Foreign Born Physicians and Healthcare Outcomes in Rural Communities

Marcelo Castillo and Siraj Bawa[1]

US Department of Agriculture

Economic Research Service

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Abstract: Using administrative data on all approved H-1B visas during 2000-2010, we study the efficacy of a set of government programs incentivizing foreign-born physicians to practice in rural areas. We show evidence that changes in national immigration policy had noticeable effects on the number of foreign physicians practicing medicine in rural communities in the US.

[1] Siraj G. Bawa and Marcelo Castillo are economists with the Economic Research Service of the U.S. Department of Agriculture. The views expressed here are the authors' and do not necessarily represent those of the Economic Research Service or the U.S. Department of Agriculture.

1. Introduction

The persistent shortage of physicians, especially primary care doctors, in rural areas is a latent problem that is expected to worsen over the next years. [2][3] The shortage may worsen because a large share of physicians are reaching the age of retirement, and also because the increase in insured people that followed the Affordable Care Act passage. In response to the shortage, the government has enacted several initiatives to incentivize physicians to train and practice medicine in rural areas. A set of such initiatives specifically targets foreign-born physicians undergoing residency training in the US. We analyze the impact that these programs had on the location decisions of foreign physicians; moreover, we provide evidence that various changes in immigration policy during the 2000 to 2010 period had a substantial effect on the number of foreign physicians practicing in rural America.

While in residency, most foreign physicians in the US hold a J-1 visa. Once they complete their program, J-1 residents must return to their home countries for at least two years before they are eligible to request a work or an immigrant visa in the US. This two-year physical presence requirement can be waived at the request of an interested government agency, under the condition that the J-1 resident commits to practicing for a three-year period in a medically understaffed area. Using novel microdata on foreign physicians on H-1B visas -- an employment-based visa used by J-1 residents to transition to their first job after residency—we document that most J-1 residents transitioning into H-1B status received an

[2] We refer to rural areas are those classified as nonmetro areas by the Office of Management and Budget in 2003. Throughout the paper, we use the terms rural and nonmetro interchangeably.
[3] Primary care areas include internal medicine, general/family medicine, and pediatrics.

IGA waiver, and rural areas hosted 35 percent of these waivers. [4] The geographical restrictions attached to IGA waivers have resulted in rural areas hiring a disproportionately large number of foreign physicians relative to the US population. For example, in the year 2000, over 30 percent of all newly hired H-1B physicians were employed in nonmetro areas while the share of the population living in these areas was around half of that number.

What are the labor market impacts of the inflow of foreign physicians into rural communities? The answer to this question is challenging empirically because variation in the hiring of foreign physicians across rural areas may be caused by differences in their current economic environment. A shock to productivity in a rural area, for example, may increase demand for all labor inputs and thus physician hiring may be endogenous to the employment of domestic workers. In this paper, we take a first step to answering this question by developing two instrumental variables to help us with identification. Our instruments combine differences across rural areas in their initial exposure to foreign physicians with changes in the nationwide supply of foreign physicians which are arguably exogenous to labor demand conditions in any given rural area. In future work, we use our instruments to estimate the impacts of foreign doctors on rural labor market outcomes. Our analysis employs data on all approved H-1B visas during 2000-2010. These data are obtained under a Freedom of Information Act Request from the US Citizenship and Immigration Service (USCIS).

The first instrument builds on the empirical methodology of Kerr and Lincoln (2010) who study the effect of H-1B workers on the rate of patenting and employment. The idea is to

[4] To our knowledge, we are the first to document these patterns in H-1B employment and J-1 waiver usage in rural communities.

leverage exogenous changes in the national availability of H-1B visas induced by changes in immigration policy to identify employment effects. For the 2004 fiscal year, the H-1B cap was lowered from to 195,000 visas per year to 65,000, where it has remained since. The decrease in the cap reduced rural employment of H-1B physicians that receive a non-IGA waiver. Though most foreign physicians employed in rural areas obtained an IGA waiver, rural areas also employ physicians that have completed their 2-year home country requirement, and physicians that have received other types of waiver of their 2-year home country requirement. Unlike physicians on IGA waivers, these latter group of physicians is subject to the H-1B cap, and thus when the level of the cap decreases, it becomes more difficult for them to obtain H-1B visas. The lowering of the cap had a stronger impact in rural areas in states that historically hired relatively more H-1Bs with non-IGA waivers. This differential decline in visas across rural areas is arguably unrelated to changes in their relative economic opportunities.

We show that employment of physicians on IGA waivers is unaffected by the lowering of the cap, as expected given that these group of workers are cap-exempt. However, we document that starting in 2006 there was a steep reduction in the number of IGA waivers granted at the national level (i.e. rural and urban areas). This reduction coincided with an increase of similar magnitude of national visas issued to non-IGA waiver physicians. This pattern at the national level is consistent with a scenario in which it becomes relatively easier to obtain non-IGA waivers after 2006, and this leads to a reduction in the supply of J-1 physicians that apply for an IGA waiver. This supply decrease had a stronger impact in rural areas in states that historically hired relatively more H-1Bs with IGA waivers.

2. Background

The H-1B visa program is the largest employment-based visa category for skilled foreign workers in the US, with most H-1B recipients having at least a bachelor's degree. Foreign physicians in the US usually hold an H-1B visa during their first job as a board certified physician**.** Below, we provide relevant background on the J-1 and H-1B visa programs and the path taken by foreign physicians to board certification and initial employment in the US.

2.1 Steps to First-Time Employment by Foreign Physicians in the US

To practice medicine without supervision in the US, a physician must be board certified, which is achieved through the following steps:

1. Obtain a medical degree (M.D.) by successfully graduating from medical school in the US or abroad.[5]

2. The newly minted M.D.s must complete a medical residency program in the US or Canada in an area of specialization such as internal medicine, surgery, pediatrics, etc. Medical residency lasts between 3 to 7 years depending on the field of specialization. We refer to foreign physicians in residency as "foreign residents."

3. After finishing residency, the physician must pass the board exam of their specialization area. If successful, the board certified physician is allowed to

[5] It is important to note that medical literature refers to doctors trained in medical schools outside the US as "International Medical Graduates" (IMG); which, in the context of our paper, might generate confusion as US citizens earning an M.D. abroad will also be included in this category. In this paper, foreign residents and physicians are M.D holders that are non-US nationals.

practice unsupervised in this specialty.[6] We refer to board certified physicians that are foreign-born as "foreign physicians."

While in residency in the US, foreign residents hold an H-1B or a J-1 visa. After the culmination of their residency program, H-1B residents can transition immediately after residency into their first job as a board certified physician without having to change visa status or adjusting to permanent residence. Unlike their H-1B counterparts, once they complete their program, J-1 residents are required to return to their home country, or country of last legal residence, for two years.[7] Only once they meet this "2-year home residency requirement", can they request an immigrant visa, permanent residence, or some employment-based visas such as the H-1B visa.[8]

Foreign physicians on J-1 visas may transition to H-1B status immediately after residency only if they obtain a waiver of the 2-year home residency requirement. Physicians can obtain J-1 waivers in two main ways. The first avenue is to obtain a J-1 waiver from the US Citizenship and Immigration Services (USCIS) at the request of an interested government agency (IGA).[9] Under a set of federal programs aiming to reduce shortages of healthcare professionals in some areas, a large fraction of which are rural areas, some government

[6] Additionally, physicians can go through a fellowship after residency to obtain a sub-specialization such as cardiology, or infectious disease. Graduate medical education encompass residency and fellowship training programs.
[7] The "home residency requirement" is stipulated in section 212(e) of the Immigration and Nationality Act of 1965 and its subsequent amendments.
[8] For most J-1 holders, the home residency requirement can easily be waived by obtaining a non-objection statement from the applicant's home country. Physicians, however, are the only group of professionals precluded from seeking a waiver under those grounds. This special provision for physicians under a J-1 visa was introduced in the Health Professions Educational Assistance Act of 1976 which also contained several controversial pieces of legislation that have shaped graduate medical education (GME), and therefore, the health sector, through the decades. In fact, the Act introduced several modifications targeting foreign nationals seeking to enter a US GME program; these changes had immediate disruptive effects (Goodman and Wanderman (1981)).
[9] The IGA first submits a waiver request to the Department of State (DOS). The DOS processes the request and sends a recommendation to the US Citizenship and Immigration Services (USCIS) which ultimately grants the waiver.

agencies can request waivers on behalf of J-1 residents. Once the waiver request is approved, the USCIS issues an H-1B visa to the resident.

The largest of such waiver initiatives is the Conrad 30 program. [10]The program gives each state the opportunity to recommend up to 30 waivers to J-1 residents if they commit to serve for a three-year period in a health facility located in a Health Professional Shortage Area (HPSA), a Medically Underserved Area (MUA), or serving a Medically Underserved Population (MUP). Similar waiver programs are administered by the Health and Human Services Department, the Delta Regional Authority, the Appalachian Regional Commission, and the Veteran's Administration.

Alternatively, J-1 residents may petition the Department of Homeland Security for a waiver of the 2-year home residency requirement if their departure from the US would cause exceptional hardship to the resident's US citizen (or US permanent resident) spouse or child. Moreover, J-1 residents may request a waiver if they would face persecution under political, racial, or religious grounds. [11] We refer to both waivers as "non-IGA waivers." Physicians receiving a hardship waiver can then apply for a working visa or, if they qualify, for permanent resident status. Because of long waiting times in the approval of permanent resident applications, physicians may choose to obtain work authorization in the interim by obtaining an H-1B visa. To our knowledge, there are no publicly available estimates on the

[10] The Conrad program was introduced as an amendment to the INA through the passage of the immigration and Nationality Technical Corrections Act of 1994. The original Conrad program allowed only for 20 spots per state but this limit was expanded to 30 in the 21st Century Department of Justice Appropriations Authorization Act of 2002.
[11] Clause (iii) of Section 212(e) of the Immigration and Nationality Act of 1965.

number of hardship waivers granted each year. Below, we provide an estimate of the relative importance of IGA and hardship waivers.

2.2 The H-1B Visa Cap

The H-1B program came into effect under the Immigration Act of 1990. Congress set an initial quota (the "cap") of 65,000 visas to be issued each year, though this figure has changed over time. Figure 1 shows the evolution of the cap from 1990 to 2008, as well as the actual number of cap-bound visas granted during the period. By the middle of the 1990s, the cap became binding and was provisionally increased to over 100,000 workers for fiscal years 1999 and 2000.[12] The cap was further raised to 195,000 for the 2001-2003 period. Visa demand fell during the 2001-recession. As a consequence, the cap was not reached in fiscal years 2002 and 2003, which led Congress to let the provisional increase expire and return the cap back to 65,000 in 2004. Ever since 2004, the cap has been reached every year, even though an extra 20,000 visas were allocated to foreign workers with graduate degrees from universities in the United States.

2.3 Cap Exemptions

Under the American Competitiveness in the Twenty-First Century Act of 2000, government, universities, and some nonprofit research organizations became exempt from the cap. Importantly, institutions affiliated with these organizations (such as teaching hospitals) also became exempt from the cap. Foreign workers hired by teaching hospitals on H-1B visas (e.g. physicians, residents, nurses, etc.), for example, are not counted towards the

[12] This took place under the American Competitiveness and Workforce Improvement act of 1998.

cap. Likely as a consequence, the number of H-1B residents increased noticeably since the year 2000. In Figure 2, we show the total number of H-1B and J-1 residents from 2000 to 2014 reported by the American Medical Association. Though the number of J1 residents was much larger than the number of H-1B residents in 2000, by 2005 the two groups were close to the same size, though the trend reversed starting in 2010.

Also exempt from the cap are J-1 residents that obtain an IGA waiver. Because of this, securing an IGA waiver virtually guarantees that the worker will obtain an H-1B visa. J-1 residents that receive hardship waivers, on the other hand, are subject to the cap and thus to obtain an H-1B they must secure employment with a cap-exempt institution or secure one of the limited visas under the cap. Similarly, physicians applying for US employment while abroad, perhaps because they returned to their home country to serve their 2-year home country requirement, are also subject to the cap. It is worth noting that if a worker is originally hired by an exempt institution on an H-1B visa (e.g. an H-1B resident) changes employment to a non-exempt institution, the new visa now counts towards the cap.

In summary, after completing residency, J-1 residents on IGA waivers are cap-exempt. Hardship waiver J-1 residents, H-1B residents, and physicians abroad are exempt only if their employer is a cap-exempt institution. For this reason, the level of the cap should only affect the employment opportunities of this latter group of physicians.

2.4 H-1B Application Process

The application process requires a potential recipient to be sponsored by her prospective employer, and thus the firm and the H-1B worker meet in advance. The employer-employee

match can occur in a multitude of ways. For instance, firms can recruit foreigners already in the US under a different visa classification (e.g. students on F-1 or J-1 visas) or directly from abroad perhaps through a firm's foreign affiliates. Once the match occurs, the firm must file a form I-129, "Petition for a Nonimmigrant Worker" with the USCIS. The USCIS approves the petition if admission conditions are met and based on visa availability given that the petition is cap-bound (GAO 2011). If the worker is already in the U.S., the USCIS changes their previous visa classification to H-1B, and the employee may begin working immediately. Otherwise, the worker takes the approved I-129 to a consular office of the Department of State which reviews the entire package and issues the visa. Cap-bound petitions are approved on a first-come-first-served basis, irrespective of firm or worker characteristics such as industry or occupation.

The USCIS issues visas valid for three years at a time after which the employer can apply for a three-year extension. As well, the worker can switch employers at any point in time (e.g. H-1B residents can transition into their first job, or change their program of residency). Extensions and changes of employer require the filing of a new Form I-129 though they do not count towards the cap. The H-1B is a "dual intent" visa: the recipient can pursue legal immigrant status while holding a temporary visa. At any point during the worker's employment arrangement, the firm can choose to file for permanent residency for the worker, in which case the worker can renew their visa indefinitely in one-year intervals until they receive a final decision on their permanent residency application.

2.5 H-1B Data

For our analysis, we use data on physicians on H-1B visas employed in the US for the first time after completion of residency. Physicians in this group are J-1 residents transitioning into employment, whether directly from residency after been having granted an IGA or a Hardship waiver, or after having completed their 2-year home country requirement outside of the US. As well, this group encompasses H-1B visa holders transitioning from residency into their first job as a board certified physician.

To capture this population, we use microdata from two separate datasets on all H-1B visas granted. These datasets are assembled from the Form I-129. These records are not readily available to the public and were obtained directly from the USCIS under two separate Freedom of Information Act requests.[13]

We use two datasets because they each contain information useful to us that are not common across datasets. Both datasets contain information on an applicant's occupation, industry, country of origin, annual earnings, highest level of education attained, current visa classification status (e.g. J-1, F-1, not currently a visa holder), and whether the application is for initial employment or a renewal of a previously approved H-1B visa (e.g. continuation of employment, change of employer, etc.)

Our main dataset contains the employer's address which allows us to determine whether the physician is employed in a rural area. These data span the 1998 to 2012 period. Our secondary dataset does not contain the employer's location but contains an indicator for

[13] The main micro dataset used in this study was obtained by the authors. The secondary data were kindly given to us by Magnus Lofstrom of the Public Policy Institute of California.

whether the applicant received an IGA waiver, as well as whether the physician is hired by a cap-bound or a cap-exempt employer. These data span the 2000 to 2010 period.

Although our datasets are constructed from the same underlying data, we can only merge them together from 2004 to 2010. Before 2004, the secondary dataset is missing values for some key variables, and as a result, many records are not uniquely matched across both datasets. From 2004 on, we can match around 98 percent of the data for physicians. Matching these data is a very time-consuming process requiring the standardization of variables in both datasets to account for differences in coding schemes. Since we can only match our data from 2004 onwards, we will use the secondary dataset to describe national trends in physician employment by waiver type and cap status of the employer from 2000 to 2010, and the combined datasets from 2004 to 2010 for the corresponding rural trends.

A challenge in our data is that the records, whether for initial employment or renewals of previously approved H-1B visas, do not distinguish between foreign physicians undergoing residency on an H-1B and board certified physicians engaging in full employment on H-1B status. Fortunately, we know that resident salaries are much lower than those of physicians and that there is minor variation in resident salaries across hospitals in the US. Thus, we can reasonably infer who is a resident from their annual earnings. We also know that if an applicant classified as a physician (occupation code DOT 070) is transitioning from an F-1 visa to an H-1B visa, then it must be the case that worker is beginning residency after completing medical school in the US. Accordingly, we use the wages of the pool of F-1 first-time H-1B applicants to categorize residents. We find that 99 percent of observations in this group earn under 65,000 dollars per year and thus categorize

residents using this criterion. Furthermore, the bi-annual "survey of residents/fellows stipends and benefits report" reports mean salaries for residents well below the $65,000 cutoff for any given year and, the 75th percentile reports a salary of $61,699 for a 3rd-year resident in 2013.

We perform many sensitivity checks to this specification to ensure that our cutoff properly identifies residents. For example, virtually all workers classified as residents are employed by cap-exempt institutions, as we would expect given that teaching hospitals are affiliated with a medical school/university and are thus cap-exempt. Moreover, only 3 percent of residents in our data are employed in rural areas, as we would expect given that teaching hospitals are overwhelmingly located in urban areas (whether these areas are HPSAs or not). This last point also tells us that rural employers will tend to be cap-bound and thus the key role played by IGA waivers, which are not subject to the cap, in the recruitment of foreign doctors in rural areas. In the appendix, we plot trends in resident employment over time. Reassuringly, the trend in our data closely tracks enrollments of H-1B residents at US hospitals reported in Figure 2.

A related concern is that, although we can tell first-time employment of J-1 residents transitioning to an H-1B visa (i.e. all petitions for initial employment that have a current visa status of J-1) we cannot precisely discern which records correspond to H-1B residents transitioning into their first job. In our data, we can tell when an H-1B resident first receives an H-1B visa. However, once the H-1B resident graduates and becomes employed as an H-1B physician, the new H-1B petition filed will be noted as a change of employment. We can identify employment changes in our data but cannot tell whether the physician did their

residency on an H-1B or a J-1, or whether the employment change is taking place further down a physician's career ladder. Nonetheless, employment changes in our data provide an upper bound on the number of H-1B residents employed as physicians for the first time. For rural areas, these changes are small and constant throughout the period, and thus for clarity, we focus on initial employment of J-1 physicians.

3. National Trends in the Employment of Foreign Physicians

In Figure 3 we document the evolution of the annual number of H-1B visas for initial employment granted to physicians at the national level from 2000 to 2010. From 2000 to 2004, we observe an increase in the number of H-1B visas granted annually from around 1300 to over 1600. Starting in 2005, we see a large decline in H-1B visas, and by 2006 the number of physicians falls below 1200 and then remains relatively stable at that level for the rest of the period. Figure 4 shows that both the initial increase in the level of national newly granted visas to physicians and the subsequent decline is mostly attributed to cap-bound employers. Visas to cap-exempt employers hover around 400 per year though we see a moderate increase starting in 2006.

In Figure 5 we plot employment, by cap-bound employers, of H-1B physicians that obtained IGA and non-IGA waivers.[14] In the figure, we see that when the cap was lowered in 2004, there was a sharp decrease in visas granted to non-IGA physicians. On the other hand, IGA waivers granted to cap-bound employers were virtually unchanged when the cap first decreased. This responsiveness to the level of the cap by non-IGA physicians is

[14] We plot the figure using data from 2001 to 2010 because our secondary dataset is missing IGA waiver information for the year 2000.

precisely what we would expect given that IGA waiver physicians are cap-exempt but non-IGA waiver physicians are not.

The graph also shows that the number of IGA waivers granted to cap-bound employers began a sharp decline starting in 2006 which coincided with a steady increase in the number of non-IGA waivers granted. This inverse relationship between IGA and non-IGA visas for capped employers after 2006 seems to be part of a broader trend at the national level. In Figure 6, we show the national totals for hardship and IGA waivers (we combine capped and exempt employers). We see that from 2001 to 2003 IGA waivers granted more than doubled. This original increase in IGA waivers is likely a result of the Conrad program increasing from 20 to 30 waivers per state. By 2003, IGA waivers became more common than non-IGA waivers, and an even larger fraction of the total once non-IGA waivers declined following the contraction in the cap.

Noticeably, after 2006 there was a large increase in the number of hardship waivers granted nationally. [15] By 2008, non-IGA hardship waivers became the predominant waiver used for employment by US employers. This observed relationship is consistent with a scenario in which J-1 residents prefer the non-IGA over the IGA waiver since it comes with no geographical restriction, i.e. physicians with a non-IGA waiver are not bound to work in rural areas. We posit that the decline in IGA waivers granted stems from the fact that hardship waivers become the prevalent mode of transition from J-1 to US employment. Though a decline in state-level IGA waivers during this period has been noted by other researchers (RHRC 2016), to our knowledge, we are the first to document that the decline

[15] The increase in hardship employment after 2006 is split evenly between capped and cap-exempt employers. In the appendix, we show that the relative employment of hardship J-1 physicians is responsive to the level of the cap. When the cap is high, physicians on hardship waivers are hired at relatively higher rates by capped employers.

took place at the national level, and to document the corresponding trend for hardship waivers.

4. Rural Trends in the Employment of Foreign Physicians

In Figure 7 we plot the annual number of H-1B visas for initial employment granted to physicians in rural areas from 2000 to 2010. We classify rural areas based on the metro definitions from the Office of Management and Budget in 2003. From 2000 to 2003, the number of rural H-1B visas first increased from 340 to 450 visas, and then decreased slightly in 2004. When the cap was lowered in 2004, we see a sharp decline in the number of visas granted to rural communities. This large decline came almost entirely from non-IGA waiver employment, which decreased by over 50 percent between 2004 and 2006. From 2006 on, the decline was driven in its entirety by a reduction in IGA waivers granted to rural communities, while an increase in non-IGA waivers dampened the overall negative effect.

The aggregate trends shown in the data are consistent with a scenario in which, because rural employers tend to be cap-bound, a lower cap decreases hiring of non-IGA waiver physicians, the group of physicians that are subject to the cap, while having no effect on IGA waiver physicians because they are exempt from the cap. Once the national supply of IGA waiver physicians dried up in 2006, perhaps because hardship waivers became easier to obtain, the decrease in rural employment of foreign physicians stemmed from a decline in IGA waiver physicians. Because rural areas tend to be less desirable than urban areas, or because employers in these areas are bound by cap limitations, the corresponding increased

inflow of non-IGA waiver physicians after 2006 only partially mitigated the reduction in IGA waiver physician inflow.

We explore these possible scenarios in more detail by testing the following two propositions. First, we test whether rural areas in states that initially hired more non-IGA physicians, suffered a relatively larger reduction in H-1B physician employment after the cap was lowered in 2004. Second, we test whether rural areas in states that initially hired relatively more IGA physicians suffered a larger decline after the national increase in non-IGA physicians starting in 2006. The two explanatory variables in the model below will serve as instrumental variables in our future analysis of the impacts of foreign doctors on rural labor market outcomes.

We measure the exposure of rural area in state *i* to the national decline in IGA waivers granted as $I_{i,2004} = \frac{IGA_{i,2004}^{rural}}{IGA_{national,2004}}$ where $IGA_{i,2004}^{rural}$ is the number of IGA waivers in the rural community of state i in 2004, and $IGA_{national,2004}$ is to the number of hardship waivers granted at the national level in 2004. It is worth noting that the most exposed rural areas are not necessarily in states that grant lots of IGA waivers because some of these states may grant them to underserved communities in urban areas.

Correspondingly, we measure how exposed a rural community is to changes in the national level of the cap as $D_{i,2004} = \frac{Hardship_{i,2004}^{rural}}{Hardship_{national,2004}}$ where $Hardship_{i,2004}^{rural}$ is the number of non-IGA waivers in the rural community of state *i* and $Hardship_{national,2004}$ is the number of non-IGA waivers granted at the national level. We measure both $I_{i,2004}$ and $D_{i,2004}$ in 2004, before treatment, and in the first year for which we can construct our measures given the

scope of our data. We also scale both measures by 100 to improve readability of the estimated coefficients.

We estimate the following model:

$$visas_{it}^{rural} = \alpha_i + \mu_t \underset{(t=-5.19)}{-4.0 * I_{i,2004} * W_t} \underset{(t=-3.43)}{-4.55 * D_{i,2004} * \pi_t} + \epsilon_{it}$$

where $visas_{it}^{rural}$ is the total number of H-1B visas granted to foreign physicians in rural communities in a state, $W_t = 1$ if t > 2006, and $\pi_t = 1$ if t > 2004. We include state fixed effects α_i to control for the fact that some states may always grant more or fewer IGA visas to rural areas than others, perhaps because they are larger or because they tend to grant relatively more visas to underserved areas in urban communities. We also control for common shocks μ_t affecting all rural communities in each year. We estimate the model for 50 states from 2000 to 2010, and we cluster standard errors at the level of the state. We report the t-ratios associated with each coefficient in parenthesis.

Both coefficients of interest are of the expected sign and highly significant. The decrease in national IGA waiver supply during the 2006-2010 period leads to 2.4 fewer physicians per year in the rural community with the mean value of the exposure metric $I_{i,2004}$. The decrease in the level of the H-1B cap also had a negative impact for rural areas hosting a high proportion of foreign physicians that obtained a non-IGA waiver. For the rural community at the mean value of $D_{i,2004}$, the decrease in the cap in 2004 leads to 1.4 fewer physicians granted per year.

5. Conclusion

In this paper, we have analyzed the role of IGA waiver programs in the employment of physicians in rural America. Using novel microdata on foreign physicians on H-1B visas, we have shown that rural areas receive a disproportionately large number of physicians on H-1Bs, and this disproportion stems from the fact that IGA waivers play a major role in the national employment of foreign physicians and rural areas obtain 35 percent of all IGA waivers granted nationally, on average.

We have also shown that the decline in the employment of foreign physicians in rural areas from 2004 to 2010 stems from a combination of a decline in the level of the H-1B visa cap and from a steep decline in the number of IGA waivers granted at the national level.

In future research, we will consider how hiring foreign doctors affects the employment and business survival of healthcare providers in US rural counties. The analysis of business survival will take place at the level of the firm. Using fuzzy matching and Soundex algorithms, we have linked our H-1B microdata to firm-level characteristics from the National Establishment Time-Series (NETS) database, a longitudinal dataset that contains yearly employment levels for most U.S. establishments for 1990-2013. Our empirical strategy will consist of relating H-1B physician counts with annual changes in county/firm-level employment during the 2000-2010 period. We will identify employment effects by using the exogenous variation in rural foreign physician employment we have described above.

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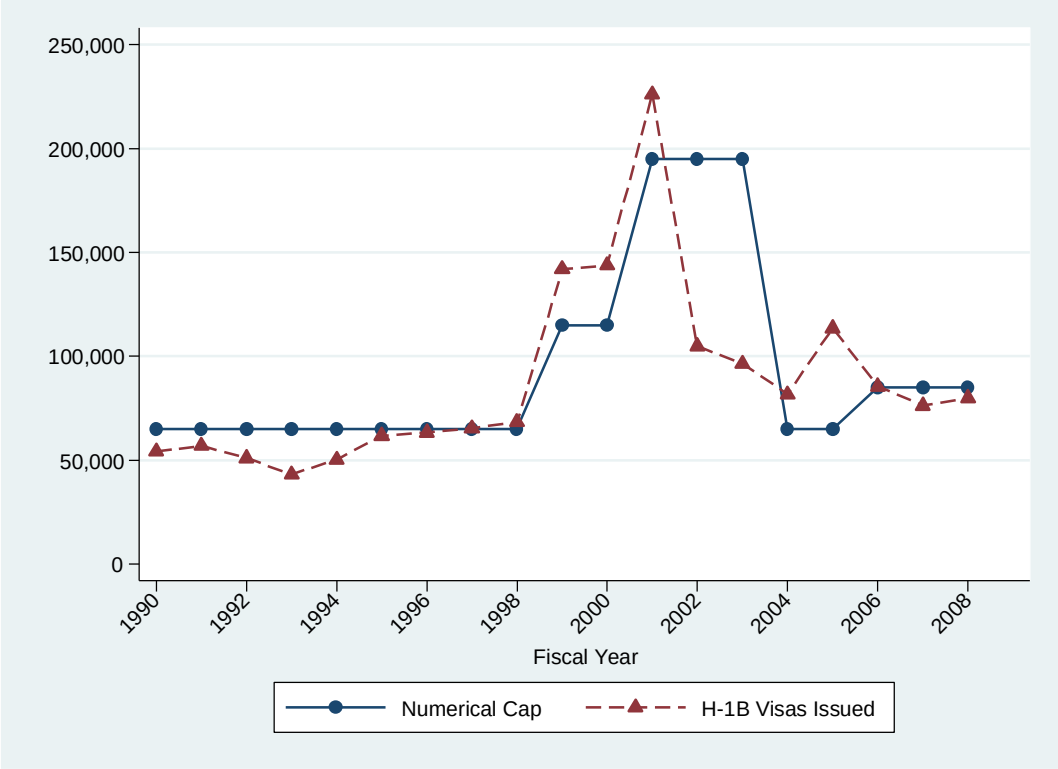
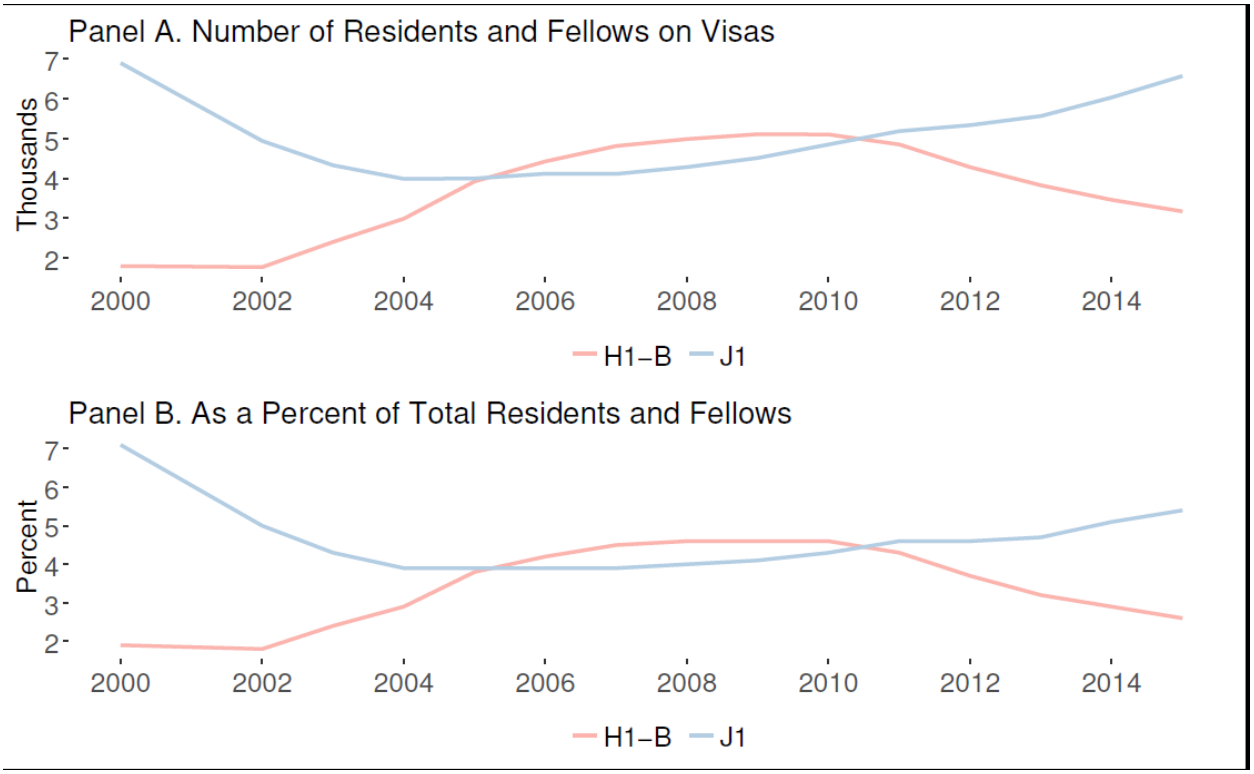
Figure 1---The H-1B numerical cap and number of approved visas subject to the cap, 1990-2008



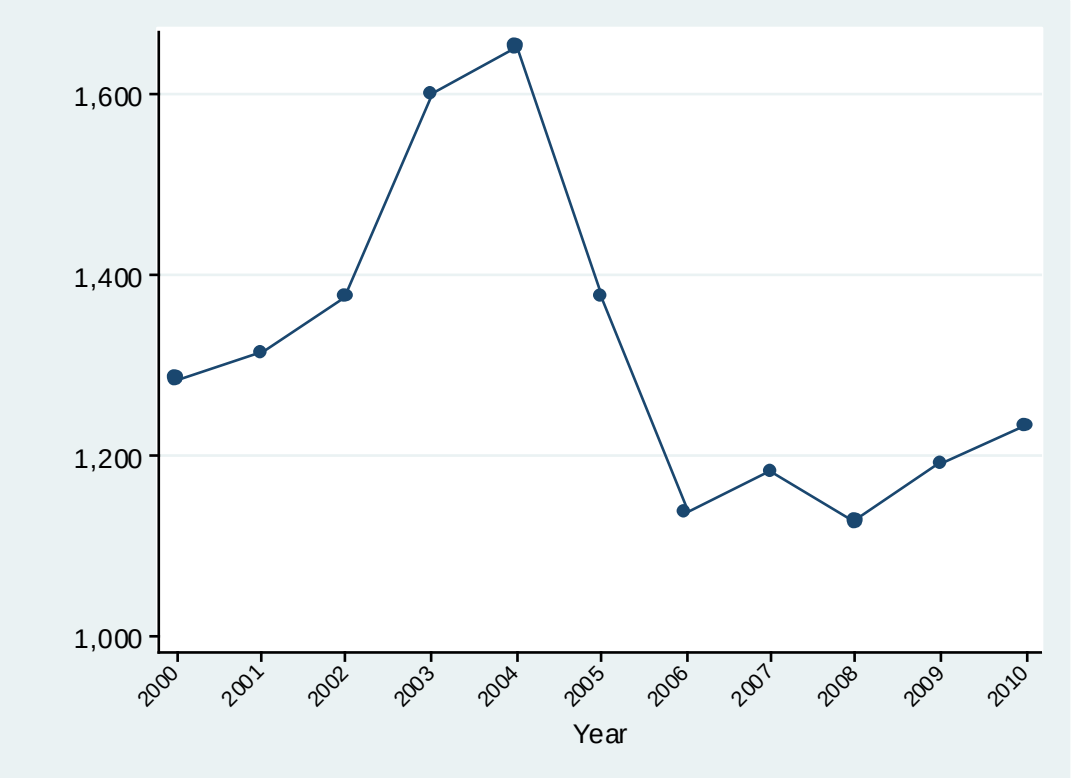
Notes: Figure 1 shows the evolution of the H-1B numerical cap and the actual number of visas issued subject to the cap for 1990-2008. The figure excludes visas issued to Healthcare and Education because these sectors became fully or partially exempt from the cap through the American Competitiveness in the Twenty-First Century Act of 2000. Data on aggregate visa issuances from 1990 to 1997 are taken from Kerr and Lincoln (2010). Data on aggregate visa issuances from 1998 to 2008 are computed using data from the Form I-129.

Figure 2- Number of Foreign Resident Physicians and Fellows by Visa Type



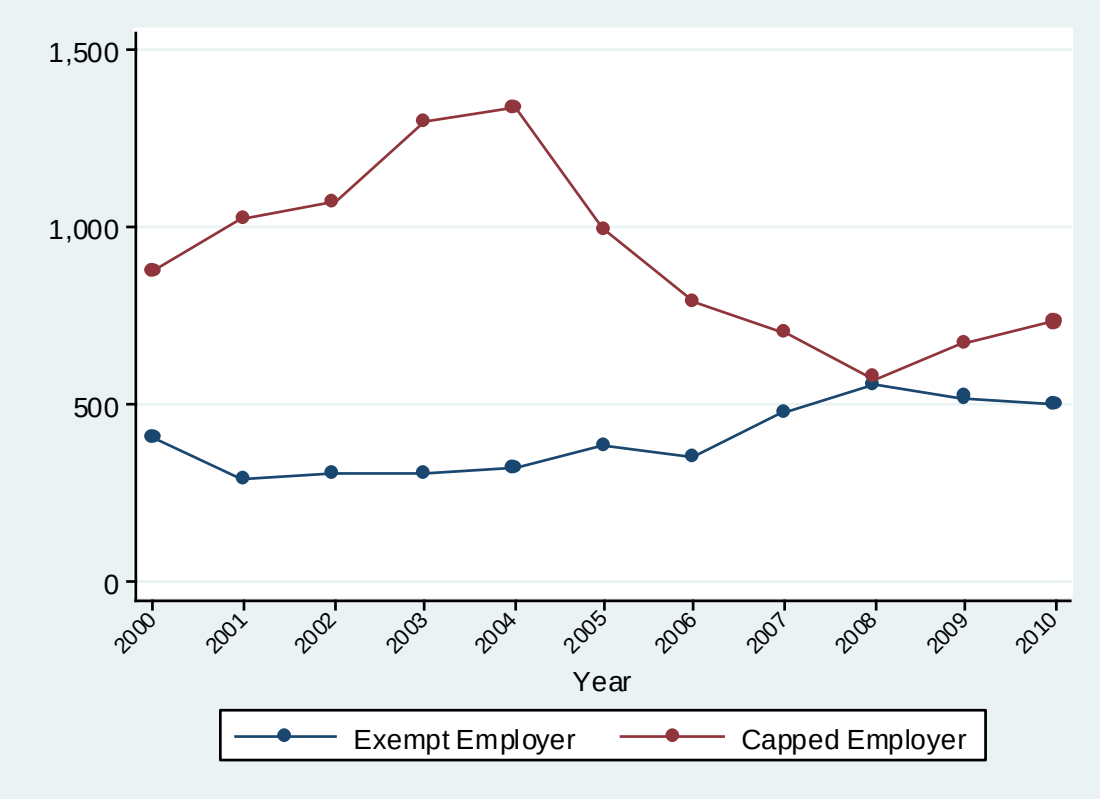
Data Source: American Medical Association

Figure 3 – H-1B Visas for Initial Employment Granted to Physicians at the National Level



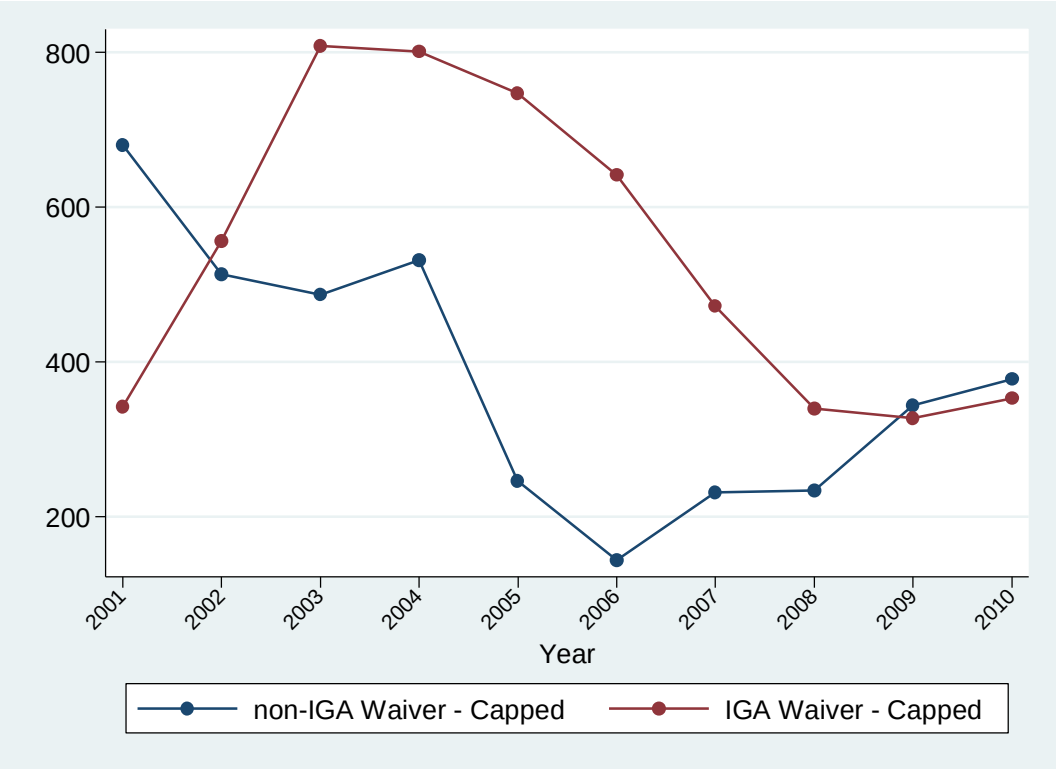
Data Source: Form I-129

Figure 4 – Physician Employment by Capped and Exempt Employers at the National Level



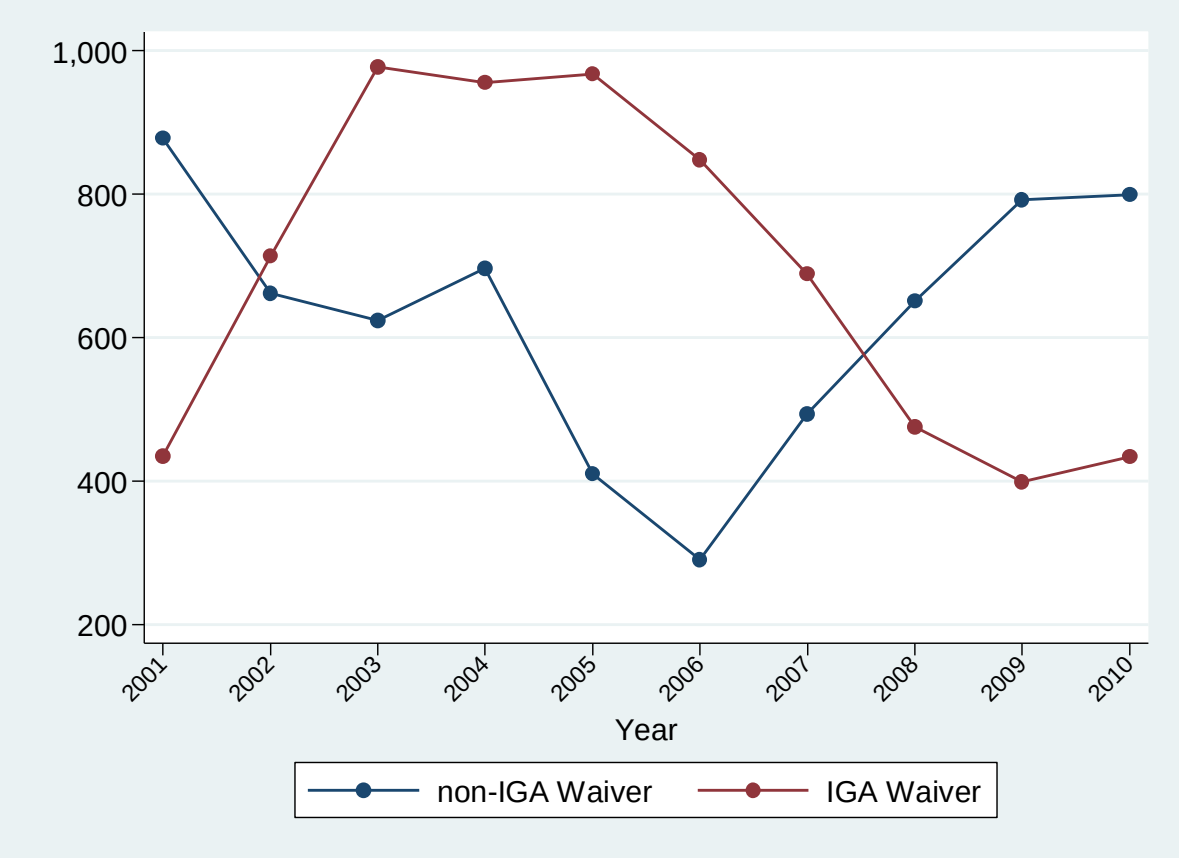
Data Source: Form I-129

Figure 5 – Physician Employment by Capped Employers at the National Level, IGA Waivers and non-IGA Waivers



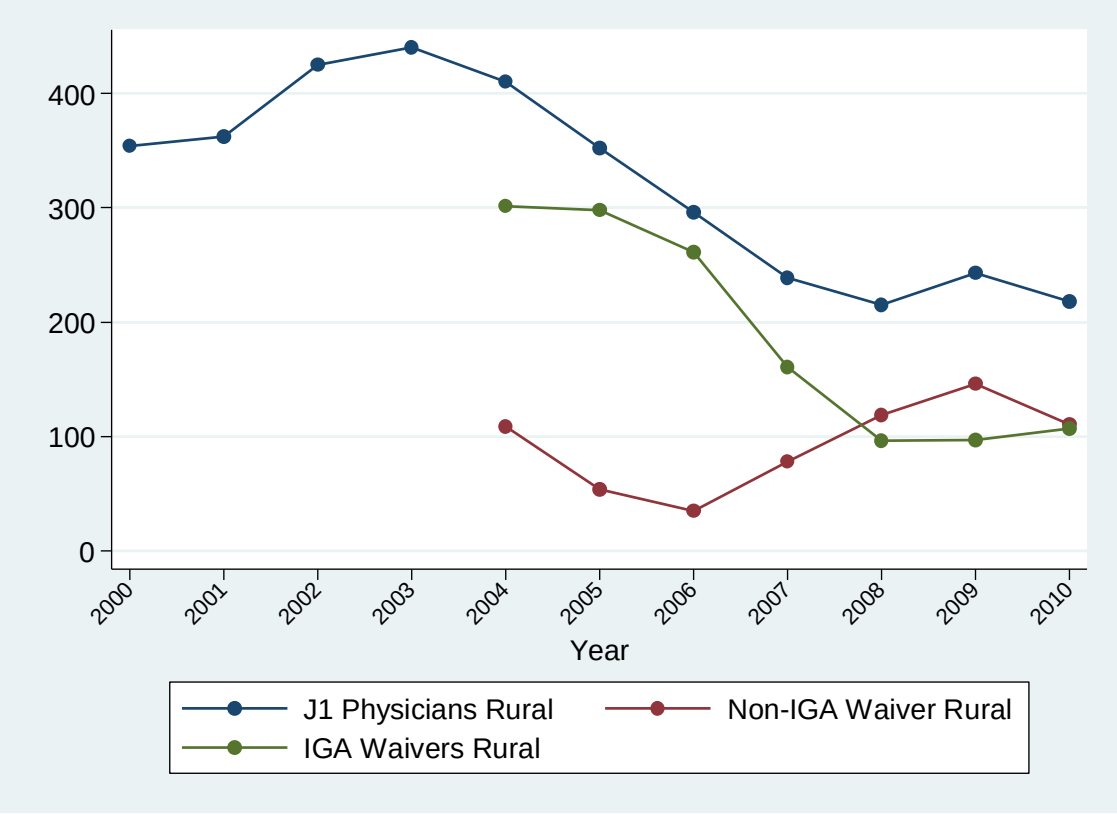
Data Source: Form I-129

Figure 6 – Physician Employment: IGA Waivers and non-IGA Waivers at the national level



Data Source: Form I-129

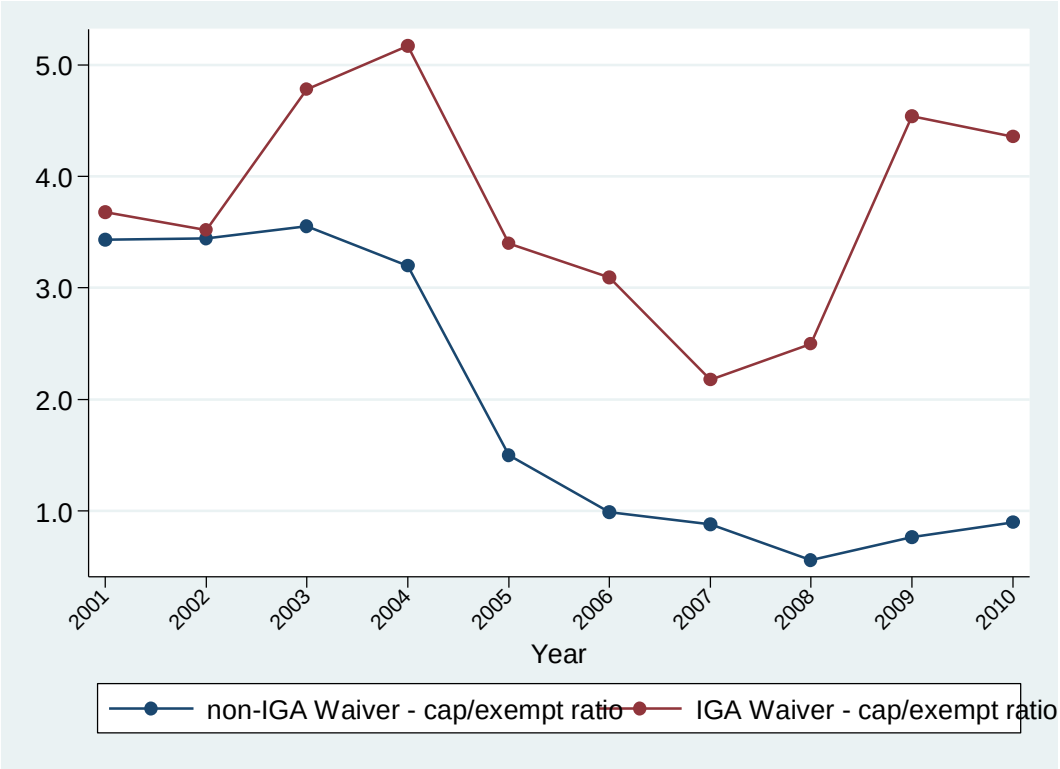
Figure 7 – Physician Employment in Rural Communities



Data Source: Form I-129

Appendix

Figure 8 –Relative Employment of IGA and non-IGA waiver Physicians by employer type



Data Source: Form I-129