

Fertility Regulation in an Economic Crisis

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Abstract

Substantial international aid is spent reducing the cost of contraception in developing countries, as part of a larger effort to reduce global fertility and increase investment per child worldwide. The importance for fertility behaviors of keeping contraceptive prices low, however, remains unclear. Targeting of subsidies and insufficient price variation have hindered prior attempts to estimate the effect of monetary and non-monetary contraceptive costs on fertility behavior. Using longitudinal survey data from the Indonesia Family Life Survey, we exploit dramatic variation in prices and incomes that was induced by the economic crisis in the late 1990s to pin down the effect of contraceptive availability and costs as well as household resources on contraceptive use and method choice. The results are unambiguous: monetary costs of contraceptives and levels of family economic resources have a very small (and well-determined) impact on contraceptive use and choice of method.

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Introduction

Governments and donor organizations devote substantial resources to making family planning services widely available and affordable, in the belief that effective use of family planning leads to increased investments in children and higher per capita income in low income countries. In 2008, governments, multilateral organizations, private foundations, and non-governmental organizations spent roughly \$3.1 billion on the provision of family planning services in developing countries, but estimates suggest that fully meeting needs for effective contraception would have cost an additional \$3.6 million (Singh et al. 2009). The benefits of planning families wisely are large, but the cost of supplying services is high, and so understanding how couples respond to contraceptive prices is important.

From a user's perspective, the "price" of family planning encompasses not only the fees that are paid, but also the acquisition and evaluation of information about contraceptive methods and the quality and availability of services (Schultz, 1969). Substantial infrastructure investments since the 1960s have made family planning information and services far more accessible across the globe. Accordingly, attention has shifted towards service prices as a key policy lever for achieving program goals. On the one hand, prices are often heavily subsidized so that couples have access to affordable contraception. On the other hand, user fees defray family planning program costs and contribute to assuring the quality of services.

Striking the right balance between family planning program cost recovery versus affordability for clients is key and depends critically on the responsiveness of couples' contraceptive choices to variation in the prices of contraceptives. The fact that contraceptives are heavily subsidized in developing countries presumably reflects the perception that contraceptive use would decline dramatically if prices were allowed to increase. There is remarkably little scientific evidence that speaks to whether this is correct. We address this important open question by examining the impact on contraceptive use of price changes in Indonesia between 1997 and 2000.

Indonesia is ideally suited for this research for at least three reasons. First, over the last forty years, the Indonesian government has invested heavily in the provision of family planning services throughout the country, and is widely credited with making access to services widely available and, thereby, contributing to significant reductions in fertility during this period (Hull, 2002).

Second, the financial crisis during the late 1990s was accompanied, in Indonesia, by dramatic increases in the prices of modern contraceptives, relative to other goods, along with significant shifts in the relative prices of different contraceptive methods. This unprecedented price variation was driven by the collapse of the Indonesian rupiah, which fell from around 2,000 per US\$ in mid 1997 to around 15,000 per US\$ in early 1998, and led to a ten-fold increase in inflation between 1997 and

1998. Moreover, since government budgets were set in nominal terms well before the onset of the crisis, their diminished purchasing power resulted in reduced supplies of subsidized contraceptives. Because the crisis was largely unanticipated, the price variation it produced can be legitimately treated as driven by factors exogenous to contraceptive choices, at least in the short run. The setting thus provides considerable purchase for isolating the effect of price changes on both contraceptive use and method choice. Further, after several decades of sustained economic growth, real resources in the hands of households fell, on average, by around 15% in one year. We harness this large, unanticipated decline in resources to measure the impact of income shocks on contraceptive choice.

Third, we exploit an unusually rich longitudinal survey designed to address this research question. The survey contains not only individual-level information on contraceptive choices and household resources, but also comprehensive information on the array of prices each individual faced, as well as detailed characteristics of the family planning distribution network at the village level. The Indonesia Family Life Survey (IFLS) is an ongoing survey that has been following individuals since 1993. Immediately after the first re-survey in 1997, we designed and implemented a special re-survey of a sub-sample of respondents in 1998 in order to directly assess the impact of the financial crisis. A follow-up of all respondents was conducted in 2000.

The combination of all these factors provides a unique opportunity to pin down the effect of changes in contraceptive costs and household resources on contraceptive behavior. We find that very large changes in prices of contraceptives have little impact on the decision to use contraceptives or on method choice, even among the poorest couples. This is an important result which suggests that reductions in subsidies for contraceptives are unlikely to be accompanied by changes in the contraceptive behavior of couples. We also find that as household resources decline, couples are more likely to use contraceptives although, as with prices, the effect is very modest in magnitude.

The next section provides the conceptual framework for this research and describes our empirical strategy. It is followed by a discussion of the context, data and empirical results.

Conceptual framework and empirical approach

Given the policy relevance of credible estimates of contraceptive price effects, many analysts have sought to quantify the relationship between contraceptive price changes and demand for contraceptives.

When national-level family planning programs were introduced, contraceptives were typically provided free of charge. Early research focused on the impact of charging small amounts for contraceptives. Most studies suggest either that demand for free contraceptives is little different from demand for contraceptives with a low price tag, or that demand is higher if users pay a small

amount for contraception, perhaps because of distrust of free commodities, or because higher prices signal higher quality (see Lewis, 1986, for a review).

A few studies have assessed consumers' sensitivity to variation in prices that is randomly assigned. An early study, conducted in Taiwan, reports that the number of new pill acceptors was twice as large in a town that introduced pills at \$0.13 per strip as in a town in which the price was set at \$0.26 per strip (Cernada, 1982). More recently, Bratt et al (2002) report on an experiment with contraceptive pricing in Ecuador, in which 15 clinics raised their prices for IUD insertions and revisits by different amounts. While their results suggest that IUD usage responds modestly to price changes, it is difficult to draw firm conclusions because the elasticity of demand is estimated very imprecisely.¹

A key advantage of these research designs is that prices were changed specifically for the purpose of studying the effects of those changes on demand. However, the implementation of randomized variation is not straightforward in social science research. Bratt et al (2002) describe some of the sources of contamination in their study. Moreover the studies are conducted in a limited number of sites which contributes to their low statistical power and raises questions about external validity.

Other studies compare observed behavior before and after national-level changes in price, often for contraceptive supplies provided through social marketing programs. In Bangladesh, for example, sales of socially marketed condoms fell by 46% in the year after a 60% increase in prices was imposed (Ciszewski and Harvey, 1994). Although prices of pills distributed through the social marketing program rose as well, the change in pill sales was far more muted.

An important issue that affects interpretation of results from the studies described above is that changes in demand for commodities are reported from the perspective of the supply point at which the price changed. Although demand for particular commodities or services fell at specific supply points, it is not clear whether users switched to other providers or to other methods. If contraceptive suppliers, or contraceptive methods, are good substitutes for one another, then a change in the price of one method at a particular supplier may result in a large change in source of supply or method choice, but in little or no change in overall contraceptive prevalence. Thus, it is difficult to draw conclusions from these studies about the impact of price changes on overall contraceptive prevalence or method mix.

Addressing these concerns requires information on individuals, their use of contraceptives and information on prices for multiple methods and provider types in conjunction with a theoretical

¹ The 95% confidence intervals around estimated elasticities range from zero (indicating no change in demand when prices change) to close to unity (indicating a 10% increase in prices will result in a 10% decline in use).

foundation for modeling behavioral choices made by couples. We draw on an economic model of consumer demand applied to contraceptive choice (Rosenzweig and Schultz, 1996; Schultz, 1997).

Couples make choices over their lives that affect both the timing of births and completed family size. These fertility-related decisions have powerful implications for the couples' own well-being and that of their families. For example, decisions about investments in children — and thus child quality — may partially depend on the total number of children born and on the timing of births. Children may also impact household well-being less directly. On the one hand, children will absorb resources because of their consumption needs and need for time spent raising those children. On the other hand, children may contribute to household well-being by providing labor services, reducing vulnerability to risk through spatial or occupational diversification, altering the distribution of power within the household, increasing security in old age, and generating economies of scale in home production and consumption. Given the magnitude of the lifetime costs and benefits of having a child, we assume couples consider the future when making reproductive decisions.

Contraceptive use and choice of contraceptive method are fundamental mechanisms by which a couple influences total fertility and birth spacing. Couples likely consider preferences regarding the timing, quantity, and quality of children, economic resources and prices, and the long term consequences of childbearing when making decisions regarding contraceptive use:

$$C_{imt} = f_t(p_{mt}^c, p_{mt}, x_{mt}, x_{imt}, \varepsilon_{imt}) \quad [1]$$

where C_{imt} is use of contraception (or a particular method) by couple i , in community m , at time t .

The vector of prices for contraceptives, p_{mt}^c , includes prices of each of the methods available to the couple. Prices are the same within a community but vary over time. We define contraceptive prices broadly since contraceptive behaviors may be influenced by variation in the availability, quality and efficacy of contraceptives, availability and quality of services associated with contraceptives and the user fees for the contraceptives themselves. As a convenient shorthand, we refer to all of these influences as “prices” of contraceptives. Prices of all other goods in the community are p_{mt} , and other community-level characteristics such as infrastructure are x_{mt} . Characteristics of the couple, x_{imt} , include household resources as well as socio-demographic characteristics such as age and education. Unobserved characteristics of the couple and the community, ε_{imt} , include, for example, tastes, health and fecundity of the couple, levels and quality of resources in communities and effectiveness of community leaders in extracting resources from the central government.

Holding utility constant, a price increase will result in either a decrease or no change in the quantity demanded. But utility does not remain constant in the face of a price change. Price increases

reduce the purchasing power of those who buy contraceptives, because maintaining the same level of contraceptive use has become more expensive. The effect on demand of this change is theoretically ambiguous. If the reduction in income induced by the price increase results in increased contraceptive demand, and if the magnitude of this effect more than offsets the utility-constant price effect, then, in theory, a price increase could result in increased demand. Thus, while the direction is theoretically ambiguous, in general we expect contraceptive use to decline or stay the same as the (monetary or non-monetary) cost of obtaining contraceptives increases.

On the one hand, spending on contraceptives is typically small compared with the substantial lifetime costs and benefits of having a child. This suggests that even a sizeable increase in the monetary price of contraceptives may have little impact on the decision to use contraceptives. On the other hand, if households are liquidity constrained, large price increases may result in substantially reduced use of contraceptives. Moreover, if prices decline but are expected to rise in the future, then couples may stock up now. In these cases, demand may be very responsive to prices. Clearly, the magnitudes of the effects of prices on contraceptive choices are fundamentally empirical questions.

Studies have estimated linearized approximations to the contraceptive demand function [1]:

$$C_{imt} = \alpha_0 + \alpha_1 p_{mt}^c + \alpha_2 p_{mt} + \alpha_3 x_{mt} + \alpha_4 x_{imt} + \mu_i + \mu_m + U_{imt} \quad [2]$$

where, for expositional ease, unobserved heterogeneity ε_{imt} is separated into three additive components, $\mu_i + \mu_m + U_{imt}$. The couple-specific effect, μ_i , captures time-invariant differences across couples in lifetime resources, fecundity, tastes for contracepting, family size and so on. The community-specific effect, μ_m , reflects differences across communities that do not change over time such as fixed levels of health and non-health infrastructure, economic and social resources as well as permanent differences in prices that arise, for example, from differences in transportation costs to distributors. Finally, U_{imt} captures all other unobserved heterogeneity that varies over time.

Most studies in the literature have relied on cross-section data to estimate contraceptive demand functions. As an example of a careful study, Schwartz et al (1989) estimate demand for different contraceptive methods with a multinomial logit specification, which allows method-specific price effects. Using data from the Philippines, Jamaica, and Thailand, they report that higher prices for a particular method are generally associated with significantly lower probabilities of choosing that method. They find little evidence of switching methods in response to price differences. Whereas the estimated price effects for pills, IUDs, and sterilization are small, condom use is considerably more sensitive to price differences. The model estimated for the Philippines includes the choice not to contracept. Those results suggest that differences in prices have only a small, albeit significant, association with overall contraceptive prevalence.

A similar estimation strategy is adopted by Akin and Rous (1997), also using data from the Philippines. They find that method price is *not* statistically significantly associated with contraceptive choice. The authors conclude that either measurement error in prices swamps the effects of prices on demand for contraceptives, or, in contrast with Schwartz et al (1989), prices do not significantly affect the choice of a contraceptive method.

More generally, there is substantial variation in estimated price effects among studies that exploit cross-sectional variation in prices. While this may be due to measurement error in prices and heterogeneity in study populations, it is possible that it may be attributed to the empirical methods themselves. In particular, there are legitimate questions about whether the reasons underlying spatial variation in contraceptive prices observed in cross-section data may affect interpretation of estimated price effects (Rosenzweig and Wolpin, 1986).

For example, it makes sense for policy makers to target family planning program subsidies to the places where the impacts will be largest. If the goal is to increase contraceptive use, then subsidies will tend to be targeted to communities where contraceptive prevalence is low. Studies that fail to take into account non-random placement of family planning subsidies will yield upwardly biased estimates of the impact of prices on contraceptive prevalence. This may explain the observation that higher prices are sometimes associated with greater use (Lewis, 1986).²

The nature and direction of non-random program placement is likely to vary from context to context. In some cases, family planning programs may be disproportionately allocated to areas where health services are well-developed and contraceptive use is high, possibly for political reasons or because well-connected advocates for resources are more likely to live in areas with more resources. In those instances, estimated price effects will be negatively biased.

Without an understanding of the processes that underlie geographic variation in prices of contraceptives, it is difficult to know how to interpret estimated price effects based on cross-section data. Contraceptive price outcomes reflect the decisions of multiple actors including users, producers, sellers, non-government organizations and government agencies. Both variation in market structure and the nature and extent of family planning subsidies across contexts potentially contribute to the heterogeneity in estimated price effects in the literature.

It is evident from [2] that a legitimate empirical concern arises if a covariate in the model is correlated with an unobserved factor that affects contraceptive demand. This is the case in the examples described above, since family planning program resources, which are not observed, affect

² Molyneaux and Gertler (2000) suggest family planning services have been targeted in this way in Indonesia where cross-section studies document that contraceptive use is lowest in areas with the strongest family planning programs (Lerman et al, 1989; Molyneaux, Pandi and Wibisono, 1990; Wirakartakusumah, 1988).

prices of contraceptives which, in turn, affect use. To the extent that the allocation of family planning resources across communities is fixed, in relative terms, over time during the study period, its impact on estimates of price effects will be absorbed by the community fixed effects, μ_m , in which case estimated effects in [2] will be unbiased. This approach amounts to examining the association between changes in prices and changes in contraceptive use, which calls for longitudinal data at the community level. More generally, models that include community fixed effects will provide unbiased estimates of price effects as long as all unobserved variation that affects contraceptive use is common within each community and fixed across time. These methods have not typically been applied to estimate the impact of prices on contraceptive use, although the strategy has been used to address the more general question of how family planning program inputs impact fertility in Indonesia (Gertler and Molyneaux, 1994; Pitt, Rosenzweig and Gibbons, 1993) and Thailand (Schultz, 1997b). Neither analysis documents a strong link between family planning program inputs and fertility.

The assumption of community-specific fixed effects is not innocuous. For example, assume that some people within a community (say the poor) have access to subsidized services while others do not. If the composition of these groups changes (because of an economic shock, for example), it is unlikely that unobserved heterogeneity can be treated as fixed within communities. The same issue arises if people who move (into or out of the community) have different attitudes towards contraceptive use relative to those who do not move. This might arise, for example, if movers and stayers have different tastes for numbers of children or for investments in the human capital of their children. The economic crisis was accompanied by significant geographic mobility, with poorer families with more children tending to move to rural and lower cost locations after the collapse of the Indonesian economy. In order to directly address these concerns, the empirical models estimated below include couple-specific fixed effects, μ_i , which absorb all unobserved characteristics of couples that do not vary during the study period. These estimates, which are robust to changes that occurred in communities around the time of the crisis, underscore the value of repeated observations on the same couples in IFLS.

Estimates of price effects based on these models will be unbiased if there are no unobserved characteristics that change during the study period and also affect contraceptive use and prices (or any other covariate). This assumption has been relaxed in innovative studies that examine the impact of family planning programs on fertility. For example, Molyneaux and Gertler (2000) exploit the political economy of family planning program resource allocations in Indonesia to create instruments for allocations which, they argue, are set at the province level. Thus, any increase in resources allocated to one area within a province is offset by a decline in another area within the same

province. They find that fertility declines as levels of funding for family planning programs rise although the estimated effects are small in magnitude. Angeles, Guilkey and Mroz (1998) jointly model the allocation of family planning programs and determinants of fertility where prior year allocations of resources identify current allocations. Neither of these studies addresses the question of whether contraceptive use responds to price changes.

We take a related, but different, approach to address the fact that family planning subsidies are potentially endogenous and exploit a unique feature of our context. The Indonesian financial crisis, which was both very large and largely unanticipated, had a dramatic impact on real levels of resources available to family planning programs. Nominal resources were allocated during the government budget cycle in mid-1997 prior to the onset of the crisis. The combination of high rates of inflation and subsequent budget cuts — all of which were unanticipated at the start of the budget cycle — substantially reduced the real purchasing power of public resources and, therefore, resulted in large and unexpected increases in the prices of contraceptives that couples faced. It is these changes that underlie our identification of the effects of prices on contraceptive demand. Before turning to the estimates, the next section describes the context more fully.

Context

Notwithstanding the economic crisis of the late 1990s, socioeconomic development in Indonesia has improved significantly over the past four decades. From 1967 to 1997 Indonesia's per capita gross domestic product (GDP) increased by almost 5 percent per year. At the same time, Indonesia achieved nearly universal enrollment in primary school and reduced the infant mortality rate by about two-thirds. Fertility declined as well, from 5.9 in the late 1960s to 2.8 in 1997 — a fall ascribed to several different factors: economic growth, rising levels of education and women's labor force participation, increases in age at marriage, and a strong national family planning program (Gertler and Molyneaux, 1994; Hull, 2002).

Indonesia's National Family Planning Coordinating Board (BKKBN) has won numerous accolades and is often cited as a model for family planning programs in the developing world (Hull, 2002; Warwick, 1986; World Bank, 1990). BKKBN coordinates a number of activities designed to provide a full range of contraceptive services at a high level of quality and to reduce fertility (Hamidjoyo and Chauls, 1995; UNFPA, 1998; Wilopo, 1997). Central objectives include promoting the small family norm, educating women about family planning, recruiting village-level family planning volunteers, and working with the Ministry of Health (MOH) to distribute contraceptives and to organize outreach efforts (Hugo et al, 1987; Suyono, 1988; United Nations, 1991).

For much of the 1970s and 1980s contraceptives were typically available free of charge.

Beginning in the late 1980s the “Blue Circle” social marketing campaign encouraged users to purchase contraceptives from the private sector (which has routinely charged for services), while the “KB Mandiri” (family planning self-motivation and self-sufficiency) movement pushed users to pay small fees for methods still subsidized by the government (Jensen, 1996; Mependuduk/BKKBN, 1998; Sihombing, 1994).

Demographic and Health Survey (DHS) data indicate that efforts to encourage “self-sufficiency” in family planning have had an impact. By 1997 more than half of all contraceptors relied on the private sector for supplies, and only 16% of users received contraceptives for free (Central Bureau of Statistics, 1998).

The primary methods supported by BKKBN are oral contraceptives, injections, implants, intrauterine devices, male and female sterilization, and condoms. Methods that require a clinical setting, such as implants and IUDs are available from government health centers (physician-headed clinics that provide subsidized primary health care), private practitioners (doctors, midwives, and nurses), and government and private hospitals. Some of these providers also offer sterilization.

Methods that do not require a clinical setting are available at both the fixed-site clinics and private practices described above and at commercial pharmacies and community-based distribution points. Community-based distribution of family planning has long been a hallmark of the Indonesian program. Early on, BKKBN hired family planning fieldworkers from local communities to cultivate new acceptors and distribute those resupply methods that require no medical training. As use grew, fieldworkers could no longer handle resupply. Local volunteers were recruited to administer village posts that distributed condoms and pills supplied by family planning fieldworkers (MOH, 1990; Shiffman, 2002). These “Integrated Service Posts” (*posyandu* or community health posts) take place once per month. They are organized by neighborhood volunteers and attended by reproductive-age women and children under five. Ideally the posts are also attended by health center staff and family planning fieldworkers. If trained health workers are present the posts provide contraceptive injections. Otherwise oral contraceptives and condoms are available (Kosen and Gunawan, 1996).

Indonesia’s well-organized system for making family planning widely available was dealt a harsh blow by the economic crisis of the late 1990s. The Indonesian Rupiah came under pressure in the latter part of the year, falling from around Rp2,400 per US\$ in July to about Rp4,800 by December of that year. In January 1998, the Rupiah collapsed, to Rp15,000 per US\$, and continued to fluctuate wildly in value for much of the rest of the year, stabilizing around Rp10,000 per US\$ (Frankenberg, Beegle and Thomas, 1999). Sharp increases in prices accompanied the financial chaos. Estimates by the Central Statistical Bureau put annual inflation at about 80 percent in 1998. The subsequent two years were less chaotic, and by 2000 the per capita growth rate in GDP had

rebounded to 4.5%, although the exchange rate remained at about Rp9,000 per US\$ (Strauss et al, 2004).

Changes of this magnitude have the potential for substantially affecting supply of and demand for family planning services. The higher exchange rate resulted in higher prices for imported supplies, and a lack of confidence in the banking sector prevented domestic pharmaceutical companies from obtaining credit to import raw materials necessary to manufacture products. Contraceptive manufacturers discussed rising prices with the government, early projections forecast a shortfall in funds necessary to meet the country's needs for contraceptive commodities, and BKKBN could no longer routinely fill health centers' requests for supplies to meet anticipated supply needs (UNFPA, 1998).

In 1998 the Indonesian government took several steps to deal with supply-side factors that might impinge on access to contraceptives. One strategy involved prioritizing the use of subsidized foreign exchange for the procurement of raw materials so that Indonesia's domestic pharmaceutical industry could maintain production (Lieberman, Juwono and Marzoeki, 2001). Another strategy involved obtaining funding for (and in-kind donations of) contraceptive commodities from bilateral and multilateral development organizations (UNFPA, 1998).

As these efforts were getting underway, policy makers turned their attention to concerns that supply-side changes would reduce contraceptive use, induce switches to cheaper methods, and increase reliance on subsidized public providers rather than private providers. A second round of policy responses focused on maintaining levels of demand. Efforts to encourage users to pay for an ever-greater share of contraceptive costs were suspended (UNFPA, 1998). As part of a more general social safety net program, poor households were issued cards that provided them access to free health and family planning services. These social safety net measures were funded by loans put in place during the 1998/99 fiscal year but were slow to get off the ground (Sumarto et al, 2001).³ Our data (described below) indicate that, as of late 1998, only about 3 percent of households were in possession of cards entitling them to free health and family planning services.

With the onset of the crisis, the price of contraceptives rose because contraceptives are typically imported or produced domestically using imported inputs. Although BKKBN has a track

³ The health card program began in 1994 giving health cards to the poorest 20% of Indonesia's villages and village leaders distributed the cards to poor households within their villages (Gibbons, 1995). In 1998 plans were laid to strengthen the program and to adopt BKKBN's "pre-prosperous" classification system as the criteria for giving out health cards. According to this system, a household is "pre-prosperous" if any of the following are not true: all household members are able to practice their religious principles, all household members are able to eat twice a day, all household members have different sets of clothing for home, work, school, and visits, the largest floor area of the house is not made of dirt, and the household is able to seek modern medical assistance for those who are sick and for family planning (Sumarto et al, 2001).

record of successfully allocating family planning resources toward those areas with greatest need, this process is implemented via a series of meetings taking place at several geographic levels over the course of the year preceding resource allocations (Molyneaux and Gertler, 2000). The allocations for 1998 were determined in the first half of 1997, prior to the crisis, and were not changed in response to the crisis. Thus changes in contraceptive prices between 1997 and 1998 are primarily due to changes in the exchange rate rather than changes in the allocation of government resources. The empirical results presented below exploit this fact. The empirical models measure the impact of crisis-induced changes in contraceptive prices on contraceptive use and method choice for the same couples before and after the crisis. The couple-specific effects included in the models absorb time-invariant factors that might affect contraceptive choices such as long-run resource availability and education as well as the longer-run allocation of resources for family planning and health infrastructure and services (to the extent these effects can be treated as linear and additive).

The crisis was accompanied by very large declines in income for most households, with the average real wage declining over 40% between 1997 and 1998. We thus include time-varying household resources, measured by *per capita* household expenditure (PCE), in the models. This serves two purposes. Controlling PCE will assure that estimates of price effects are not contaminated by income effects and the models provide estimates of the impact of income shocks on contraceptive use. Our estimates of price and income effects on contraceptive use will be unbiased under the assumption that there are no other unmeasured time-varying factors that affect prices, family resources and contraceptive use.

This assumption seems plausible for changes between 1997 and 1998. It is more controversial several years after the onset of the crisis. By 2000, families had adjusted their lives in response to the economic shock. Public family planning resources may have been redirected toward the areas that were particularly hard hit by the economic downturn, or toward particularly price-sensitive areas.⁴ To the extent that targeting was not directed towards people who were more (or less) inclined to use contraceptives, our estimates for changes between 1997 and 2000 will not be contaminated by the policy choices. With this caveat in mind, we present estimates of price and income effects as the crisis unfolded and over the longer term with the latter providing insights into the timing and duration of behavioral responses to the crisis.

⁴ The health card program represents an effort to target particular households thought to be price-sensitive. It is unclear whether the households who meet the criteria for receiving a health card actually are price-sensitive. Suryahadi, Suharso and Sumarto (1999) show that 75% of 'pre-prosperous' households are 'non-poor' by an indicator of poverty based on expenditure level. In the next section we discuss results from a test of differential price-responsiveness on the part of individuals in households with a health card.

Data

IFLS is a longitudinal survey that has elicited health and socioeconomic information from a sample of Indonesian households over the past fifteen years. The first wave, IFLS1, was conducted in 1993 and interviewed 7,224 households across 13 Indonesian provinces. The first follow-up, IFLS2, was conducted in 1997 and re-interviewed at least one household member from 94% of households interviewed in IFLS1. In 1998, IFLS2+ was designed and implemented specifically to capture the immediate impacts of the economic crisis. The sample consisted of all respondents interviewed in a sub-sample of about one-quarter of the original IFLS enumeration areas.⁵ IFLS2+ re-interviewed at least one household member from 99% of the eligible households interviewed in IFLS2. The third wave, IFLS3, was conducted in 2000 and included the entire sample of IFLS respondents. At least one person was re-interviewed from 96% of those households interviewed in IFLS1 or IFLS2.

For the purposes of this paper a key strength of IFLS is that, in addition to detailed information about respondents' use of contraceptives and their resources, data are collected on infrastructure, resources, and services at the community level.⁶ Data on the monetary and non-monetary costs of contraceptives are obtained from a sample of government, private, and community facilities that provide services in the area. Health facilities that were visited and interviewed were selected from lists compiled from household survey respondents' answers to questions about knowledge of facilities. In each community the most frequently mentioned government, private, and community facilities were interviewed, and additional facilities listed by the household respondents were selected at random.⁷ In 1998 interviewers were instructed to reinterview the facilities interviewed in 1997. If a facility could not be recontacted, interviewers added a new facility based on a recommendation from the community leader. In 2000 the sampling procedure used in 1997 was repeated. Approximately 12 facilities are interviewed per IFLS community.

Drawing on data from the facility surveys, Table 1 describes availability and service charges of contraceptives aggregated to the community level, distinguishing private practices, health centers

⁵ The sample of enumeration areas for IFLS2+ was drawn in two stages. First, to reduce costs, 7 of the original 13 IFLS provinces were selected (West Nusa Tenggara, Central Java, Jakarta, West Java, South Kalimantan, South Sumatra, and North Sumatra). Second, within these provinces, enumeration areas were purposively selected to match the IFLS sample as closely as possible. The households selected for IFLS2+ cover the full spectrum of socioeconomic status and economic activity represented in the larger sample and achieve over 80% efficiency.

⁶ A community is defined as a *desa* (village) in rural areas or *kelurahan* (neighborhood) in urban areas. At baseline, IFLS covered 313 communities of which 90 were included in IFLS2+.

⁷ Sampling from a list of providers compiled from household respondents avoids imposing an arbitrary catchment area boundary. In each community the geographic area from which facilities are drawn is the area that is relevant for a random sample of individuals (those who respond to our household survey) who live there. The facility need not be located within the administrative boundary that defines the village, although in many cases it is.

and health posts. To measure the immediate impact of the financial crisis, comparisons are drawn between 1997 and 1998 for those communities included in IFLS2+ (Panel A) and between 1997 and 2000 for all IFLS communities to provide insights into longer term changes (Panel B).⁸ For each facility type, if any facility in the community provides the method, it is assumed to be available. Service charges, or prices, are calculated separately, by provider type, for oral and injectable contraceptives. The prices cover the median user charges for three months of supply – that is, three strips of pills (for oral contraceptives) or one shot (for injectables) from the provider type in the community.⁹ All prices in the tables are denominated in thousands of Rupiah and converted to December 1996 Rupiah using a monthly, regional consumer price index published by *Badan Pusat Statistik* (BPS).¹⁰

Oral and injectable contraceptives were effectively universally available from both private providers and health centers in 1997 and there was very little change in availability from these providers through the crisis. Pills were available from health posts in about 85% of communities in 1997 and 1998 but in only two-thirds of communities by 2000. This is the only significant decline in availability at the community level. Injections were available from health posts in about half the communities throughout the study period. Whereas availability was little affected by the crisis, this is not the case for prices.

The economic crisis was accompanied not only by large changes in the real costs of contraceptives, but also substantial shifts in the relative costs of methods by provider type. Between 1997 and 1998, the median price of oral contraceptives from private practices declined by over 1,000 Rp (or 25%) and by over 500 Rp (or 30%) from health centers, while remaining stable at health posts. During the same period, the prices of injectables increased, especially in health centers and health posts (where prices rose around 20%). In 1998, oral contraceptives were substantially less expensive than injectables for every provider. In sharp contrast, between 1998 and 2000, the prices of injectables changed very little while the prices of oral contraceptives reversed course and rose. By

⁸ Columns 1 and 4 differ because the former is based on the subset of communities in IFLS2+ and the latter is based on all IFLS communities. None of these differences in availability or service charges is significant.

⁹ Median prices are conditional on the method being available in both years. If availability or median service charge is missing for a community, we impute using the value observed in that same community in the previous (or subsequent) wave. This happens in up to five communities for the 1997-1998 panel, depending on the method and facility type, and in up to ten communities for the 1997-2000 panel. When availability or service charge is missing in both waves, we impute the value using the sample mean. This happens for no more than two communities, regardless of method and facility type.

¹⁰ The index is based on prices collected from urban centers (44 cities across the 27 provinces of Indonesia) and is generally regarded as the best available price index. Inflation in rural areas in 1998 may have been slightly higher than inflation in urban areas, which will potentially overstate price increases. The rural-urban differences are estimated to be no more than 5% (Thomas et al, 1999) and, to a large extent, will be absorbed by the fixed effects in the regression models.

2000, pills were significantly more expensive than they were in 1997 for every provider type and, at private practices, pills were more expensive than injectables.

In sum, the crisis was accompanied by a dramatic and immediate shift in the relative cost of available contraceptive methods, with oral contraceptives becoming much less expensive relative to injectable contraceptives. Over the longer run, service charges for oral contraceptives caught up so that there was an overall increase in the real price of using contraception. While service charges are lower at public than private facilities, government was unable to shelter public facilities from the increasing cost of contraception so the private-public gap declined over the time period. The changes in prices are driven by the combined impact of the collapse of the rupiah (and thus cost of inputs, most of which are imported), the stocks that existed in Indonesia as the crisis unfolded, and the impact of the crisis on subsidies from the public sector.

Panel 1 of Table 2 provides evidence on whether these substantial shifts in prices were accompanied by changes in contraceptive use and method mix. We focus on women who were 15 through 49 and married at the time of each survey. Women interviewed in both 1997 and 1998 (in the sub-sample of IFLS2+ communities) are included in Panel A and all women interviewed in IFLS in 1997 and 2000 are included in Panel B.¹¹

Overall, contraceptive use hardly changed, with about 6 out of every 10 women using any contraceptive method in each survey year. Underlying this stability are some modest changes in method use and sources of contraceptives. At the onset of the crisis in 1998, changes in the fraction of women using pills or injections were insignificant, but a small, significant increase occurred in the use of other methods.¹² As the crisis unfolded, use of pills and injections declined significantly as women switched into IUDs and implants.

There was also a movement away from public providers (health centers and health posts) towards private providers. The decline in the fraction of women who obtained contraceptives from health centers was rapid (taking place between 1997 and 1998 when availability changed very little but prices rose relative to the private sector) and the decline at health posts occurred after the onset of the crisis (between 1998 and 2000, when availability also declined).

Prices were not the only thing that changed dramatically during the crisis – household resources also collapsed. As shown in panel 2 of Table 2, real monthly household PCE fell by about 15% during the first year of the crisis and remained constant in real prices for the following two

¹¹ Of 15-49 year old married women interviewed in 1997, 96% were re-interviewed in 1998 and 91% were re-interviewed in 2000. Extending the sample to include those not interviewed in two waves has no substantive impact on the magnitude or significance of the estimates.

¹² In 1997, intra-uterine devices (IUDs) accounted for about 50% of the other methods; implants and female sterilization accounted for about 20% each.

years. This is an unprecedented and arguably unanticipated decline in resource availability for the average Indonesian.

It is useful to put the magnitude of the contraceptive prices in perspective. On average, real household PCE was over 130,000 Rp per month in 1997, while sample average community-median contraceptive service charges ranged between about 500 Rp and 1750 Rp per month of service, depending on the type of facility and contraceptive used. In other words, the typical contraceptive service charge in 1997 ranged from between 0.4% and 1.3% of household PCE.

Given the very large changes in prices and resources, and the muted changes in contraceptive use, Tables 1 and 2 suggest the price and income elasticities of demand for contraceptives are very small. We turn next to multivariate regression models to directly measure these elasticities.

Regression results

Regression estimates are presented for empirical models designed to identify the effects of contraceptive prices and household resources on both overall use of contraception and on method choice. The main results, reported in Tables 3 and 4, exploit the longitudinal dimension of IFLS. Estimates in Panel A of each table use the sub-sample of respondents interviewed in 1997 and 1998 and measure the effect of unanticipated changes in contraceptive prices that arose because of the crisis. Results for the full sample of respondents, interviewed in 1997 and 2000, are reported in panel B of each table.

All models include a couple-specific fixed effect so that the estimates should be interpreted as the impact of innovations in prices and incomes on contraceptive choices. More generally, the fixed effects absorb time-invariant unobserved heterogeneity that might contaminate estimated price and income effects including a couple's fecundity, tastes and fertility goals as well as the placement of reproductive health services and geographic distribution of subsidies.

Following Table 1, contraceptive prices are construed broadly to include whether a specific method is available in the community as well as the community-level median service charge for that method (conditional on it being available). Table 3 reports results for community-level prices of pills and injections; Table 4 distinguishes the source of each of these methods.¹³ Because the distribution of prices is long-tailed, and because some prices are zero, the regressions include the square root of

¹³ Community and facility information is not available for individuals who were not living near an IFLS community because they had moved to a different location. These individuals are assigned the community characteristics of their location as of 1997 (or as of 1993 if the individual had already exited their initial community by 1997). By 1997, 7% of female ever married household members aged 15–49 lived outside of an IFLS community. Among those interviewed in both 1997 and 1998, 3% moved away from IFLS communities between waves. Among those interviewed in both 1997 and 2000, 6% moved away from IFLS communities between waves.

prices (which approximates a logarithmic transformation for positive prices). All standard errors and test statistics are bootstrapped taking into account clustering of surveys.

In general, greater availability of methods should result in either higher use or no change in use whereas higher service charges should result in either lower use or no change. Predictions are more complicated for method-specific use. An increase in the service charge for a particular method, holding constant the prices of all other methods, should result in either a decline in use of that method or no change. Under the reasonable assumption that methods substitute for one another, there will either be no change in use of other methods or a compensating increase in use as couples switch to the relatively less expensive method.

Column 1 in each panel of Table 3 displays the estimated effects of availability and the square root of service charges on contraceptive use (relative to not using any method). The second set of columns in each panel displays estimates from seemingly unrelated regressions of the effect of contraceptive prices on the demand for oral, injectable, and other contraceptive methods, where no method is the omitted group.¹⁴

Large swings in contraceptive prices around the time of the crisis had only small effects on contraceptive use. Specifically, changes in the service charges for pills and injections had no impact on overall use of contraceptives (column 1 of each panel). Method mix, however, did respond to the changes in service charges (as indicated by the joint χ^2 test at the foot of the table) although none of the estimated price effects is individually significant or substantively large. For example, between 1997 and 1998, the service charge for injections rose by about 15% on average. The models predict a 0.5 percentage point decline in injection users and a 0.9 percentage point increase in pill users. The price effects are even smaller between 1997 and 2000.

No change in availability of contraceptives occurred between 1997 and 1998 (and so those controls are not included in the models in Panel A), and only small changes in availability occurred between 1997 and 2000. None of these changes is significant (individually or jointly), although these estimates are poorly determined.

Table 1 established substantial heterogeneity in changes in prices and availability of contraceptives by provider-type within the IFLS communities. It is possible that by ignoring this heterogeneity, we have masked adjustments to changes by users. This possibility is explored in Table 4, which distinguishes prices and availability by source.

¹⁴ Other contraceptive methods include IUD, diaphragm, condom, sterilization, and traditional methods. All models are based on ordinary least squares and so, by construction, for each covariate, the estimates in columns [2] sum to the estimate in column [1]. Our conclusions are substantively the same for logit models.

Neither overall contraceptive use nor method choice was affected by changes in the service charges for or availability of pills or injections between 1997 and 1998, either individually or taken together. Between 1997 and 2000, changes in the service charges for injections are not associated with changes in use or method choice. In fact, the only prices that have a significant impact on contraceptive choices are source-specific pill service charges and these effects are, again, small in magnitude. Higher costs of pills from health posts resulted in a modest reduction in use of modern methods as women stopped using pills and injections. Higher costs of pills from other providers had no impact on overall use but were accompanied by switching into methods other than the pill (injections when prices were higher in health centers and other methods when prices were higher in private practices).

Recall that pill availability in health posts declined considerably between 1997 and 2000 with 15% of communities no longer having a health post that stocked pills. We estimate that those in communities where pills were no longer available experienced a 7 percentage point reduction in the use of modern methods – split equally between pills and injections. This result should be interpreted cautiously. While it is plausible that this reflects the causal effect of availability, we cannot rule out that changes in supply responded to changes in demand.

In real terms, household resources declined by about 15% between 1997 and 1998 and remained depressed through 2000. This unprecedented decline in resources was accompanied by an increase in the fraction of couples using contraceptives both immediately and over the longer term. While the magnitude of this increase is very modest – around 0.5 percentage points – it is significant for the longer time period (and larger sample). For a very small fraction of women, reduced resources resulted in greater efforts to control fertility.

In sum, the evidence from Indonesia is unambiguous. Dramatic declines in household resources and substantial changes in the prices of contraceptives by method and source are accompanied by very small changes in use and method mix. The price and income effects are not only small but also estimated with sufficient precision to rule out substantively important effects of large changes in contraceptives prices on use and method mix.

These results may hide heterogeneous responses across couples to the changes that occurred around the onset of the crisis. For example, couples who were hardest hit by the crisis may have responded differently from other couples. To explore this possibility, the models were re-estimated with interactions for whether the female in the couple reported (in 1998) that over the past 12 months their life had changed in ways that made them better or worse off (relative to experiencing little change). We find no differences in the responsiveness to price changes across these groups.

Responsiveness to price changes in 1998 may depend on expectations about whether changes

around the time of the crisis were temporary or permanent. Fixed effect models were re-estimated with interactions for whether individuals reported (in 1998) that they expected the current bad times to improve significantly within the next 12 months. We find no evidence this group is more or less sensitive to prices relative to those who perceived the changes as more permanent.

More generally, it is possible that price responsiveness is greater among those with fewer resources and those for whom the costs of contraceptive failure are greater. We have explored whether effects of changes in service charges vary with three socio-economic and demographic characteristics of the couples: the age of the woman, her education and household PCE (results not shown). Between 1997 and 1998, there is no evidence of heterogeneity in responsive to price changes across these characteristics. Between 1997 and 2000, only two of the interactions are significant. First, relative to younger women, older women are more responsive to changes in the price of pills as they switch into more permanent methods of limiting fertility. Second, better educated women do not respond at all to changes in the prices of pills whereas less educated women do (coefficient estimate is -0.057, standard error is 0.025). This does not appear to reflect resource constraints as there are no differences in responses to prices across the distribution of household PCE.¹⁵

Conclusions

Previous attempts to estimate the sensitivity of contraceptive prevalence and method mix to changes in the price of contraception have not produced conclusive estimates, largely because of insufficient price variation and the targeting of contraceptive subsidies in ways that bias standard estimation strategies.

Indonesia provides an excellent laboratory in which to pin down the effects of contraceptive price on use of modern methods and on method choice. The economic crisis in the late 1990s induced large, unanticipated changes in both the real and relative prices of contraception. Specifically, the crisis resulted in an immediate rise in the cost of injectable contraceptives relative to oral contraceptives, followed by a substantial increase in the real costs of both contraceptive methods. In the year after the crisis, reallocation of public resources in response to the crisis was limited, suggesting that models that include individual fixed effects yield estimates of the price effect that are unlikely to be contaminated by non-random allocation of family planning resources.

¹⁵ Estimates across the distribution of PCE may be contaminated by the fact that individuals from “pre-prosperous” households were eligible for health cards entitling them to free or subsidized family planning services. This explanation cannot address the lack of significant price effects for the 1997/98 panel, because only 3% of the 1998 households were in possession of a health card, but a higher fraction of households had a health card in 2000. For both panels we interacted an indicator for having a health card with contraceptive prices to examine whether price sensitivity was greater among individuals in households without a card. We found no systematic evidence that it was.

We find little evidence of sensitivity to contraceptive prices with respect either to overall use or to method choice, particularly in the period immediately following the onset of the economic crisis. Contraceptive behaviors are slightly more responsive to prices between 1997 and 2000 although the effects remain small in magnitude. The price effects are estimated with sufficient precision to rule out that the impact of increasing service charges would have a substantial impact on contraceptive use. That said, directions of the effects are largely consistent with *a priori* expectations. Lower availability or higher charges for a particular method results in small declines in use of that method, switches into substitutes and, overall, modest reductions in contraceptive use.

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Table 1: Availability and service charges of pills and injections, by facility type at the community level

| Method | Facility type | A: 1997/1998 Panel | | | B: 1997/2000 Panel | | |
|---|-----------------------|--------------------|----------------|-----------------|--------------------|----------------|----------------|
| | | 1997 [1] | 1998 [2] | Change [3] | 1997 [4] | 2000 [5] | Change [6] |
| <i>Availability (% communities have)</i> | | | | | | | |
| Pill | at a private practice | 100.0 (0.0) | 97.8 (1.6) | -2.2 (1.6) | 98.1 (0.8) | 99.0 (0.6) | 1.0 (1.0) |
| | at a health center | 100.0 (0.0) | 98.9 (1.1) | -1.1 (1.1) | 98.7 (0.6) | 98.1 (0.8) | -0.6 (1.0) |
| | at a health post | 87.8 (3.5) | 87.8 (3.5) | 0.0 (4.2) | 85.0 (2.0) | 68.4 (2.6) | -16.6 (2.9) |
| | any source | 100.0 (0.0) | 100.0 (0.0) | 0.0 (0.0) | 99.4 (0.5) | 99.7 (0.3) | 0.3 (0.6) |
| Injection | at a private practice | 100.0 (0.0) | 100.0 (0.0) | 0.0 (0.0) | 98.7 (0.6) | 99.7 (0.3) | 1.0 (0.7) |
| | at a health center | 97.8 (1.6) | 98.9 (1.1) | 1.1 (1.9) | 98.1 (0.8) | 99.4 (0.5) | 1.3 (0.9) |
| | at a health post | 48.9 (5.3) | 52.2 (5.3) | 3.3 (6.4) | 43.5 (2.8) | 43.8 (2.8) | 0.3 (3.4) |
| | any source | 100.0 (0.0) | 100.0 (0.0) | 0.0 (0.0) | 99.7 (0.3) | 100.0 (0.0) | 0.3 (0.3) |
| <i>Service charge (median at community level)</i> | | | | | | | |
| Pill | at a private practice | 4.58 (0.41) | 3.42 (0.29) | -1.15 (0.38) | 5.25 (0.22) | 5.76 (0.16) | 0.52 (0.20) |
| | at a health center | 1.75 (0.14) | 1.20 (0.10) | -0.54 (0.14) | 1.63 (0.07) | 1.98 (0.08) | 0.35 (0.09) |
| | at a health post | 1.35 (0.15) | 1.40 (0.14) | 0.04 (0.18) | 1.49 (0.09) | 2.26 (0.12) | 0.78 (0.13) |
| | all sources | 2.18 (0.17) | 1.62 (0.10) | -0.57 (0.15) | 2.14 (0.08) | 3.23 (0.10) | 1.09 (0.10) |
| Injection | at a private practice | 4.71 (0.13) | 4.92 (0.11) | 0.21 (0.13) | 4.73 (0.07) | 4.94 (0.05) | 0.20 (0.06) |
| | at a health center | 2.85 (0.15) | 3.60 (0.14) | 0.75 (0.19) | 2.45 (0.09) | 2.88 (0.10) | 0.43 (0.10) |
| | at a health post | 2.50 (0.30) | 3.00 (0.30) | 0.50 (0.27) | 2.75 (0.17) | 3.45 (0.17) | 0.70 (0.21) |
| | all sources | 3.79 (0.12) | 4.31 (0.09) | 0.52 (0.13) | 3.64 (0.07) | 4.36 (0.06) | 0.71 (0.08) |

Notes: There are 90 communities in panel A and 313 communities in panel B. Prices measured in thousands of 1996 Rupiah. (Standard errors in parentheses)

Table 2: Contraceptive use and method choice by women

| | A: 1997/1998 Panel | | | B: 1997/2000 Panel | | |
|---|--------------------|---------------|----------------|--------------------|----------------|----------------|
| | 1997 [1] | 1998 [2] | Change [3] | 1997 [4] | 2000 [5] | Change [6] |
| <i>1. % women using contraceptives</i> | | | | | | |
| Any method | 57.4 (1.3) | 59.0 (1.3) | 1.6 (1.2) | 60.1 (0.7) | 60.0 (0.7) | -0.1 (0.8) |
| <i>1.1 By method</i> | | | | | | |
| Pill | 21.0 (1.1) | 21.5 (1.1) | 0.5 (0.9) | 16.6 (0.6) | 14.9 (0.5) | -1.7 (0.6) |
| Injection | 21.0 (1.1) | 20.1 (1.1) | -0.9 (0.9) | 23.6 (0.6) | 22.1 (0.6) | -1.5 (0.7) |
| Other | 15.5 (1.0) | 17.4 (1.0) | 2.0 (0.7) | 19.9 (0.6) | 23.0 (0.6) | 3.1 (0.5) |
| <i>1.2 By source</i> | | | | | | |
| Private practice | 21.6 (1.1) | 21.9 (1.1) | 0.3 (1.1) | 25.3 (0.7) | 28.9 (0.7) | 3.6 (0.7) |
| Health center | 16.6 (1.0) | 12.0 (0.9) | -4.6 (1.0) | 14.1 (0.5) | 12.4 (0.5) | -1.7 (0.6) |
| Health post | 7.3 (0.7) | 8.2 (0.7) | 0.9 (0.8) | 5.7 (0.3) | 4.4 (0.3) | -1.3 (0.4) |
| Other | 12.6 (0.9) | 11.0 (0.8) | -1.5 (1.0) | 10.3 (0.5) | 13.9 (0.5) | 3.6 (0.6) |
| <i>2. Household resources</i> | | | | | | |
| <i>per capita expenditure</i> (Rp 000 per month) | 115.7 (6.5) | 95.9 (2.8) | -19.8 (5.6) | 133.6 (10.0) | 113.2 (2.1) | -20.4 (9.8) |
| Number of women | 1378 | | | 4462 | | |

Notes: Means (and standard errors).

Table 3: Effects of contraceptive prices and household resources on use of contraceptives and method choice
 Service charges and availability measured at community level

| Covariates | A: 1997/1998 Panel | | | | B: 1997/2000 Panel | | | |
|--|------------------------|-----------------|--------------------|-----------------|------------------------|-----------------|--------------------|-----------------|
| | Use any method? [1] | Pill [2.1] | Injection [2.2] | Other [2.3] | Use any method? [1] | Pill [2.1] | Injection [2.2] | Other [2.3] |
| <i>Community level</i> | | | | | | | | |
| <i>Service charge of method (square root)</i> | | | | | | | | |
| Pill | 0.04 (0.03) | 0.02 (0.03) | -0.01 (0.02) | 0.03 (0.01) | -0.01 (0.02) | -0.02 (0.01) | -0.01 (0.01) | 0.01 (0.01) |
| Injection | 0.03 (0.04) | 0.07 (0.04) | -0.04 (0.02) | -0.01 (0.02) | 0.00 (0.02) | -0.01 (0.02) | -0.03 (0.02) | 0.03 (0.02) |
| <i>[1] if method available</i> | | | | | | | | |
| Pill | | | | | -0.25 (0.37) | -0.30 (0.31) | -0.17 (0.47) | 0.22 (0.24) |
| Injection | | | | | 0.39 (0.29) | 0.29 (0.27) | -0.01 (0.41) | 0.11 (0.19) |
| <i>Household level</i> | | | | | | | | |
| <i>ln(PCE)</i> | -0.03 (0.02) | -0.01 (0.02) | -0.01 (0.02) | -0.02 (0.01) | -0.04 (0.01) | 0.01 (0.01) | -0.03 (0.01) | -0.02 (0.01) |
| <i>Joint test (p value of Xsq test)</i> | | | | | | | | |
| <i>Rejection implies negative own-price or positive cross-price effect for at least one method</i> | | | | | | | | |
| Prices | 0.29 | 0.03 | | | 0.31 | 0.01 | | |
| Availability | | | | | 0.33 | 0.47 | | |
| Prices and availability | | | | | 0.43 | 0.02 | | |
| Observations | 2756 | | | | 8924 | | | |

Notes: Bootstrapped standard errors in parentheses below coefficient estimates take into account clustering of surveys. All models include couple fixed effects along with minimum distance to provider, education and age of male and female respondent, whether male is in household.

Table 4: Effects of contraceptive prices and household resources on use of contraceptives and method choice

Service charges and availability measured by source of contraceptive method

| | | A: 1997/1998 Panel | | | | B: 1997/2000 Panel | | | |
|--|------------------|------------------------|-----------------|--------------------|-----------------|------------------------|-----------------|--------------------|-----------------|
| | | Use any method? [1] | Method choice | | | Use any method? [3] | Method choice | | |
| | | | Pill [2.1] | Injection [2.2] | Other [2.3] | | Pill [4.1] | Injection [4.2] | Other [4.3] |
| <i>Price of method, by source:</i> | | | | | | | | | |
| Pill | Private Practice | -0.02 (0.03) | -0.01 (0.02) | -0.01 (0.02) | 0.00 (0.02) | 0.02 (0.01) | 0.00 (0.01) | -0.01 (0.01) | 0.02 (0.01) |
| | Health Center | 0.03 (0.04) | 0.02 (0.03) | -0.02 (0.02) | 0.03 (0.02) | 0.01 (0.01) | -0.01 (0.01) | 0.03 (0.02) | -0.02 (0.01) |
| | Health Post | 0.045 (0.03) | 0.03 (0.03) | 0.01 (0.02) | 0.01 (0.02) | -0.05 (0.01) | -0.01 (0.01) | -0.03 (0.01) | 0.00 (0.01) |
| Injection | Private Practice | -0.05 (0.10) | -0.01 (0.07) | -0.01 (0.07) | -0.03 (0.06) | -0.07 (0.04) | -0.01 (0.03) | -0.04 (0.04) | -0.02 (0.03) |
| | Health Center | -0.02 (0.03) | 0.01 (0.03) | -0.02 (0.02) | -0.01 (0.02) | 0.01 (0.01) | 0.01 (0.01) | 0.00 (0.01) | 0.00 (0.01) |
| | Health Post | 0.03 (0.05) | -0.02 (0.04) | 0.03 (0.03) | 0.02 (0.03) | 0.02 (0.02) | 0.00 (0.01) | 0.01 (0.01) | 0.02 (0.01) |
| <i>Availability of method, by source:</i> | | | | | | | | | |
| Pill | Private Practice | 0.16 (0.20) | 0.17 (0.16) | 0.02 (0.10) | -0.02 (0.10) | -0.07 (0.08) | -0.02 (0.06) | -0.05 (0.07) | 0.00 (0.08) |
| | Health Center | 0.02 (0.21) | 0.06 (0.17) | -0.06 (0.15) | 0.02 (0.12) | 0.00 (0.05) | 0.02 (0.04) | -0.01 (0.05) | -0.01 (0.04) |
| | Health Post | -0.03 (0.07) | -0.03 (0.06) | 0.03 (0.05) | -0.03 (0.04) | 0.07 (0.02) | 0.04 (0.02) | 0.04 (0.02) | 0.00 (0.02) |
| Injection | Private Practice | | | | | 0.03 (0.12) | -0.07 (0.11) | 0.04 (0.13) | 0.06 (0.16) |
| | Health Center | 0.02 (0.15) | -0.01 (0.12) | 0.06 (0.11) | -0.03 (0.09) | -0.05 (0.06) | 0.01 (0.05) | -0.01 (0.07) | -0.04 (0.05) |
| | Health Post | -0.08 (0.10) | 0.02 (0.09) | -0.07 (0.07) | -0.03 (0.07) | -0.02 (0.03) | 0.00 (0.02) | 0.01 (0.03) | -0.03 (0.02) |
| <i>ln(HH per capita expenditure)</i> | | -0.03 (0.02) | 0.00 (0.02) | 0.00 (0.02) | -0.02 (0.01) | -0.04 (0.01) | 0.01 (0.01) | -0.03 (0.01) | -0.02 (0.01) |
| <i>Joint test effects are <=0 (p value of Xsq test)</i> | | | | | | | | | |
| Prices | | 0.44 | | 0.65 | | 0.00 | | 0.00 | |
| Availability | | 0.64 | | 0.88 | | 0.01 | | 0.04 | |
| Prices and availability | | 0.75 | | 0.86 | | 0.01 | | 0.01 | |
| Sample size | | 2756 | | | | 8924 | | | |

Notes: Bootstrapped standard errors in parentheses below coefficient estimates. Models include couple fixed effects. Other controls are minimum distance to provider, education and age of male and female, whether male is in household.