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1976-2012

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# Job Vacancies in Colombia: 1976-2012\*

Andrés Álvarez<sup>1</sup> and Marc Hofstetter<sup>2</sup>

## Abstract

Based on the counting of Help-wanted advertisements in print newspapers, we present national vacancy indexes and vacancy rates for Colombia. These series will allow tackling a myriad of questions related to the functioning of the labor markets in emerging economies, where such datasets were not available until now.

**Keywords:** Vacancies, Help-wanted index, unemployment, Beveridge curve, labor market, Colombia.

**JEL codes:** E24, E32, J63, J64.

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# **Vacantes laborales en Colombia: 1976-2012**

Andrés Álvarez & Marc Hofstetter

## **Resumen**

A partir del conteo de avisos clasificados de empleo en los principales periódicos se construye un índice de vacantes y una tasa de vacantes para Colombia. Este es el primer intento de construir series con representatividad nacional y de tal extensión no sólo en el Colombia sino en general para países en desarrollo. Estas series permitirán abordar una gran cantidad de preguntas relacionadas con el funcionamiento del mercado laboral en economías emergentes.

## 1. Introduction

In Álvarez and Hofstetter (2012, 2013, AH hereafter) we built a 50 year-long monthly vacancies' series for the city of Bogota based on the counting Help-wanted (HW) advertisements in the main newspaper in town, *El Tiempo*. This represented the first effort to build a proxy for vacancies in Colombia. As a matter of fact that constituted a pioneer dataset within Latin America as there are no survey-based vacancies' series in the region and only a few efforts similar (but shorter or less frequent) to those in the aforementioned paper.

We extend the scope of AH to seven main metropolitan areas using the information collected by AH and by the Banco de la República (Arango 2013). With these datasets we build national help wanted indexes and vacancy rates. Moreover, we discuss the correspondence of the vacancy rate to the business cycle in Colombia and report Beveridge curves. While we report some hypotheses that might explain the shifts and patterns that become apparent from this first look at the data, a rigorous analysis examining their plausibility is beyond the scope of the paper. With these datasets and the preliminary look at them we hope to spark new research in the area.

The count of HW advertisements is taken from the print versions of the main newspaper in each city. They come from AH and Arango (2013). The Banco de la República will continue collecting the HW information and making it available for public use. See details in Arango (2013). The monthly series start in 1976, the year when household surveys—and thus reliable labor market information—became available.

The seven cities are those chosen by the DANE—the national statistical agency—to perform the household surveys starting in 1984: Bogota, Medellin, Cali, Barranquilla, Bucaramanga, Pasto and Manizales. Prior to 1984 the surveys are only available for the four main cities (the first four in the list). Population-wise these seven cities account for roughly half of the urban population in Colombia since the mid seventies.

In the next section we describe how the data was collected. In section 3, we build a national HW Index (HWI) and a corresponding national Vacancy Rate (VR). We also propose modified series that take into account the fact that with the rise of online HW webpages, the traditional print versions have lost ground as outlets for the advertisements. Section 4 takes a first look at the resulting series. Finally section 5 concludes.

## 2. The raw data: the HW counting

The HW information was collected in seven cities—Bogota, Medellin, Cali, Barranquilla, Bucaramanga, Pasto and Manizales by counting the HW advertisements published in the main newspaper in each town, corresponding, respectively, to: *El Tiempo*, *El Colombiano*, *El País*, *El Herald*, *Vanguardia Liberal*, *El Diario del Sur* and *La Patria*. The dataset covers the 1976 to 2012 period.

The strategy of following only the leading newspaper in town is identical to the one used in the US for the Conference Board Help wanted index; we also used it in AH. Of course, focusing on one newspaper could be misleading if either there are other very important players in the local markets or if the relative importance of the newspapers suffers large changes over time. We argue that neither of these premises is likely to have a considerable effect on the sample.

As for the first point, there are no historical data on circulation of the newspapers in Colombia. Nevertheless, over the last few years there are survey-based data on the number of readers. Each of the chosen newspapers leads by a wide margin the respective local markets. In Bogota and Cali, where the distance between the leading newspaper and the runner-up is the smallest, the relative ratio of daily readers is above 4. In other cities like Barranquilla and Bucaramanga the ratio is above 15, while in Manizales *La Patria* is the only relevant newspaper. Moreover, as AH showed for Bogota, this gap is even larger if one looks at the relative ratio of advertisements, as the larger carrier tends to concentrate the majority of postings.

Concerning changes in the relative importance of the newspapers over time, we argued in AH that if markets are concentrated (as in Bogota) these changes might be innocuous for the series. In the case of Bogota, *El Espectador* stopped circulating for several years (except for Sunday's edition). Nevertheless, the impact on the advertisements of *El Tiempo* (main newspaper in Bogota) is negligible, as prior to the temporary disappearance of *El Espectador*, the advertisements in *El Tiempo* had a relative importance of 9:1 with respect to *El Espectador*.

As in AH the advertisements are counted in one issue per month. To choose the weekday, we first counted all advertisements within a few weeks over time to find if there are preferred weekdays for job-postings and to check if those preferences changed over time. If a certain day was a clear winner in a newspaper and that day remained the dominant one over time, we counted the advertisements the third time this day showed up each month. In case the chosen day happened to fall on a holyday, we counted the advertisements (of the same weekday) in the previous week. If the carrier did have more than one leading day or the leading day switched over time, we collected the information on the two leading days. The appendix A1 provides further details and reports the raw values of HW announcements in each city.<sup>3</sup> Arango (2013) will report this dataset along with continuous updates and make them publicly available.

### **3. The national Help-wanted Index (HWI) and Vacancy Rate (VR)**

The importance of newspapers as well as the propensity to post HW ads in them might be different across cities. For these reasons adding the rough HW count for the cities to obtain a national count of HW ads would be misleading. Instead, we use an analogous strategy to the one adopted by the Conference Board Help-Wanted Index (e.g., Preston, 1977) in the US. We convert the city

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<sup>3</sup> In Barranquilla our dataset starts in 1978, rather than 1976; in Pasto it starts in 2000. In both cases the reason is that it was not possible to access the complete flow of print issues needed prior to these dates.

specific count of advertisements into city specific *indexes* with a common base year—in our case we set the city indexes equal to 100 in year 2000. Then, these indexes are averaged across cities using the relative weights of their respective labor forces over time. (To obtain the labor force series we had to merge several pieces of information. The assumptions made are reported in Appendix A2). The relative weights are adjusted according to the availability of HW indexes. For example, for the period 1976-1977 the weights are calculated only for the five cities for which HW data is available. Since January 1978 Barranquilla is included and finally the full set of seven cities, including Pasto, is used since January 2000.

As for most of the sample period the official labor market statistics are available on a quarterly basis, in this paper we build quarterly HWIs and VRs.<sup>4</sup> Of course, the HW count is monthly and researchers might want to exploit this higher frequency. The data we publish in the appendix and in Arango (2013) will allow them to do so.

The national quarterly HWI provides information about the evolution of national vacancies without taking into account the labor force growth over time. Thus it should exhibit an upward trend—as the economy and the population grow, so should the number of vacancies. The results are plotted in Figure 1; the dataset can be found in the Appendix 3.

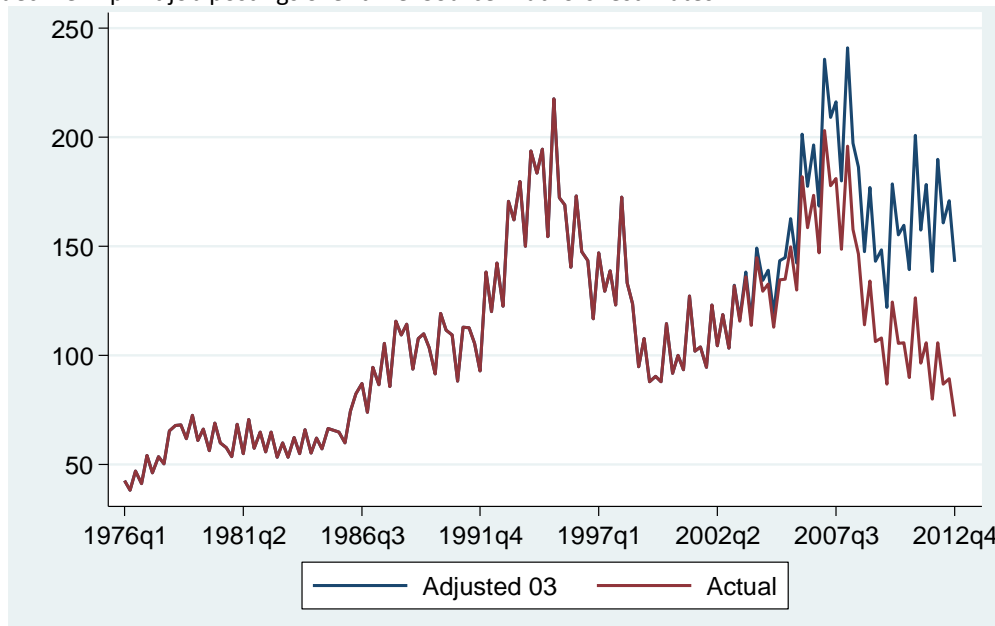
To construct a vacancy *rate*—one that takes into account the labor force growth—we follow the strategy proposed by Zagorsky (1998) for the HWI in the US, that is, we divide the HWI by the total labor force (in millions). Results are depicted in Figure 2: the data is also available in the Appendix 3.

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<sup>4</sup> We estimate the quarterly city-specific index by averaging the monthly series over the three months of respective quarters.

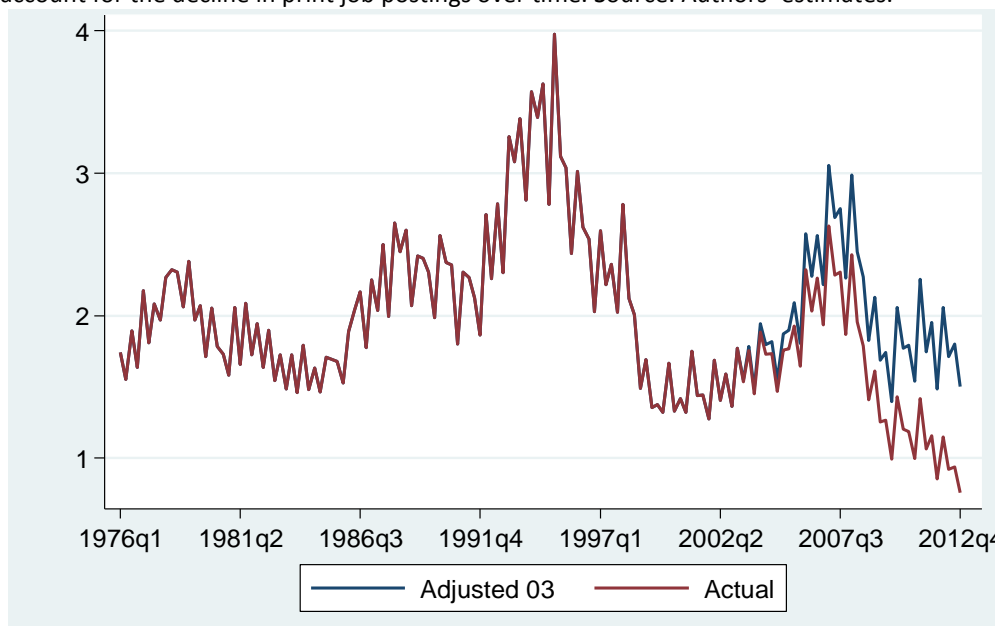
**Figure 1: National quarterly vacancy indexes, 1976-2012.**

Actual: weighted average of city indexes. Adjusted O3: series adjusted to account for the decline in print job postings over time. Source: Authors' estimates.



**Figure 2 National quarterly vacancy rates, 1976-2012.**

Actual: estimated using the weighted average of city indexes. Adjusted O3: series adjusted to account for the decline in print job postings over time. Source: Authors' estimates.



Note that the vacancy rate declines over the last years of the sample. For instance, it reaches the lowest level since the mid seventies after 2010. This appears as an abnormal behavior of the labor demand as this period is characterized by a positive phase of the business cycle (see Alfonso et al. 2013). Rather than reflecting a drop in labor demand, this decline is most likely



explained by the corresponding fall in the use of print newspapers in favor of Internet based HW announcements.

Vacancy series based on the HW count of ads in print newspapers face the challenge of correcting them to deal with the decline of print HW ads in favor of online postings. Facing this same problem in the US, Barnichon (2010) estimated the decline in print ads based on the diffusion of the internet. He used these estimates to adjust the historic series based on the count of HW advertisements in newspapers. In AH we used Barnichon's adjustment to correct the series for Bogota. Nevertheless, we started adjusting the series later than Barnichon given that the internet diffusion in Bogota lagged that of the US.

In AH, focusing in Bogota, we concluded that 2001 was the right year to start the adjustment. This choice was based on two facts. On the one hand, 2001 was the year that El Tiempo, the main newspaper in Colombia and the one used in AH, launched what became the most popular online service for job postings, *www.elempleo.com*. Thus it made sense to start discounting the relative importance of print outlets after that year. Moreover, an algorithm proposed in AH, explained below, confirmed that this year was an appropriate choice.

With the national series the initial hunch suggests that the adjustment should start later given that the internet diffusion in the rest of the country lagged that of Bogota. Nevertheless, setting a starting date based on the history of online platforms is difficult at the national level. Thus we rely on the same algorithm used in AH to check the most appropriate starting date to begin the adjustment. We found that the best initial date for applying Barnichon's adjustment to our national series is 2003, two years later than in AH.

Concerning the algorithm, it is based on the estimation of a simple Beveridge curve, that is, a relationship between unemployment and vacancies. The algorithm picks the adjusting date that minimizes the gap between the predicted and the actual unemployment rate at the end of the sample (2012). In other words, the algorithm generates different adjusted vacancies' series (with

Barnichon's adjustment factors), one for each possible starting year for the adjustment. For each adjusted vacancy series, it predicts unemployment for 2012 using the respective Beveridge curve estimation. Then it chooses the starting date that minimizes the described gap. 2003 is the best year according to this metric.<sup>5</sup>

In Figure 1 reported earlier, the adjusted help wanted index (AHWI) is depicted along with the original one. In Figure 2, the corresponding adjusted vacancy rate (AVR) is also depicted. All series are also reported in Table A3 in the Appendix.

The literature dealing with vacancy rates constructed with HW data has pointed at a number of additional problems that might bias the estimated rates over time. For instance, the relative importance of the chosen newspapers might change over time (a point we already discussed above). Moreover, if the propensity to advertise vacancies in newspapers varies across productive sectors and the relative importance of the latter changes over time, we will observe changes in the estimated vacancy rates even if the true vacancies remain unaltered. As explained in AH the problems caused by sectoral changes over time cannot be addressed in our case because we do not collect information regarding the sectors to which the advertisements belong.

#### **4. A first look at the series**

Do the adjusted series make sense? What do they tell us about the labor market in Colombia? As a first simple inspection, using the dates of recessions reported in Alfonso et al. (2013), we plot the AVR (this time seasonally adjusted) in Figure 3. The AVR peaks around the time the recessions begin; its trough also tends to coincide with the end of the recession. The highest AVR over the 37 years studied was reached in 1995q1, coinciding with the peak of other

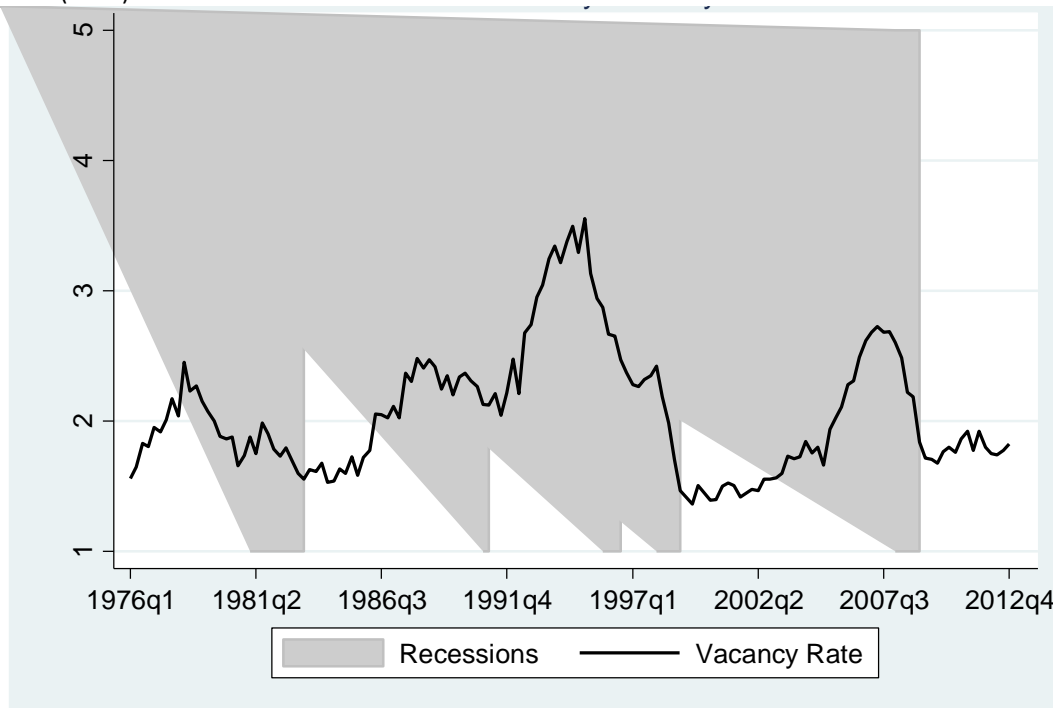
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<sup>5</sup> If one minimizes the gap over the period 2010-2012 rather than only the last year, the algorithm still selects 2003 as the best year to start the adjustment.

macroeconomic variables prior to the 98-99 crisis. For instance, real housing prices peaked during that period before the real estate bubble burst a couple of years later. The lowest AVR figures occur toward the end of the century coinciding with the worst recession of the sample period.

**Figure 3: Quarterly Adjusted Vacancy Rate (AVR) and Recessions.**

The AVR depicted here is seasonally adjusted. Source: author’s estimates. Recession’s source: Alfonso et al. (2013).

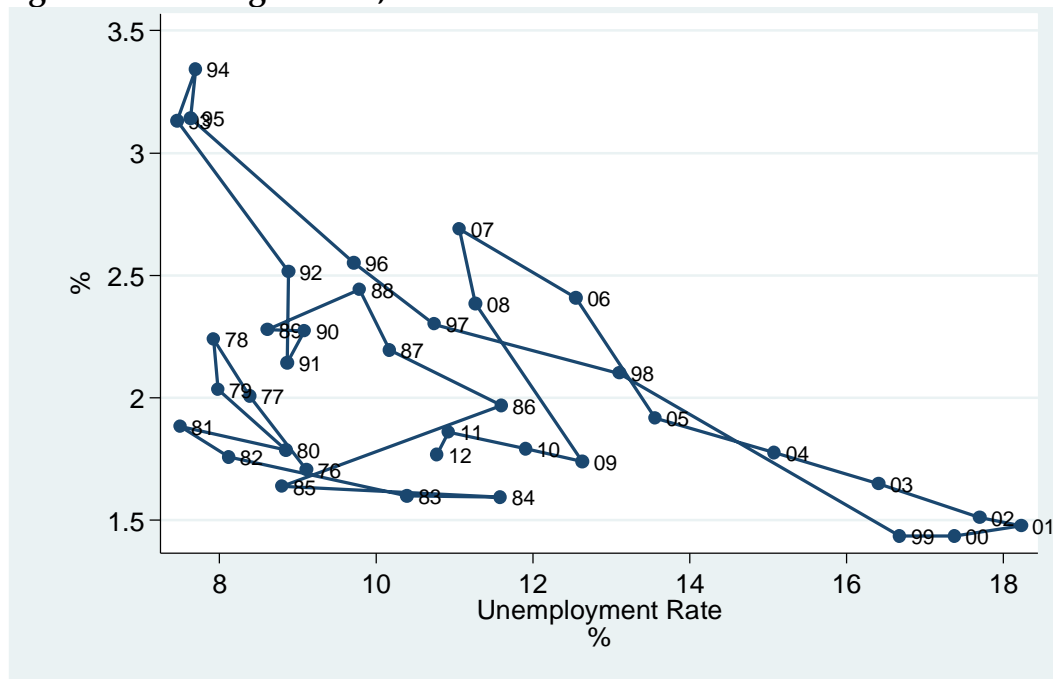


One additional inspection of the series comes from the relationship between vacancies and unemployment—the so-called Beveridge curve—useful to identify structural changes in labor markets. The theory behind Beveridge curves predicts a negative-sloping relationship. During economic downturns vacancies tend to decrease and unemployment to rise. The opposite happens during economic booms. Moreover, the theory also suggests that the relationship could shift due to structural changes. Estimating the slope and the intercept of the relationship and their changes over time helps interpreting the driving forces of the labor market.

In Figure 4 we depict the Beveridge curve for the period 1976-2012, using the official annual rate of unemployment (adjusted *à la* Ball et al. 2012) and the average annual AVR. The expected inverse relationship between

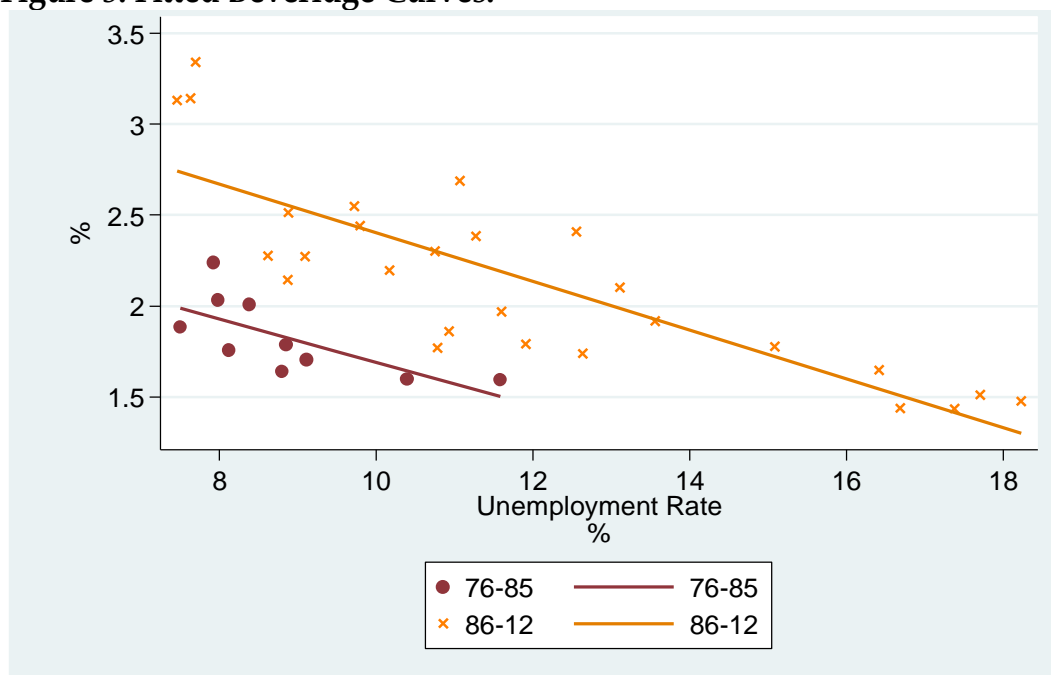
unemployment and vacancies emerges. During bad times the points tend to move down and to the right, that is, to combinations of lower AVRs and higher unemployment rates. See, for instance, how the locus moved in that direction during the 1998-99 crisis and the milder recession of the early 80s associated with the so-called debt crisis.

**Figure 4: Beveridge Curve, 1976-2012.**



The plot suggests that in the mid eighties there is an outward shift in the relationship. In Figure 5, we fit a linear Beveridge relation for the sub-periods 1976-1985 and 1986-2012. The outward movement of the curve is more evident now. Explaining the forces behind this movement is a paramount task for future research. The magnitude of the shift is very large. Note for instance that while 1980 and 2012 exhibited similar vacancy rates, the latter occurred with two percentage points of extra unemployment. The actual horizontal distance between the fitted lines is even larger than that.

**Figure 5. Fitted Beveridge Curves.**



What could explain the outward shift? We speculate on some possible causes and leave a more definitive answer for future research. A Beveridge curve outward movement could be explained by increasing frictions or mismatches in the labor market. Colombia implemented at the end of the 1980s and early 1990s an important set of structural reforms including trade reforms. One possibility to explain part of the shift is that as some sectors shrank and others expanded, the set of demanded labor skills changed increasing the mismatches. This theory would imply a decrease in the job matching efficiency as an explanation for the outward shift in the curve.

A second possibility is related to increases in unemployment caused by increases in the labor force participation rate. These would raise the unemployment rate for the same vacancy rate, shifting the Beveridge curve outwards. Nevertheless, while the labor force has increased over time, the data does not point at a sharp break during the mid 80s. In a similar line, future research should estimate regional Beveridge curves using the city indexes published in the Appendix and study, among others, the importance of the level and the changes in the relative female labor force participation rates to explain shifts and positions of the curves. For instance, Barranquilla's female

labor force participation rates are much lower than in other cities. It also has one of the lowest unemployment rates in the country.

A third reason behind the shift could be related to more churning, that is, increases in the number of firms searching for workers and workers searching for jobs. Again in the midst of the structural reforms undertaken at the time, this is a hypothesis worth checking.

Hobijn and Sahin (2013) study recent Beveridge curve shifts in industrialized countries and conclude that rightward shifts after the Great Recession were apparent in countries where the construction employment saw a disproportionate decline occurring “on the heels of large declines in housing prices”. While Jaramillo (2004) shows that during the 1980s real housing prices in Bogota declined, there does not seem to be any sharp change in the mid 80s suggesting that the shift in Colombia could be explained a la Hobijn and Sahin. The hypothesis though could explain why in the late 90s the curve did not shift back. Indeed, the crisis at the end of the Century included a collapse of the mortgage sector and a sharp decline in real estate prices. The effects were long lasting; by 2013, the relative importance of mortgages as a proportion of the GDP was roughly half of what it was prior to the crisis.

Another possible explanation has to do with the minimum wage legislation. In 1986 there was a sharp increase in the real minimum wage (e.g., Hofstetter, 2006). Whether this increase played a role in explaining the persistent shift in the Beveridge curve remains an open question. The avenue is worth studying given that there is evidence pointing at higher unemployment rates in regions where the minimum wage is more binding (Hofstetter 2012) and given Bernal and Cárdenas’ (2004) findings about the persistence of a high wage elasticity of labor demand.

These hypotheses could be tested and might form a chronological story of how Colombia ended up with the worst natural unemployment rate in the Hemisphere. A more rigorous statistical analysis on the shifts of the Beveridge

curve and its slope is also necessary in order to better identify the chronology and forces behind it. We hope this new data will enhance our understanding of the functioning of Colombia's labor market and trigger new research on the particularities of developing countries' labor demand. Moreover, this research agenda would greatly benefit if other countries in the region put together similar vacancy series.

## **Concluding remarks**

The central bank of Colombia and AH have collected data on help wanted advertisements published in the print versions of the main newspapers in seven cities in Colombia, at a monthly frequency over the period 1976 to 2012. As explained in Arango (2013) it expects to continue doing so and making the flow of data publicly available.

In this paper, using this dataset which we describe carefully, we propose a national help wanted index and a national vacancy rate. These constitute to our knowledge the first series of vacancies in emerging economies covering a long period at a high frequency. The data are useful for the analysis of the labor market and we hope to spark a new research agenda.

Colombia has one of the highest natural unemployment rates in Latin-America. Using the vacancy rate presented in this paper, we show that there is a large outward shift in the Beveridge curve in the mid eighties. Finding the explanations of the shift is a paramount task for future research and could shed more light on the puzzlingly high and persistent unemployment rates.

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## Appendix

### A1: Number of Help-Wanted announcements per city

#### Barranquilla:

Source: the city's local newspaper called "El Heraldo"; number of HW advertisements published the third Friday of each month beginning in January 1978.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1978	53	47	44	54	59	49	54	49	60	54	56	43
1979	56	53	61	37	42	26	62	53	45	53	76	25
1980	58	43	32	27	32	34	26	24	32	39	40	39
1981	52	47	35	32	34	28	32	36	43	47	35	20
1982	41	31	34	32	27	29	30	32	29	36	31	26
1983	43	32	30	28	31	30	35	39	37	31	34	27
1984	49	43	45	42	40	43	41	39	45	44	40	31
1985	43	38	42	44	45	47	46	50	49	52	47	40
1986	22	67	51	44	53	58	51	52	59	58	56	47
1987	67	66	57	68	76	59	61	58	63	71	93	34
1988	73	74	74	81	88	86	78	77	66	93	74	53
1989	76	63	84	66	83	71	63	88	78	81	87	67
1990	102	80	81	84	82	75	86	62	82	100	85	51
1991	101	82	79	77	83	95	81	66	84	99	95	66
1992	132	121	110	105	108	86	97	105	108	121	93	81
1993	128	66	109	115	134	100	156	146	136	170	137	126
1994	151	101	142	138	113	122	162	148	144	133	137	105
1995	192	149	138	89	120	103	136	124	128	119	130	113
1996	138	95	123	140	96	105	140	167	148	115	111	109
1997	180	163	135	122	104	115	125	127	130	136	124	103
1998	159	142	92	113	105	92	127	133	122	143	132	76
1999	89	58	58	71	53	70	63	71	75	78	81	51
2000	83	100	81	54	52	59	49	53	63	72	87	82
2001	126	74	83	86	70	73	82	86	100	82	88	62
2002	112	103	99	98	89	107	88	88	97	98	105	66
2003	91	89	87	93	101	98	101	114	111	123	114	71
2004	98	79	116	92	126	90	85	99	94	88	94	106
2005	118	106	78	77	73	98	83	98	93	82	79	63
2006	90	84	106	120	69	91	80	112	103	100	110	99
2007	157	143	130	126	123	126	112	118	123	110	109	84
2008	137	134	122	133	130	123	105	103	96	108	105	58
2009	89	52	96	114	90	70	94	64	74	72	71	54
2010	75	54	79	73	70	75	76	73	75	75	84	68
2011	104	91	60	50	68	67	77	79	78	64	47	43
2012	78	41	72	65	59	60	58	63	77	72	61	46

**Bogota:**

Source: "El Tiempo", the main national newspaper; number of HW advertisements published the third Friday of each month.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1976	387	434	252	338	387	239	376	391	387	370	365	249
1977	439	472	454	425	294	248	450	553	313	516	428	316
1978	602	527	461	497	569	529	443	565	583	652	534	388
1979	624	630	539	705	600	404	563	398	560	635	501	268
1980	678	641	407	590	419	547	565	331	504	555	474	292
1981	570	562	474	510	600	391	607	687	654	626	550	330
1982	644	638	365	656	406	349	579	670	604	563	550	347
1983	584	559	471	477	488	462	526	539	503	578	553	337
1984	651	554	484	455	464	431	497	493	551	662	562	275
1985	600	515	502	593	441	370	512	511	607	616	568	338
1986	639	628	499	696	694	727	721	686	805	775	725	486
1987	709	742	781	547	794	802	769	1050	874	775	827	504
1988	1089	916	828	876	1009	836	1007	1034	918	952	902	561
1989	1088	942	646	937	996	792	676	934	855	952	806	572
1990	1116	898	879	1035	892	776	872	846	918	850	772	390
1991	1049	842	776	869	885	877	758	817	871	954	804	512
1992	1236	982	926	724	941	1008	1069	1249	1087	1214	993	731
1993	1642	1209	1203	1348	1333	1254	1359	1443	1345	1328	1292	837
1994	1864	1399	1391	1496	1432	1356	1433	1592	1490	1571	1152	805
1995	2102	1616	1435	1586	1492	1290	1095	1341	1309	1352	1120	882
1996	1754	1269	1173	1256	946	1212	1052	1012	1059	963	1060	552
1997	1244	1037	908	1000	934	983	1039	910	970	1019	996	662
1998	1556	1214	1162	987	995	919	938	850	712	674	659	509
1999	1092	653	646	659	570	586	622	590	598	638	684	496
2000	910	690	627	549	584	530	518	690	608	631	645	499
2001	1006	801	716	739	605	570	659	607	637	655	667	415
2002	913	691	673	692	577	578	727	647	709	771	666	423
2003	912	772	663	676	700	605	710	737	767	781	740	467
2004	971	799	701	773	671	625	684	776	720	676	672	515
2005	1043	746	672	831	789	775	902	886	790	867	853	698
2006	1439	1064	910	1066	976	904	988	1062	1095	940	871	778
2007	1362	1102	1018	1192	1024	885	1163	1090	1081	964	1019	578
2008	1589	1069	1012	907	1067	884	957	867	984	904	722	643
2009	1136	858	725	683	694	598	639	736	671	619	533	409
2010	1085	608	683	605	707	626	710	694	715	695	524	496
2011	1175	660	606	554	602	573	639	593	613	581	509	403
2012	844	636	660	605	589	480	594	518	550	445	491	291

## Bucaramanga:

Source: "Vanguardia Liberal", the main local newspaper; number of HW advertisements published the third Sunday of each month.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1976	94	63	55	33	61	61	55	88	89	108	48	36
1977	92	87	57	94	70	35	62	72	82	93	89	40
1978	124	131	102	112	106	99	143	147	149	103	98	61
1979	125	112	84	42	77	79	77	107	79	95	56	47
1980	96	95	92	78	93	65	94	69	93	75	54	36
1981	119	105	98	50	108	73	122	92	109	109	67	57
1982	126	113	107	112	88	56	133	160	115	124	95	58
1983	122	104	71	69	61	95	94	135	125	119	106	57
1984	96	109	96	77	83	81	101	93	115	124	109	69
1985	121	102	106	122	77	68	89	105	133	118	98	64
1986	127	122	135	121	123	116	130	136	160	156	98	51
1987	134	111	110	123	132	122	115	127	139	155	108	93
1988	156	123	144	155	131	96	120	154	132	125	120	77
1989	161	149	92	140	138	144	153	137	78	139	96	90
1990	151	149	134	132	145	132	174	152	140	143	115	81
1991	178	147	137	159	132	149	129	189	171	169	144	107
1992	225	189	196	125	184	185	217	146	250	206	140	132
1993	330	265	270	294	250	233	298	303	294	248	221	165
1994	368	279	272	281	277	240	273	326	292	269	248	168
1995	369	335	286	141	210	188	275	240	319	275	233	154
1996	276	144	183	261	197	204	141	307	260	265	252	162
1997	299	243	186	242	237	230	303	290	301	345	267	147
1998	374	290	302	302	269	183	280	266	146	254	253	132
1999	280	229	177	194	184	194	243	183	104	269	246	133
2000	294	248	247	195	277	216	233	332	308	320	286	96
2001	354	311	283	130	274	310	113	230	192	342	348	259
2002	403	359	312	321	220	313	290	379	367	400	341	262
2003	396	345	322	246	356	325	443	444	387	353	395	214
2004	457	475	435	394	482	353	463	537	485	516	513	269
2005	573	529	366	354	427	488	618	523	578	567	426	366
2006	620	642	601	613	640	653	691	739	699	716	516	435
2007	783	714	774	633	551	531	653	676	658	626	208	420
2008	723	553	472	602	494	424	455	541	495	484	432	205
2009	542	420	354	170	439	333	462	493	174	452	418	203
2010	521	472	412	494	364	403	390	253	147	427	544	310
2011	562	419	620	313	433	533	560	616	632	443	358	222
2012	430	413	434	220	300	278	289	456	423	413	357	336

## Cali:

Source: "El País", the main local newspaper; number of HW advertisements published the third Sunday of each month.<sup>6</sup>

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1976	83	108	121	105	108	96	146	105	147	158	98	68
1977	111	112	130	216	199	148	115	128	136	153	123	66
1978	170	158	137	158	153	131	142	158	146	152	106	207
1979	189	149	145	134	145	109	213	149	161	170	166	88
1980	200	150	148	140	113	160	158	165	97	170	119	61
1981	165	159	141	126	179	122	141	164	152	143	140	52
1982	132	153	102	158	119	109	86	137	129	128	113	57
1983	134	106	80	89	88	106	101	123	145	124	70	71
1984	141	134	120	94	142	128	113	126	161	125	149	51
1985	155	137	124	146	133	141	149	123	170	184	138	79
1986	218	189	106	195	178	202	191	220	240	272	208	131
1987	266	242	203	249	267	228	246	306	279	274	243	143
1988	331	349	281	306	310	269	278	311	359	302	278	167
1989	398	325	192	369	390	376	355	319	348	322	298	91
1990	444	350	370	445	440	367	349	380	431	400	362	137
1991	454	342	232	404	427	443	401	354	410	375	399	192
1992	574	481	466	497	519	498	454	521	547	501	471	291
1993	676	618	602	620	607	549	637	576	661	579	529	381
1994	735	649	659	706	681	658	621	623	741	669	320	434
1995	824	639	630	621	627	554	575	545	595	506	403	159
1996	566	426	441	496	420	421	494	422	443	377	389	235
1997	531	436	258	376	439	425	426	428	452	392	372	265
1998	544	471	465	434	448	349	422	410	366	332	307	163
1999	392	341	277	328	279	276	300	286	301	309	283	194
2000	467	393	369	352	396	338	376	396	391	386	366	124
2001	491	397	389	413	439	396	360	435	441	395	375	194
2002	524	449	301	406	377	340	486	474	474	461	441	220
2003	533	496	489	455	501	460	505	510	536	505	407	272
2004	577	585	525	499	496	435	565	525	497	461	461	320
2005	674	553	320	565	510	546	529	615	569	551	492	347
2006	727	601	556	625	622	578	718	736	771	650	583	216
2007	794	700	681	695	688	547	513	636	620	693	657	404
2008	781	605	591	577	530	480	461	466	442	369	345	244
2009	479	368	354	372	315	516	339	364	354	318	292	170
2010	415	352	324	327	285	252	334	317	286	234	201	148
2011	360	267	262	228	259	245	266	286	224	242	242	153
2012	311	253	241	234	230	230	224	220	219	198	191	76

<sup>6</sup> The number of HW ads was counted for Sundays and Thursdays; the former has usually higher relative importance, therefore we only report the Sunday's HW advertisements.

## Manizales:

Source: "La Patria", the main local newspaper; number of the average HW advertisements published the third Sunday and Monday of each month.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1976	10	6	1,5	3	2	4	3,5	6,5	3,5	8,5	7,5	7
1977	7	14	9	9	9	6	10	7,5	10	12	9	9
1978	22	17,5	5	13,5	19	7	7	12	19	16,5	12,5	9
1979	16	10,5	9,5	5	7	10	12	10	10	11	8	6
1980	7	13	10	13	8	3,5	8	9	12	9	15	5,5
1981	16	10	6	4	6	7	10	2	8	7	9	7
1982	5	4	5,5	12	6,5	13,5	15,5	6,5	6	8	5,5	1
1983	12	11	12	6,5	8	11,5	10	6	10	14	10	8,5
1984	18	11,5	12,5	13	8	12,5	9	9	13	18	12	6
1985	25,5	15	12	13	10,5	11,5	10	11	6	19,5	11	8
1986	19	8	9,5	14	18	10	11	8,5	8	11,5	16	2,5
1987	17,5	17	10,5	7	14,5	17	13	18,5	23	19,5	22,5	11
1988	27,5	13	13	13,5	13,5	16,5	18	15,5	12	9	13,5	9
1989	24	19,5	8	10	8	13	14,5	19	15	15	15	7
1990	24	21	11	12	14	10	13	6	15,5	13	19	9
1991	21	19	11	14	25	12	12	10	18	12	15	9
1992	33	12	13	14	16	22	19	9	16	18	22	11
1993	33	18	22	27,5	23	20,5	32	17	19,5	31	24	25
1994	39	30	36	39	31	22	41	35	25	29	27	38
1995	49	42	38,5	27	33	32	32	38,5	34	22	42	21,5
1996	45	26	33	37	41	25	30	33	27	32	26	23
1997	42	24,5	25	23	22	30	25	21	18	23	35,5	19
1998	37	26	33,5	32	33	24	30,5	29,5	34,5	29,5	23,5	19
1999	39	20	20	20,5	24	25	25,5	22,5	19,5	26,5	29	20
2000	30	27	31	33	34	26,5	29,5	29,5	24,5	38,5	28,5	23
2001	43	24	25	26,5	38,5	28	25,5	25	21,5	28	34	25
2002	35,5	28,5	27,5	30,5	37	28	32	30	27,5	35	30	23,5
2003	48	29,5	32,5	17	40	31	25	30	27	31,5	39	20
2004	40,5	34,5	36,5	41,5	40,5	29,5	31	33,5	30,5	29,5	32	28
2005	61	54,5	35	39	29	49,5	37,5	42	45	45	41	32,5
2006	53,5	36,5	51,5	18	40,5	37	41,5	55,5	35	65	49,5	29,5
2007	65,5	69,5	47,5	47,5	47	47	40,5	43,5	47,5	51,5	53	66
2008	93	52	42	46,5	49,5	47	46,5	35,5	30	31	45	34
2009	53	34,5	45,5	42	39	23	36	26,5	28,5	21	25	26,5
2010	49	36	39	45	42	33,5	27,5	28	30	33,5	29	18,5
2011	39,5	28	32	37	31,5	32	40	48	28,5	44	28,5	27
2012	43,5	37	32	36,5	33,5	32	20	24	27	24	27,5	30

## Medellin:

Source: “El Colombiano”, the main local newspaper; number of HW advertisements published the third Sunday of each month with the exception of March 2010, where we used the second Sunday.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1976	58	86	59	30	83	69	62	85	87	89	81	44
1977	97	94	84	96	89	72	102	109	87	109	82	68
1978	111	114	94	124	130	121	112	115	124	97	102	57
1979	118	126	110	63	106	95	125	123	123	115	79	53
1980	126	114	115	120	104	87	129	97	124	134	110	40
1981	145	133	140	38	94	92	86	105	116	110	109	66
1982	149	112	81	101	97	82	66	97	74	86	90	46
1983	101	91	63	85	85	75	102	107	107	94	86	52
1984	113	100	68	70	93	93	116	73	105	108	82	29
1985	118	107	108	45	77	84	68	96	112	95	82	55
1986	162	126	104	101	122	116	127	112	131	19	100	69
1987	186	187	135	58	155	101	174	116	180	133	130	90
1988	213	197	144	175	128	145	130	160	150	131	110	89
1989	228	128	105	165	135	126	189	150	107	128	130	94
1990	167	181	137	96	182	109	143	134	167	159	122	90
1991	213	161	131	151	154	136	128	127	171	48	116	89
1992	200	158	166	62	197	187	198	161	191	186	145	111
1993	276	228	204	152	225	169	239	242	230	225	177	151
1994	313	173	234	287	253	208	274	254	248	255	250	175
1995	345	290	223	127	215	223	267	223	284	209	197	148
1996	307	233	241	253	222	174	150	208	210	166	172	164
1997	280	194	199	201	133	194	234	191	242	190	209	146
1998	328	277	209	258	269	155	198	200	196	190	136	125
1999	226	171	146	159	164	145	168	190	172	181	157	116
2000	262	194	190	157	227	210	238	209	231	221	177	139
2001	303	230	226	128	259	176	210	228	215	179	188	152
2002	294	211	189	246	200	185	223	256	266	234	195	166
2003	318	314	260	132	329	286	320	315	345	300	267	170
2004	326	335	307	339	317	262	293	286	312	267	237	202
2005	365	98	186	289	275	273	293	333	329	313	280	202
2006	449	379	348	160	399	338	395	398	161	371	328	263
2007	553	406	398	487	373	348	403	422	371	363	355	262
2008	527	372	322	326	334	300	312	283	273	257	207	143
2009	293	225	233	209	201	139	218	207	208	204	185	147
2010	301	236	254	245	242	171	222	229	209	189	193	116
2011	312	233	228	182	267	216	189	220	214	169	178	137
2012	269	105	196	194	205	135	197	190	167	157	166	152

**Pasto:**

Source: "Diario del Sur", the main local newspaper; number of HW advertisements published the third Sunday of each month, starting in 2000.<sup>7</sup>

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2000	15	14	11	9	10	13	10	6	8	15	8	7
2001	10	5	7	3	10	11	10	7	6	10	9	6
2002	24	11	9	8	8	7	10	5	6	2	6	4
2003	7	6	6	2	8	11	11	4	10	5	9	4
2004	13	15	17	14	16	14	13	8	8	15	8	7
2005	28	13	8	14	10	16	18	10	19	5	13	13
2006	18	16	17	13	10	12	9	17	10	13	12	10
2007	21	11	13	12	18	13	10	8	12	12	10	14
2008	21	14	17	10	16	9	15	8	16	13	13	8
2009	17	9	8	7	13	8	5	6	9	4	10	7
2010	8	7	10	12	11	4	6	6	9	6	7	3
2011	14	6	10	3	8	3	7	8	8	4	7	3
2012	10	12	5	11	9	5	5	6	5	5	3	6

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<sup>7</sup> The number of HW ads was counted for Sundays, Fridays and Saturdays; although we collected some monthly data for Fridays and Saturdays before the year 2000, the information was fragmented. Therefore we preferred the series of HW ads reported on Sundays from the year 2000 on, since there are no breaks for the series on this day for the period mentioned.

## A2: Labor force series

To build comparable series of the Labor Force we made some adjustments to the available official datasets. The labor force series starts in 1976, when DANE did the first systematic Household Survey, named *Encuesta Nacional de Hogares* (ENH), since then there have been several methodological breaks:

1. In 1982 the survey, previously developed only for the main cities, expanded to cover also the complete metropolitan areas that included them.
2. Since 1984 all the metropolitan areas started reporting labor force data on a quarterly basis. Previously, the cities of Bucaramanga, Manizales and Pasto were surveyed every six months and Bogotá, Cali, Medellín and Barranquilla reported quarterly data.
3. In 2001 the ENH was replaced by the ECH (*Encuesta Continua de Hogares*/Continuous Household Survey). The main differences between both surveys are that the ECH collected labor market data each month, the ENH instead did it on a quarterly basis. Furthermore, in the ECH the conditions that defined the employed and unemployed changed.<sup>8</sup>
4. In 2006 the GEIH (*Gran Encuesta Integrada de Hogares*) replaced the ECH. Although the definitions of employment and unemployment remained unchanged, some of the labor force questions were reformulated. Also, the implementation of the GEIH caused a break in the series, which was later dealt by an expert's commission who redefined, among other things, new expansion factors related with demographical changes and representativeness.

The sources for the data used for the construction of our vacancy index and rate are the following:

**Source 1** (1976-1990): “20 Años de la Encuesta de Hogares en Colombia, 1970-1990”<sup>9</sup>. Reported data for cities (since 1976) and for metropolitan areas (since 1982). *Expansion Factor* based on the adjusted population projections from the 1985 national census.

**Source 2** (1984-2000) Stage 43-110 of the ENH developed by DANE. *Expansion Factors* based on the population projections from the 1993 national census.

**Source 3** (2000): DANE's ECH. *Expansion Factors* based on the population projections from the 1993 national census.

**Source 4:** (2001-2013) DANE's labor force data report based on the ECH and the GEIH's surveys<sup>10</sup>.

### The Adjustments:

Since the labor force series before 1982 did not consider the complete metropolitan areas, but reported only cities' data, we build an adjustment factor ( $Af_1$ ) that created metropolitan area labor force series since 1976. Using 32 quarters (1982q1-1989q1)

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<sup>8</sup> The number of hours worked for being considered an Unpaid Family Worker was lowered; also the concept of willingness to accept immediately a job offer was incorporated in the unemployment definition.

<sup>9</sup> *20 Años de la Encuesta de Hogares en Colombia, 1970-1990*. República de Colombia, Departamento Administrativo Nacional de Estadística, 1991.

<sup>10</sup> [http://www.dane.gov.co/files/investigaciones/boletines/ech/ech/anexo\\_ech\\_jul13.xls](http://www.dane.gov.co/files/investigaciones/boletines/ech/ech/anexo_ech_jul13.xls)



where data at the city and the metropolitan areas were reported separately, we construct the following adjustment factor:

$$Af_1 = 1 + \frac{\sum_{t=1982q1}^{1989q4} \frac{LFI_{met\ t} - LFI_{city\ t}}{LFI_{city\ t}}}{32}$$

Where *LFI* stands for the Labor Force indicator being considered, *met* denotes the metropolitan area series and *city* the city series. This adjustment factor was used to transform the data from 1976 to 1982.

For the cities in which data was reported biannually during 1976-1984 in the ENH, the following adjustment was developed for constructing series with quarterly frequencies:

$$LFI_{it\ sample1} = \frac{LFI_{it-1} + LFI_{it+1}}{2}$$

Where *LFI* is the Labor Force indicator being considered, *i* is the metropolitan area considered and *t* is the quarter for which data was not reported.

To splice the resulting series from **source 2**, we built a second Adjustment Factor ( $Af_2$ ) for each metropolitan area using the six years of overlap between both series, therefore:

$$Af_2 = 1 + \frac{\sum_{t=1984q1}^{1989q4} \frac{LFI_{it\ sample2} - LFI_{it\ sample1}}{LFI_{sample1}}}{24}$$

This adjustment factor was used for transforming the data between 1976 and 1983.

In order to correct the break between the resulting series and the one taken from the ECH, we build another Adjustment Factor. We used the same strategy as above, although the only year in which the series overlapped was the 2000. The resulting series do not show a break related to the fourth series aforementioned.

The unemployment rate is affected by the same breaks as the Labor Force series; therefore we use a similar methodology for adjusting the series for each city, as the one presented above, which is in line with the adjustment method presented in Ball, Hofstetter and De Roux (2011).

**A3: Table A3.1** Vacancy Index per City, National Help Wanted Index (HWI), National Vacancy Rate in % (VR), Unemployment Rate in % (U), Adjusted national HWI (AHWI), Adjusted national VR in % (AVR).

	Barr.	Bogo.	Buca.	Cali	Mani.	Mede.	Pasto	HWI	VR	U	AHWI	AVR
1976q1		57.37	27.79	28.66	20.35	33.08		42.50	1.74	9.89		
1976q2		51.54	20.31	28.39	10.47	29.65		38.04	1.55	9.02		
1976q3		61.70	30.41	36.56	15.70	38.13		46.93	1.90	9.21		
1976q4		52.61	25.16	29.77	26.74	34.87		41.01	1.64	8.31		
1977q1		72.98	30.93	32.43	34.88	44.81		54.01	2.17	9.02		
1977q2		51.70	26.08	51.72	27.91	41.87		46.00	1.81	8.97		
1977q3		70.36	28.31	34.82	31.98	48.55		53.57	2.08	8.37		
1977q4		67.37	29.10	31.42	34.88	42.20		50.23	1.97	7.18		
1978q1	68.98	85.02	46.79	42.72	51.74	51.98		65.38	2.27	8.59		
1978q2	77.60	85.28	41.55	40.61	45.93	61.10		67.65	2.32	8.16		
1978q3	78.08	85.07	57.54	40.97	44.19	57.19		68.04	2.30	7.33		
1978q4	73.29	84.16	34.34	42.72	44.19	41.71		61.79	2.06	7.62		
1979q1	81.44	95.87	42.07	44.37	41.86	57.68		72.56	2.38	8.36		
1979q2	50.30	91.38	25.95	35.65	25.58	43.01		60.79	1.97	7.78		
1979q3	76.65	81.33	34.47	48.05	37.21	60.45		66.23	2.07	7.83		
1979q4	73.77	75.07	25.95	38.95	29.07	40.24		56.27	1.71	7.95		
1980q1	63.71	92.29	37.09	45.75	34.88	57.84		68.93	2.05	9.56		
1980q2	44.55	83.20	30.93	37.94	28.49	50.67		59.71	1.78	9.20		
1980q3	39.28	74.86	33.55	38.59	33.72	57.03		57.56	1.73	8.25		
1980q4	56.53	70.63	21.63	32.15	34.30	46.27		53.36	1.58	8.36		
1981q1	64.19	85.87	42.20	42.72	37.21	68.11		68.25	2.06	8.54		
1981q2	45.03	80.26	30.28	39.23	19.77	36.50		54.87	1.66	7.88		
1981q3	53.17	104.16	42.33	41.98	23.26	50.02		70.40	2.09	7.30		
1981q4	48.86	80.52	30.54	30.78	26.74	46.44		57.24	1.73	6.28		
1982q1	50.78	88.06	45.35	35.55	16.86	55.72		64.65	1.94	8.26		
1982q2	42.16	75.44	33.55	35.46	37.21	45.62		55.72	1.64	7.91		
1982q3	43.59	99.08	53.47	32.34	32.56	38.62		64.84	1.90	8.30		
1982q4	44.55	78.06	36.30	27.38	16.86	36.17		53.31	1.55	8.00		
1983q1	50.30	86.30	38.93	29.40	40.70	41.55		59.81	1.72	9.67		
1983q2	42.63	76.30	29.49	26.00	30.23	39.92		53.10	1.48	10.88		
1983q3	53.17	83.84	46.40	33.90	30.23	51.49		62.22	1.73	9.96		
1983q4	44.07	78.49	36.96	24.35	37.79	37.80		54.75	1.46	11.07		
1984q1	65.63	90.31	39.45	36.29	48.84	45.78		65.84	1.79	11.84		
1984q2	59.88	72.18	31.59	33.44	38.95	41.71		55.11	1.48	11.76		
1984q3	59.88	82.40	40.50	36.75	36.05	47.90		61.95	1.63	11.40		
1984q4	55.09	80.15	39.58	29.86	41.86	35.68		57.18	1.47	11.34		
1985q1	58.92	86.46	43.12	38.22	61.05	54.26		66.39	1.71	12.21		
1985q2	65.15	75.07	34.99	38.59	40.70	33.56						

	<b>Barr.</b>	<b>Bogo.</b>	<b>Buca.</b>	<b>Cali.</b>	<b>Mani.</b>	<b>Mede.</b>	<b>Pasto</b>	<b>HWI</b>	<b>VR</b>	<b>U</b>	<b>AHWI</b>	<b>AVR</b>
<b>1985q3</b>	69.46	87.15	42.86	40.61	31.40	44.97		64.72	1.68	11.98		
<b>1985q4</b>	66.59	81.38	36.70	36.84	44.77	37.80		59.92	1.53	10.99		
<b>1986q1</b>	67.07	94.43	50.33	47.13	42.44	63.87		74.41	1.89	11.98		
<b>1986q2</b>	74.25	113.19	47.18	52.82	48.84	55.23		82.49	2.04	12.65		
<b>1986q3</b>	77.60	118.27	55.83	59.81	31.98	60.29		86.92	2.17	11.22		
<b>1986q4</b>	77.13	106.19	39.97	56.13	34.88	30.63		73.86	1.78	10.53		
<b>1987q1</b>	91.02	119.34	46.53	65.32	52.33	82.77		94.38	2.25	11.59		
<b>1987q2</b>	97.25	114.58	49.41	68.35	44.77	51.16		86.62	2.04	10.52		
<b>1987q3</b>	87.19	143.99	49.93	76.34	63.37	76.58		105.44	2.50	9.68		
<b>1987q4</b>	94.85	112.61	46.66	60.63	61.63	57.52		85.55	1.99	8.88		
<b>1988q1</b>	105.87	151.48	55.44	88.29	62.21	90.26		115.68	2.65	11.03		
<b>1988q2</b>	122.16	145.49	50.07	81.30	50.58	72.99		109.22	2.45	10.32		
<b>1988q3</b>	105.87	158.21	53.21	87.09	52.91	71.69		114.23	2.60	8.81		
<b>1988q4</b>	105.39	129.13	42.20	68.63	36.63	53.77		93.60	2.07	8.98		
<b>1989q1</b>	106.83	143.08	52.69	84.06	59.88	75.11		107.72	2.42	9.50		
<b>1989q2</b>	105.39	145.70	55.31	104.27	36.05	69.41		109.84	2.40	8.98		
<b>1989q3</b>	109.70	131.80	48.23	93.89	56.40	72.67		103.49	2.31	7.84		
<b>1989q4</b>	112.57	124.58	42.60	65.32	43.02	57.35		91.45	1.98	8.13		
<b>1990q1</b>	125.99	154.69	56.88	106.94	65.12	79.02		119.24	2.56	8.79		
<b>1990q2</b>	115.45	144.53	53.60	115.02	41.86	63.05		111.52	2.37	9.47		
<b>1990q3</b>	110.18	140.94	61.07	106.57	29.07	72.34		109.43	2.35	8.89		
<b>1990q4</b>	113.05	107.58	44.43	82.59	36.05	60.45		88.12	1.80	9.19		
<b>1991q1</b>	125.51	142.60	60.55	94.44	59.30	82.28		113.01	2.31	9.32		
<b>1991q2</b>	122.16	140.68	57.67	117.04	59.30	71.85		112.66	2.27	9.37		
<b>1991q3</b>	110.66	130.78	64.09	107.03	46.51	69.41		105.43	2.13	8.54		
<b>1991q4</b>	124.55	121.37	55.05	88.75	41.86	41.22		92.92	1.87	8.24		
<b>1992q1</b>	173.89	168.11	79.95	139.73	67.44	85.38		138.17	2.71	9.42		
<b>1992q2</b>	143.23	142.92	64.74	139.09	60.47	72.67		120.02	2.26	9.61		
<b>1992q3</b>	148.50	182.06	80.34	139.83	51.16	89.61		142.17	2.79	7.95		
<b>1992q4</b>	141.32	157.09	62.65	116.03	59.30	72.02		122.54	2.30	8.53		
<b>1993q1</b>	145.15	216.76	113.37	174.18	84.88	115.36		170.73	3.26	8.41		
<b>1993q2</b>	167.19	210.40	101.83	163.16	82.56	88.96		162.23	3.08	7.89		
<b>1993q3</b>	209.82	221.74	117.30	172.16	79.65	115.85		179.84	3.38	6.73		
<b>1993q4</b>	207.43	184.84	83.09	136.79	93.02	90.10		150.02	2.81	6.81		
<b>1994q1</b>	188.74	248.84	120.45	187.69	122.09	117.31		193.78	3.57	8.83		
<b>1994q2</b>	178.68	229.06	104.59	187.87	106.98	121.87		183.49	3.39	8.56		
<b>1994q3</b>	217.49	241.41	116.78	182.36	117.44	126.44		194.44	3.63	6.51		
<b>1994q4</b>	179.64	188.64	89.78	130.73	109.30	110.79		154.30	2.78	6.88		
<b>1995q1</b>	229.46	275.52	129.75	192.28	150.58	139.80		217.60	3.98	6.96		
<b>1995q2</b>	149.46	233.55	70.64	165.55	106.98	92.06		172.37	3.12	7.79		
<b>1995q3</b>	185.87	200.24	109.31	157.56	121.51	126.11		169.09	3.04	7.52		
<b>1995q4</b>	173.41	179.33	86.76	98.12	99.42	90.26		140.47	2.44	8.25		

	<b>Barr.</b>	<b>Bogo.</b>	<b>Buca.</b>	<b>Cali.</b>	<b>Mani.</b>	<b>Mede.</b>	<b>Pasto</b>	<b>HWI</b>	<b>VR</b>	<b>U</b>	<b>AHWI</b>	<b>AVR</b>
<b>1996q1</b>	170.54	224.36	79.03	131.65	120.93	127.25		173.09	3.01	8.83		
<b>1996q2</b>	163.35	182.54	86.76	122.83	119.77	105.74		147.45	2.62	9.96		
<b>1996q3</b>	217.96	166.98	92.79	124.85	104.65	92.55		143.46	2.54	10.29		
<b>1996q4</b>	160.48	137.68	88.99	91.96	94.19	81.79		116.83	2.03	9.78		
<b>1997q1</b>	228.98	170.51	95.41	110.70	106.40	109.65		146.98	2.60	10.67		
<b>1997q2</b>	163.35	155.97	92.92	113.92	87.21	86.03		129.39	2.22	11.52		
<b>1997q3</b>	182.99	156.08	117.17	119.98	74.42	108.68		138.73	2.36	10.44		
<b>1997q4</b>	173.89	143.14	99.48	94.53	90.12	88.80		122.99	2.03	10.34		
<b>1998q1</b>	188.26	210.24	126.61	135.97	112.79	132.63		172.58	2.78	12.42		
<b>1998q2</b>	148.50	155.11	98.82	113.09	87.21	111.12		133.34	2.12	13.68		
<b>1998q3</b>	182.99	133.67	90.69	110.06	119.19	96.78		123.58	2.01	12.89		
<b>1998q4</b>	168.14	98.49	83.75	73.68	73.26	73.48		94.67	1.49	13.42		
<b>1999q1</b>	98.20	127.84	89.91	92.79	76.74	88.47		107.74	1.69	16.84		
<b>1999q2</b>	92.93	97.05	74.97	81.12	74.42	76.25		87.85	1.35	17.13		
<b>1999q3</b>	100.12	96.78	69.46	81.49	82.56	86.35		90.27	1.38	17.27		
<b>1999q4</b>	100.60	97.21	84.93	72.21	86.05	73.97		87.90	1.32	15.48		
<b>2000q1</b>	126.47	119.07	103.41	112.91	93.02	105.25	126.98	114.64	1.67	17.49		
<b>2000q2</b>	79.04	88.92	90.17	99.77	97.67	96.78	101.59	91.78	1.33	17.58		
<b>2000q3</b>	79.04	97.10	114.42	106.84	94.19	110.47	76.19	100.03	1.42	17.66		
<b>2000q4</b>	115.45	94.91	92.01	80.48	115.12	87.49	95.24	93.40	1.32	16.78		
<b>2001q1</b>	135.57	134.90	124.25	117.32	106.98	123.67	69.84	127.25	1.75	20.14		
<b>2001q2</b>	109.70	102.34	93.58	114.65	109.88	91.73	76.19	101.86	1.44	18.18		
<b>2001q3</b>	128.38	101.75	70.12	113.55	92.44	106.40	73.02	103.92	1.44	17.83		
<b>2001q4</b>	111.14	92.88	124.38	88.56	112.79	84.56	79.37	94.58	1.28	16.76		
<b>2002q1</b>	150.42	121.75	140.76	117.04	101.16	113.08	139.68	123.17	1.69	19.15		
<b>2002q2</b>	140.84	98.76	111.93	103.17	102.33	102.81	73.02	104.42	1.41	17.79		
<b>2002q3</b>	130.78	111.38	135.78	131.74	108.14	121.38	66.67	118.73	1.59	18.13		
<b>2002q4</b>	128.86	99.45	131.45	103.08	111.63	96.95	38.10	103.25	1.36	15.74		
<b>2003q1</b>	127.90	125.49	139.32	139.46	148.84	145.34	60.32	131.77	1.77	17.45	132.05	1.77
<b>2003q2</b>	139.88	105.92	121.49	130.09	98.84	121.71	66.67	115.63	1.53	16.79	116.65	1.55
<b>2003q3</b>	156.17	118.38	166.97	142.49	116.28	159.67	79.37	135.90	1.76	16.94	138.05	1.78
<b>2003q4</b>	147.54	106.30	126.08	108.77	120.93	120.08	57.14	113.67	1.45	14.46	116.29	1.49
<b>2004q1</b>	140.36	132.12	179.16	154.98	143.60	157.72	142.86	144.88	1.89	17.01	149.32	1.94
<b>2004q2</b>	147.54	110.63	161.07	131.37	139.53	149.57	139.68	129.33	1.73	15.39	134.33	1.80
<b>2004q3</b>	133.17	116.56	194.63	145.80	120.93	145.17	92.06	132.77	1.74	14.55	139.01	1.82
<b>2004q4</b>	137.96	99.61	170.12	114.10	111.05	115.03	95.24	113.02	1.47	13.36	119.32	1.55
<b>2005q1</b>	144.67	131.59	192.40	142.12	175.00	105.74	155.56	134.64	1.76	15.45	143.39	1.87
<b>2005q2</b>	118.80	128.06	166.32	148.92	136.63	136.37	126.98	134.78	1.77	13.77	144.85	1.90
<b>2005q3</b>	131.26	137.84	225.29	157.37	144.77	155.60	149.21	149.85	1.93	13.38	162.59	2.09
<b>2005q4</b>	107.31	129.29	178.11	127.70	137.79	129.53	98.41	129.85	1.65	11.62	142.31	1.80
<b>2006q1</b>	134.13	182.49	244.17	173.08	164.53	191.61	161.90	181.77	2.32	13.62	201.31	2.57
<b>2006q2</b>	134.13	157.52	249.80	167.66	111.05	146.15	111.11	158.51	2.03	12.48	177.48	2.28

	<b>Barr.</b>	<b>Bogo.</b>	<b>Buca.</b>	<b>Cali</b>	<b>Mani.</b>	<b>Mede.</b>	<b>Pasto</b>	<b>HWI</b>	<b>VR</b>	<b>U</b>	<b>AHWI</b>	<b>AVR</b>
<b>2006q3</b>	141.32	168.16	279.03	204.41	153.49	155.44	114.29	173.46	2.26	12.30	196.48	2.56
<b>2006q4</b>	148.02	138.43	218.48	133.12	167.44	156.74	111.11	146.96	1.94	11.79	168.50	2.22
<b>2007q1</b>	205.99	186.18	297.64	199.82	212.21	221.10	142.86	203.13	2.63	12.76	235.88	3.06
<b>2007q2</b>	179.64	165.81	224.77	177.31	164.53	196.82	136.51	177.73	2.28	11.20	209.17	2.69
<b>2007q3</b>	169.10	178.26	260.42	162.52	152.91	194.87	95.24	181.17	2.31	10.83	216.24	2.75
<b>2007q4</b>	145.15	136.93	164.35	161.14	198.26	159.67	114.29	148.56	1.87	9.46	179.95	2.26
<b>2008q1</b>	188.26	196.23	229.10	181.63	217.44	198.94	165.08	195.84	2.43	11.93	240.93	2.99
<b>2008q2</b>	184.91	152.81	199.21	145.80	166.28	156.42	111.11	157.79	1.96	11.35	197.31	2.45
<b>2008q3</b>	145.63	150.14	195.41	125.77	130.23	141.43	123.81	146.40	1.79	11.30	186.23	2.27
<b>2008q4</b>	129.82	121.32	146.92	88.01	127.91	98.90	107.94	114.00	1.41	10.48	147.65	1.83
<b>2009q1</b>	113.53	145.38	172.48	110.34	154.65	122.36	107.94	134.04	1.61	13.77	176.91	2.13
<b>2009q2</b>	131.26	105.60	123.46	110.52	120.93	89.45	88.89	106.38	1.25	12.41	143.21	1.69
<b>2009q3</b>	111.14	109.40	147.97	97.11	105.81	103.14	63.49	107.92	1.27	12.54	148.32	1.74
<b>2009q4</b>	94.37	83.46	140.63	71.66	84.30	87.33	66.67	86.85	0.99	11.81	121.99	1.40
<b>2010q1</b>	99.64	127.04	184.14	100.23	144.19	128.88	79.37	124.38	1.43	13.20	178.72	2.06
<b>2010q2</b>	104.43	103.62	165.27	79.38	140.12	107.21	85.71	105.59	1.21	12.25	155.37	1.77
<b>2010q3</b>	107.31	113.30	103.54	86.08	99.42	107.54	66.67	105.85	1.19	11.78	159.67	1.79
<b>2010q4</b>	108.74	91.70	167.89	53.56	94.19	81.14	50.79	89.92	1.00	10.41	139.20	1.54
<b>2011q1</b>	122.16	130.52	209.83	81.67	115.70	125.95	95.24	126.33	1.42	12.72	200.93	2.26
<b>2011q2</b>	88.62	92.45	167.63	67.25	116.86	108.35	44.44	96.28	1.07	10.98	157.51	1.74
<b>2011q3</b>	112.10	98.65	236.96	71.29	135.47	101.51	73.02	105.87	1.16	10.10	178.38	1.95
<b>2011q4</b>	73.77	79.83	134.08	58.52	115.70	78.86	44.44	79.79	0.86	9.89	138.59	1.49
<b>2012q1</b>	91.50	114.42	167.37	73.95	130.81	92.87	85.71	105.84	1.15	11.75	189.78	2.06
<b>2012q2</b>	88.14	89.51	104.59	63.76	118.60	87.01	79.37	86.77	0.92	11.12	160.79	1.71
<b>2012q3</b>	94.85	88.87	153.08	60.91	82.56	90.26	50.79	89.13	0.94	10.56	170.90	1.80
<b>2012q4</b>	85.75	65.61	144.95	42.72	94.77	77.39	44.44	71.95	0.76	9.67	142.92	1.50