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Missing Airline Passengers

By Lindsey Grant

Last year, two very wise commentators discussed the idea that anomalies — the things that don't fit comfortably into our view of the nature of reality — may point the way to the next stage of understanding.[1] They took their examples from astronomy, geology and biology. One might well start with the more mundane example of the aircraft manifests.

To begin with the facts...

All commercial and private aircraft entering or leaving the country are required to submit summaries of their passenger manifests (Form I-92), along with the individual arrival/departure forms (I-94) that are required of arriving and departing aliens. These are collected by the Immigration & Naturalization Service (INS), and the summaries are processed by a contractor for the Department of Transportation (DOT). The data are not published, but they are available.[2] The traffic now exceeds 30 million annually in each direction. The totals since 1978 are shown in Figure 1 and the net excess of arrivals over departures is highlighted in Figure 2.

Cutting through the confusion about immigrant vs. non-immigrant vs. American, the second graph shows that about one to two million more people fly into the U.S. each year than fly out — and the number has been rising. Remember, this is just commercial and private air traffic; it says nothing about land arrivals and clandestine movements by land or air or sea. The popular image of illegal immigration is of Mexicans or Central Americans running across our land border, or of Cubans and Haitians in tiny boats. Even Census Bureau efforts to estimate the total numbers of "undocumented aliens" (as they delicately call them) has focused on Mexican migration by land. Here is another ball game, and a less dramatic one, that has been largely ignored.

We can run the series back for thirty years (Figure 3).[3] The gap between arrivals and departures has widened from less than four million in the '60s to nearly 16 million in the '80s.

How the Evidence is Gathered

The totals should be pretty solid for arrivals. Incoming alien passengers are required to fill out Form I-94, and the carriers must complete Form I-92 summary reports. INS itself collects the I-94 forms.

The data are broken down by region and country, and by "Aliens" vs. (U.S.) "Citizens" (resident aliens are included in "citizens"). These breakdowns are of dubious validity, for reasons that will become clear.

Since INS is little interested in departures, it simply asks the carriers to collect the forms in their behalf on outgoing flights, which the carrier may or may not do. The carriers have very compelling operational, legal and financial reasons not to falsify their total payloads, which should therefore be fairly solid. Not so the country-by-country and citizen/alien breakdowns. The carriers are supposed to report them on Form I-92, but in practice they frequently simply submit the total number. The local INS office then tries to reconstruct the breakdowns using the I-94 forms collected from passengers on the flight. Every visiting alien whose I-94 form is not turned in is automatically counted as an American. This, says INS, gives "the false impression that many more visitors overstay their period of admission than actually do."[4]

The common wisdom thus is that the failure to collect all the I-94 forms leads to an undercount of departing aliens and an overcount of departing Americans. This would be a convenient way of explaining all those disappearing "visitors", except for one problem: it doesn't explain the overall gap. Even with the alleged overstatement, the statistics show fewer U.S. citizens leaving than arriving, in every decade from the '20s through the '70s, by a grand total of over two million.[5] The discrepancy has mounted. In 199O, it was 351 thousand. Over time, this comes close to a mathematical impossibility. Where do all the incoming "Americans" come from? There aren't that many American citizen babies born overseas. Is the passport fraud business that large?

The Statistical Confusion

By contrast with the annual gap of over two million in the data from the manifests, the Bureau of the Census uses a figure of 200,000 per year for illegal immigration, most of it by land from Mexico. They started using that figure in 1986. Before that, they had made no allowance for illegal immigration, because they had no good data. Perhaps they changed because they were stung by the charge that they had been "using the only figure that was sure to be wrong." Census statisticians have put the likely total of illegal immigrants in the U.S. between two and four million, while admitting that any estimate of this figure is particularly conjectural. (One key Census report on illegal immigration was described as an effort to

"count the uncountable.")[6]

The 1980s debate about the number of illegal immigrants was a response to some very high estimates by government officials, including an INS Commissioner, and I wonder if perhaps the subsequent estimates may have reflected a human impulse to debunk the high guesses and reassert their own statistical authority.

The problem is not with the Census Bureau, which is a highly professional organization. It is with the lack of basic data. Since illegal immigrants are unlikely to check in unless they are caught, the estimates are necessarily based on statistical inference rather than direct evidence, and the calculations are based on estimates of residuals, which tend to magnify any inherent errors.

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Aside from clandestine border crossers, those who overstay nonimmigrant visas are presumably the principal source of unrecorded immigration. INS stopped trying to count emigrants in 1957. In l980, they stopped collecting the data needed even for an estimate of total emigration.[7] At the same time, they stopped publishing estimates of the rate at which nonimmigrant visitors departed the country. Without departure statistics for migrants or nonmigrants, the government has little direct evidence on which to calculate net legal migration or clandestine immigration through that second loophole.

During the 1970s, before it stopped reporting them, the INS figures for departing aliens ran far below arrivals, suggesting that a lot of them were simply staying here. (In FY 1976, the gap was nearly 2.7 million; in FY 1977 it was over 3.2 million.[8]) This was, naturally enough, a source of embarrassment to the INS, and it probably helps to explain the decision to stop publishing the figures.

There are, in short, large and growing holes in the data needed for any estimate of net immigration, legal or illegal. Quite a mess. Our immigration statistics are bad and getting worse. In this murk, it would seem prudent to make use of whatever direct information is available, and the figures from passenger manifests should be a principal source.

In the case of movement between the U.S. and Puerto Rico, the Census Bureau in fact has been using the data from air passenger manifests as their principal source — though with considerable misgiving.

Can the Gap be Explained?

There is a ready explanation for part of the gap between arrivals and departures. Many legal immigrants arrive by air, and are expected to stay. INS compiles unpublished statistics for the ports of entry of each year's immigrants.[9] The data are no longer explicitly broken down between air and land arrivals (legal arrivals by sea are negligible); but one can arrive at an approximate figure for arrivals of immigrants by air, by breaking out the traditional airports of entry. In FY 1990, the figure was 365 thousand. The figure will rise as the immigration act of 1990 increases the flow.

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In 1990 (Figure 2), the overall gap from the manifests was about 2.4 million. This calculation reduces the unexplained gap to about two million.[10]

There is another, somewhat more obscure, explanation for part of the discrepancy. The official statistics for gross legal immigration were fairly steady, rising from 531 thousand in FY 1980 to 643 thousand in FY 1988. These figures aren't what they seem. About 1/3 of those "arrivals" are actually "adjustments". In other words, they are people who arrived illegally or stayed illegally in earlier years, and who have managed to get their status legalized. Whether or not they were supposed to be immigrants, they have immigrated, and upon "adjustment" they enter the statistical system. This phenomenon is particularly dramatic right now. The official figure for immigration jumped to 1.09 million in FY 1989 and 1.54 million in FY 1990, but about half of each of those figures represented legalizations of illegal resident aliens under the 1986 amnesty.

With the data available, there is no way to match the adjustments with their year of arrival, but be it noted that some part of the gap — perhaps something like 100 to 200 thousand per year on a long term basis — is eventually regularized in the immigration statistics.

That is some help, but not much. We must still face an apparent gap approaching nearly two million each year, and growing.

How Solid are the Figures from the Manifests?

Some private planes may carry unmanifested passengers from — or more likely to — the U.S. (Anybody who has seen the lineup of executive jets at the airport at Eagle Pass, Texas, a poor little border town, must suspect that there is considerable activity

going on that doesn't get into the statistics. Sample radar searches in connection with drug control activities have suggested that there are hundreds of unrecorded flights across U.S. borders daily.) Compared to the scale of the recorded movements, however, this movement is unlikely to be statistically important — and, if anything, it probably adds to the net inflow.

Military flights are not covered. They will introduce some element of error, in a period when we had about a half million military personnel and their civilian support staff overseas. Most of those who leave by military aircraft generally return the same way, but there are exceptions, plus some wives acquired and babies born overseas. Again, however, they are more likely to increase than to decrease the true net inflow.

For the bulk of the traffic — airlines, charters, private planes not breaking the law — I have suggested that the regional and citizen/alien breakdowns are very shaky, but that the overall numbers should be pretty solid. There are probably some transcription errors in typing up the summaries, but it is hard to believe this is an important source of error.[11] I can identify only two significant potential sources of error:

- Perhaps there is an asymmetrical triangular traffic, with many people arriving by direct flights from overseas and then departing by land via Mexico or Canada, and with fewer people running the triangle in the opposite direction. This is an ingenious hypothesis, but not a very convincing one. It could be checked out. However, the U.S. Government does not maintain sufficient records to prove or disprove this hypothesis, and it would be difficult to sort out such movement from the back-ground noise (there are literally hundreds of millions of land border crossings per year.) There is another variant: the "gap people" may have been leaving by air via Canada, since the collected manifests do not cover air traffic with Canada. Daniel Vining (see Note 3) looked at Canadian air traffic records and found little support for that hypothesis.

- Departing aircraft (charters, in particular) may perhaps sometimes fail to submit I-92s. This could be an important source of error. Departing aircraft are required by statute to submit passenger manifests, but INS considers the requirement to be met by the submission of any I-94 forms collected. Apparently, neither INS nor DOT has any procedure for checking airport departure logs to assure that the requirement has been met, nor is submission of the I-92 required in order to get airport clearance for departure. They do check the Airline Guide to see if a flight was missed. When they find one, they make an estimate (based on samples a decade old) of the number and characteristics of the passengers. This is said to happen in about 15 percent of departures.

We have here another annoying residual. If 3 percent of departing aircraft in 1990 failed to report, it could have led to a 40 percent error in the apparent gap. It wouldn't take many such failures to explain the gap. This is an important potential source of error, and an easily corrected one.

Because of tight budgets, the tabulation of data from the manifests is already nearly two years behind. There apparently is some current discussion in DOT of doing away entirely with that process, and relying on periodic reports directly to DOT from the airlines. One such system, using the "T-100" form, was instituted in 1990. No data have yet been published. A report on 1990-91 is in process, but I am told it will give only gross traffic totals, not arrivals and departures. DOT considers more detailed information to be confidential. Airline-by-airline data may indeed be privileged information, but the totals and the regional patterns should not, and it may be another useful check.

The question would still arise: how complete are the data? If prior experience is any indicator, a shift to reliance upon the periodic reports would be a backward step. IATA (the International Air Transport Association) collects such data on a voluntary basis, and their own evaluation is that it is not complete enough to be a useful guide to total net flows.[12]

I have suggested that there is a possibility that incomplete reporting of departures could explain some or even all the apparent gap. This is, however, no excuse for ignoring the data from the manifests, as is presently the case. It is one of the few sources of hard data available. If there are errors, they could easily be corrected. There is no substitute for enforcing the law and making the submission of manifests or I-92 summaries a condition for airports' departure clearance.

The Intractable Gap

How do the government's statisticians explain the gap? In short: they don't. In a number of conversations with the hands-on technicians, I found most of them puzzled and somewhat embarrassed by it. Since it flies in the face of conventional wisdom, some of them attempt to minimize it, but the explanations do not go beyond the discussion of potential sources of error above.

I myself am overwhelmed at the apparent size of the gap. The experts in Census have the same problem. They point out that so large an influx should turn up in other statistics. Specifically, they argue that there is no sign in the 1990 decennial census count of something like 10-15 million unexpected residents. (They do admit to a probable undercount of about 5 million, some of whom presumably are illegal entrants.) The census numbers, they say, are broadly consistent with what was known about the earlier population, plus recorded births and estimated net

immigration, and minus known deaths.

This is all very well, but the argument encounters two serious problems.

The first one, again, is that problem of residuals. Birth and death records in the U.S. are thought to be very good, but no effort is made to match individual births and deaths. Even if there is indeed a large illegal population that does not want to be found, births and deaths among that group would not change the overall data in a way that would make it possible to count them with any precision. (In fact, a larger population base would help to explain the circumstance that our urban birth and death rates seem unusually high, compared with other industrial countries.)

The second problem is related to the first one. The specialists argue that those people must live somewhere, and that the Census Bureau knows where the housing is and would find the inhabitants. This reasoning is questionable for two reasons. For one thing, Census may not know where all the housing is. The traditional definitions are changing. Some years back, the authorities suddenly discovered that many garages in Los Angeles had been covertly converted into rental housing; the people who lived there would be unlikely to volunteer to be counted. Warehouses in New York City are being converted to dormitories, sometimes occupied on the "hot bed" system, where people may occupy a bed in shifts. This practice was long known in — for instance — Hong Kong. Developed in a time of less desperate population pressures, our census system may be behind the curve in recognizing what now constitutes a place to live. The 1990 effort to find the homeless may be the tip of the iceberg. Our cities certainly *look* a lot more crowded, and with a greater variety of racial types and accents, than the Census Bureau's modest 200,000 figure would suggest.

More important is the assumption fundamental to our census system: that people are willing to be counted. In 1990, one-fourth of those people in identified housing units didn't send in their forms. There is provision for personal follow-up, and there are post-enumeration surveys to test the undercount. They are ingeniously devised, and they succeed in finding some of the people. Still, a person who didn't want to be counted the first time probably doesn't want to be counted the second time. If people are unwilling to open the door, the census counters use "imputation". They assume that the occupants of that unit are identical in number and characteristics to those enumerated in a comparable unit nearby. If the person who responded in that other unit was less than candid, the undercount is simply doubled.

"These remarks are not meant as criticism of the beleaguered Census Bureau. It is forced to work with limited and questionable data."

Undercount, apparently, is most serious among Black males. Why? Laws make mores. Our principal welfare program (AFDC) has a "man in the house rule." If there is a male breadwinner, the women and children are not entitled to welfare. This makes it prudent to conceal any evidence of a man's presence, and certainly to avoid telling an official enumerator of any sort that a man lives there. Who is likely to open doors during the daytime in poor neighbor-hoods? Single welfare mothers, who are not away at work.

If that syndrome works among citizens, how much more powerful it must be for those who live in fear of being sent back to, say, Haiti, or Somalia.

The census is designed by the middle class. I wonder whether many of us understand the visceral urge to stay away from government, except perhaps to apply for welfare, that motivates people who have long been in an uneasy relationship with the law. During the 1990 census, posters blossomed in the poor neighborhoods of Washington DC, warning people to avoid being counted or they would be drafted. This doesn't make it easy.

Until we are prepared to cordon off sample areas to conduct surprise counts — and I hope that time is far away — this problem will be with us. The present approach will not tell us much about that gap in the manifests.

"Most important, from my perspective, is the connection between immigration and population."

These remarks are not meant as criticism of the beleaguered Census Bureau. It is forced to work with limited and questionable data. They do very sophisticated demographic analyses, but the analyses are built on a pyramid of assumptions and judgments, and on data sources that are themselves questionable. The cumulative error can become formidable. I hope that the professionals would leap at the chance to spend more time developing hard data, even at the expense of time spent on the theoretical models. In the particular case of the manifests, they haven't leapt yet.

Is It All Really That Important?

In modern societies, relying as they do on statistics, bad data almost insure bad policies. Governments are surprised by urban riots that may be generated in part by worse crowding and more desperate conditions than the official figures — fed by

bad immigration data — suggested. Infrastructure investment, the planning for schools, the allocation of funds among the states and cities, all can go awry if they are based on bad data. Our expectations concerning per capita resource use, income, environmental impacts, are all skewed by bad demographic data.

Most important, from my perspective, is the connection between immigration and population. We stand already at 250 million, and current fertility and assumed immigration levels could take us past 500 million within the next century. Immigration constitutes something like half of present growth (depending on how one counts it), and the proportion is rising. This is one of the few issues truly central to our national future, and it is fundamentally important to know whether we really do understand what is happening.

This essay cannot begin to go again over the grounds for believing that such growth is thoroughly bad for us. The arguments have been set forth elsewhere.[13] Perhaps I can summarize it in a well-worn formula:

I=PCT.

The impacts that a society inflicts upon its environment and its resource base (I) are determined by the size of the population (P) times the consumption levels (C), times the technology coefficient (T). (The equation is really a rule of thumb. It does not account for thresholds and non-linearities, but they usually make the problem worse rather than better, and it is a useful rule.)

Of those three variables, population is perhaps the most fundamental and difficult one to address. Small wonder, then, that it becomes a matter of deep concern if we cannot correctly estimate the size of a principal determinant of population change.

This is not to say that, if we can find unadmitted immigrants, the source should be closed. For example, about 300,000 of the annual "nonimmi-grant" arrivals are students. Many students, notoriously, do not go home. However, those alien students constitute a large proportion — more than half, in some scientific fields — of our current crop of graduate students. It may be a sad commentary on the state of American education, but we need those skills. Perhaps, with better counting, we would have a better fix on just who makes up the immigrant stream, and adjust our quota system according to a clearer vision of who is migrating, and who we want.

We need the best information we can get, not simply to limit immigration, but to fit it to our national needs and priorities.

What Can Be Done About It?

If the nation thinks it important to know how large it is or how fast it is growing, the time perhaps has come for a serious look at the way it collects information — before the 2000 census leads to an even larger proportion of statistical dropouts.

At the simplest level, a serious effort should be made to check out the validity of the gap in the manifests. Let me offer a caveat: the study should involve but not be controlled by the Census Bureau. The Bureau has staked out its position. Specialists tend to circle the wagons when they are challenged, particularly by an outsider. I know. I used to be a specialist. This is too important to be brushed off.

If the gap proves real, it will change our fundamental thinking about a component of immigration that has been almost ignored, and perhaps it will lead to a new look at the even more complicated statistical problem of judging illegal immigration by land.

If the gap proves illusory, the data should be improved. Here, after all, is one of the few potential sources of solid data about one major element of U.S. demography.

"If the gap proves real, it will change our fundamental thinking about...immigration..."

The information in the manifests would be less important if we made better use of available technology in logging people in and out of the country. We should perhaps take a hard look at the way INS collects data on the international movement of people. From the outside, the system seems thoroughly antiquated. It is, after all, a question of inventory management, and there are sophisticated systems throughout the private sector that can do that job remarkably well. One can visualize an integrated, computerized system keeping track of movements, starting with the issuance of visas, continuing through arrival in the U.S., and completed with the logging out of departures, and capable of summarizing the results in a way that can be used by Census. It would probably be cheaper and require fewer hours of hand work than the present process. In 1993, should we still be manually logging I-94s, in and out?

For anybody still professing faith in the present system, consider the total breakdown when President Carter asked INS to locate the Iranian students, or the frenzied efforts last spring to find the passengers who had disembarked in Los Angeles from an airplane that turned out to be carrying passengers from Latin America with active cholera.

If the "manifest gap" or some part of it is real, as I suspect it is, we come to an even more fundamental question: what price do we pay for the peculiarly American aversion to asking people to identify

themselves?

There are 30 million annual arrivals by air and hundreds of millions by land. Keeping track of them, and persuading the visitors to leave eventually, would be a formidable task even with better information systems. The solution is not to try to halt the flow and retreat into a sort of Fortress America. We gain too much from the flow of people and ideas. On the other hand — as I have suggested — we have powerful reasons not to surrender our national right to decide who — and how many — shall acquire the right to live here.

If as a nation we should really decide to control the traffic rather than simply counting it, there is an elegant and straightforward solution: better identification, coupled with laws that permit only those admitted to reside here to hold jobs, obtain professional licenses, or do the other things that only residents should be doing. The required identification presumably would be a Social Security card or a call-in system comparable to those used by credit card companies, but using Social Security numbers.

The "right to anonymity" is not enshrined in the Constitution. In that simpler time, anonymity was hardly a realistic possibility. In practice, we expect to be identified. We voluntarily forego anonymity in all sorts of transactions every day, and we rely on documentation — usually Social Security cards or drivers licenses — to prove who we are.

The civil rights advocate warns that Big Brother will be watching you, and indeed there is a tradeoff, but it is only one of many tradeoffs required as our society becomes bigger and more complex. In fact, the Social Security number is already mandatory, and it is widely used as an identifier. The proposed new use is hardly revolutionary.

Big Brother is watching you, anyway, and the person most likely to profit from the ability to manipulate false identities is unlikely to be doing much good for society. Like million-dollar transactions paid in cash, it is usually an adjunct to some sort of anti-social activity, from the trucker obtaining a new driver's license in another state when he has been convicted of DWI in his own state, to the drug trafficker.

History does not suggest any particular correlation between mandatory identification systems and personal freedom. Despotism has flourished with and without identity cards. On the other hand, most other modern industrial societies have some identity system without infringing on individual rights.

This proposal has been treated at greater length in other papers.[14] For the purposes of this essay, the point is that, with better identification, the flow into and out of the U.S. could continue unimpeded, but the restrictions on employment and perhaps other activities would prevent most would-be back door immigrants from converting an ostensible visit into permanent residence. The information from the aircraft manifests would then be simply a useful check against the computerized log-in log-out process, and perhaps a warning signal when a gap re-emerged.

Until we reach that happy stage, we would be well advised to make better use of the information that lies, unused, at hand. ■

NOTES

[1] Alan Lightman and Owen Gingerich, "When Do Anomalies Begin?", *Science*, Vol. 255, February 7, 1991, pp. 690-695.

[2] Unpublished data through CY 1990 are available through the Center for Transportation Information, DTS-44, Volpe National Transportation Systems Center, Kendall Square, Cambridge, MA 02142, (617) 494-2450. Traffic to and from Canada and Puerto Rico is not included.

[3] Professor Daniel A. Vining, Jr., University of Pennsylvania, in 1982 published a study of net migration suggested by INS/DOT and International Air Transport Association (IATA) passenger manifest data: "Net Migration by Commercial Air: A Lower Bound on Total Net Migration to the United States", published with a rebuttal and counter-rebuttal in *Research in Population Economics*, Vol. 4, pp. 333-360. The pre-1978 data in Figure 1 are drawn from his work. I should, however, note that he went on to the formidable task of attempting an estimate of net migration by air; my purpose is the simpler one of calling attention to data that are dramatically at variance with the current wisdom concerning immigration levels.

[4] *1989 Statistical Yearbook of the INS*, September 1990, p. xxxvi.

[5] *INS 1977 Annual Report*, Table 11, p. 58. The figures do not include traffic with Canada.

[6] The Bureau at the same time raised the estimate of annual emigration from 36,000 to 160,000, thus cushioning the arithmetical impact of recognizing the fact of illegal immigration. The judgement process that led to the selection of the 200,000 figure is detailed in Robert Warren and Jeffrey S. Passel, "A Count of the Uncountable: Estimates of Undocumented Aliens Counted in the 1980 United States Census", *Demography*, Vol. 24, No. 3, August 1987, pp. 375-393. See also Jeffrey S. Passel and J. Gregory Robinson, "Methodology for Developing Estimates of Coverage in the 1980 Census Based on Demographic Analysis: Net Undocumented Immigration", Preliminary Evaluation Results Memorandum No. 114, Bureau of the Census, September 1988.

[7] INS Bulletin #5, April 1990.

[8] *INS 1977 Annual Report*, Table 2, p. 34 and Table 11, p. 58. Internal evidence suggests that the gap was created in part by incomparable series, with "aliens admitted" including certain aliens entering by land and "aliens departed" limited to form I-94 holders leaving by international common carrier, but the documentation is unclear and INS cannot clarify it.

[9] INS, "Detail Run 422. Immigrants Admitted by Port of Entry," assembled annually by fiscal years.

[10] Note that the manifest data are for calendar years; the INS figures are by fiscal years.

[11] I have noticed at least one internal inconsistency. It is negligible in the gross data but (because of the problem of residuals mentioned above) it amounted to about 5 percent of the net gap. This is not sufficient to alter the basic proposition that there is a massive and unexplained gap, and I assume that any errors are more or less random.

[12] Telephone conversations on April 9, 1992 with Terry Denny, IATA-Montreal and Peter Morris, IATA-London.

[13] A list of *NPG Forum* papers is available from Negative Population Growth, Inc. The papers bearing on environment and population are included in Lindsey Grant, *Elephants in the Volkswagen*, (New York: W. H. Freeman & Co., 1992).

[14] David Simcox, *Secure Identification: The Weak Link in Immigration Control* and *Sustainable Immigration: Learning to Say No* (*NPG Forum* papers dated 1988 and 1990, Negative Population Growth, Inc.).