988	632	1,150	856	958	888	977	585
1989	715	948	1,181	990	964	1,168	695
1990	1,231	1,315	1,421	1,203	1,258	1,359	725
1991	1,424	2,061	2,028	1,676	1,506	2,187	810
1992	1,539	2,542	2,512	1,951	2,154	1,889	1,575
1993	1,661	2,867	3,651	4,141	3,367	2,375	1,926
1994	1,992	2,863	5,336	2,567	3,412	3,524	2,236
1995	2,142	3,627	5,732	4,148	3,111	3,760	2,553
1996	3,092	1,900	5,812	4,726	5,921	6,348	3,742
1997	4,001	2,562	7,253	5,841	4,437	7,417	3,444
1998	4,692	3,709	11,415	7,119	6,788	8,400	6,769
1999	4,129	5,371	10,302	7,020	5,898	8,012	5,485
2000	5,170	7,778	11,235	8,214	8,553	6,529	6,258
2001	5,067	7,025	11,908	7,831	6,906	8,987	7,088
2002	5,929	6,644	13,791	8,505	8,218	7,823	6,841
2003	5,660	7,041	12,233	8,380	9,349	8,662	7,266
2004	6,064	6,603	13,144	9,053	9,502	9,254	6,021
2005	6,916	7,080	14,331	10,015	8,702	7,693	6,086

Appendix 2.13 (continued)
Average wage per-hour in the public sector by occupational category
(Current pesos)

| Year | Professional | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	232	247	252	261	224	223	228
1985	246	258	298	289	264	247	260
1986	290	338	359	343	309	287	308
1987	363	383	445	436	384	373	405
1988	475	445	575	548	516	481	507
1989	599	629	738	686	612	638	592
1990	757	773	916	870	803	740	770
1991	981	984	1,312	1,091	1,094	939	954
1992	1,237	1,903	1,485	1,433	1,382	1,228	1,154
1993	1,657	1,721	2,083	2,735	1,800	1,763	1,626
1994	2,156	2,355	2,790	2,658	2,718	2,199	2,056
1995	2,841	2,680	3,179	2,937	2,475	2,642	2,526
1996	3,416	3,238	4,075	3,759	3,312	3,336	3,159
1997	4,353	3,849	5,395	4,372	4,398	4,353	3,866
1998	5,871	4,802	6,458	5,748	5,589	5,114	4,727
1999	6,189	5,783	7,606	6,585	6,064	6,023	5,691
2000	6,399	6,888	7,333	7,149	6,954	6,929	6,260
2001	7,669	6,836	8,562	7,407	8,063	7,617	6,409
2002	8,226	7,113	8,785	7,791	8,065	7,533	7,273
2003	8,081	7,376	8,885	8,399	8,360	7,200	7,574
2004	8,287	6,666	9,367	9,043	8,020	8,285	7,051
2005	9,135	6,572	10,042	9,169	8,363	8,542	8,009

Appendix 2.14 (continued)
Average wage per-hour in the private sector by occupational category
(Current pesos)

| Year | Professional | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	172	219	252	236	241	222	206
1985	226	238	293	282	287	276	210
1986	250	313	347	321	363	297	206
1987	301	316	421	422	360	390	346
1988	373	362	564	513	473	456	325
1989	489	490	702	635	603	509	459
1990	648	559	876	768	772	678	552
1991	800	730	1,186	994	959	894	615
1992	1,051	1,005	1,494	1,244	1,311	1,234	869
1993	1,383	1,460	2,817	1,846	1,725	1,704	1,064
1994	1,879	2,165	3,017	2,132	2,232	1,959	1,474
1995	2,193	2,033	3,207	2,967	2,576	2,400	1,657
1996	2,862	2,510	3,875	3,006	3,497	3,323	2,763
1997	3,519	3,158	5,469	4,313	4,393	3,670	2,877
1998	4,383	3,895	6,207	4,616	4,711	4,512	3,590
1999	4,168	4,208	6,005	5,456	4,859	5,317	3,712
2000	6,393	5,034	8,138	4,864	6,277	4,810	5,033
2001	5,177	5,113	6,816	5,164	6,054	5,169	4,391
2002	4,560	4,737	7,852	6,142	5,683	5,043	4,925
2003	4,944	4,593	6,967	5,848	6,787	4,875	4,899
2004	5,687	4,766	8,999	6,935	7,304	5,400	5,314
2005	6,171	5,406	8,367	7,304	7,327	6,016	5,861

Appendix 2.15 (continued)
Average wage per-hour in the public sector by occupational category
(Current pesos)

Year	Office						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	126	144	147	131	129	143	119
1985	149	174	168	151	151	165	140
1986	189	197	208	196	193	175	181
1987	216	210	252	252	226	215	204
1988	291	277	326	312	277	265	253
1989	342	352	390	397	367	363	308
1990	457	454	477	456	451	430	409
1991	549	594	657	608	575	527	520
1992	669	719	799	782	796	715	621
1993	987	1,030	1,047	1,088	1,194	951	830
1994	1,226	1,318	1,679	1,274	1,296	1,121	1,006
1995	1,453	1,572	1,764	1,611	1,430	1,426	1,134
1996	1,988	2,274	1,909	1,715	1,936	1,637	1,635
1997	2,223	2,661	2,599	2,238	2,412	2,075	2,000
1998	3,026	3,551	2,748	2,784	2,914	2,895	2,675
1999	2,789	3,845	3,382	3,170	3,204	3,376	2,733
2000	3,503	4,119	3,292	3,277	3,545	3,964	3,019
2001	3,940	4,451	4,099	4,282	4,127	4,536	3,458
2002	3,592	4,029	5,584	4,020	3,931	4,179	3,778
2003	4,773	3,967	5,231	4,039	4,350	4,671	4,111
2004	4,782	4,598	4,796	4,950	4,575	4,499	4,762
2005	4,819	4,431	6,307	5,535	4,826	4,555	4,978

Appendix 2.16 (continued)
Average wage per-hour in the private sector by occupational category
(Current pesos)

| Year | Office | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	90	111	112	102	97	93	75
1985	101	122	132	112	118	102	86
1986	124	142	159	139	136	132	109
1987	144	157	187	180	164	155	139
1988	181	188	224	216	200	215	164
1989	219	253	283	266	249	263	193
1990	287	319	369	324	330	305	250
1991	383	422	503	438	415	394	319
1992	472	529	619	545	538	500	437
1993	625	680	806	761	702	673	537
1994	853	968	1,088	939	882	846	664
1995	882	1,070	1,397	1,084	1,060	937	779
1996	1,136	1,514	1,500	1,250	1,290	1,172	983
1997	1,395	1,708	1,955	1,525	1,616	1,406	1,189
1998	1,714	2,221	2,202	1,795	1,907	1,736	1,409
1999	1,764	2,259	2,560	2,087	2,099	1,975	1,644
2000	1,938	2,729	2,503	2,017	2,179	2,173	1,717
2001	1,974	2,325	2,429	2,161	2,157	2,211	1,787
2002	2,093	2,390	3,284	2,430	2,292	2,169	1,951
2003	2,163	2,190	2,860	2,387	2,480	2,362	2,013
2004	2,336	2,466	3,188	2,688	2,731	2,364	2,193
2005	2,496	2,673	3,386	2,795	2,758	2,491	2,207

Appendix 2.17 (continued)
Average wage per-hour in the public sector by occupational category
(Current pesos)

Year	Other						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	106	106	97	101	99	88	88
1985	129	144	118	127	127	97	103
1986	145	143	157	143	155	121	128
1987	170	191	174	183	171	155	150
1988	227	223	213	223	216	178	194
1989	261	277	269	276	283	258	247
1990	341	356	333	347	346	298	314
1991	450	463	436	435	474	384	388
1992	598	570	567	600	551	495	536
1993	774	783	739	815	699	639	738
1994	1,037	1,020	1,007	1,037	1,009	925	848
1995	1,235	1,179	1,177	1,241	1,114	976	1,073
1996	1,613	1,556	1,468	1,329	1,474	1,342	1,308
1997	1,796	2,082	2,129	1,731	1,743	1,610	1,535
1998	2,197	2,333	2,099	1,986	2,115	1,862	2,026
1999	2,313	2,257	2,465	2,161	2,337	2,111	2,264
2000	3,031	2,497	2,443	2,431	2,777	2,492	2,354
2001	2,662	2,642	2,551	2,755	2,809	2,894	2,583
2002	2,989	2,760	2,827	3,276	3,077	2,758	2,930
2003	3,241	2,896	3,056	3,358	3,252	3,026	3,170
2004	3,646	3,163	2,919	3,853	3,371	2,962	3,355
2005	3,785	3,202	3,791	3,858	3,961	3,292	3,345

Appendix 2.18 (continued)
Average wage per-hour in the private sector by occupational category
(Current pesos)

Year			Other				
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	76	84	82	83	81	73	51
1985	82	105	99	94	101	76	65
1986	104	117	128	119	115	92	75
1987	125	128	146	152	138	115	94
1988	154	161	180	180	175	155	116
1989	202	209	232	231	216	188	142
1990	256	273	313	290	275	233	179
1991	333	347	418	401	351	303	233
1992	422	440	493	508	451	392	291
1993	543	567	668	703	609	479	390
1994	705	803	875	839	736	645	489
1995	826	908	1,030	971	864	688	568
1996	1,013	1,111	1,257	1,074	1,104	942	735
1997	1,181	1,329	1,790	1,248	1,341	1,114	891
1998	1,399	1,546	1,857	1,559	1,546	1,386	1,060
1999	1,500	1,735	1,944	1,739	1,644	1,589	1,248
2000	1,501	1,743	1,957	1,711	1,789	1,672	1,220
2001	1,540	1,821	1,804	1,824	1,800	1,590	1,217
2002	1,710	1,935	1,963	1,910	1,834	1,600	1,416
2003	1,728	1,946	1,964	1,971	1,977	1,791	1,454
2004	1,885	2,152	2,180	2,095	2,151	1,974	1,560
2005	2,077	2,362	2,465	2,368	2,330	2,034	1,706

Appendix 3.1
Average wage per-hour
(2005 Pesos)

Year	Public sector			Private sector		
	Total	Male	Female	Total	Male	Female
1984	5,195	5,413	4,878	3,187	3,300	2,955
1985	4,927	5,146	4,634	3,009	3,122	2,787
1986	4,956	5,167	4,655	3,039	3,170	2,782
1987	4,850	4,962	4,690	2,906	2,970	2,782
1988	4,839	5,062	4,532	2,836	2,921	2,676
1989	4,862	5,088	4,572	2,880	2,940	2,773
1990	4,690	4,859	4,467	2,863	2,959	2,689
1991	4,772	5,021	4,450	2,884	2,920	2,823
1992	4,835	4,841	4,829	2,866	2,936	2,750
1993	5,316	5,474	5,124	3,251	3,398	3,017
1994	5,862	6,242	5,399	3,399	3,473	3,280
1995	5,466	5,620	5,289	3,197	3,303	3,032
1996	5,744	5,910	5,553	3,194	3,274	3,069
1997	6,051	6,193	5,901	3,276	3,382	3,113
1998	6,490	6,716	6,256	3,322	3,398	3,208
1999	6,541	6,726	6,337	3,247	3,252	3,239
2000	6,706	6,809	6,601	3,206	3,227	3,177
2001	6,822	6,638	7,011	2,896	2,878	2,920
2002	6,823	6,696	6,947	2,917	2,832	3,036
2003	6,722	6,720	6,725	2,821	2,788	2,866
2004	6,482	6,515	6,449	2,962	2,958	2,968
2005	6,701	6,621	6,786	3,031	3,013	3,056

Notes: The average real wages reported in this appendix are calculated using the data from Appendix 1, deflated using the consumer price index 2005=100.

Appendix 3.2 (continued)
Average wage per-hour in the public sector
(2005 Pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	5,144	5,064	5,364	5,222	5,050	4,967	4,909
1985	4,846	4,907	5,140	4,921	4,819	4,501	4,743
1986	4,650	4,751	5,444	4,647	4,820	4,504	4,806
1987	4,576	4,435	5,291	4,918	4,653	4,311	4,803
1988	4,736	4,275	5,324	4,824	4,667	4,247	4,720
1989	4,660	4,484	5,422	4,833	4,591	4,730	4,504
1990	4,547	4,303	5,109	4,716	4,725	4,283	4,633
1991	4,536	4,260	5,418	4,624	4,966	4,211	4,477
1992	4,346	5,202	5,223	4,940	4,803	4,432	4,351
1993	4,957	4,966	5,692	5,940	5,404	4,716	5,097
1994	5,277	5,488	6,789	5,598	6,085	4,918	5,070
1995	5,601	5,378	6,028	5,690	4,855	5,005	5,346
1996	6,041	5,614	6,295	5,164	5,537	5,411	5,835
1997	6,162	5,904	7,660	5,339	5,944	5,597	5,845
1998	6,808	6,297	7,296	6,196	6,614	6,099	6,243
1999	6,312	6,351	7,730	6,338	6,390	6,188	6,524
2000	6,573	7,226	6,855	6,131	6,717	6,787	6,592
2001	6,870	6,649	7,648	6,438	7,078	6,682	6,499
2002	6,541	6,592	7,791	6,541	6,595	6,290	7,249
2003	7,016	6,403	7,353	6,238	6,994	6,034	7,051
2004	6,705	5,755	7,037	7,099	6,568	6,089	6,459
2005	6,894	5,456	7,724	7,025	6,788	6,202	6,747

Appendix 3.3 (continued)
Average wage per-hour in the private sector
(2005 Pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	2,782	3,196	3,470	3,276	3,012	2,825	1,984
1985	2,526	3,107	3,330	2,990	2,990	2,474	1,995
1986	2,611	3,115	3,498	3,072	2,849	2,470	1,902
1987	2,531	2,655	3,296	3,211	2,718	2,501	2,008
1988	2,455	2,504	3,251	2,995	2,742	2,518	1,930
1989	2,513	2,658	3,372	3,073	2,689	2,464	1,893
1990	2,509	2,656	3,386	2,974	2,737	2,356	1,872
1991	2,435	2,643	3,508	3,142	2,686	2,368	1,758
1992	2,417	2,689	3,400	3,105	2,717	2,428	1,804
1993	2,571	2,936	3,997	3,641	3,050	2,467	2,086
1994	2,761	3,415	4,146	3,400	3,052	2,673	2,162
1995	2,643	3,004	3,925	3,429	2,923	2,456	2,001
1996	2,811	3,173	3,907	3,048	3,168	2,827	2,372
1997	2,848	3,199	4,876	3,226	3,227	2,799	2,324
1998	2,867	3,324	4,679	3,247	3,247	2,907	2,350
1999	2,716	3,257	4,205	3,469	3,066	3,110	2,372
2000	2,815	3,247	4,290	3,094	3,312	2,853	2,298
2001	2,527	3,089	3,621	3,021	2,996	2,619	2,161
2002	2,456	2,977	3,948	3,145	2,900	2,455	2,354
2003	2,390	2,779	3,436	2,888	3,160	2,599	2,225
2004	2,482	2,820	3,808	3,067	3,187	2,661	2,236
2005	2,661	3,059	3,897	3,146	3,063	2,611	2,255

Appendix 3.4 (continued)
Male average wage per-hour in the public sector
(2005 Pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	5,536	5,297	5,607	5,456	5,139	5,070	5,184
1985	5,440	5,173	5,410	5,050	4,852	4,569	4,950
1986	4,943	5,069	5,740	4,723	4,941	4,718	4,979
1987	4,686	4,572	5,406	4,831	4,768	4,367	5,210
1988	5,134	4,492	5,520	5,008	4,772	4,507	5,015
1989	4,837	4,806	5,654	5,108	4,708	4,918	4,836
1990	4,792	4,645	5,223	4,943	4,748	4,299	4,924
1991	4,738	4,672	5,627	5,050	5,202	4,243	4,764
1992	4,442	4,589	5,346	5,044	4,966	4,395	4,446
1993	5,179	5,267	5,893	6,101	5,304	4,663	5,501
1994	5,568	5,299	7,470	5,648	6,629	5,133	5,550
1995	6,049	5,605	6,037	5,778	4,880	5,008	5,714
1996	6,033	5,576	6,529	5,197	5,663	5,519	6,407
1997	6,433	6,204	7,864	5,244	5,991	5,609	6,188
1998	7,186	6,458	7,448	6,171	6,891	6,412	6,536
1999	6,116	6,607	8,286	6,123	6,298	6,526	6,893
2000	6,489	7,163	6,622	6,049	7,083	7,006	6,986
2001	6,612	6,751	7,201	5,903	6,759	6,507	6,578
2002	6,398	6,631	7,440	5,750	6,625	6,224	7,293
2003	6,863	6,138	7,204	6,098	7,231	5,980	7,335
2004	6,605	5,787	7,078	6,734	6,649	6,225	6,547
2005	6,569	5,662	7,354	6,375	7,048	5,966	7,024

Appendix 3.5 (continued)
Male average wage per-hour in the private sector
(2005 Pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	2,909	3,365	3,619	3,411	3,101	2,749	2,034
1985	2,621	3,250	3,503	2,984	3,160	2,479	2,015
1986	2,754	3,325	3,691	3,161	2,978	2,529	1,891
1987	2,565	2,739	3,429	3,248	2,798	2,511	1,953
1988	2,572	2,604	3,410	3,062	2,823	2,501	1,897
1989	2,564	2,812	3,432	3,180	2,746	2,445	1,892
1990	2,580	2,729	3,581	3,117	2,813	2,346	1,861
1991	2,496	2,712	3,578	3,163	2,765	2,321	1,739
1992	2,553	2,802	3,483	3,243	2,789	2,386	1,800
1993	2,679	3,027	4,336	3,818	3,168	2,439	2,030
1994	2,829	3,589	4,275	3,492	3,116	2,612	2,142
1995	2,730	3,077	4,194	3,605	3,005	2,429	1,962
1996	2,897	3,267	4,085	3,132	3,239	2,842	2,400
1997	2,961	3,347	5,362	3,291	3,317	2,806	2,317
1998	2,941	3,426	4,997	3,382	3,350	2,875	2,261
1999	2,679	3,319	4,309	3,457	3,098	3,102	2,321
2000	2,913	3,275	4,554	3,069	3,236	2,890	2,168
2001	2,523	3,043	3,678	3,064	3,057	2,594	2,042
2002	2,505	2,987	3,702	3,116	2,853	2,401	2,202
2003	2,355	2,780	3,473	2,894	3,161	2,558	2,090
2004	2,488	2,840	3,898	3,026	3,232	2,695	2,109
2005	2,679	3,049	3,939	3,128	3,097	2,532	2,141

Appendix 3.6 (continued)
Female average wage per-hour in the public sector
(2005 Pesos)

Year	City						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	4,619	4,652	5,023	4,823	4,924	4,838	4,515
1985	4,164	4,540	4,783	4,718	4,771	4,421	4,457
1986	4,265	4,239	5,054	4,518	4,646	4,219	4,546
1987	4,434	4,188	5,133	5,059	4,503	4,234	4,203
1988	4,244	3,953	5,043	4,535	4,536	3,914	4,287
1989	4,457	4,052	5,139	4,423	4,441	4,523	4,002
1990	4,247	3,777	4,961	4,389	4,697	4,262	4,252
1991	4,271	3,647	5,164	4,109	4,675	4,172	4,080
1992	4,240	6,073	5,086	4,814	4,616	4,478	4,223
1993	4,696	4,526	5,483	5,716	5,525	4,773	4,541
1994	4,944	5,718	5,996	5,532	5,405	4,671	4,414
1995	5,070	5,113	6,017	5,578	4,828	5,002	4,923
1996	6,048	5,662	6,024	5,115	5,391	5,307	5,146
1997	5,907	5,580	7,485	5,464	5,888	5,584	5,456
1998	6,447	6,130	7,148	6,224	6,344	5,805	5,870
1999	6,545	6,060	7,117	6,580	6,494	5,865	6,087
2000	6,666	7,286	7,075	6,225	6,380	6,597	6,121
2001	7,093	6,553	8,117	7,015	7,388	6,859	6,405
2002	6,659	6,556	8,111	7,321	6,562	6,359	7,203
2003	7,146	6,690	7,528	6,391	6,735	6,091	6,713
2004	6,804	5,729	7,000	7,475	6,487	5,957	6,358
2005	7,237	5,244	8,090	7,839	6,512	6,429	6,421

Appendix 3.7 (continued)
Female average wage per-hour in the private sector
(2005 Pesos)

| Year | City | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	2,540	2,784	3,200	2,985	2,815	3,015	1,852
1985	2,380	2,781	3,026	3,004	2,633	2,462	1,942
1986	2,350	2,628	3,172	2,898	2,570	2,344	1,928
1987	2,472	2,461	3,076	3,140	2,554	2,477	2,134
1988	2,255	2,274	2,994	2,866	2,583	2,563	2,005
1989	2,434	2,353	3,278	2,863	2,582	2,506	1,896
1990	2,390	2,503	3,074	2,712	2,599	2,380	1,896
1991	2,333	2,499	3,408	3,106	2,555	2,465	1,795
1992	2,216	2,456	3,282	2,876	2,594	2,518	1,813
1993	2,415	2,756	3,527	3,350	2,857	2,517	2,186
1994	2,654	3,064	3,967	3,249	2,944	2,798	2,199
1995	2,501	2,869	3,576	3,160	2,790	2,508	2,072
1996	2,685	3,006	3,669	2,916	3,057	2,797	2,329
1997	2,690	2,959	4,258	3,127	3,086	2,785	2,336
1998	2,762	3,159	4,278	3,055	3,099	2,965	2,506
1999	2,763	3,157	4,075	3,485	3,022	3,122	2,463
2000	2,695	3,202	3,963	3,129	3,409	2,800	2,493
2001	2,533	3,160	3,557	2,963	2,926	2,658	2,353
2002	2,393	2,960	4,224	3,184	2,959	2,544	2,590
2003	2,432	2,778	3,394	2,879	3,159	2,661	2,440
2004	2,474	2,788	3,706	3,123	3,132	2,613	2,426
2005	2,639	3,076	3,848	3,170	3,021	2,724	2,423

Appendix 3.8 (continued)
Average wage per-hour by occupational category
(2005 Pesos)

Year	Public sector				Private sector			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	11,994	7,756	4,472	3,153	13,645	7,666	3,361	2,577
1985	11,010	7,067	4,135	3,155	11,203	7,138	3,097	2,461
1986	10,139	7,122	4,281	3,198	11,029	7,174	3,119	2,520
1987	12,263	7,190	4,116	3,048	12,023	6,813	3,008	2,421
1988	11,410	7,221	4,091	2,939	11,740	6,733	2,850	2,342
1989	10,857	7,196	4,014	2,949	11,258	6,749	2,825	2,360
1990	10,145	6,938	3,842	2,857	11,020	6,331	2,807	2,358
1991	10,880	7,073	3,839	2,860	11,382	6,352	2,846	2,369
1992	10,591	7,196	3,790	2,884	11,403	6,541	2,813	2,319
1993	11,091	7,871	4,307	3,106	13,621	8,420	3,008	2,542
1994	12,015	8,511	4,623	3,383	12,540	8,285	3,262	2,657
1995	10,768	7,815	4,295	3,240	11,118	7,582	3,201	2,537
1996	10,805	8,028	4,361	3,377	11,680	7,582	3,074	2,526
1997	10,984	8,477	4,519	3,511	10,368	8,094	3,114	2,544
1998	13,134	8,919	4,863	3,446	12,938	7,905	3,176	2,494
1999	13,259	9,265	4,809	3,386	10,640	7,441	3,154	2,471
2000	13,027	9,284	4,842	3,506	11,403	8,264	3,053	2,298
2001	11,974	9,360	5,242	3,436	9,888	7,031	2,762	2,114
2002	11,229	9,207	5,035	3,488	10,172	6,848	2,902	2,111
2003	11,669	8,761	5,047	3,487	9,600	6,344	2,657	2,054
2004	11,464	8,382	4,909	3,435	9,486	6,999	2,766	2,123
2005	11,627	8,476	5,076	3,627	9,231	6,843	2,770	2,226

Appendix 3.9 (continued)
Average wage per-hour in the public sector by occupational category
(2005 Pesos)

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	12,829	9,111	4,706	3,270	10,316	6,430	4,227	2,818
1985	11,497	8,184	4,373	3,288	9,596	6,049	3,914	2,793
1986	10,623	8,292	4,591	3,282	8,399	6,023	3,978	2,953
1987	12,910	8,199	4,207	3,152	8,204	6,284	4,026	2,747
1988	12,271	8,437	4,385	3,060	8,533	6,105	3,816	2,602
1989	11,365	8,211	4,267	3,117	9,118	6,278	3,797	2,547
1990	10,808	7,822	3,958	3,022	8,718	6,093	3,730	2,474
1991	11,087	8,177	3,955	3,065	10,228	6,065	3,734	2,392
1992	10,537	7,732	3,905	3,055	10,699	6,739	3,699	2,485
1993	11,674	8,942	4,427	3,329	9,218	7,003	4,204	2,579
1994	11,381	10,297	5,323	3,499	13,258	7,029	4,060	3,084
1995	10,973	8,996	4,591	3,332	10,325	6,898	4,090	3,011
1996	11,281	9,063	4,531	3,470	9,560	7,190	4,241	3,151
1997	11,784	9,358	4,948	3,635	9,440	7,816	4,208	3,246
1998	15,071	10,152	4,920	3,472	9,285	7,962	4,826	3,388
1999	15,338	10,380	5,278	3,423	9,589	8,366	4,472	3,300
2000	13,978	10,278	5,197	3,537	10,737	8,574	4,623	3,435
2001	12,678	10,059	5,486	3,416	10,850	8,864	5,090	3,485
2002	10,272	10,122	5,171	3,479	12,522	8,553	4,952	3,510
2003	11,843	9,708	5,489	3,493	11,310	8,076	4,749	3,467
2004	12,760	9,385	5,291	3,422	9,379	7,721	4,662	3,470
2005	12,396	9,248	5,312	3,689	10,211	7,958	4,904	3,423

Appendix 3.10 (continued)
Average wage per-hour in the private sector by occupational category
(2005 Pesos)

Year	Male				Female			
	Managerial	Professional	Office	Other	Managerial	Professional	Office	Other
1984	14,114	8,822	3,419	2,685	11,558	5,990	3,308	2,291
1985	12,429	8,280	3,128	2,559	7,616	5,517	3,070	2,222
1986	11,938	8,723	3,172	2,625	8,075	5,141	3,072	2,256
1987	12,793	8,079	3,028	2,489	9,701	5,356	2,991	2,256
1988	12,971	8,085	2,826	2,430	8,338	5,270	2,870	2,131
1989	12,134	7,771	2,855	2,424	9,159	5,595	2,801	2,214
1990	12,109	7,378	2,806	2,453	8,560	5,105	2,808	2,136
1991	12,341	7,390	2,774	2,405	9,373	5,202	2,900	2,293
1992	12,230	7,460	2,820	2,400	9,750	5,512	2,808	2,149
1993	15,261	10,733	2,933	2,649	11,042	6,028	3,063	2,326
1994	13,725	9,510	3,213	2,765	10,672	6,965	3,299	2,433
1995	12,088	8,995	3,278	2,649	9,771	6,071	3,146	2,315
1996	13,545	8,908	3,123	2,602	9,102	6,210	3,038	2,376
1997	11,474	9,519	3,074	2,676	8,946	6,579	3,145	2,282
1998	14,477	9,223	3,262	2,583	10,870	6,595	3,114	2,322
1999	11,815	8,425	3,170	2,540	9,307	6,539	3,142	2,339
2000	12,192	10,171	3,082	2,334	10,361	6,701	3,033	2,234
2001	11,148	7,755	2,644	2,151	8,301	6,367	2,847	2,049
2002	11,597	7,340	2,635	2,138	8,532	6,416	3,097	2,064
2003	10,887	7,217	2,510	2,070	8,108	5,608	2,768	2,027
2004	10,603	8,080	2,614	2,155	8,040	6,084	2,879	2,070
2005	10,233	7,711	2,617	2,249	8,130	6,041	2,883	2,189

Appendix 3.11 (continued)
Average wage per-hour in the public sector by occupational category
(2005 Pesos)

Year	Managerial						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	5,902	15,214	14,115	11,901	15,382	8,712	10,757
1985	9,805	9,186	14,068	9,816	9,370	6,464	7,421
1986	9,532	15,445	11,299	10,236	8,824	8,485	8,665
1987	9,080	11,099	14,354	12,315	11,351	9,192	8,288
1988	9,875	14,812	11,510	16,724	10,083	10,273	10,826
1989	9,647	14,672	12,202	10,225	7,474	10,173	9,724
1990	9,403	9,184	11,993	11,155	9,504	9,411	7,394
1991	9,435	11,903	12,917	14,212	8,151	9,220	9,449
1992	11,273	7,745	11,995	10,550	11,237	9,165	7,843
1993	7,832	6,891	11,868	11,637	25,170	7,585	8,520
1994	9,205	9,066	18,375	9,433	10,213	10,222	8,067
1995	10,629	15,787	11,880	13,920	8,437	9,893	9,203
1996	11,116	8,209	11,441	9,276	11,061	13,236	9,805
1997	10,362	8,605	14,767	10,704	10,913	12,790	9,569
1998	9,952	18,086	14,610	14,947	12,466	23,144	11,250
1999	9,654	10,278	21,982	13,626	13,153	11,783	11,389
2000	10,823	39,915	15,558	11,502	11,128	27,427	9,789
2001	10,252	13,668	17,641	10,516	10,198	10,624	11,481
2002	9,224	10,165	17,466	14,205	9,214	10,690	10,956
2003	12,414	9,327	17,746	10,034	11,518	10,404	10,823
2004	12,827	8,414	19,105	13,119	12,068	8,309	11,357
2005	9,702	10,559	17,884	11,502	11,839	9,582	10,922

Appendix 3.12 (continued)
Average wage per-hour in the private sector by occupational category
(2005 Pesos)

Year	Managerial						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	9,361	20,427	14,328	14,870	12,597	10,182	7,803
1985	8,709	6,935	12,329	11,003	11,315	9,175	9,272
1986	7,026	20,498	11,973	11,186	10,188	7,830	8,705
1987	10,085	11,702	13,143	15,287	9,171	11,191	6,735
1988	8,707	15,850	11,795	13,199	12,229	13,456	8,054
1989	7,829	10,372	12,925	10,839	10,549	12,787	7,604
1990	10,434	11,147	12,040	10,195	10,666	11,520	6,146
1991	9,259	13,399	13,186	10,894	9,793	14,220	5,268
1992	7,878	13,010	12,857	9,984	11,027	9,668	8,061
1993	6,941	11,986	15,263	17,310	14,073	9,929	8,051
1994	6,778	9,741	18,155	8,733	11,611	11,991	7,607
1995	6,028	10,209	16,134	11,676	8,755	10,583	7,186
1996	7,204	4,426	13,542	11,012	13,797	14,792	8,718
1997	7,868	5,038	14,265	11,488	8,727	14,588	6,773
1998	7,776	6,147	18,917	11,798	11,249	13,921	11,219
1999	6,171	8,029	15,399	10,492	8,816	11,976	8,199
2000	7,076	10,644	15,375	11,241	11,704	8,935	8,565
2001	6,423	8,904	15,094	9,927	8,754	11,391	8,984
2002	7,066	7,918	16,436	10,137	9,795	9,323	8,154
2003	6,297	7,833	13,609	9,323	10,401	9,636	8,084
2004	6,370	6,936	13,808	9,510	9,982	9,721	6,325
2005	6,916	7,080	14,331	10,015	8,702	7,693	6,086

Appendix 3.13 (continued)
Average wage per-hour in the public sector by occupational category
(2005 Pesos)

Year	Professional						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	7,439	7,929	8,077	8,383	7,202	7,157	7,307
1985	6,362	6,673	7,705	7,483	6,820	6,395	6,730
1986	6,315	7,353	7,815	7,465	6,724	6,243	6,696
1987	6,400	6,754	7,846	7,691	6,778	6,584	7,140
1988	6,545	6,125	7,929	7,545	7,104	6,624	6,980
1989	6,561	6,889	8,073	7,514	6,695	6,988	6,482
1990	6,413	6,549	7,766	7,371	6,809	6,272	6,525
1991	6,377	6,400	8,528	7,093	7,112	6,102	6,199
1992	6,333	9,740	7,601	7,333	7,074	6,284	5,904
1993	6,925	7,195	8,708	11,432	7,522	7,371	6,795
1994	7,337	8,013	9,492	9,044	9,248	7,483	6,994
1995	7,996	7,544	8,949	8,267	6,967	7,436	7,109
1996	7,960	7,544	9,495	8,759	7,716	7,773	7,361
1997	8,562	7,570	10,610	8,599	8,650	8,561	7,603
1998	9,730	7,958	10,703	9,525	9,263	8,475	7,834
1999	9,251	8,644	11,368	9,843	9,063	9,003	8,507
2000	8,758	9,426	10,035	9,783	9,517	9,482	8,568
2001	9,720	8,665	10,853	9,389	10,220	9,655	8,124
2002	9,804	8,478	10,470	9,286	9,612	8,978	8,668
2003	8,990	8,206	9,884	9,343	9,301	8,010	8,427
2004	8,705	7,003	9,840	9,499	8,425	8,703	7,406
2005	9,135	6,572	10,042	9,169	8,363	8,542	8,009

Appendix 3.14 (continued)
Average wage per-hour in the private sector by occupational category
(2005 Pesos)

Year	Professional						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	5,505	7,037	8,071	7,586	7,729	7,121	6,601
1985	5,852	6,155	7,588	7,305	7,425	7,133	5,442
1986	5,448	6,820	7,548	6,988	7,898	6,462	4,491
1987	5,316	5,579	7,437	7,446	6,359	6,877	6,104
1988	5,143	4,987	7,775	7,074	6,514	6,288	4,474
1989	5,355	5,362	7,684	6,950	6,602	5,574	5,025
1990	5,489	4,737	7,422	6,511	6,547	5,749	4,681
1991	5,199	4,747	7,711	6,462	6,236	5,810	3,997
1992	5,377	5,143	7,646	6,368	6,708	6,316	4,447
1993	5,780	6,101	11,775	7,717	7,211	7,124	4,449
1994	6,392	7,365	10,266	7,256	7,596	6,666	5,016
1995	6,172	5,721	9,028	8,350	7,252	6,755	4,665
1996	6,668	5,849	9,029	7,004	8,147	7,742	6,438
1997	6,921	6,211	10,756	8,483	8,640	7,218	5,659
1998	7,263	6,454	10,286	7,650	7,808	7,477	5,950
1999	6,231	6,290	8,977	8,156	7,263	7,948	5,548
2000	8,749	6,889	11,136	6,656	8,590	6,583	6,887
2001	6,562	6,480	8,639	6,546	7,673	6,552	5,566
2002	5,435	5,646	9,359	7,320	6,773	6,010	5,870
2003	5,500	5,109	7,751	6,506	7,550	5,423	5,450
2004	5,974	5,007	9,453	7,285	7,673	5,673	5,583
2005	6,171	5,406	8,367	7,304	7,327	6,016	5,861

Appendix 3.15 (continued)
Average wage per-hour in the public sector by occupational category
(2005 Pesos)

Year	Office						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	4,054	4,606	4,719	4,190	4,153	4,599	3,804
1985	3,858	4,508	4,337	3,901	3,913	4,260	3,614
1986	4,103	4,284	4,526	4,274	4,189	3,811	3,934
1987	3,817	3,704	4,440	4,453	3,996	3,804	3,595
1988	4,006	3,819	4,489	4,294	3,814	3,649	3,487
1989	3,749	3,852	4,265	4,347	4,014	3,977	3,370
1990	3,875	3,844	4,044	3,864	3,820	3,641	3,466
1991	3,566	3,863	4,269	3,954	3,740	3,426	3,378
1992	3,424	3,681	4,091	4,003	4,073	3,658	3,180
1993	4,124	4,307	4,376	4,547	4,990	3,976	3,469
1994	4,172	4,483	5,712	4,335	4,410	3,814	3,422
1995	4,089	4,424	4,966	4,533	4,024	4,013	3,193
1996	4,631	5,298	4,448	3,997	4,510	3,815	3,810
1997	4,372	5,233	5,111	4,402	4,745	4,081	3,933
1998	5,015	5,884	4,554	4,615	4,830	4,797	4,433
1999	4,169	5,747	5,056	4,738	4,789	5,046	4,085
2000	4,794	5,637	4,505	4,485	4,852	5,425	4,131
2001	4,994	5,642	5,196	5,428	5,231	5,749	4,383
2002	4,281	4,802	6,656	4,792	4,686	4,980	4,502
2003	5,310	4,413	5,819	4,493	4,839	5,196	4,574
2004	5,024	4,830	5,038	5,199	4,806	4,726	5,003
2005	4,819	4,431	6,307	5,535	4,826	4,555	4,978

Appendix 3.16 (continued)
Average wage per-hour in the private sector by occupational category
(2005 Pesos)

Year	Office						
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	2,898	3,555	3,582	3,275	3,101	2,979	2,393
1985	2,622	3,153	3,402	2,905	3,057	2,638	2,224
1986	2,704	3,087	3,463	3,022	2,958	2,877	2,373
1987	2,541	2,776	3,297	3,184	2,900	2,731	2,445
1988	2,499	2,588	3,083	2,977	2,756	2,959	2,254
1989	2,397	2,764	3,099	2,913	2,722	2,875	2,111
1990	2,430	2,703	3,128	2,743	2,801	2,586	2,117
1991	2,487	2,743	3,269	2,845	2,699	2,559	2,074
1992	2,417	2,708	3,166	2,787	2,753	2,559	2,238
1993	2,613	2,842	3,368	3,183	2,935	2,814	2,246
1994	2,901	3,292	3,702	3,195	3,001	2,878	2,260
1995	2,481	3,013	3,933	3,050	2,984	2,639	2,191
1996	2,648	3,528	3,495	2,913	3,006	2,732	2,290
1997	2,743	3,359	3,844	2,999	3,179	2,765	2,339
1998	2,840	3,682	3,650	2,974	3,161	2,877	2,335
1999	2,637	3,377	3,827	3,119	3,137	2,952	2,457
2000	2,653	3,734	3,425	2,760	2,982	2,973	2,350
2001	2,502	2,947	3,079	2,739	2,734	2,802	2,264
2002	2,495	2,849	3,914	2,896	2,731	2,585	2,326
2003	2,406	2,437	3,181	2,656	2,759	2,628	2,240
2004	2,454	2,591	3,349	2,824	2,869	2,483	2,304
2005	2,496	2,673	3,386	2,795	2,758	2,491	2,207

Appendix 3.17 (continued)
Average wage per-hour in the public sector by occupational category
(2005 Pesos)

Year			Other				
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	3,400	3,415	3,116	3,243	3,173	2,825	2,837
1985	3,344	3,736	3,063	3,279	3,276	2,517	2,657
1986	3,151	3,118	3,416	3,103	3,379	2,629	2,788
1987	2,994	3,378	3,065	3,238	3,010	2,737	2,656
1988	3,134	3,067	2,936	3,078	2,982	2,458	2,675
1989	2,858	3,027	2,942	3,024	3,097	2,825	2,698
1990	2,893	3,017	2,822	2,945	2,936	2,525	2,665
1991	2,928	3,010	2,833	2,831	3,083	2,499	2,523
1992	3,058	2,920	2,904	3,072	2,820	2,534	2,743
1993	3,237	3,274	3,087	3,405	2,921	2,672	3,083
1994	3,529	3,470	3,428	3,528	3,432	3,147	2,885
1995	3,477	3,317	3,314	3,492	3,135	2,746	3,019
1996	3,758	3,627	3,420	3,097	3,434	3,128	3,048
1997	3,532	4,095	4,187	3,405	3,429	3,166	3,019
1998	3,641	3,866	3,478	3,291	3,505	3,086	3,357
1999	3,458	3,374	3,685	3,230	3,494	3,156	3,383
2000	4,147	3,418	3,344	3,327	3,801	3,410	3,222
2001	3,374	3,348	3,233	3,492	3,561	3,668	3,274
2002	3,562	3,290	3,370	3,905	3,668	3,287	3,492
2003	3,606	3,222	3,400	3,735	3,618	3,367	3,527
2004	3,831	3,323	3,067	4,048	3,541	3,112	3,525
2005	3,785	3,202	3,791	3,858	3,961	3,292	3,345

Appendix 3.18 (continued)
Average wage per-hour in the private sector by occupational category
(2005 Pesos)

| Year | Other | | | | | | |
	Bucaramanga	Barranquilla	Bogotá	Cali	Medellín	Manizales	Pasto
1984	2,454	2,705	2,645	2,667	2,589	2,350	1,648
1985	2,132	2,722	2,566	2,442	2,602	1,965	1,671
1986	2,269	2,548	2,779	2,588	2,501	1,994	1,626
1987	2,209	2,264	2,574	2,685	2,434	2,037	1,664
1988	2,120	2,225	2,477	2,476	2,406	2,131	1,594
1989	2,214	2,286	2,539	2,523	2,363	2,055	1,559
1990	2,168	2,311	2,650	2,461	2,333	1,974	1,516
1991	2,168	2,257	2,715	2,607	2,285	1,967	1,513
1992	2,160	2,250	2,522	2,602	2,308	2,007	1,490
1993	2,270	2,369	2,791	2,938	2,545	2,004	1,628
1994	2,399	2,733	2,978	2,857	2,506	2,196	1,663
1995	2,325	2,556	2,899	2,734	2,432	1,937	1,598
1996	2,360	2,588	2,930	2,501	2,573	2,195	1,713
1997	2,322	2,614	3,520	2,455	2,638	2,191	1,752
1998	2,319	2,562	3,078	2,583	2,562	2,297	1,757
1999	2,243	2,593	2,906	2,600	2,457	2,375	1,866
2000	2,054	2,386	2,678	2,342	2,449	2,289	1,669
2001	1,952	2,308	2,286	2,313	2,281	2,016	1,542
2002	2,038	2,307	2,340	2,276	2,186	1,907	1,688
2003	1,923	2,165	2,185	2,193	2,199	1,993	1,618
2004	1,981	2,261	2,290	2,201	2,259	2,074	1,639
2005	2,077	2,362	2,465	2,368	2,330	2,034	1,706