

Winner of the Theodore J. Lowi Policy Studies Journal Best Article Award of the American Political Science Association Public Policy Section

## Subsidizing Migration? Mexican Agricultural Policies and Migration to the United States

Jeronimo Cortina

---

*Migration theories often ignore the role that states play in stimulating migration through public assistance policies. Using the case of Mexico, this article explores the role of the state as a migrant-producing actor by examining the relationship between migration and social assistance policies in the form of monetary cash transfers. It argues that direct, unconditional cash transfers, like those provided by agricultural programs such as Procampo, rather than providing the incentives needed to retain individuals in their home country, may instead be providing the resources needed to migrate, particularly if the amount of the transfer is insufficient to spur investment. Instead of discouraging migration by enhancing economic opportunities and reducing poverty, such policies can actually make it easier and more appealing for its beneficiaries to migrate.*

---

**KEY WORDS:** Mexico–U.S. migration, international migration, unconditional cash transfers, agriculture, public assistance policies

### Introduction

Can a state inadvertently stimulate migration through its social assistance policies? Migration is an expensive undertaking; only those who can bear the associated costs and risks are likely to migrate. However, with the aid of cash transfers granted by government programs, and credits from loan-sharks, poor households are able to overcome their financial constraints and generate levels of income sufficient for migration (Kanbur, 1981). Such transfers make Hirschman's "exit" (1970, 1974, 1978) a real alternative for those who want to leave the country. Put simply, social assistance policies that grant small, direct monetary transfers unconditionally can stimulate migration by creating a new "push" factor in which state resources are used to migrate, rather than serving their intended purpose: providing an incentive to stay.

Using the case of Mexico, this article tests the impact of social assistance policies in the form of cash transfers on migration. In particular, it focuses on the effects of Procampo, a federally administered cash transfer program designed to aid agricultural producers, on Mexican migration to the United States. Utilizing state cash

transfers as an explanatory variable, this study adds to the existing literature by showing that some variants of these social programs indeed correlate with out-migration flows.

From a policy perspective this article focuses on the intervention—the cash transfer, which can, in some cases, produce an effect opposite to the one originally intended. The article also suggests how such programs can be implemented in ways that encourage investment at home rather than stimulate migration. Furthermore, the results point to potential benefits to migrant-receiving states, such as the United States, of assisting in the funding of incentive programs that successfully inhibit migration and promote development in migrant-producing countries such as Mexico.

At the *municipio* level (a *municipio* in Mexico is the equivalent of a county in the U.S.), Procampo is predictive of greater migration up to a certain threshold; that is, the relationship between Procampo and migration takes the shape of an inverse U-shaped curve, suggesting that given certain small amounts of this particular transfer, and due to its unconditional nature, Procampo may not provide sufficient incentives for some people to stay, but instead contributes to out-migration. When the cash transfer amount increases, the relationship between Procampo and migration becomes negative. This means that larger cash transfers appear to help reduce out-migration, plausibly because they provide enough incentives for some people to stay.

At the individual level, after controlling for potential confounders, this article shows that those participating in Procampo were significantly more likely to migrate than nonparticipants. Increased purchasing power is associated with increased migration because it enables households to cover at least some of the initial costs of out-migration.

Among the most evident migration-related costs are transportation and crossing the border. On average, in the years 2000 and 2010, ground transportation from Southeast Mexico to the U.S. border cost between US\$60 and US\$150, while the services of a smuggler ranged between US\$1,500 and US\$2,500, respectively (Hanson, 2006; Roberts, Hanson, Cornwell, & Borger, 2010). At those times the average annual income per-capita in Southeast Mexico was around US\$890, according to the Mexican Ministry of Social Development (SPPE [Subsecretaría de Prospectiva, Planeación y Evaluación], 2002; UNDP, 2005). Thus individuals from the Southeast might have to spend more than twice their total annual income to get across the border. How can people from this area migrate—given their limited capacity to cover the initial costs?

The state, through its social assistance policies, may be contributing to the migration process by subsidizing some of these initial costs. Migrant-sending states may benefit economically from out-migration. Economically, given the magnitude of remittances, migrant-sending states can become dependent on these resources, and thus on migration, to achieve the macroeconomic benefits associated with these monetary flows. At the individual level, the increased likelihood of migration due to having more purchasing power may create a Pareto “optimal situation” via remittances that might not be attainable through welfare policies.

To model county-level migration in relation to resources received via Procampo, a multi-level random intercepts—or fixed effects—model was used to account for state-level characteristics, which include pull factors such as income differentials between Mexico and the United States. To test the impact of Procampo on migration at the individual level, a probit instrumental-variables regression was applied to account for the possible endogeneity between Procampo and migration. The rest of the article is organized as follows: the next section provides a theoretical scaffold describing how incorporating the state, through its policies, can act as a migration-inducing actor, enhancing our understanding of this complex phenomenon. The following section elaborates on the connection between migration and Procampo. Next I describe the data/methodology and the results, ending with a discussion of the findings and their potential policy implications.

### **International Migration and State Policies: Theoretical Considerations**

Rather than an “overall encompassing theory of immigration” (Portes, 1997, p. 10), international migration is better explained through the interaction of an aggregation of complementary theories operating at distinct levels of aggregation (Massey, 1999). As Massey noted, potential migrants engage in cost-benefit calculations (as predicted by neoclassical theories and their proponents);<sup>1</sup> households minimize risks and overcome barriers to capital and credit (as suggested by the new economics of labor migration);<sup>2</sup> both individuals and households draw on social capital and migrant networks to facilitate international movement (social capital<sup>3</sup> and cumulative causation theories);<sup>4</sup> and the socioeconomic context within which migration decisions are made is determined by structural forces operating at the local, national and international levels (as hypothesized by world systems theories).

The treatment of “context,” however, is utterly atheoretical (Zolberg, 1999). It is precisely here that the incorporation of the state and its policies as a migrant-inducing actor provides a reasonable theoretical scaffold upon which it is possible to organize and understand some of the contextual effects within which migration decisions are made.

State policies frame the incentive structure faced by individuals (Ostrom, 2007). Not only do state policies shape the rules and the scenarios within which individuals must act, but they also mold the structure of the community in which the context is created (Kiser & Ostrom, 1982). From a classical political economy point of view, an individual’s choice depends on how he or she perceives the costs and benefits of various choices and their likely outcomes (Radnitzky, 1987), such as migrating to minimize risks or to overcome barriers to access to capital. The choices and likely outcomes, however, are mediated by the rules, scenarios, and contexts that state policies create, which in turn create information about the incentives available to individuals. When state policies generate accurate information about the costs and benefits of a particular outcome—such as whether to stay or migrate—that outcome can be adequately represented as a constrained maximization problem.

Information about the costs and benefits of a particular outcome is mediated by the “action-arena” in which the policy takes place. In the case of social assistance

policies in the form of cash transfers, the conditionality, timing (i.e., rules), magnitude (i.e., scenario) and characteristics of the community to which the subsidy is destined (i.e., the context) play a significant role in determining their impact on migration.

When transfers are made before the recipient is forced to comply with certain conditions or choose his action—that is, before the recipient decides whether to use the transfer for the intended purpose or for another purpose—the recipient will behave like Becker's (1974, 1991) "rotten-kid" (Hirshleifer, 1977, 1985). In other words, if there are no conditions (such as when a transfer is made or how it is to be used) placed on the disbursement of a transfer, then the actions of the recipient do not determine whether or not the transfer is granted. Therefore, the recipient has no incentive to use the transfer for its intended purpose. He or she will instead be free to use it for whatever other purposes maximize his or her own utility. Chami (1996) shows that when, in the context of inter-familial transfers, private information and market risk exist, pre-commitment to a transfer ensures that the recipient will maximize the family's total income. In the context of this article the conditionality of a cash transfer produces similar outcomes in relation to whether or not recipients will use the transfer for its intended purpose.

Using randomized data from Progresa (now known as *Oportunidades*—"Opportunities")—a conditional cash transfer program implemented by the Mexican government with the aim of reducing poverty—Stecklov, Winters, Stampini, and Davis (2003) and Angelucci (2004, 2005) show that on average, Progresa tended to reduce migration levels. Assistance provided by Progresa was dependent upon the recipients' adherence to a particular set of conditions. For example, in order to receive the cash transfer, women need to visit basic health services and attend nutrition counseling meetings. Their children had to be enrolled in school and demonstrate at least 85% attendance during the previous two months. Procampo, in contrast, is not a conditional cash transfer, which allows recipients to use the transfer for whatever other purpose they wish rather than for the intended one.

### **Procampo and Migration**

Procampo was initiated at the end of 1993 to help modernize the Mexican grain-producing sector as a response to the adoption of the North American Free Trade Agreement (NAFTA). Procampo became a "buffer policy" whose purpose was to protect and prepare producers for the imminent trade liberalization, after a 15-year transition period (Merino, 2010). It was designed to allow agricultural producers to freely choose their crops and means of production without creating price distortions, thus permitting them, theoretically, to compete in the global marketplace. Procampo replaced the previous agricultural policy, which was based on a system of price supports and marketing strategies primarily directed towards large-scale producers. One of the main differences between Procampo and the earlier policy was the broad coverage offered by Procampo to Mexico's

estimated 2 million low-income farmers (subsistence and sub-subsistence producers) (Merino, 2010), whose harvests were too small to sell on the market (Fox & Haight, 2010).

Procampo complements individuals' income with a direct monetary subsidy for each hectare (~\$708 MP around \$70 USD for the year 2000 and ~\$963 MP around \$76 for the year 2010) or a fraction thereof registered in the program. Thus the subsidy operates independently of production or volume harvested, putting producers on an equal footing, regardless of their size, in terms of access to the subsidy. The only condition is that the area registered must be cultivated, destined for an ecological project, or exploited for timber or cattle.

Procampo is entirely managed by Mexico's federal government. Each year, producers submit an application to the Ministry of Agriculture's Rural Development Support Center (CADER), which, together with the Social Oversight Committee, reviews applications and supporting documentation and sends applications to the regional office of Agricultural Marketing Support Services (ASERCA), where they are processed and initially approved. After review within ASERCA and at the Ministry's regional offices, applications receive final approval and ASERCA issues checks, which are delivered to producers at the CADER location where they submitted their application.

Cash transfers such as Procampo help to compensate for higher opportunity costs and higher risks experienced by those with fewer resources. Individuals can use cash transfers to invest and earn more, and in so doing stimulate the local economy, which in turn contributes to increased national economic growth.

The issue raised in this article, however, is related to the amount of the transfer and the incentives to achieve this outcome. The magnitude of assistance will directly shape recipients' future expectations and plans—including plans to migrate. Small subsidies that cannot be used productively because of the characteristics of the local market are not going to create enough incentives for people to stay behind. Rather, small cash transfers may ignite the migratory process by providing individuals with resources just sufficient enough to cover the start-up costs associated with migration. The subsidy reduces a household's "capacity constraints" related to the material means to migrate (Hägerstrand, 1975),<sup>5</sup> due to a substitution effect, via increased purchasing power. However, when the magnitude of the transfer increases to a certain level, the subsidy can be used productively and thus serve as an incentive for recipients to remain in their home country (Kanbur, 1981).

### Data, Models, and Results

This section has two purposes. The first is to predict the degree of migration per county by the amount of Procampo benefits received and other controls. The second purpose of this section is to predict the likelihood of migration among those individuals who receive Procampo compared to those who do not.

### *County-Level Migration*

Data for the county-level model was derived from three sources: (i) the 1999 and 2009 census of agricultural producers benefiting from Procampo at the county level; (ii) county-level migration data from 2000 and 2010 (CONAPO, 2002, 2012); and (iii) the 2000 and 2005 county-level human development index data (PNUD, 2005, 2010). These three data sources have been combined in this article into a single, county-level database by year.

The outcome variable is given by the migration index for 2000 and 2010, constructed by Mexico's Population Council, CONAPO. The index is a composite measure derived from a principal components analysis of the 2000 and 2010 Mexican Censuses that measures the migration rate in each county. "This index provides reliable information about the level of U.S. migration prevailing at the county level" in Mexico (MMP, 2011).

The index's four variables encompass the most significant characteristics of the migratory phenomenon. The first is the percentage of households in the country that receive remittances. This variable takes care of potential problems that may have occurred with other operationalizations. For example, if the amount of money remitted had been used as the outcome variable, it could have artificially inflated the rate of migration caused by other factors (such as receiving social assistance income in the United States [Taylor, 2002] or finding a better-paying job).

The second variable is the percentage of households in a county with migrant members of their families in the United States. This variable reflects current migratory patterns in a particular county. The third and fourth variables—the percentage of households with circular migrants (members of a household that migrated to the United States but at the time of the Census were living in Mexico) and the percentage of households with returned migrants (members of a household who in 1995 for the 2000 index and 2005 for the 2010 index lived in the United States but decided to return to Mexico, and at the time of the Census were counted as residents)—measure the extent to which migrant networks may be established in a particular county. Table 1 shows the coefficients of the first principal component used to estimate the migration index for 2000 and 2010.

As shown in Table 1, the range of these coefficients is not significantly wide: 0.07 for 2000 and 0.06 for 2010. The range's magnitude indicates not only the statistical importance of each of these variables in the construction of the index but more importantly their conceptual contribution to the index. Each variable pinpoints some

**Table 1.** Principal Component Coefficients by Variable of CONAPO's Migration Index

Item	First Component 2000	First Component 2010
% Households that receive remittances	0.311	0.304
% Households with migrants in the United States	0.307	0.295
% Households with circular migrants	0.245	0.261
% Households with returned migrants	0.293	0.319

*Source:* CONAPO (2002, 2012).

of the most important mechanisms associated with migration, namely, economic factors (remittances) and migrant networks (households with migrants in the United States and circular and returned migrants). Excluding any of these variables or using them independently of each other would represent a biased or incomplete account of the migratory phenomenon. Overall these variables explain 74 percent and 72 percent of the variance in the migration index for 2000 and 2010, respectively. The migration index can take negative and positive values, meaning “less” and “more” migration. To facilitate the interpretation of this variable, however, without chaining the ordering imposed by the index, this analysis transforms it to a scale ranging from 0 to 100 (see online Appendix A); that is, from nomigration whatsoever (all the variables composing the index would have null values) to full migration (all variables would have a value of 100%).

The main predictor is the amount of the Procampo benefit, in Mexican pesos per county (corporations and associations are excluded because the focus of this article is on the influence of the Procampo program on migration in participating households at the county level). The data comes from the 1999 and 2009 censuses of agricultural producers benefiting from the program (ASERCA, 2001, 2010), so that the temporal priority of the predictor over the outcome variable can be clearly ascertained, thereby avoiding some of the “which came first, the chicken or the egg?” sort of problems that arise when variables are simultaneously determined. In addition to the linear term, the analysis also includes its quadratic version in order to model the hypothesized inverse U-shaped relationship between Procampo and migration. Both the linear and quadratic terms are centered by subtracting the mean from all observations to eliminate multicollinearity problems and improve the interpretability of the coefficients.

As control variables in the model, I used socioeconomic/developmental characteristics of Mexican counties, including the Human Development Index (HDI) to control for obvious differences between counties and to control for potential selection effects in the sense of more developed counties potentially receiving more Procampo. The HDI is a “composite index that measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined gross enrollment ratio for primary, secondary and tertiary schools; and a decent standard of living, as measured by GDP per capita in purchasing power parity (PPP) US dollars” (UNDP, 2005, p. 214).

Other control variables include the *log* of per capita income PPP in USD per county, to control for inter-county differences in personal income; the *log* of total population per county as an indicator of “rural-ness;” the percent of economically active women per county, to control for extent of male migration (as men migrate, more women would become economically active). As an indicator for the most common type of irrigation, a county was given a value of 1 if agriculture primarily relied on direct rainfall (rain-fed farming), or, otherwise, a value of 0. Similarly, a county whose most common crop is maize was given a value of 1; a value of 0 was given otherwise. These two last variables are included to control for degree of rural development. As mentioned, one of the main unique characteristics of Procampo is

its coverage of low-income farmers; that is, those who rely on rain-fed farming and/or plant maize, which represents more than two-thirds of Mexico's agricultural production and half of the total usage of land destined for agricultural purposes (Nadal, 2000). Migration would tend to be higher in those counties where maize and rain-fed farming are prevalent, as compared to those in which irrigation is mainly conducted by mechanical means and maize is not the main agricultural crop. Lastly, in order to control for the quintessential "pull" factor of migration (those that lure/attract people to move), I include the ratio of U.S. to Mexico per capita incomes by dividing the average per capita personal income from the top 10 U.S. states with the largest proportion of immigrants from Mexico<sup>6</sup> (U.S. Bureau of Economic Analysis, 2000, 2010) by each county's average per capita personal income (PNUD, 2005).

Out of the 2,457 counties in Mexico not all are eligible to receive Procampo. This analysis includes only those counties that received Procampo, yielding a sample of 2,345 counties for 2000 and 2,170 for 2010. Some descriptive statistics are presented in Table 2, which shows the mean, standard deviation, and minimum and maximum values for the outcome, predictor, and control variables.

#### *Model and Results: County-Level Migration*

The study predicts migration per county with a varying intercepts per state multilevel model.<sup>7</sup> State effects detect variations not accounted for in the covariates described above. For instance, states vary in climate and rainfall, which determines which kind of crop can be harvested and the amount of land available for agricultural purposes. Also, these effects help absorb other differences in migratory histories and resource allocation per state; the federal government, for instance, may direct more resources to states in which its partisan base is concentrated, to maximize its electoral gains.

The results for 2000 and 2010 are shown in Table 3. The working hypothesis was that Procampo would be found to be positively associated with migration, while its quadratic term would be negatively associated with migration, confirming that the relationship between Procampo and migration is shown by an inverse U-shaped curve. The predictors work in this way: the linear term indicates that a \$1,000,000 pesos (~\$100,000 USD in 2000 and ~\$79,000 USD in 2010) increase per county in Procampo for 2000 and 2010 is associated with a 0.60 percent and 0.36 percent increase in migration, respectively; whereas the quadratic term indicates that a \$1,000,000 Mexican pesos increase per county after the maximum possible value of the curve (estimated at around 43,000,000 Mexican Pesos or \$4,300,000 USD in 2000 and 62,000,000 Mexican pesos or \$4,900,000 for 2010)—holding the other covariates constant—is associated with a -0.08 percent decrease in migration for 2000 and a -0.018 percent decrease in migration for 2010. The magnitude of the increase is quite significant, especially when we take into account that the average migration rates were 2.52 percent and 2.72 percent for 2000 and 2010, respectively (see Table 3).<sup>8</sup>

The coefficient of the HDI suggests that as the development in terms of life expectancy, education, and the standard of living increase, migration will tend to

Table 2. Summary Statistics for County-Level Variables

Variable/Year	Obs.		Mean/Freq.		Std. Dev.		Min.		Max.	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Migration index	2,345	2,170	2.5	2.8	2.7	2.3	0.0	0	19.9	12.7
Procampo (MP\$)	2,345	2,170	3,106,217	2,753,679	6,331,162	9,173,655	708	482	98,100,000	208,000,000
H. development index	2,345	2,170	0.7	0.8	0.1	0.1	0.4	0.4	0.9	0.9
Avg. per capita income (USD)	2,345	2,170	4,408	5,909	2,544	2,788	836	1,467	19,593	25,945
Econ. active female pop (%)	2,345	2,170	0.3	0.2	0.1	0.1	0.0	0.0	0.6	0.5
Total population	2,345	2,170	35,989	38,390	99,995	103,947	109	195	1,622,697	1,485,941
Irrigation (# counties where rain fed farming)	2,345	2,170	2,219	1,161	—	—	—	—	—	—
Maize (# counties where maize predominates)	2,345	2,170	2,060	1,085	—	—	—	—	—	—
US-MEX income differential (times)	2,345	2,170	10	8	6	4	2	2	37	27

Source: Author calculations with data from PNUD, ASERCA, and CONAPO.

**Table 3.** Estimated Coefficients from a Fixed Effects Regression Predicting County-Level Migration, Given Procampo and Other Controls

	2000	2010
Procampo	0.602 (3.99)**	0.361 (3.98)**
Procampo squared	-0.079 (3.07)**	-0.018 (2.61)**
Human Development Index	-0.361 (-0.23)	-4.389 (3.17)**
% economically active female population	0.517 (-0.75)	1.552 (2.26)*
$\log(\text{Total population})$	0.481 (-1.54)	0.893 (3.05)**
$\log(\text{Total population squared})$	-0.054 (3.28)**	-0.067 (4.42)**
Irrigation (1 = rain-fed farming)	-0.323 (-1.43)	-0.264 (3.06)**
Maize	0.089 (-0.52)	0.627 (6.88)**
U.S.-Mex. income differential	-0.083 (4.27)**	-0.085 (3.45)**
Intercept	4.229 (1.97)*	4.042 (2.07)*
N	2,345	2,170
Wald $\chi^2(12)$	191.95	213.51
Prob > $\chi^2$	0	0

z statistics in parentheses.

\* $p < 0.05$ ; \*\* $p < 0.01$ .

decrease. The coefficient of the percent of economically active female population suggests that as men migrate, more women become economically active. The  $\log$  of total population suggests that migration decreases as the population at the county-level increases up to a certain threshold where the relationship is reversed (as indicated by the coefficient of the quadratic term). In other words, migration would tend to be lower in densely populated areas such as major urban centers in comparison to sparsely populated areas, such as rural areas, given the huge gap in the opportunity structure between the two. The effect of rain-fed farming on migration rates in counties where it is the most common type of irrigation tends to be lower than in counties where the most common type of irrigation is mechanical. In counties where maize is the most prevalent crop, migration tends to increase in comparison with counties in which crops other than maize are more prevalent. The coefficient of the U.S.-Mex. income differential indicates that as the income gap grows, that is, as the attractiveness of the United States as a destination country increases, migration tends to decrease. This may seem counterintuitive at first. After all, migrants are more likely to move to more attractive places than to unattractive ones, but as personal incomes from potential migrants decrease so does the probability of migrating since the costs of moving become too prohibitive for many to afford the move.

Those counties above the threshold at which migration decreases as a by-product of Procampo are distinct in several ways. For example, the average HDI

Table 4. Mean Differences between Counties Below and Above Threshold

	2000		2010	
	Below	Above	Below	Above
HDI	0.7	0.76	0.75	0.83
Per capita income (avg. USD)	\$4,395	\$7,166	\$5,890	\$10,271
U.S.-Mex. income differential (times)	9	5	8	4
Arable land (hectares)	4,020	90,130	2,408	111,072

in those counties below the maximum value of the curve (i.e., where the relationship becomes negative) was 0.06 and 0.08 for 2000 and 2010, respectively. The per capita income differences between counties are even more striking: \$2,771 in 2000 and \$4,381 in 2010. The difference in the U.S. to Mexico per capita incomes' ratio was four times smaller in counties above the threshold, while the average arable land was significantly higher in those counties (see Table 4).

#### *Individual-Level Migration*

Knowing the effects of Procampo at the county level takes us only halfway. To investigate whether the state stimulates migration through its social assistance policies, it is necessary to focus on the household level. Data for the individual-level model came from two sources: (i) the November 1997 survey of the socioeconomic conditions of rural Mexican households (*Encuesta de Características Socioeconómicas de los Hogares—ENCASEH*) (PROGRESA, 1997); and (ii) the 1995 census of agricultural producers benefiting from Procampo at the county level. For this study, these two data sets were merged into a single, individual-level database.

The ENCASEH was primarily designed to collect information on the demographic and economic structure of households, the availability of health services, and characteristics of dwellings. The universe was constructed from households/persons belonging to localities that presented significant levels of poverty in the states of Guerrero, Hidalgo, Puebla, Querétaro, San Luis Potosí, Michoacán, and Veracruz. The survey included 24,077 households and 125,674 individual-level observations. The sample of states included in the ENCASEH is ideal to test whether state social assistance policies promote migration in locations where it cannot be fully explained through current migration theories.

The outcome is given by a dichotomous variable that takes the value of 1 if a member of the household migrated during the past 12 months and 0 otherwise (between November 1996 and November 1997). The main predictor takes a value of 1 if the household received Procampo and 0 otherwise. Control variables include the official poverty classification, based on the 2003 official definition applied to the 1997 data. The 2003 (rather than the 1997) definition is used because the 2003 threshold for classifying a household as poor is far more comprehensive than the one used for 1997, which is based solely on a households' ability to cover the minimum official food basket.<sup>9</sup> For 2003, households with per-person income below the level required to purchase the basic food basket and meet educational and health needs were

Table 5. Summary Statistics for Individual Level Variables

Variable	Obs.	Mean/Freq.	Std. Dev.	Min.	Max.
Procampo county-level (pesos)	23,466	14,300,000	15,300,000	28,860	148,000,000
Procampo	23,466	7,920	—	—	—
Poverty classification (1 = poor)	23,466	22,115	—	—	—
Work (1 = worked)	23,466	19,851	—	—	—
Remittances (1 = mig. sends rem.)	23,466	215	—	—	—
Permanent migration (No. of perm. mig.)	23,466	288	—	—	—
Owens a house (1 = house owner)	23,466	20,754	—	—	—
Arable land (1 = has arable land)	23,466	14,677	—	—	—
Nontraditional mig. region (1 = SE region)	23,466	5,763	—	—	—

Source: Author with data from ENCASEH.

classified as poor (CONEVAL, 2006). Also included is if members of the household were employed, if the household received remittances, an indicator variable if the dwelling is owned, and an indicator variable if the household had arable land available for cultivation. This set of variables (poverty, employment, if the household receives remittances, home ownership, and arable land) controls for the economic capacity of the household, which determines its ability to cover some of the costs associated with migration. In addition, in order to control for the effects of migrant networks and chain migration (or lack thereof), I include the number of permanent migrant members of the household and an indicator variable for nontraditional migrant regions in which migrant networks and chain migration should be less prevalent.

Overall, the analysis expects individuals who received Procampo to be more likely to migrate than those who did not receive the cash transfer. For the purpose of this article, I included only international migrants as well as non-migrants, to have a clear beneficiary and control group, discarding 611 household observations (mostly internal migrants or those that migrated before receiving Procampo), yielding a sample of 23,466 observations. Descriptive statistics are shown in Table 5.

#### *Model and Results: Individual-Level Migration*

Given that Procampo is not randomly assigned within the territory nor within the population, we cannot assume that its relationship with migration will be independent. One way to address this lack of independence between Procampo and migration is through the adoption of instrumental variables. Following Ravallion and Wodon (2000), this study used the 1995 county-level amount of Procampo as an instrument to control for the potential endogeneity between Procampo and migration; that is, between the decision to participate in the program with respect to the decision to migrate.<sup>10</sup>

Conceptually, the instrument can be thought of as a randomizer affecting Procampo at the individual level, but not directly affecting migration, except through Procampo at the individual level. In other words, the instrument suggests the plausibility that Procampo is independently distributed.<sup>11</sup> This plausible independence is

reinforced by the administrative procedures by which Procampo is implemented. The Ministry of Agriculture allocates resources across lower-level administrative units that support and provide services for agricultural trading, which in turn allocate funds to a more local operational unit (CADER), which is in charge of distributing cash transfers to producers. This administrative procedure guarantees that individual transfers within a certain geographical area are dependent on the allocation to that particular area, and thus independent of the attributes of other areas participating in the program.

To predict the likelihood of migration among individuals who receive Procampo and those who do not, a cluster probit instrumental-variables regression was used to model the potential endogeneity and the grouped nature of the data at the county level. The model clusters the data at this level of analysis in order to produce robust and correct estimations of the sample-to-sample variability (Wooldridge, 2002).<sup>12</sup> I fit the model to the overall sample, as well as to a subset of the data, in order to test for the effect of Procampo among poor individuals (which should be higher and more statistically significant than among the overall sample). I chose to subset the data rather than including an interactive term between Procampo and the poverty indicator because this would have violated one of the main assumptions of the model: the impact of Procampo on migration is solely through the instrument.

Table 6 shows the results. Column 1 presents the estimates of an ordinary probit, estimating the probability of migrating given Procampo and other controls, with its respective marginal effects, while column 2 presents the estimates from the instrumental-variables probit regression and its marginal effects, in order to simplify interpretation of the coefficients (column 4). Column 5 shows the coefficients from the instrumental-variables probit regression for those classified as poor, and column 6 presents its respective marginal effects.<sup>13</sup>

The results from the Wald test allow us to reject the null hypothesis of exogeneity ( $\rho = 0$ ), suggesting that instrumenting the endogenous variable was the appropriate modeling strategy (not only to obtain credible estimates, but also to avoid conceptual inaccuracies in terms of the theoretical direction of the effect of Procampo on migration, which could have led to a different conclusion).<sup>14</sup> Overall, Table 6 shows that Procampo is associated with a positive and statistically significant effect on migration (column 3); the marginal effect of Procampo on temporary migration—that is, the probability of migration—is around 0.32 (column 4). This implies that, *ceteris paribus*, a person who receives Procampo is 0.32 more likely to migrate than a person who does not receive the cash transfer. The effect of Procampo among poor individuals is also statistically significant; its magnitude is around 3 percentage points higher than that of the overall sample. Poor individuals who receive a Procampo transfer are 0.33 more likely to migrate than wealthier individuals who receive the transfer (column 6).<sup>15</sup>

Not surprisingly, and in line with other findings, those who reside in nontraditional migrant regions are, on average, less likely to migrate than their respective counterparts due, possibly, to the lack of established migrant networks. Those who have more resources were less likely to migrate; for instance, those who own arable land do not, perhaps, need to migrate for work. Those with family members living in

Table 6. Estimated Coefficients from a Probit and IV-Probit Clustered Regression Predicting Individual-Level Migration, Given Procampo and Other Controls

	All observations			Poor		
	Probit (1)	dy/dx (2)	IVProbit (3)	dy/dx (4)	IVProbit (5)	dy/dx (6)
Procampo	0.06 (1.07)	0.01 (1.05)	1.75 (5.36)**	0.32 (2.61)*	1.80 (5.68)**	0.33 (2.66)*
Poverty classification (1 = poor)	-0.45 (-6.34)**	-0.04 (-5.37)**	-0.37 (4.55)**	-0.07 (-6.32)**	—	—
Work (1 = worked)	0.43 (8.57)**	0.04 (6.67)**	0.09 (0.77)	0.02 (0.90)	0.05 (0.42)	0.01 (0.46)
Remittances (1 = household receives remittances)	-0.16 (0.86)	-0.02 (-0.85)	-0.29 (1.76)	-0.05 (-1.64)	-0.21 (-1.20)	-0.04 (-1.16)
Permanent migration (no. of permanent migrants)	0.07 (4.57)**	0.01 (4.38)**	0.06 (5.15)**	0.01 (6.10)**	0.06 (4.21)**	0.01 (5.50)**
House (1 = owns a house)	0.18 (2.62)*	0.02 (2.64)*	0.05 (0.68)	0.01 (0.75)	0.03 (0.42)	0.01 (0.44)
Land (1 = owns arable land)	-0.18 (3.94)**	-0.02 (-3.59)**	-0.95 (6.59)**	-0.17 (-2.90)*	-0.96 (-6.79)**	-0.18 (-2.91)*
Migrant region (1 = nontraditional)	-1.45 (8.81)**	-0.14 (-5.78)**	-1.00 (-4.17)**	-0.18 (-7.13)**	-0.99 (-4.03)**	-0.18 (-7.00)**
Constant	-1.45 (12.93)**	—	-0.90 (3.31)**	—	-1.18 (-3.68)**	—
Pseudo R <sup>2</sup>	.09					
Observations	23,466		23,466		22,115	
Wald test of exogeneity ( $\rho = 0$ ): $\chi^2$ (1)			10.43 $p > \chi^2 = 0.001$		10.98 $p > \chi^2 = 0.000$	

Robust Z statistics in parentheses.  
\*significant at 5%; \*\*significant at 1%.

the U.S. were also more likely to migrate, given that having such a network in place facilitates the migratory process.

### Discussion and Conclusion

In answer to the question raised at the beginning of this article—does the state stimulate migration through its social assistance policies?—this study finds that in the case of Mexican counties, Procampo is positively correlated with more migration to the United States up to a certain threshold, after which the relationship becomes negative. At the individual level, households that received Procampo were more likely to migrate to the United States in comparison to those that did not receive cash transfers. This effect was notably stronger among the poor than among the wealthier. For poor households, cash transfers increase household income and thereby relax budgetary constraints, allowing them to cover some of the initial costs associated with out-migration.

What are the implications of state actions manifested through public assistance policies? The findings suggest that incorporating the state as a migrant-producing actor provides a theoretical foundation by which it is possible to organize and understand some of the contextual effects within which migration decisions are made. State policies frame the incentive structure faced by potential migrants in which they are confronted by the costs and benefits of various choices and their outcomes. In the case of social assistance policies, the conditionality and the amount of the transfer determine the potential impact of such policies on migration. Conditional policies compel recipients to pursue certain actions in order to receive the transfer: in other words a “pre-commitment.” If potential recipients want to receive the subsidy, they need to demonstrate that they have complied with the conditions that make them eligible to receive it, just as our theory predicts. As previous works have shown (Angelucci, 2004, 2005; Stecklov et al., 2003), this conditionality translates into a decreased likelihood of migration. In contrast, unconditional programs such as Procampo, especially when transfer amounts are small, do not provide enough incentives for some recipients to remain in place, and thus tend to contribute to increased migration. In other words, the actions of the state manifested through its public assistance policies shape the context in which potential migrants evaluate the costs and benefits of migrating. Given the lack of pre-commitment, in conjunction with recipients’ private information and market risks associated with the agricultural sector, individuals will seek to maximize their own utility rather than complying with the intended purpose of the subsidy. At the individual level, poor individuals who receive Procampo are more likely to migrate than their counterparts, highlighting Procampo’s unanticipated consequences on migration via a substitution effect. This finding is quite revealing since poor individuals are less likely to migrate, due to their lack of resources. However, once they receive the cash transfer they are *more* likely to migrate, due to the increase in purchasing power.

The results of this article have important policy implications for migrant-sending and receiving countries. They suggest that when direct cash subsidies are small, they may be insufficient for making productive investments and be used instead for

emigration. In Mexico, for instance, the average cost of producing one hectare of maize in highly productive and rich regions of the country during the period of study of this article was around 8,500 pesos (US\$850) (Vega-Valdivia & Moreno, 2004), while the cost of producing one hectare of maize in poor regions of the country, such as Oaxaca, was around 2,750 pesos (US\$275) (Colegio de Postgraduados, 2001). Therefore, the average cost of producing one hectare of maize was around 5,600 pesos (US \$560), and the producer price (the price that producers are paid for their output) was around 1,600 pesos (US\$160) per tonne (FAOSTAT, 2007). On average, a rural producer can harvest three tonnes of maize per hectare; assuming the producer can sell all of his or her production, he or she would earn around 4,800 pesos (US\$480) per hectare. If the producer receives the subsidy, he or she would get 708 pesos in 2000 or 963 pesos in 2010 (US\$70 and US\$76, respectively) per hectare, which would reduce the cost to around 4,600 to 4,900 pesos (US\$370 in 2010 and US\$490 in 2000) per hectare of maize.

Thus, even after the subsidy, the rural producer would experience a loss of around 10 pesos (around US\$1 for 2000 and US\$0.79 for 2010) per hectare of maize harvested and sold per agricultural cycle.<sup>16</sup> With this loss, agricultural producers may not even consider investing thousands of times more than what they could potentially make in order to produce one hectare of maize, and might opt instead to use this subsidy for migration-related costs.

As previously mentioned, migration is costly. On average, the cost of migrating without documents from the Southeast of Mexico to the United States was around US\$2,200 in 2000 and around US\$5,000 in 2010 (including smuggling and transportation costs). Although this amount is almost 2.5 times larger than the average income per-capita in the same region, the premium—that is, the difference between what an immigrant would earn in the United States minus what an immigrant could earn in Mexico—is significant. The average per capita income of an immigrant who has lived in the United States for less than 10 years is around \$12,000 USD (Passel, 2005), while the average income per-capita in the Southeast was around \$890 USD (SPPE, 2002). These figures suggest that an immigrant is going to be better off in the long run if he or she invests the subsidy to cover at least some of the costs associated with migration rather than using it for maize production.

Why has the impact of Procampo on migration decreased over time? First, between 2000 and 2010 the subsidy per hectare increased by 36 percent, which, according to the theory presented in this article, should provide more incentives for people to stay and thus reduce the overall migration rate at the county level. Second, according to a recent Pew Hispanic study (Passel, Cohn, & Gonzalez-Barrera, 2012) the intensified enforcement of immigration laws in the United States has made crossing the border illegally more difficult, expensive, and dangerous. Additionally, the slow-moving U.S. economy demagnetized the jobs magnet, which, coupled with Mexico's economic growth, reduced the attractiveness of the United States.

By increasing the amount of the cash transfer well above US\$70–US\$76 per hectare, the Mexican government could provide sufficient resources to agricultural producers to make their lands profitable, and shift the balance between the decision to migrate or to stay in the home country. Moreover, the results of this article

highlight the fact that the decision to migrate is a byproduct of complex economic, social, and political factors and cannot be simply conceived as a rational choice by an individual, or a reflection of disparities between sending and receiving societies.

The results of this article tap into the “conditionality dilemma” debate. They suggest that the non-conditional nature of Procampo, coupled with private information and market risks, do not provide enough incentives for would-be migrants to use the transfer for its intended purposes.

Any attempt at reforming the immigration system, either comprehensively or not, cannot ignore the regional nature of the issue. That is, migration cannot be “unilaterally” managed. The analysis presented here could also contribute to future policy discussions, especially in countries aiming at managing migration flows, such as the United States and Mexico. For example, the creation of a regional structural fund aimed at rural counties in which migration is not yet a prevalent phenomenon could provide the necessary incentives to transform idle arable land into a productive investment, minimizing the migratory pressure that exists in those regions of the country. Migration will not stop abruptly; in order to arrive at a humane, beneficial, and better-managed migration corridor, a co-development strategy between the United States and Mexico would allow the demand and supply of labor in both countries to arrive at an equilibrium that would be mutually beneficial in the long run.

**Jerónimo Cortina** is an Assistant Professor in the Department of Political Science and the Center for Mexican American Studies at the University of Houston.

### Notes

The author would like to thank Ryan Kennedy, Ralph Chami, TA and the three anonymous reviewers for their time to help improve this article and the Center for Mexican American Studies at the University of Houston for their generous support.

1. See Becker (1964); Borjas (1989, 1994, 1999); Harris and Todaro (1970); Okun (1968); Okun and Richardson (1961); Sjaastad (1962); Todaro (1976).
2. See Stark (1991); Stark and Bloom (1985); Stark and Taylor (1989, 1991); Taylor (1987).
3. See Massey and España (1987); Massey, Goldring, and Durand (1994).
4. See Myrdal (1957); Massey (1990).
5. It is important to note that most migrants, in order to finance their trip from Mexico to the United States, borrow money that they start paying back once they have settled on their destination. This article does not pretend to suggest that with funds granted by these policies immigrants will be able to pay all the costs associated with migration. Rather, this article asserts simply that such funds will enable immigrants to cover at least some of initial costs associated with the travel aspect of migration.
6. I also operationalized this variable by dividing the U.S. average per capita personal income and found no significant differences.
7. The model takes the following form:  $y_i = \alpha_{ji} + \beta x_i + e_i$ .
8. In order to test for potential selection bias in the sense of Procampo favoring more developed counties, I ran a series of multilevel regressions (results available in the online Appendix B) predicting the amount of Procampo at different levels of development (as measured by UNDP's HDI). The results suggest that Procampo does not increase with development. To the contrary, the effects of development on Procampo are not statistically significant as development increases.

9. I also run the regression using the 1997 poverty classification and obtain similar results. Regression results are available upon request.
10. The general model is given by  $y_{1i}^* = y_{2i}\beta + x_{1i}\gamma + u_i \dots (1)$  and  $y_{2i} = x_{1i}\Pi_1 + X_{2i}\Pi + v_i \dots (2)$  where  $i = 1, \dots, N$ ,  $y_{2i}$  is the endogenous variable,  $x_{1i}$  represents the exogenous variable, and  $X_{2i}$  represents a vector of control variables.
11. This means that Procampo is independently distributed from  $u_i$  and  $v_i$  from Eqn. 1 and Eqn. 2 respectively and that they are dependent on  $y_{1i}^*$ , in other words that  $x_{1i}$  was used to determine its value.
12. The statistical analysis is performed with Stata's *ivprobit* command with the clustered option.
13. As a robustness check I also ran the model subsetting the data to households who owned a house or who owned land. The impact of Procampo on the likelihood of migration is also positive, but its magnitude is 16 and 38 percentage points smaller than that of the sample including poor households in line with the hypothesis raised in this section of the article. Regression results are available upon request.
14. The F-statistic and R-Squared for the first stage regressions for the IVProbits reported in columns 3 and 5 are  $F(8, 114) = 108.95$   $\text{Prob} > F = 0.0000$ ;  $R\text{-squared} = 0.2731$  and  $F(7, 114) = 123.75$ ;  $\text{Prob} > F = 0.0000$ ;  $R\text{-squared} = 0.2740$ , respectively.
15. I also ran this model segmenting by those who own land and by those who own a house as proxies for wealth. Procampo has a positive effect on temporal migration, however the magnitude of the effect is smaller than that in poorer households. Regression tables are available upon request.
16. Other authors estimate similar losses of around 10 pesos per hectare when using animal production techniques (see Cruz, Martínez, & Omaña, 2004).

## References

- Angelucci, Manuela. 2004. *Aid and Migration: An Analysis of the Impact of Progresa on the Timing and Size of Labour Migration* (IZA DP No.1187). Bonn: Institute for the Study of Labour.
- . 2005. "Aid Programs' Unintended Effects: The Case of Progresa and Migration." Department of Economics, University of Arizona.
- ASERCA. 2001. *Productores Apoyados de Procampo. Ciclos Primavera-Verano/Otoño-Invierno*. <http://www.sagarpa.gob.mx/agricultura/Programas/proagro/procampo/Beneficiarios/Paginas/2013.aspx>. Accessed February 9, 2013.
- . 2010. *Productores Apoyados de Procampo. Ciclos Primavera-Verano/Otoño-Invierno*. <http://www.sagarpa.gob.mx/agricultura/Programas/procampo/Beneficiarios/Paginas/2012.aspx>. Accessed February 9, 2013.
- Becker, Gary S. 1964. *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*. New York: National Bureau of Economic Research; distributed by Columbia University Press.
- . 1974. "A Theory of Social Interaction." *Journal of Political Economy* 82: 1063–93.
- . 1991. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Borjas, George. 1989. "Economic Theory and International Migration." *International Migration Review* 23 (3): 457–85.
- . 1994. "The Economics of Immigration." *Journal of Economic Literature* 32 (4): 1667–717.
- . 1999. "The Economic Analysis of Immigration." In *Handbook of Labor Economics*, eds. Orley Ashenfelter and David Card. Amsterdam: Elsevier.
- Chami, Ralph. 1996. "King Lear's Dilemma: Precommitment versus the Last Word." *Economic Letters* 52: 171–76.
- Colegio de Postgraduados. 2001. *Evaluación Socioeconómica de Comunidades Indígenas*. México: Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación.
- CONAPO. 2002. *Índices de Intensidad Migratoria México-Estados Unidos*. México: Consejo Nacional de Población.

- . 2012. *Índices de Intensidad Migratoria México-Estados Unidos*. México: Consejo Nacional de Población.
- CONEVAL. 2006. *Aplicación de la Metodología del Comité Técnico para la Medición de la Pobreza 200–2005*. México: Consejo Nacional de Evaluación de la Política de Desarrollo Social.
- Cruz, Artemio, Tomás Martínez, and Jose Manuel Omaña. 2004. "Fuentes de Fuerza, Diversidad Tecnológica y Rentabilidad de la Producción de Maíz en México." *Ciencia Ergo Sum* 11 (3): 275–83.
- FAOSTAT. 2007. "PriceSTAT." Food and Agriculture Organization of the United Nations. Retrieved November 13, 2013 from <http://faostat3.fao.org/faostat-gateway/go/to/download/P/PP/E>.
- Fox, Jonathan, and Libby Haight. 2010. *Subsidizing Inequality: Mexican Corn Policy Since NAFTA*. Washington, DC: Woodrow Wilson International Center for Scholars.
- Hanson, Gordon H. 2006. "Illegal Migration from Mexico to the United States." *Journal of Economic Literature* 44 (4): 126–42.
- Harris, John R., and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two Sector Analysis." *American Economic Review* 60 (1): 126–42.
- Hägerstrand, Torsten. 1975. "Space, Time and Human Conditions." In *Dynamic Allocation of Urban Space*, eds. Anders Karlqvist, Lars Lundqvist, and Folke Snickars. Farnborough: Saxon House, 3–14.
- Hirschman, Albert. 1970. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*, Cambridge, MA: Harvard University Press.
- . 1974. "Exit, Voice, and Loyalty: Further Reflections and a Survey of Recent Contributions." *Social Science Information* 13 (1): 7–26.
- . 1978. "Exit, Voice, and the State." *World Politics* 31 (1): 90–107.
- Hirshleifer, Jack. 1977. "Shakespeare versus Becker on Altruism: The Importance of Having the Last Word." *Journal of Economic Literature* 15: 500–2.
- . 1985. "The Expanding Domain of Economics." *American Economic Review* 75: 53–68.
- Kanbur, Ravi. 1981. "Short Run Growth Effects in a Model of Costly Migration with Borrowing Constraints: Will Rural Development Work?" In *Essays in Microeconomics and Economic Development*, eds. D. Currie, D. Peel, and W. Peters. London: Croom Helm, 386–412.
- Kiser, Larry L., and Elinor Ostrom. 1982. "The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches." In *Strategies of Political Inquiry*, ed. Elinor Ostrom. Beverly Hills, CA: Sage, 179–222.
- Massey, Douglas S. 1990. "Social Structure, Household Strategies and the Cumulative Causation of Migration." *Population Index* 56 (1): 3–26.
- . 1999. "Why Does Immigration Occur? A Theoretical Synthesis." In *The Handbook of International Migration: The American Experience*, eds. Charles Hirschman, Philip Kasinitz, and Josh DeWind, New York: Russell Sage Foundation., 34–52.
- Massey, Douglas S., and Felipe García España. 1987. "The Social Process of International Migration." *Science* 237 (4816): 733–38.
- Massey, Douglas S., Luin Goldring, and Jorge Durand. 1994. "Continuities in Transnational Migration: An Analysis of Nineteen Mexican Communities." *American Journal of Sociology* 99 (6): 1492–533.
- Merino, Mauricio. 2010. "Agricultural Subsidy Programs: The Rationale and Irrationality of a Poorly-Designed Policy." In *Subsidizing Inequality: Mexican Corn Policy since NAFTA*, eds. Jonathan Fox and Libby Haight. Washington, DC: Woodrow Wilson International Center for Scholars, 51–66.
- MMP. 2011. "Mexican Migration Project." University of Guadalajara and Office of Population Research of Princeton University. Retrieved June 25, 2011 from <http://mmp.opr.princeton.edu/>.
- Myrdal, Gunnar. 1957. *Rich Lands and Poor: The Road to World Prosperity*. New York: Harper.
- Nadal, Alejandro. 2000. *The Environmental & Social Impacts of Economic Liberalization on Corn Production in Mexico*. Oxford, UK: Oxfam GB & WWF International.
- Okun, Bernard. 1968. "Interstate Population, Migrant and State Income Inequality." *Economic Development and Cultural Change* 16 (2): 297–313.
- Okun, Bernard, and Richard Richardson. 1961. "Regional Income Inequality and Internal Population Migration." *Economic Development and Cultural Change* 9: 129–43.

- Ostrom, Elinor. 2007. "Institutional Rational Choice: An Assessment of the Institutional Analysis and Development Framework." In *Theories of the Policy Process*, ed. Paul A. Sabatier. Boulder, CO: Westview Press, 21–64.
- Passel, Jeffrey. 2005. *Unauthorized Migrants: Numbers and Characteristics*. Washington, DC: The Pew Hispanic Center.
- Passel, Jeffrey, D'Vera Cohn, and Ana Gonzalez-Barrera. 2012. *Net Migration from Mexico Falls to Zero and Perhaps Less*. Washington, DC: Pew Hispanic Center.
- PNUD. 2005. "Índice de Desarrollo Municipal en México." Programa de las Naciones Unidas para el Desarrollo. Retrieved June 28, 2011 from <http://mmp.opr.princeton.edu/http://www.undp.org.mx/desarrollohumano/disco/index.html>.
- . 2010. "Índice de Desarrollo Municipal en México." Programa de las Naciones Unidas para el Desarrollo. Retrieved June 28, 2011 from <http://mmp.opr.princeton.edu/http://www.undp.org.mx/desarrollohumano/disco/index.html>.
- Portes, Alejandro. 1997. "Immigration Theory for a New Century: Some Problems and Opportunities." *International Migration Review* 31: 799–825.
- PROGRESA. 1997. "Encuesta Nacional de Características Socioeconómicas de los Hogares." Secretaría de Desarrollo Social. Retrieved June 28, 2011 from [http://www.oportunidades.gob.mx/EVALUACION/es/eval\\_cuant/bases\\_cuanti.php](http://www.oportunidades.gob.mx/EVALUACION/es/eval_cuant/bases_cuanti.php).
- Radnitzky, Gerard. 1987. "Cost-Benefit Thinking the Methodology of Research: The Economic Approach Applied to Key Problems to the Philosophy of Science." In *Economic Imperialism: The Economic Approach Applied to Outside the Field of Economics*, eds. Gerard Radnitzky and Peter Bernholz. New York: Paragon House, 283–334.
- Ravallion, Martin, and Quentin Wodon. 2000. "Does Child Labour Displace Schooling? Evidence on Behavioral Responses to an Enrollment Subsidy." *The Economic Journal* 110: 158–75.
- Roberts, Bryan, Gordon Hanson, Derek Cornwell, and Scott Borger. 2010. *An Analysis of Migrant Smuggling Costs Along the Southwest Border*. Washington, DC: Department of Homeland Security.
- Sjaastad, Larry A. 1962. "The Costs and Returns of Human Migration." *The Journal of Political Economy* 70 (5): 80–93.
- SPPE (Subsecretaría de Prospectiva, Planeación y Evaluación). 2002. "Ingresos Municipales: Resultados del Estudio de Imputación entre el Censo de Población y la ENIGH 2000." Secretaría de Desarrollo Social. Retrieved June 28, 2011 from [http://www.oportunidades.gob.mx/EVALUACION/es/eval\\_cuant/bases\\_cuanti.php](http://www.oportunidades.gob.mx/EVALUACION/es/eval_cuant/bases_cuanti.php).
- Stark, Oded. 1991. *The Migration of Labor*. Cambridge, MA: Blackwell.
- Stark, Oded, and David E. Bloom. 1985. "The New Economics of Labor Migration." *American Economic Review* 75: 173–78.
- Stark, Oded, and J. Edward Taylor. 1989. "Relative Deprivation and International Migration." *Demography* 16: 1–14.
- . 1991. "Migration Incentives, Migration Types: The Role of Relative Deprivation." *The Economic Journal* 101 (408): 1163–78.
- Stecklov, Guy, Paul Winters, Marco Stampini, and Benjamin Davis. 2003. *Can Public Transfers Reduce Migration? A Study based on Randomized Experimental Data (ESA Working Paper no.03-16)*. Rome: The Food and Agriculture Organization of the United Nations.
- Taylor, J. Edward. 1987. "Undocumented Mexico-U.S. Migration and the Returns to Households in Rural Mexico." *American Journal of Agricultural Economics* 69 (3): 626–38.
- . 2002. "Do Government Programs 'Crowd In' Remittances?" In *Sending Money Home: Hispanic Remittances and Community Development*, eds. Rodolfo De la Garza and Briant L. Lowell. Lanham, MD: Rowman and Littlefield, 189–212.
- Todaro, Michael P. 1976. *Internal Migration in Developing Countries: A Review of the Theory, Evidence, Methodology and Research Priorities*. Geneva: International Labour Organization.
- UNDP. 2005. "Human Development Report." United Nations Development Program. Retrieved June 28, 2011 from [http://www.sedesol.gob.mx/es/SEDESOL/Informe\\_anual\\_sobre\\_la\\_situacion\\_de\\_pobreza\\_y\\_rezago\\_social](http://www.sedesol.gob.mx/es/SEDESOL/Informe_anual_sobre_la_situacion_de_pobreza_y_rezago_social).

- U.S. Bureau of Economic Analysis. 2000, 2010. Annual. "Regional Economic Accounts, SA1-3 Personal Income Summary." Retrieved April 30, 2013 from [http://www.bea.gov/iTable/index\\_regional.cfm](http://www.bea.gov/iTable/index_regional.cfm).
- Vega-Valdivia, Dixia D., and Pablo Ramírez Moreno. 2004. *Situación y Perspectivas del Maíz en México*. Chapingo: Universidad Autónoma de Chapingo.
- Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.
- Zolberg, Aristide R. 1999. "Matters of the State: Theorizing Immigration Policy." In *Handbook of International Migration: The American Experience*, eds. Albert Hirschman, Philip Kasinitz, and Josh DeWind. New York: Russell Sage, 71-93.

### Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix A. Estimation of CONAPO's Migration Index.

Appendix B. Multilevel Regressions Predicting the Amount of Procampo at Different Levels of Development.